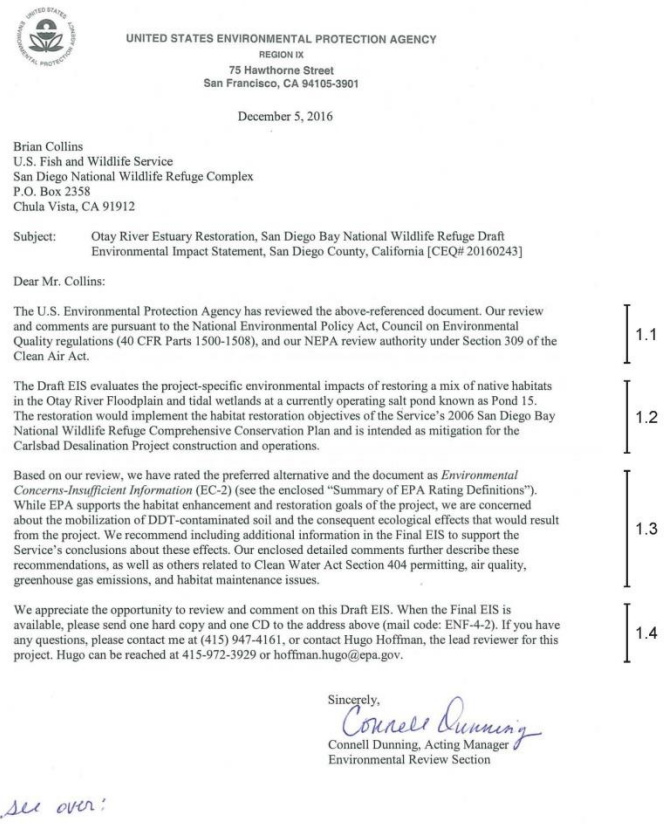
APPENDIX A

Comments on Draft EIS and
Responses to Comments

Comment Letter 1



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

December 5, 2016

Brian Collins
U.S. Fish and Wildlife Service
San Diego National Wildlife Refuge Complex
P.O. Box 2358
Chula Vista, CA 91912

Subject: Otay River Estuary Restoration, San Diego Bay National Wildlife Refuge Draft Environmental Impact Statement, San Diego County, California [CEQ# 20160243]

Dear Mr. Collins:

The U.S. Environmental Protection Agency has reviewed the above-referenced document. Our review and comments are pursuant to the National Environmental Policy Act, Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act. 1.1

The Draft EIS evaluates the project-specific environmental impacts of restoring a mix of native habitats in the Otay River Floodplain and tidal wetlands at a currently operating salt pond known as Pond 15. The restoration would implement the habitat restoration objectives of the Service's 2006 San Diego Bay National Wildlife Refuge Comprehensive Conservation Plan and is intended as mitigation for the Carlsbad Desalination Project construction and operations. 1.2

Based on our review, we have rated the preferred alternative and the document as *Environmental Concerns-Insufficient Information* (EC-2) (see the enclosed "Summary of EPA Rating Definitions"). While EPA supports the habitat enhancement and restoration goals of the project, we are concerned about the mobilization of DDT-contaminated soil and the consequent ecological effects that would result from the project. We recommend including additional information in the Final EIS to support the Service's conclusions about these effects. Our enclosed detailed comments further describe these recommendations, as well as others related to Clean Water Act Section 404 permitting, air quality, greenhouse gas emissions, and habitat maintenance issues. 1.3

We appreciate the opportunity to review and comment on this Draft EIS. When the Final EIS is available, please send one hard copy and one CD to the address above (mail code: ENF-4-2). If you have any questions, please contact me at (415) 947-4161, or contact Hugo Hoffman, the lead reviewer for this project. Hugo can be reached at 415-972-3929 or hoffman.hugo@epa.gov. 1.4

Sincerely,
Connell Dunning
Connell Dunning, Acting Manager
Environmental Review Section

See over!

Response to Comment Letter 1

U.S. Environmental Protection Agency
Connell Dunning, Acting Manager
December 5, 2016

1.1 The U.S. Fish and Wildlife Service (Service) appreciates the U.S. Environmental Protection Agency's (EPA) detailed review of the Draft Environmental Impact Statement (EIS).

1.2 This comment does not challenge the adequacy of the EIS or dispute the content disclosed in the EIS. No response is required.

1.3 The comment regarding the EPA's rating of EC-2 is noted. The analyses and conclusions addressing the potential effects of mobilization of DDT-contaminated soils on downstream resources that were presented in the Draft EIS and described in greater detail in Appendix I of the Draft EIS were the subject of peer review at the request of the California Coastal Commission (CCC). Both peer reviewers found the modeling approaches and methodologies used in the analyses to be appropriate with some comments regarding assumptions and uncertainties. For more information related to this topic, see Responses 2.5–2.23.

1.4 A hard copy of the Final EIS and one CD containing an electronic version of the document will be forwarded to the EPA upon completion.

Enclosure(s): (1) Summary of EPA Rating Definitions
(2) EPA's Detailed Comments

cc: Michelle Lynch, U.S. Army Corps of Engineers
Kate Huckelbridge, California Coastal Commission
Lisa Honma, San Diego Regional Water Quality Control Board

2

SUMMARY OF EPA RATING DEFINITIONS*

This rating system was developed as a means to summarize the U.S. Environmental Protection Agency's (EPA) level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the Environmental Impact Statement (EIS).

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

ADEQUACY OF THE IMPACT STATEMENT

"Category 1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

"Category 2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analysed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

"Category 3" (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in the draft EIS, which should be analysed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640, Policy and Procedures for the Review of Federal Actions Impacting the Environment

U.S. EPA DETAILED COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE OTAY RIVER ESTUARY RESTORATION, SAN DIEGO BAY NATIONAL WILDLIFE REFUGE, SAN DIEGO COUNTY, CALIFORNIA, DECEMBER 5, 2016

Contaminants

EPA notes that, according to the Draft EIS and Appendix F, "Sampling and Analysis Reports," high levels of DDT and other contaminants were discovered in soils within the Otay River Floodplain east of Nestor Creek. Although the Fish and Wildlife Service (Service) is not proposing to excavate or directly disturb these soils, the Draft EIS explains that changes in hydrology resulting from the project would increase flood scour and erosion of contaminated soils thereby increasing DDT levels in the surrounding environment. 1.5

Mitigation Measures to Reduce Contaminant Mobilization

EPA strongly suggests that additional mitigation measures be considered for the purpose of minimizing mobilization of contaminated soils from the Otay River Floodplain. In Appendix I to the Draft EIS, "DDT Analysis," it is explained that flood events are expected to erode and scour contaminated soils, depositing them as sediments throughout portions of the San Diego Bay. In many sample locations, the DDT concentrations significantly exceed the National Oceanic and Atmospheric Administration (NOAA) sediment screening level[1] for which a high probability of toxicity from exposure is expected. The Service's analysis concludes that, although both of the action alternatives would mobilize more DDT-contaminated soils as compared with the "no action" alternative, the ultimate sediment concentrations and the thickness of deposited sediments layers will not result in significant impacts. However, the Draft EIS does not identify specific measures to reduce erosion and scour of DDT-contaminated soils. 1.6

Mitigation measures to minimize erosion are identified for the purposes of compliance with the required site-specific Stormwater Pollution Prevention Plan (SWPPP) for construction activities and to reduce erosion from "clean" stockpiles. SWPPP measures are required for areas disturbed by construction and expected to end at the completion of construction. Vegetation of stockpiles, and other measures to address erosion of this uncontaminated soil, will also end upon removal of the stockpiles. 1.7

The Service should adopt a monitoring and mitigation plan to address uncertainties about the effects of increased DDT in the surrounding environment resulting from the project and to ensure that impacts do not exceed those expected from analyses in the Draft EIS and supporting appendices. An adaptive management approach may be appropriate. Conclusions in the Draft EIS about less than significant effects from DDT derive from information presented in Appendix F, "Sampling and Analysis Reports," and Appendix I, "DDT Analysis." These analyses are supported by chemical and soil samples, hydrodynamic modelling, calculations of erodibility, and assumptions for average characteristics and behavior of organisms. 1.8

For Alternatives B and C, analyses conclude that the highest depth-proportional exposure to DDT expected for benthic organisms is between 7.1 and 7.9 micrograms per kilogram (µg/kg) dry-bulk concentration. This is slightly higher than NOAA's Effects Range-Low (ERL) quick screening levels[1] for DDT (1 µg/kg) and for total DDT+DDE+DDD (1.58 µg/kg). Additional analyses in the DDT Analysis include an assessment of ecological risk to birds, including the federally endangered light-footed Ridgeway's rail. The Draft EIS concludes that impacts to benthic organisms would be limited and 1.9

[1] NOAA's Screening Quick Reference Tables (SQuiRTs) are available at http://response.restoration.noaa.gov/environmental-restoration/environmental-assessment-tools/squirt-cards-faq.html

1

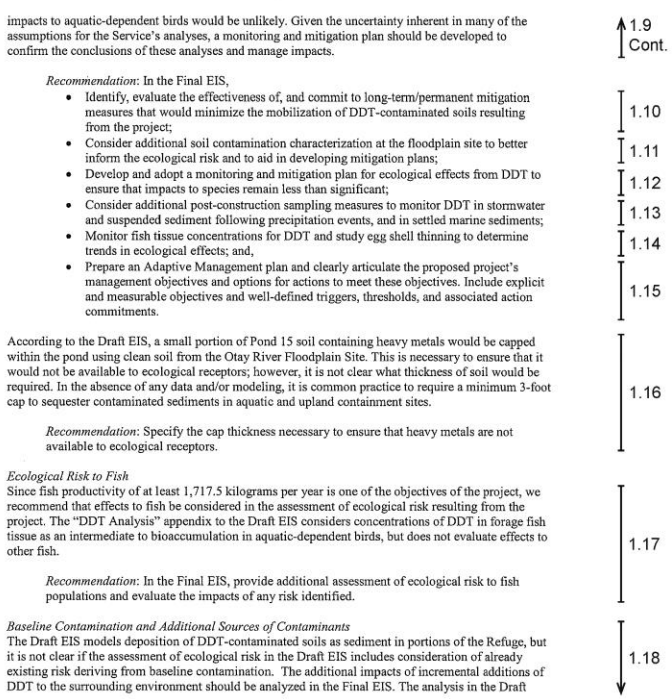
1.5 According to the Otay River Estuary Restoration Project Fluvial Analysis Study (Everest 2016), which was provided as Appendix H of the Draft EIS, under existing conditions the maximum flood velocities associated with the 100-year flood within the Otay River floodplain west of the I-5 bridge would erode the entire area of contaminated soils present east of Nestor Creek. Under the Intertidal Alternative and Subtidal Alternative for the Otay River floodplain, the maximum flood velocities associated with the 100-year flood in the area east of Nestor Creek would be higher than those predicted under existing conditions and would also erode the entire area of contaminated soils present east of Nestor Creek. The project design has since been revised, as described in the Final EIS and analyzed in an updated Fluvial Analysis Study (Everest 2017 [Appendix H of the Final EIS]), to use the material previously proposed for placement in temporary stockpiles as a permanent 1.0- to 1.5-foot thick cover over the existing ground where high concentrations of DDTs were identified. This exposure reduction cover (ERC) would be placed over approximately 23.4 acres to the east of the proposed Otay River Floodplain Site and vegetated with appropriate native vegetation. Section 2.3.2.2 and Figure 2-1a of the Final EIS have been revised accordingly.

		As presented in Appendix H of the Final EIS, flood modeling that includes the ERC indicates the flood velocities would be lower in the ERC area and that the proposed alternatives with the incorporation of the ERC area have the potential to slightly decrease erosion in the area east of Nestor Creek during the 100-year flood event. The cover would therefore further minimize the potential risk for the contaminated soils to be distributed by flood flows during extreme storm events. With slower velocities and the presence of additional uncontaminated soil overlying the contaminated soils, the likelihood is decreased that the underlying soil and its associated contaminants would be redistributed and therefore is not likely to have a measurable effect on the prey base for aquatic-dependent species and impacts on aquatic-dependent birds as a result from the anticipated deposition of DDT-contaminated sediments following a 100-year flood event.
	1.6	Although no significant adverse effects to downstream resources from the deposition of DDT-contaminated sediments following a 100-year flood event are anticipated (refer to Appendices H and I in the Final EIS), as stated above, the scope of the selected alternative has been revised to include an ERC for the upland floodplain area east of the Nestor Creek. Once all the material has been properly compacted, the ERC will be revegetated with an appropriate mix of local

native scrub species. The added clean soil cover, along with the establishment of native vegetation on this site, will further reduce the potential for mobilization of DDT-contaminated soils (refer to revised Appendix H and Appendix I in the Final EIS for additional information).

1.7 The mitigation measure related to the preparation and implementation of a project-specific stormwater pollution prevention plan (SWPPP) is just one of a number of measures that would be taken to minimize impacts related to erosion and water quality. Other measures that have been incorporated into the scope of the project include properly compacting all manufactured fill slopes, maintaining slope gradients at 3:1 or flatter, and, planting and/or seeding all slopes located outside of the hypersaline salt pond system to establish appropriate native vegetation. Best management practices would be implemented at all times during the construction period, and disturbed areas will be revegetated at the completion of the project. These measures are addressed in the Final EIS in various sections, including Section 4.2.2.1 and 4.2.5. Also note that the Final EIS has been revised to eliminate the proposed stockpiles and instead use the excess material to cover contaminated soils east of Nestor Creek, as described in Response 1.6.

	1.8	The analysis provided in Appendix I of the Draft EIS support the conclusion that the project will have a less than significant effect on the environment with respect to DDT. To address any remaining uncertainties, the project scope has been revised to eliminate the stockpiling of excavated material for future use, and instead, the excess material will be used to cover the contaminated area east of Nestor Creek, as described in Responses 1.5 and 1.6. Appendix H has been revised in the Final EIS to include analysis of the change in the erosional effects of a significant flood event to the contaminated site once it is topped with clean soil and vegetated with native vegetation, as described in Section 2.3.2.2 of the Final EIS. The project also proposes to monitor the physical changes of this covered area following a significant flood event to determine if any DDT-contaminated soil has been exposed or eroded away. If erosion of the DDT-contaminated soils is identified, sampling will be initiated to determine if unacceptable levels of DDT are present in exposed soils or within the restored portion of the floodplain. If necessary, appropriate remedial measures to address DDT contamination would be identified and implemented.
	1.9	Monitoring and analyses to reduce uncertainty and confirm assumptions related to the potential for adverse effects to benthic invertebrates are always welcome. However, while tracking DDT



impacts to aquatic-dependent birds would be unlikely. Given the uncertainty inherent in many of the assumptions for the Service's analyses, a monitoring and mitigation plan should be developed to confirm the conclusions of these analyses and manage impacts. 1.9 Cont.

Recommendation: In the Final EIS,

- Identify, evaluate the effectiveness of, and commit to long-term/permanent mitigation measures that would minimize the mobilization of DDT-contaminated soils resulting from the project; 1.10
- Consider additional soil contamination characterization at the floodplain site to better inform the ecological risk and to aid in developing mitigation plans; 1.11
- Develop and adopt a monitoring and mitigation plan for ecological effects from DDT to ensure that impacts to species remain less than significant; 1.12
- Consider additional post-construction sampling measures to monitor DDT in stormwater and suspended sediment following precipitation events, and in settled marine sediments; 1.13
- Monitor fish tissue concentrations for DDT and study egg shell thinning to determine trends in ecological effects; and, 1.14
- Prepare an Adaptive Management plan and clearly articulate the proposed project's management objectives and options for actions to meet these objectives. Include explicit and measurable objectives and well-defined triggers, thresholds, and associated action commitments. 1.15

According to the Draft EIS, a small portion of Pond 15 soil containing heavy metals would be capped within the pond using clean soil from the Otay River Floodplain Site. This is necessary to ensure that it would not be available to ecological receptors; however, it is not clear what thickness of soil would be required. In the absence of any data and/or modeling, it is common practice to require a minimum 3-foot cap to sequester contaminated sediments in aquatic and upland containment sites. 1.16

Recommendation: Specify the cap thickness necessary to ensure that heavy metals are not available to ecological receptors.

Ecological Risk to Fish

Since fish productivity of at least 1,717.5 kilograms per year is one of the objectives of the project, we recommend that effects to fish be considered in the assessment of ecological risk resulting from the project. The "DDT Analysis" appendix to the Draft EIS considers concentrations of DDT in forage fish tissue as an intermediate to bioaccumulation in aquatic-dependent birds, but does not evaluate effects to other fish. 1.17

Recommendation: In the Final EIS, provide additional assessment of ecological risk to fish populations and evaluate the impacts of any risk identified.

Baseline Contamination and Additional Sources of Contaminants

The Draft EIS models deposition of DDT-contaminated soils as sediment in portions of the Refuge, but it is not clear if the assessment of ecological risk in the Draft EIS includes consideration of already existing risk deriving from baseline contamination. The additional impacts of incremental additions of DDT to the surrounding environment should be analyzed in the Final EIS. The analysis in the Draft 1.18

2

concentrations in sediment and aquatic biota may be achievable; detecting effects associated with these changes may be very difficult at any trophic level. As a note, the p,p-DDT[1] concentrations on floodplain soils are ~1/5 that of total DDT concentrations. If that ratio applies to sediments, the DDT concentrations would be ~1.5 ng/g dry weight (dw), which is greater than the Effects Range-Low (ER-L) for p,p-DDT (1.0 ng/g dw) but less than the Effects Range-Median (ER-M; 7 ng/g dw). Similarly, estimated total DDT concentrations are greater than the corresponding ER-L but less than the ER-M. Long et al. (1995), who developed the ER-Ls and ER-Ms, define the range between the ER-L and ER-M as a range within which effects would occasionally occur. Long et al. (1995) point out that DDT concentrations greater than the ER-M are still a poor predictor of toxicity (i.e., toxicity is not observed when expected). Given that the predicted concentrations are below ER-Ms and that ER-Ms are poor predictors of DDT-related toxicity, detecting a change in the benthic community due to the flood-mobilized DDT, rather than other contaminants and/or other flood-related conditions, may not be achievable.

[1] DDT is generally referred to as p,p'-DDT, which was produced for its insecticidal properties. However, the grade of DDT that was generally used in insecticides included up to 14 chemical compounds; only 65%–80% of the product consisted of the active ingredient, p,p'-DDT (https://www.atsdr.cdc.gov/toxprofiles/tp35-c4.pdf).

	Risks to aquatic dependent birds were evaluated for post-flood conditions using a mix of average and conservative assumptions and, as such, conclusions are considered to be protective without being unrealistic. Successful monitoring of birds for changes in actual exposure or effects following a flood may be difficult, given the sampling demands that may be required (e.g., see Response 1.14). For birds, obtaining enough samples to detect DDT-specific effects is logistically difficult, disruptive, and may be constrained by permit requirements. We would not want monitoring to result in adverse effects in addition to any that may occur as a result of flood-related changes to existing habitats associated with a flood of this magnitude. In conclusion, post-flood monitoring to reduce uncertainty would be limited based on the feasibility of conducing chemical analysis of sediments and possibly biota, depending on actual conditions following such an event, with the results being compared to the modeled outcomes. Further, given the proposal to cover the DDT-contaminated soils present to the east of the restoration site with clean fill, as described in Responses 1.5, 1.6, and 1.8, the less than significant adverse effects to the adjacent restoration site described in Appendix I of the Draft EIS would be

	further reduced as would the potential effects associated with any uncertainty.
	1.10 Our proposal to place soils excavated from the Otay River floodplain over contaminated soils east of Nestor Creek, along with successfully establishing native vegetation over the area of DDT-contaminated soils, as addressed in Responses 1.5 and 1.6, has been incorporated into the scope of the project. This action further reduces the potential for adverse effects to downstream resources in the event of a major flood event. No significant adverse effects are anticipated; however, monitoring of the area in the event of a significant storm event is proposed, as described in Response 1.8.
	1.11 No additional sampling has been identified as being warranted for the purpose of evaluating the potential effects of the selected alternative on the environment. Soil and sediment characterization sampling and analysis were completed for the Otay River Floodplain Site and the Pond 15 Site in March 2013 and April 2013, respectively. This pre-project sampling was deemed reasonably representative of the site conditions for project planning purposes and provided adequate data for our determination that organochlorine pesticides (DDTs in particular) were the only significant project-related contaminants of concern (see also Response 1.19). These data also

		supported modeling of changes in sediment deposition with flood events and subsequent exposures of aquatic-dependent wildlife. While some additional data may result in refinements of the modeling and risk analysis, we did not anticipate, based on the original sampling coverage, that the likely incremental benefit would be meaningful. Given the organisms of concern would be free to move across the receiving areas, the initial sample spacing was adequate and appropriate for our purposes. No additional testing of this soil is proposed at this time. In addition, the Sampling Analysis Reports for both the Otay River Floodplain Site and the Pond 15 Site (Anchor 2017a, 2017b) were recently reviewed by representatives of the EPA and U.S. Army Corps of Engineers (ACOE). The review resulted in no requests for additional soil or sediment characterization or analysis.
	1.12	It may be possible to monitor for exposure, but monitoring for ecological effects would be difficult to execute and dependent upon what species take up residence in the created habitat. First, a large number of samples would be needed to be able to statistically detect changes in effects that are (given the concentrations present) likely to be subtle, not readily separated from effects of other flood-related changes, and may reflect some exposure to DDT from outside south San Diego Bay (e.g., by consuming fish from

	outside the Bay or that migrated in for part of the year). In addition, project-related changes in DDT inputs would need to be distinguished from natural variation in tissue concentrations and/or manifestation of effects that may occur among individuals or over time (e.g., year-to-year fluctuations in diet composition), again supporting the need for large sample numbers. Sampling for DDT and its effects will entail some level of disturbance (depending on the number and types of samples needed), it is destructive, and it would require permits that may limit the number of samples that can be collected. Finally, sampling can be logistically difficult in that appropriate samples for the species of concern have to be available and accessible in adequate numbers, which means the species being evaluated must tolerate disturbance (a major concern during nesting season when samples for DDT monitoring are typically collected) and handling (e.g., for blood samples). Overall, monitoring birds for changes in exposure (DDT concentration in eggs or blood) or effects (eggshell thinning) following a flood may be desirable, but to be meaningful, it may require more samples than are obtainable in these circumstances. Also refer to Responses 1.8 and 1.9. **1.13** Refer to Response 1.8. **1.14** As indicated above (see Response 1.12), additional sampling would need to be conducted such that

	meaningful conclusions can be drawn from it. Fish tissue analysis could be a component of such sampling, but it would need to be carried out in a manner that provides sufficient numbers of the right kind of species for meaningful results. The availability of fish for such sampling cannot be determined at this time. Measuring eggshell thickness can also be conducted, provided eggshell material becomes available without requiring damaging entry into the habitat. Viable eggs will not be collected as part of any monitoring efforts.
	1.15 A monitoring and adaptive management plan will be prepared by the California Coastal Commission's (CCC) Science Advisory Panel as part of the Coastal Development Permit (CDP) process.
	1.16 The actual statement in the Draft EIS is "contaminant concentrations on the Pond 15 Site are not at levels that would adversely affect habitat quality in the restored pond or the adjacent Bay environment. . . . Nevertheless, under Alternative B, the total estimated volume of contaminated material (less than 5,000 cubic yards) would be buried in the Pond 15 Site during construction." As described in Responses 2.26–2.28, the concentrations of contaminants found in the sediments in Pond 15 do not pose a risk to aquatic biota or wildlife. The fact that raising the elevations in Pond 15 to achieve the desired wetland elevations

		would also bury contaminated sediments provides a net benefit but does not represent required mitigation.
	1.17	Sediment thresholds for fish are higher than those for avian species, and therefore, decisions based on risks to birds will be protective of fish as well. Nonetheless, we have conducted an analysis of risk to fish using a literature based Critical Body Residue (CBR), combined with fish tissue/sediment ratios to estimate fish risk-based targets for DDT in sediment (see Response 1.21 for references). CBRs are total DDT or p,p'-DDE[2] concentrations in fish whole bodies that were associated with adverse effects. The CBRs recommended in the review by Beckvar and Lotufo (2011) were adopted for this analysis. Beckvar and Lotufo (2011) present ranges of effect levels for survival in juveniles and adults (0.29–113 mg/kg ww; median 2.38; N=6), survival in early life stages (0.89–24 mg/kg ww; median 1.27; N=9), and endocrine disruption in adults (0.38–0.59 mg/kg ww; N=2). We considered both the minimums and the means of the CBRs for effects in early life stage to adult fish. Insufficient data were available to calculate target sediment concentrations for fish eggs. Target concentrations in sediment were computed

[2] P,p'-DDE is an organochlorine pesticide; the ethylene metabolite of DDT. 1,1-Dichloro-2,2-bis(p-chlorophenyl) ethylene (DDE) is a breakdown product of DDT, which was used in the past as an insecticide (https://pubchem.ncbi.nlm.nih.gov/compound/p_p_-DDE).

from CBRs using biota/sediment ratios. Estimates of ratios are based on overall geometric mean values to facilitate the analysis. Ratios of DDT concentrations in fish whole bodies (µg/kg ww) to DDT concentrations in sediment (µg/kg ww) were developed for longjaw mudsucker and California killifish from data collected by the Service at the F&G Street Marsh (part of the San Diego Bay National Wildlife Refuge [San Diego Bay NWR]), and these ratios range from 31 to 39 with a geometric mean of 35. The ratio was computed using DDT levels measured in surface sediments extending from 0 to 17 cm deep (on average), which is the depth to which many benthic biota are expected to inhabit. The data for F&G Street Marsh biota and sediments are publically available in Zeeman et al. (2008a). For this analysis, the fish tissue/sediment ratio for DDT is assumed to be 35 (ww/ww based). A larger data set for south San Diego Bay (collected by the Service in 2007; report in preparation) provided a mean ratio for these species of 27; therefore, the use of 35 is considered to be conservative.

Sediment threshold levels as $\mu g_{DDT}/kg_{sediment}$ dry weight (dw) were calculated by first estimating the wet weight (ww) based concentration and then converting that to a dry weight-based concentration as follows: target wet weight assessment level in sediment (µg/kg ww) = CBR ÷ biota/sediment ratio, dry weight assessment level in sediment = ww assessment level ÷

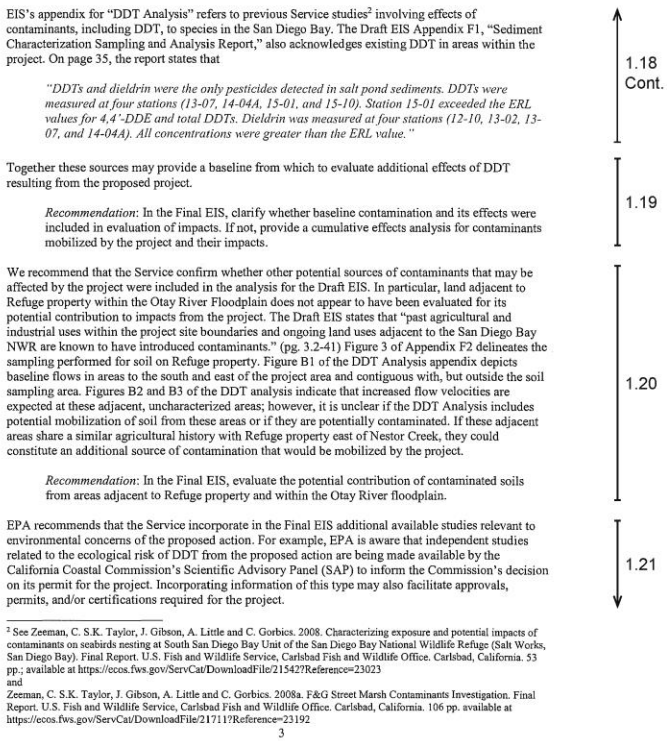
$kg_{solids}/kg_{sediment}$ where $kg_{solids}/kg_{sediment}$ = 0.54 (from publicly available data in Stransky et al 2016), and biota/sediment ratio is 35 (see above).

Potential fish risk-based sediment assessment levels for DDT are provided below:

Effect	Sediment assessment levels		
	CBR-Min (µg/kg ww)	*CBR-Med (µg/kg ww)*	*(µg/kg dw) (min/median)*
Survival juveniles and adults	290	2,380	15/126
Survival early life stages	890	1,270	46/67
Sublethal effects in adults	380	No median	20

In comparison with the estimated sediment concentrations provided for the top 20 mm sediment horizon from the modeling effort, the only outputs that exceeded any of these concentrations were those provided for the 2- and 3-foot erosion depths in the 100-year flood event and the 1-foot erosion depth for the 50-year event and, in each case, only for the initial post-flood depositions. As indicated above, our consideration of the depth of sediments affecting fish is up to 17 cm (170 mm), and consideration of 40- and 80-mm sediment horizons in the sensitivity analysis yielded no initial or final concentrations that exceeded any of the values provided above. Because fish are

		expected to be lost in a flood of this magnitude or to vacate the area during such a flood event, fish are not likely to be adversely affected by the anticipated concentrations during that initial post-flood depositional period (a majority of the settling is anticipated to occur within the first 3 months) or at any time once the material has settled fully.
	1.18	DDT concentrations already present on the project site were factored into estimates of post-flood DDT concentrations. There is only one data point for DDT concentrations in soils from the area to be restored to salt marsh, and that is 0.50 µg/kg dw (Anchor 2013). We assumed a higher concentration of 1.6 µg/kg dw based on concentrations measured in sediments from 49 stations in south San Diego Bay. Results of sampling and analyses conducted in 2013 are reported by Bay et al. (2016). The study used a stratified random sampling design for selecting stations (N=22). We also have data on concentrations of contaminants in sediments and biota collected in 2007 for a Service-funded mudflats study (Zeeman et al. in progress). A biased sampling approach was used to select sample stations (N=27) to maximize the likelihood of detecting any contaminants that were present. A number of drainages, including Otay River, were targeted as potential sources of contaminants in south San Diego Bay mudflats. Those 2007 data on DDT were used in combination with data from Bay et al.



EIS's appendix for "DDT Analysis" refers to previous Service studies[2] involving effects of contaminants, including DDT, to species in the San Diego Bay. The Draft EIS Appendix F1, "Sediment Characterization Sampling and Analysis Report," also acknowledges existing DDT in areas within the project. On page 35, the report states that

> *"DDTs and dieldrin were the only pesticides detected in salt pond sediments. DDTs were measured at four stations (13-07, 14-04A, 15-01, and 15-10). Station 15-01 exceeded the ERL values for 4,4'-DDE and total DDTs. Dieldrin was measured at four stations (12-10, 13-02, 13-07, and 14-04A). All concentrations were greater than the ERL value."*

1.18 Cont.

Together these sources may provide a baseline from which to evaluate additional effects of DDT resulting from the proposed project.

> *Recommendation*: In the Final EIS, clarify whether baseline contamination and its effects were included in evaluation of impacts. If not, provide a cumulative effects analysis for contaminants mobilized by the project and their impacts.

1.19

We recommend that the Service confirm whether other potential sources of contaminants that may be affected by the project were included in the analysis for the Draft EIS. In particular, land adjacent to Refuge property within the Otay River Floodplain does not appear to have been evaluated for its potential contribution to impacts from the project. The Draft EIS states that "past agricultural and industrial uses within the project site boundaries and ongoing land uses adjacent to the San Diego Bay NWR are known to have introduced contaminants." (pg. 3.2-41) Figure 3 of Appendix F2 delineates the sampling performed for soil on Refuge property. Figure B1 of the DDT Analysis appendix depicts baseline flows in areas to the south and east of the project area and contiguous with, but outside the soil sampling area. Figures B2 and B3 of the DDT analysis indicate that increased flow velocities are expected at these adjacent, uncharacterized areas; however, it is unclear if the DDT Analysis includes potential mobilization of soil from these areas or if they are potentially contaminated. If these adjacent areas share a similar agricultural history with Refuge property east of Nestor Creek, they could constitute an additional source of contamination that would be mobilized by the project.

> *Recommendation*: In the Final EIS, evaluate the potential contribution of contaminated soils from areas adjacent to Refuge property and within the Otay River floodplain.

1.20

EPA recommends that the Service incorporate in the Final EIS additional available studies relevant to environmental concerns of the proposed action. For example, EPA is aware that independent studies related to the ecological risk of DDT from the proposed action are being made available by the California Coastal Commission's Scientific Advisory Panel (SAP) to inform the Commission's decision on its permit for the project. Incorporating information of this type may also facilitate approvals, permits, and/or certifications required for the project.

1.21

[2] See Zeeman, C. S.K. Taylor, J. Gibson, A. Little and C. Gorbics. 2008. Characterizing exposure and potential impacts of contaminants on seabirds nesting at South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge (Salt Works, San Diego Bay). Final Report. U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office. Carlsbad, California. 53 pp.; available at https://ecos.fws.gov/ServCat/DownloadFile/21542?Reference=23023
and
Zeeman, C. S.K. Taylor, J. Gibson, A. Little and C. Gorbics. 2008a. F&G Street Marsh Contaminants Investigation. Final Report. U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office. Carlsbad, California. 106 pp. available at https://ecos.fws.gov/ServCat/DownloadFile/21711?Reference=23192

3

(2016) to obtain estimates of existing levels of DDT in Bay sediments across the southern part of the Bay. Between the two studies, DDT concentrations range from <0.05 µg/kg dw to 23 µg/kg dw. DDT was detected in 6 of the randomly sampled stations (Bay et al. 2016) and in 26 of the targeted stations (Zeeman et al. in progress). The geometric mean concentration for DDT in all south San Diego Bay sediment samples is 0.68 µg/kg dw and includes a value equal to half the detection limit for undetected isomers. The geometric mean of detected values only is approximately 1.6 µg/kg dw. This approach captures existing risk posed by DDTs present on the project site. See Response 1.21 for references.

Given the current low DDT concentrations combined with the anticipated low concentrations associated with post-flood final depositions, we do not expect cumulative impacts to fish in south San Diego Bay. For more on birds, refer to Response 2.17.

1.19 The cumulative risk associated with DDT was addressed in the Appendix I for sediments in the restored marsh by factoring an assumed existing DDT concentration of 1.6 µg/kg dw into estimates of post-flood DDT concentrations in sediments extending to depths of 20, 40, and 80 mm (3 inches). This was based on sediment concentrations measured in San Diego Bay in the studies described in Response 1.18.

	The potential for contributions of contaminants other than DDT to risk is acknowledged but was not quantified. The assessment is focused on DDT because concentrations are high enough to affect soil management decisions outright, as well as to be a driver for risk-based reasons such as persistence and potential for uptake, accumulation, and biomagnification in food web organisms ultimately consumed by wildlife species. The risk-based component is already evident in south San Diego Bay where DDT is detected in every medium that has been sampled. Anchor (2013) analyzed soils from the project site for multiple types of contaminants, most of which were below limits of detection. Unlike most other target analytes, DDT was detected at noticeably high concentrations in floodplain soils east of Nestor Creek. DDT is a known contaminant of concern in neighboring aquatic habitat (south San Diego Bay), where it is detected in sediments, and at increasingly higher levels in benthic invertebrates, forage fish, and ultimately eggs of seabirds that nest in colonies around San Diego Bay (Zeeman et al. 2008a, 2008b). The only other contaminant detected at what appear to be elevated levels in floodplain soils is toxaphene. As summarized by ATSDR (2014), toxaphene is a complex mixture of chlorinated camphenes and related terpenes, and as such, its fate and effects can be case-specific, and

	actual concentrations are difficult to quantify. It has a strong affinity for soils that may limit potential for uptake through ingestion of soil. Toxaphene in water may enter and accumulate in tissues of food web organisms but not to the same extent as DDT. Toxaphene has not been considered a contaminant of potential concern in studies of San Diego Bay because, if present at all, concentrations have always been below limits of detection in sediments, benthic invertebrates, forage fish and eggs of seabirds that nest in colonies at south San Diego Bay (Zeeman et al. 2008a, 2008b; in progress mudflats study). Absent the data needed to characterize uptake of sediment-borne toxaphene by biota (i.e., biota/sediment ratios), we are unable to quantify potential risks associated with toxaphene that is mobilized into sediment. Given the purpose of this assessment, the limited contaminants detected in potentially eroded soils, and available information on fate and effects of contaminants of potential concern, we focused on DDT as the contaminant of primary concern. The occurrence of toxaphene is acknowledged but associated risks are not readily quantified with the data and references available. It should also be noted that the material on the Otay River floodplain would be mobilized to south San Diego Bay in a 100-year flood event with or without the project. Although not presented in Appendix I to the Draft EIS, the depositional thickness of material

	modeled for south San Diego Bay was on the order of 1/10th that which was provided by the model for the restored marsh. As such, risks in receiving areas in south San Diego Bay are not anticipated to be significant. Refer also to Responses 1.8 and 1.9.
	1.20 The DDT analysis addressed in the Final EIS does not include a discussion of DDT sources in other areas of the watershed outside of the project boundary (e.g., adjacent areas) because, based on information from the San Diego Regional Water Quality Control Board (San Diego RWQCB), there are no other known sources of DDT within the watershed. The San Diego RWQCB Final California 2010 Integrated Report (303[d] List/305[b] Report) supporting information indicates that DDT is not a contaminant of concern with regards to 303(d) listing. Poggi Canyon Creek (tributary to the Otay River) was on the 303(d) list for DDT, but a review from the San Diego RWQCB found that this was due to an error in the number of reported exceedances at the time of the listing. Consequently, the San Diego RWQCB removed Poggi Canyon Creek from the 303(d) list for DDT impairment. Since no other known sources of DDT are present within the watershed, no additional analyses of DDT sources outside of the project site were considered in the analysis, and no changes to this discussion for Draft to Final EIS are warranted.

1.21 The peer review conducted by Dr. Keith Stolzenbach and Dr. Steve Schwarzbach for the contaminants analysis presented in the Draft EIS is available as Attachment A to the Response to Comments.

The following additional references were considered in conducting the DDT risk assessment for this project:

Agency for Toxic Substances and Disease Registry. 2014. *Toxicological Profile for Toxaphene.* ATSDR, U.S. Public Health Service, Atlanta, Georgia. 291 pp.

Bay, S.M., D.J. Greenstein, A.N. Parks and C.Q.T. Zeeman. 2016. *An assessment of bioaccumulation in San Diego Bay*. Southern California Coastal Water Research Project (SCCWRP) Technical Report 953. SCCWRP, Costa Mesa California.

Beckvar, N. and G.R. Lotufo. 2011. "DDT and Other Organohalogen Pesticides in Aquatic Organisms." In *Second Edition, Environmental Contaminants in Biota, Interpreting Tissue Concentrations.* W. N. Beyer and J.P. Meador, eds. CRC Press, Boca Raton, Florida. pp. 47–101.

California Department of Toxic Substances

Control Human and Ecological Risk Division (DTSC/HERD). 2000. *HERD Ecological Risk Assessment (ERA) Note Number 4*. California Department of Toxic Substances Control, Sacramento California. https://www.dtsc.ca.gov/AssessingRisk/upload/econote4.pdf.

California Department of Toxic Substances Control Human and Ecological Risk Division (DTSC/HERD). 2009. U. S. Navy and U. S. Environmental Protection Agency, Region 9 Biological Technical Assistance Group (Navy/BTAG) Toxicity Reference Values (TRVs) for Ecological Risk Assessment. February 24, 2009 update. https://www.dtsc.ca.gov/AssessingRisk/eco.cfm.

Dunning, J.B. Jr. 1984. *Body Weights of 686 Species of North American Birds*. Western Bird Banding Association Monograph No. 1. 1–38.

Stransky, C., K. Tait, C. Sheredy, R. Schottle, R. Kolb and B. Bernstein. 2016. *Aquatic Food Web Bioaccumulation Study of San Diego Bay, Final Report*. Amec Foster Wheeler Environment and Infrastructure Inc. San Diego California. Appendix B

(Chemistry Summary Tables). http://www.waterboards.ca.gov/sandiego/water_issues/programs/sdbay_strategy/index.shtml.

U.S. Environmental Protection Agency (EPA). 2007. *Ecological Soil Screening Levels for DDT and Metabolites.* OSWER Directive 9285.7-57. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. Washington, D.C.

U.S. Fish and Wildlife Service. 2003. *Evaluation of the Clean Water Act Section 304(a) Human Health Criterion for Methylmercury: Protectiveness for Threatened and Endangered Wildlife in California*. U.S. Fish and Wildlife Service, Sacramento, California.

Zeeman, C.Q.T. 2004. *Ecological Risk-Based Screening Levels for Contaminants in Sediments of San Diego Bay, Technical Memorandum CFWO-EC-TM-04-01*. U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office, Carlsbad, California.

Recommendation: For the Final EIS, gather and evaluate information relevant to the environmental impacts of the proposed action that has become available since publishing the Draft EIS. Evaluate whether this information affects the final decision regarding the proposed action, or need for additional protective measures. 1.21 Cont.

Additional Resources
The Service may wish to consider EPA's Ecological Soil Screening Levels (Eco-SSLs) in future planning for Otay River Floodplain site east of Nestor Creek. The Eco-SSLs are EPA's Office of Solid Waste and Emergency Response (OSWER) Policy Directives and they represent concentrations likely to cause unacceptable ecological risk to terrestrial birds and mammals

Recommendation: Consider soil contamination in Refuge property within the Otay River floodplain in future planning or updated plans for the area. Interim Ecological Soil Screening Level documents can be found at https://www.epa.gov/chemical-research/interim-ecological-soil-screening-level-documents. In particular, the "DDT and Metabolites" Eco-SSL is OSWER Directive 9285.7-57 (April 2007) and is available at: https://www.epa.gov/sites/production/files/2015-09/documents/eco-ssl_ddt.pdf. 1.22

Clean Water Act Section 404
We recommend that the Final EIS clarify the permitting process for proposed activities within jurisdictional waters of the U.S. and include further analyses as necessary. If an Individual Permit is required, we recommend that the Final EIS include the Clean Water Act Section 404(b)(1) alternatives analysis and identify the Least Environmentally Damaging Practicable Alternative.

Including information sufficient to demonstrate compliance with the 404(b)(1) Guidelines in the Draft EIS improves efficiency and provides a more meaningful opportunity for the public to contribute timely and substantive input on the evaluation of alternatives, which could inform the decision-making process. For future Service projects subject to the NEPA process, which also require a CWA Section 404 permit, please consider providing such information in the Draft EIS. 1.23

Recommendation: Identify the LEDPA and include the results of the Clean Water Act Section 404(b)(1) alternatives analysis in the Final EIS.

Air Quality/Greenhouse Gas Emissions
Although the Draft EIS concludes that construction activities would not result in significant impacts to air quality, we encourage the Service to identify and consider mitigation measures for construction emissions that are not already included in the proposed action or alternatives per 40 CFR § 1502.14(f), "Alternatives including the proposed action."

We note that, as presented in the Draft EIS, both the conveyor and haul truck transport options result in lower criteria air pollutant emissions, take less time to complete, and would reach restoration goals sooner than the pipeline option due to the time required for soil consolidation if material is transported as a slurry. Among the conveyor and haul truck options, the conveyor would result in more greenhouse gas emissions than the haul truck option. It appears that the largest contributor to greenhouse gas (GHG) and criteria pollutant emissions from any of the construction options is from diesel generators. We encourage the Service to explore alternatives to diesel generators, which may afford the opportunity to reduce air pollution and GHG emissions, and other impacts from construction activities. 1.24

4

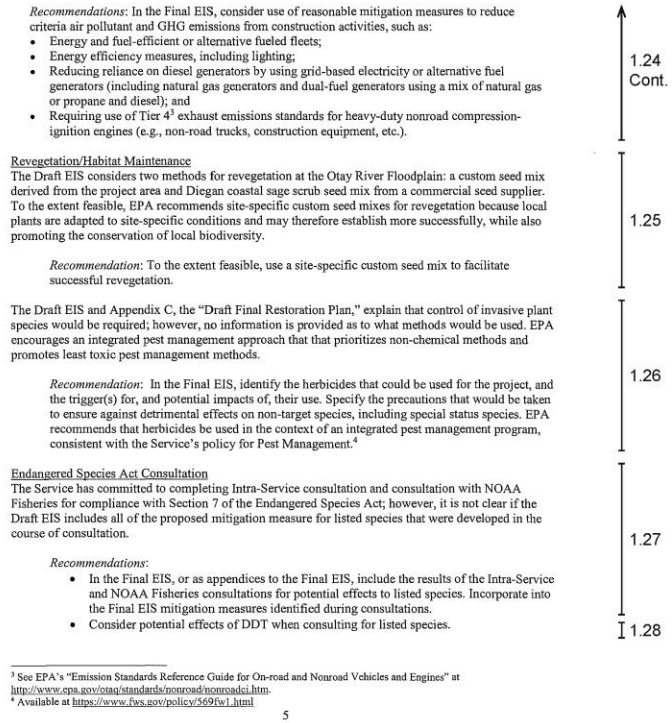
Zeeman, C., S.K. Taylor, J. Gibson, A. Little, and C. Gorbics. 2008a. *Characterizing Exposure and Potential Impacts of Contaminants on Seabirds Nesting at South San Diego Bay Unit of the San Diego National Wildlife Refuge (Salt Works, San Diego Bay) – Final Report*. U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office, Carlsbad, California.

Zeeman, C. S.K. Taylor, J. Gibson, A. Little and C. Gorbics. 2008b. *F&G Street Marsh Contaminants Investigation*. Final Report. U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office. Carlsbad, California. 106 pp.

1.22 Eco-SSLs are used to screen for risk to terrestrial receptors. We are familiar with the documents identified and will consider risk to wildlife resources in planning for future uses of the lands not included in the restoration. It is important to note that Eco-SSLs are for screening contaminant levels in soils (terrestrial), not sediments (aquatic), and therefore do not apply to the proposed salt marsh restoration.

1.23 We will be applying to the ACOE for a Nationwide 27 Permit. Nationwide permits do not require the

		preparation of the 404(b)(1) alternatives analysis; however, the Draft EIS included a thorough discussion of project impacts to waters of the United States (refer to Sections 3.3.1.4, 4.3.1.2 [Jurisdictional Waters], and 4.3.1.3 [Jurisdictional Waters]). The permitting process for proposed activities within jurisdictional waters has been clarified in the Final EIS, and a range of alternatives, as presented in the Draft EIS, have been considered. The Record of Decision will identify the environmentally preferable alternative, as required by 40 CFR 1505.2(b) of the National Environmental Policy Act, which takes into consideration the analysis of impacts to waters of the United States.
	1.24	Air quality criteria pollutant emissions and GHG emissions would be below established thresholds for all project alternatives; therefore, no further mitigation is required. It should be noted that the slurry option has been eliminated as a viable sediment delivery option in the Final EIS. This option was determined to be infeasible because of time delays associated with soil compaction following transport of the slurry to Pond 15. Specifically, habitat establishment within Pond 15 would be delayed for 3 to 5 years under this option. Should the conveyor option be selected over trucking, an alternative to diesel generators would be considered including extending electric transmission lines and associated equipment to the site temporarily to power the conveyor



Recommendations: In the Final EIS, consider use of reasonable mitigation measures to reduce criteria air pollutant and GHG emissions from construction activities, such as:

- Energy and fuel-efficient or alternative fueled fleets;
- Energy efficiency measures, including lighting;
- Reducing reliance on diesel generators by using grid-based electricity or alternative fuel generators (including natural gas generators and dual-fuel generators using a mix of natural gas or propane and diesel); and
- Requiring use of Tier 4[3] exhaust emissions standards for heavy-duty nonroad compression-ignition engines (e.g., non-road trucks, construction equipment, etc.).

1.24 Cont.

Revegetation/Habitat Maintenance

The Draft EIS considers two methods for revegetation at the Otay River Floodplain: a custom seed mix derived from the project area and Diegan coastal sage scrub seed mix from a commercial seed supplier. To the extent feasible, EPA recommends site-specific custom seed mixes for revegetation because local plants are adapted to site-specific conditions and may therefore establish more successfully, while also promoting the conservation of local biodiversity.

Recommendation: To the extent feasible, use a site-specific custom seed mix to facilitate successful revegetation.

1.25

The Draft EIS and Appendix C, the "Draft Final Restoration Plan," explain that control of invasive plant species would be required; however, no information is provided as to what methods would be used. EPA encourages an integrated pest management approach that that prioritizes non-chemical methods and promotes least toxic pest management methods.

Recommendation: In the Final EIS, identify the herbicides that could be used for the project, and the trigger(s) for, and potential impacts of, their use. Specify the precautions that would be taken to ensure against detrimental effects on non-target species, including special status species. EPA recommends that herbicides be used in the context of an integrated pest management program, consistent with the Service's policy for Pest Management.[4]

1.26

Endangered Species Act Consultation

The Service has committed to completing Intra-Service consultation and consultation with NOAA Fisheries for compliance with Section 7 of the Endangered Species Act; however, it is not clear if the Draft EIS includes all of the proposed mitigation measure for listed species that were developed in the course of consultation.

Recommendations:

- In the Final EIS, or as appendices to the Final EIS, include the results of the Intra-Service and NOAA Fisheries consultations for potential effects to listed species. Incorporate into the Final EIS mitigation measures identified during consultations.
- Consider potential effects of DDT when consulting for listed species.

1.27

1.28

[3] See EPA's "Emission Standards Reference Guide for On-road and Nonroad Vehicles and Engines" at http://www.epa.gov/otaq/standards/nonroad/nonroadci.htm.
[4] Available at https://www.fws.gov/policy/569fw1.html

5

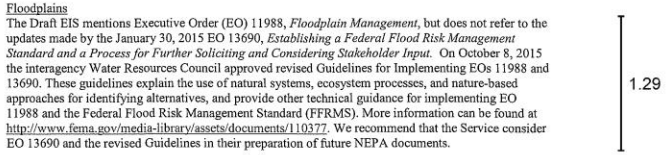
belt during construction. Additionally, conservative model default values for equipment engine tiers, load factors, and operating times were applied when modeling daily and annual emissions; however, once project construction commences, higher tiered engines and cleaner-burning fuels will likely be employed because the model assumes slightly older equipment than what is typically used in practice. Moreover, all construction equipment would be compliant with current regulations required by the California Air Resources Board.

1.25 The San Diego Bay NWR requires the use of watersheds specific or most closely proximal propagules from locally extant native plant stands to be used in our various native habitat restoration projects. The intent of this is to avoid any unintentional genetic mixing from naturally separated populations (depending upon a particular plant species' mode of germination and dispersal) and to ensure that local propagules are used in restoration projects that may have site specific genetic adaptations that may ensure they are more likely to thrive in local site conditions. Depending upon the relative endemism or the lack of particular species, we may allow for a more general Diegan coastal sage scrub or maritime succulent scrub seed or propagule mix for some species. These specific directives are at the discretion of the San Diego Bay NWR Manager for any given restoration project. For this project, we would direct potential contractors to work with local

		commercial seed collectors and growers to use propagules from as closely proximal locations as feasible and would approve all plants proposed for use in the restoration plant pallet. This contractual condition generally requires planning and some lead time to allow for the acquisition and/or propagation of enough native plant material and/or seeds from local stands to achieve the goals of a given restoration project.
	1.26	The control of invasive plant species within the project site will be implemented in accordance with the Service's Integrated Pest Management (IPM) Policy, approved in August 2010. This policy addresses pest management activities on and off Service lands. The IPM policy (Part 569, FW1, of the Service Manual), which is consistent with the Department of the Interior (Department) IPM policy (517 DM 1) and other applicable authorities, establishes procedures and responsibilities for pest management activities, adopts IPM as the Service's method for making pest management decisions, and provides guidance to employees on how to implement IPM for all pest management activities. IPM is a scientifically based, adaptive management process where available scientific information and best professional judgment of the San Diego Bay NWR staff, as well as other resource experts, is used to identify and implement a sustainable approach to managing pests by combining biological, cultural, physical, and chemical tools in a way that minimizes

	economic, health, and environmental risks. If control of invasive plants is required within the project site, it will likely involve a combination of physical (e.g., hand pulling, hoeing) and chemical control. The type of herbicide to be used on the San Diego Bay NWR will be determined based upon pest ecology (including mode of reproduction), the size and distribution of its populations, site-specific conditions (e.g., soils, topography), known efficacy under similar site conditions, and the capability to utilize best management practices to reduce and/or eliminate potential effects to non-target species, sensitive habitats, and the potential to contaminate surface and groundwater. All pesticide usage, including the type of product used, target species, application rate, and method of application, must comply with the applicable Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and State regulations pertaining to pesticide use, safety, storage, disposal, and reporting. Before pesticides can be used to eradicate, control, or contain pests on refuge lands and waters, the San Diego Bay NWR Manager must receive approval to use a specific product. Section 569 FW 1 of the Service Manual requires that pesticide use proposals (PUPs) be prepared and approved for each proposed pesticide used on refuge lands and waters. A PUP includes specific information about the proposed pesticide, including the common and chemical names of the pesticides, target

		pest species, size and location of treatment sites, application rates and methods, and Federally listed species determinations, where applicable. Section 2.3.2.5 (Planting Program) of the Final EIS, Appendix C (Final Restoration Plan), and Appendix D (Planting Plan for Uplands) have been revised to address an IPM approach to invasive plant control within the project site. Chemical control of invasive plant species will likely include products with the active ingredient glyphosate (e.g., Aquaneat, Razor Pro), imazapyr (e.g., Stalker, Habitat), and/or triclopyr (e.g., Garlon 3A, Garlon). The herbicide best suited for the existing habitat type and species to be controlled will be used within the project site. In addition, Sections 4.2.5.3.2 and 4.2.5.3.3 have been revised in the Final EIS to address the potential effects to water quality of using pesticides within the project site.
	1.27	The inter-Service consultation and consultation with NOAA Fisheries for compliance with Section 7 of the ESA will be completed prior to issuance of the Record of Decision. All appropriate mitigation measures for listed species have been incorporated into Sections 4.3.2.2 and 4.3.2.3 of the Final EIS.
	1.28	The presence of DDT-contaminated soils in the project vicinity will be addressed during consultation on listed species. Refer also to Responses 2.17, 2.22, and 2.24–2.27.



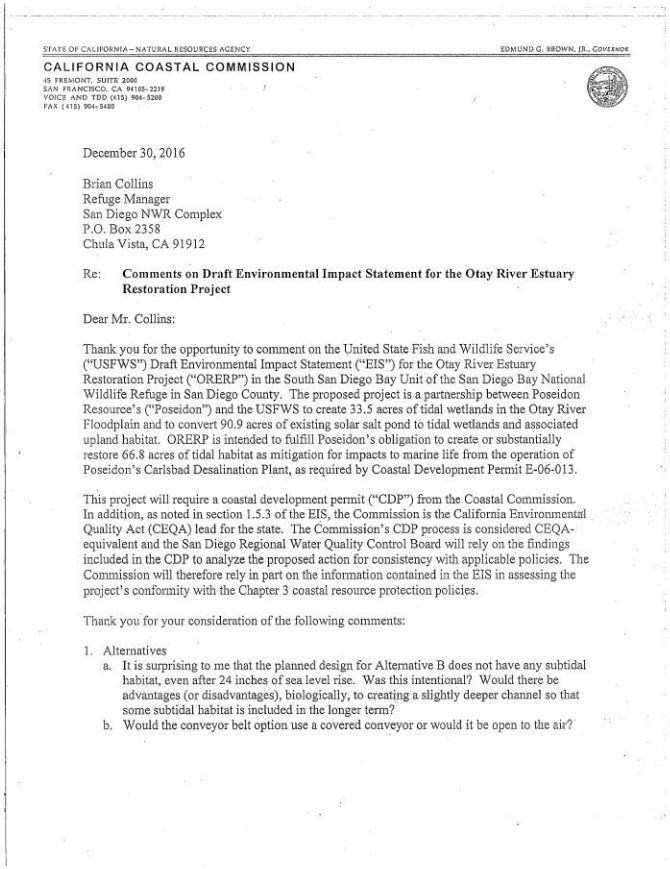
Floodplains
The Draft EIS mentions Executive Order (EO) 11988, *Floodplain Management*, but does not refer to the updates made by the January 30, 2015 EO 13690, *Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input.* On October 8, 2015 the interagency Water Resources Council approved revised Guidelines for Implementing EOs 11988 and 13690. These guidelines explain the use of natural systems, ecosystem processes, and nature-based approaches for identifying alternatives, and provide other technical guidance for implementing EO 11988 and the Federal Flood Risk Management Standard (FFRMS). More information can be found at http://www.fema.gov/media-library/assets/documents/110377. We recommend that the Service consider EO 13690 and the revised Guidelines in their preparation of future NEPA documents.

1.29

6

1.29 Section 7.1 (Compliance with Applicable Federal Laws, Regulations, Executive Orders, and Other Guidance) has been revised in the Final EIS to address Executive Order 13690, Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input.

Comment Letter 2



STATE OF CALIFORNIA – NATURAL RESOURCES AGENCY EDMUND G. BROWN, JR., GOVERNOR

CALIFORNIA COASTAL COMMISSION
45 FREMONT, SUITE 2000
SAN FRANCISCO, CA 94105- 2219
VOICE AND TDD (415) 904- 5200
FAX (415) 904- 5400

December 30, 2016

Brian Collins
Refuge Manager
San Diego NWR Complex
P.O. Box 2358
Chula Vista, CA 91912

Re: **Comments on Draft Environmental Impact Statement for the Otay River Estuary Restoration Project**

Dear Mr. Collins:

Thank you for the opportunity to comment on the United State Fish and Wildlife Service's ("USFWS") Draft Environmental Impact Statement ("EIS") for the Otay River Estuary Restoration Project ("ORERP") in the South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge in San Diego County. The proposed project is a partnership between Poseidon Resource's ("Poseidon") and the USFWS to create 33.5 acres of tidal wetlands in the Otay River Floodplain and to convert 90.9 acres of existing solar salt pond to tidal wetlands and associated upland habitat. ORERP is intended to fulfill Poseidon's obligation to create or substantially restore 66.8 acres of tidal habitat as mitigation for impacts to marine life from the operation of Poseidon's Carlsbad Desalination Plant, as required by Coastal Development Permit E-06-013. 2.1

This project will require a coastal development permit ("CDP") from the Coastal Commission. In addition, as noted in section 1.5.3 of the EIS, the Commission is the California Environmental Quality Act (CEQA) lead for the state. The Commission's CDP process is considered CEQA-equivalent and the San Diego Regional Water Quality Control Board will rely on the findings included in the CDP to analyze the proposed action for consistency with applicable policies. The Commission will therefore rely in part on the information contained in the EIS in assessing the project's conformity with the Chapter 3 coastal resource protection policies.

Thank you for your consideration of the following comments:

1. Alternatives
   a. It is surprising to me that the planned design for Alternative B does not have any subtidal habitat, even after 24 inches of sea level rise. Was this intentional? Would there be advantages (or disadvantages), biologically, to creating a slightly deeper channel so that some subtidal habitat is included in the longer term? 2.2
   b. Would the conveyor belt option use a covered conveyor or would it be open to the air? 2.3

Response to Comment Letter 2

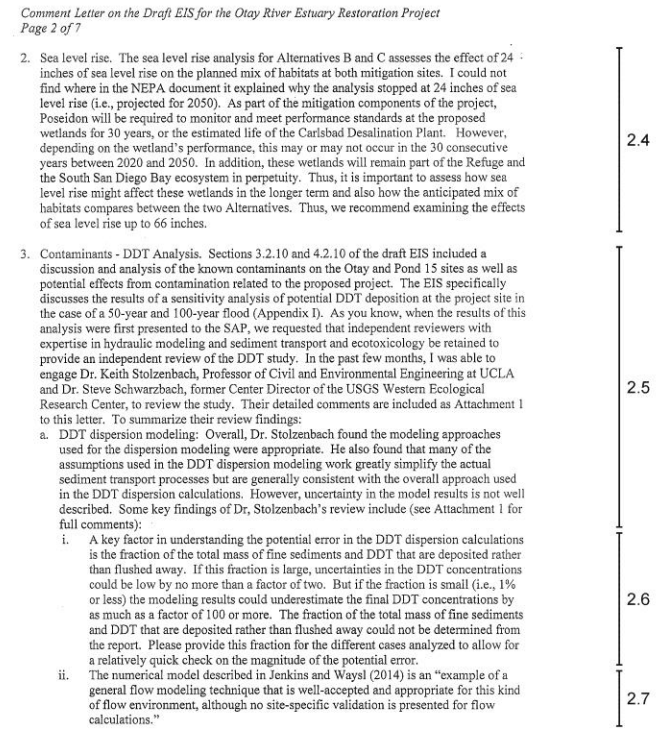
California Coastal Commission
Kate Huckelbridge
December 30, 2016

2.1 The Service appreciates the California Coastal Commission (CCC) staff's detailed review of the Draft EIS.

2.2 Review of this issue indicates that approximately 4 acres of subtidal habitat would be expected within the Otay River Floodplain Site under Alternative B at 24 inches of sea-level rise. The depiction of acreages at various stages of sea-level rise under Alternatives B and C as shown on Figures 2-6a, 2-6b, 2-6c, 2-6d, 2-6e, 2-6f, 2-7a, 2-7b, 2-7c, 2-7d, 2-7e, and 2-7f and Tables 2-6, 2-7, 2-9, 2-10, 2-14, 2-15, 4.2-10, 4.2-11, 4.2-12, and 4.2-13 have been updated in the Final EIS. (Refer also to the Memorandum from Everest International, dated October 23, 2017, which is provided as Attachment B to these Responses to Comments.)

2.3 The conveyor belt system would be an open air system; however, the soils loaded onto the conveyor belt would be sprayed with water for dust control at the soil excavation/loading site and catchment tarps would be provided below the belt to ensure that conveyed material does not spill into waterways or the

	salt ponds. Section 2.3.2.4 (Construction Methods) of the Draft EIS and Mitigation Measure MM-HYD-4 addresses the need for monitoring and the implementation of preemptive measures to ensure that loss of material from the conveyor belt is minimized to protect air and water quality during construction. This discussion has been expanded in the Final EIS to specifically address the requirement for catchment tarps. Mitigation Measure MM-HYD-4 has also been expanded to note that if the conveyor belt transport option is selected, the contractor will be required to install catchment tarps (aprons) on the underside of the conveyor belt where it crosses the Otay River or crosses or borders any salt ponds in areas where there would be the potential for the water and substrate within the ponds to be contaminated by spillage from the conveyor belts. The tarps are intended to catch and contain any material that might fall from the conveyor belt. Routine monitoring of the effectiveness of the catchment tarps is also required. Implementing this measure will minimize the potential for impacts to the Otay River and associated sensitive wetland habitat, as well as protect the existing solar salt operation.



Comment Letter on the Draft EIS for the Otay River Estuary Restoration Project
Page 2 of 7

2. Sea level rise. The sea level rise analysis for Alternatives B and C assesses the effect of 24 inches of sea level rise on the planned mix of habitats at both mitigation sites. I could not find where in the NEPA document it explained why the analysis stopped at 24 inches of sea level rise (i.e., projected for 2050). As part of the mitigation components of the project, Poseidon will be required to monitor and meet performance standards at the proposed wetlands for 30 years, or the estimated life of the Carlsbad Desalination Plant. However, depending on the wetland's performance, this may or may not occur in the 30 consecutive years between 2020 and 2050. In addition, these wetlands will remain part of the Refuge and the South San Diego Bay ecosystem in perpetuity. Thus, it is important to assess how sea level rise might affect these wetlands in the longer term and also how the anticipated mix of habitats compares between the two Alternatives. Thus, we recommend examining the effects of sea level rise up to 66 inches. 2.4

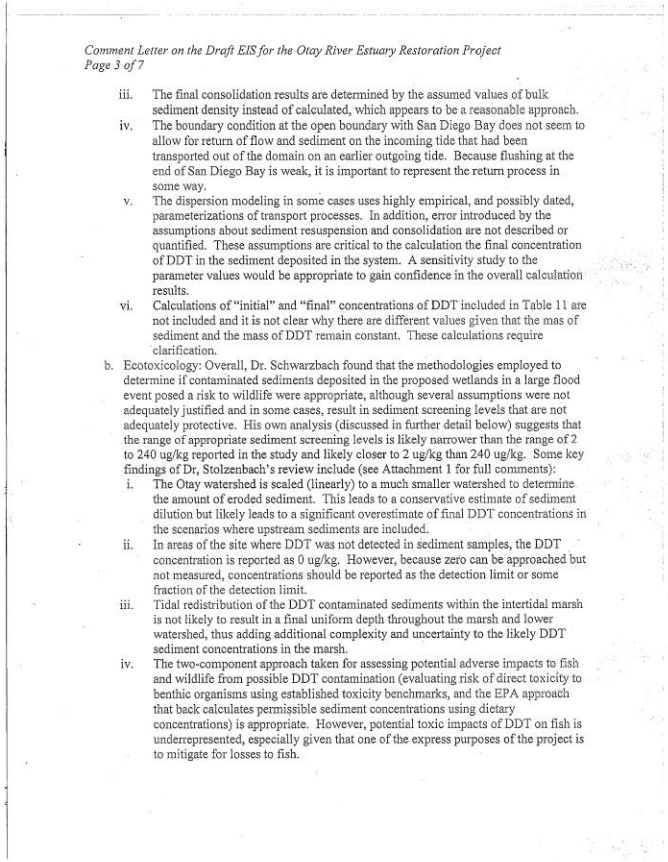
3. Contaminants - DDT Analysis. Sections 3.2.10 and 4.2.10 of the draft EIS included a discussion and analysis of the known contaminants on the Otay and Pond 15 sites as well as potential effects from contamination related to the proposed project. The EIS specifically discusses the results of a sensitivity analysis of potential DDT deposition at the project site in the case of a 50-year and 100-year flood (Appendix I). As you know, when the results of this analysis were first presented to the SAP, we requested that independent reviewers with expertise in hydraulic modeling and sediment transport and ecotoxicology be retained to provide an independent review of the DDT study. In the past few months, I was able to engage Dr. Keith Stolzenbach, Professor of Civil and Environmental Engineering at UCLA and Dr. Steve Schwarzbach, former Center Director of the USGS Western Ecological Research Center, to review the study. Their detailed comments are included as Attachment 1 to this letter. To summarize their review findings: 2.5
   a. DDT dispersion modeling: Overall, Dr. Stolzenbach found the modeling approaches used for the dispersion modeling were appropriate. He also found that many of the assumptions used in the DDT dispersion modeling work greatly simplify the actual sediment transport processes but are generally consistent with the overall approach used in the DDT dispersion calculations. However, uncertainty in the model results is not well described. Some key findings of Dr, Stolzenbach's review include (see Attachment 1 for full comments):
      i. A key factor in understanding the potential error in the DDT dispersion calculations is the fraction of the total mass of fine sediments and DDT that are deposited rather than flushed away. If this fraction is large, uncertainties in the DDT concentrations could be low by no more than a factor of two. But if the fraction is small (i.e., 1% or less) the modeling results could underestimate the final DDT concentrations by as much as a factor of 100 or more. The fraction of the total mass of fine sediments and DDT that are deposited rather than flushed away could not be determined from the report. Please provide this fraction for the different cases analyzed to allow for a relatively quick check on the magnitude of the potential error. 2.6
      ii. The numerical model described in Jenkins and Waysl (2014) is an "example of a general flow modeling technique that is well-accepted and appropriate for this kind of flow environment, although no site-specific validation is presented for flow calculations." 2.7

2.4 The effects of 66 inches of sea-level rise on the Otay River Floodplain Site and Pond 15 Site following restoration as proposed in Alternatives B and C are presented as Attachment B to these Responses to Comments.

2.5 There is a paucity of modeling capability to predict the erosion of DDT-contaminated sediment by floods and subsequent dispersion and deposition in estuaries. There are no EPA-certified models capable of making such predictions for the Otay River Estuary Restoration Project (ORERP). To provide this capability, a team of multi-disciplinary scientists and engineers coupled a fluvial model to a tidal hydraulics model (Jenkins et al. 2015), which in turn provided forcing and boundary conditions to a fine sediment transport model, which ultimately provided predictions of post-flood sediment deposition to a biological risk assessment model. This coupled modeling system addressed two basic environmental impact questions: (1) would post-flood deposition of DDT-contaminated sediments in the new tidal basins of the ORERP be harmful to the newly created wetland biology within those basins; and (2) would the ORERP have an adverse impact on post-flood deposition of DDT-contaminated sediments in San Diego Bay? Naturally, the question of error arises whenever such a diverse set of models are coupled end-to-end to make a prediction. But these two

		particular environmental impact questions that are being addressed do not require absolute modeling precision, so long as the risk assessment prediction is based on the absolute worst-case potential outcome. During the implementation of these models for the ORERP, every simplifying assumption made was purposely biased towards achieving the most conservative, worst-case outcome.
	2.6	As an initial condition, we have assumed that immediately after the flood period, the sediment yield of the 50-year and 100-year flood is uniformly dispersed throughout the floodplain and adjacent South San Diego Bay as far north as the edge of the South Bay Shelf (refer to Figures 2 and 3 of Jenkins et al. 2015). The model domain ends along an assumed open water kinematic boundary at the edge of the South Bay Shelf that extends from the northern end of the Chula Vista Wildlife Reserve across the Bay to Spinnaker Point (adjacent Spinnaker Way). All suspended sediment yield post-flood is confined either within the ORERP tidal basins or the adjacent South Bay Shelf (which includes the remaining salt ponds). This assumption is motivated by the fact that residence times for the water-mass over the South Bay Shelf are quite long, typically approximately 2.5 to 3 weeks (Largier 1995; Wang et al. 1998). Furthermore, this assumption is consistent with the geomorphology of South San Diego Bay since the South Bay Shelf is a

		depositional bottom-set formation of the Otay River delta. Given these boundary condition assumptions, the fraction of the total mass of fine sediments that are deposited rather than flushed away is exactly unity. In the model, the post-flood suspended sediment yield either settles in the ORERP or settles over the South Bay Shelf, which produces the highest possible accumulation of DDT-contaminated sediment, and gives the smallest possible modeling error.
	2.7	Site specific validation is presented in Appendix G (Tidal Hydraulics Analysis of the Otay River Estuary Restoration Plan, Jenkins and Wasyl 2014) of the Draft and Final EIS, where the validation of the modeled water level forcing over the South Bay Shelf is calibrated against measurements from the Otay Sonde near the mouth of the Otay River (Figure 10b, Appendix G in the Final EIS). The reviewer does not reference this report, only an earlier 2010 report, which was prepared prior to revisions to the project that reduced the size of the restoration footprint in the Otay River floodplain and expanded the project to include Pond 15.



Comment Letter on the Draft EIS for the Otay River Estuary Restoration Project
Page 3 of 7

iii. The final consolidation results are determined by the assumed values of bulk sediment density instead of calculated, which appears to be a reasonable approach. 2.8

iv. The boundary condition at the open boundary with San Diego Bay does not seem to allow for return of flow and sediment on the incoming tide that had been transported out of the domain on an earlier outgoing tide. Because flushing at the end of San Diego Bay is weak, it is important to represent the return process in some way. 2.9

v. The dispersion modeling in some cases uses highly empirical, and possibly dated, parameterizations of transport processes. In addition, error introduced by the assumptions about sediment resuspension and consolidation are not described or quantified. These assumptions are critical to the calculation the final concentration of DDT in the sediment deposited in the system. A sensitivity study to the parameter values would be appropriate to gain confidence in the overall calculation results. 2.10

vi. Calculations of "initial" and "final" concentrations of DDT included in Table 11 are not included and it is not clear why there are different values given that the mas of sediment and the mass of DDT remain constant. These calculations require clarification. 2.11

b. Ecotoxicology: Overall, Dr. Schwarzbach found that the methodologies employed to determine if contaminated sediments deposited in the proposed wetlands in a large flood event posed a risk to wildlife were appropriate, although several assumptions were not adequately justified and in some cases, result in sediment screening levels that are not adequately protective. His own analysis (discussed in further detail below) suggests that the range of appropriate sediment screening levels is likely narrower than the range of 2 to 240 ug/kg reported in the study and likely closer to 2 ug/kg than 240 ug/kg. Some key findings of Dr, Stolzenbach's review include (see Attachment 1 for full comments): 2.12

i. The Otay watershed is scaled (linearly) to a much smaller watershed to determine the amount of eroded sediment. This leads to a conservative estimate of sediment dilution but likely leads to a significant overestimate of final DDT concentrations in the scenarios where upstream sediments are included. 2.13

ii. In areas of the site where DDT was not detected in sediment samples, the DDT concentration is reported as 0 ug/kg. However, because zero can be approached but not measured, concentrations should be reported as the detection limit or some fraction of the detection limit. 2.14

iii. Tidal redistribution of the DDT contaminated sediments within the intertidal marsh is not likely to result in a final uniform depth throughout the marsh and lower watershed, thus adding additional complexity and uncertainty to the likely DDT sediment concentrations in the marsh. 2.15

iv. The two-component approach taken for assessing potential adverse impacts to fish and wildlife from possible DDT contamination (evaluating risk of direct toxicity to benthic organisms using established toxicity benchmarks, and the EPA approach that back calculates permissible sediment concentrations using dietary concentrations) is appropriate. However, potential toxic impacts of DDT on fish is underrepresented, especially given that one of the express purposes of the project is to mitigate for losses to fish. 2.16

2.8 Concurrence with the approach of determining final consolidation results by assuming values of bulk sediment density is noted.

2.9 Two responses are provided here because there is ambiguity in what the reviewer is stating. The comment is as follows: "The boundary conditions at the open boundary with San Diego Bay do not seem to represent any possible return on an incoming tide of sediment transported out of the domain on earlier outgoing tides." By literal interpretation of this comment, we respond that there are several open boundaries of the ORERP with San Diego Bay, including the mouth of the Otay River, the proposed inlet to Pond 15, and the inlets to Ponds 10 and 11. We treat the South Bay Shelf model domain that is outside these open boundaries as a reservoir, in which the water surface is driven up and down using the South Bay water elevation forcing function, as illustrated on Figure 10b of Jenkins and Wasyl (2014). As the water elevation changes over the South Bay Shelf, water and suspended sediment are fluxed across these open boundaries, in and out of the ORERP. If on the other hand, the reviewer is referring to "the open boundary within San Diego Bay," then our reply is that no suspended sediment fluxes (neither incoming nor out-going) across that open boundary between the South Bay Shelf and the remainder of San Diego Bay. This is accomplished by applying a kinematic boundary

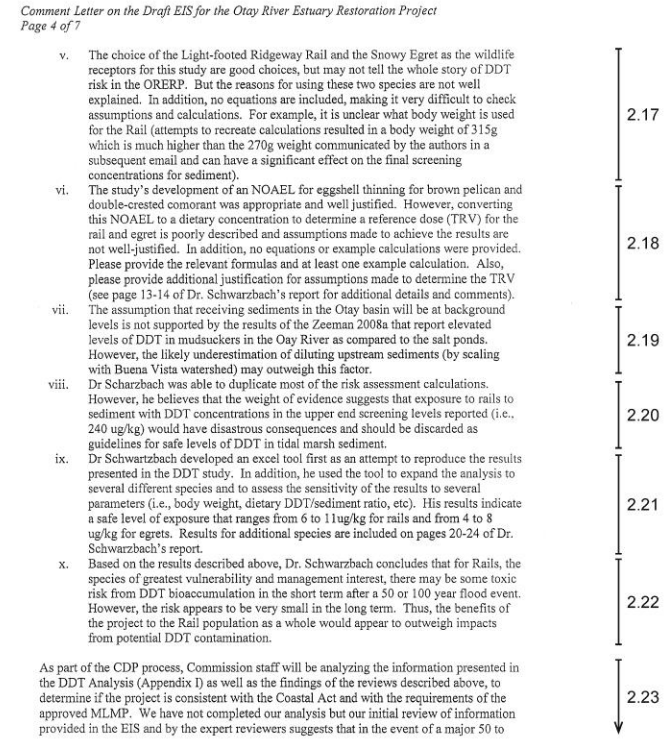
		condition of vanishing sediment concentration on that boundary surface; the same as prescribed for a turbidity front or shear line in two dimensions. This boundary condition prevents sediment flux across the open water boundary and confines all of the post-flood suspended sediment yield within the model domain in order to maximize deposition of DDT-laden sediment in the model (per the worst-case assumption) and thereby minimize potential error, as described in Response 2.6.
	2.10	The models chosen to study the potential dispersion of DDT-contaminated sediment in the tidal basins of the ORERP and on the South Bay Shelf were the same fine-sediment transport models used in the certified EIR/EIS of the San Dieguito Wetland Restoration Project, which has served as the benchmark for many of the requirements of the ORERP. These models were peer reviewed by California Coastal Commission experts, including leading researches in the field of sediment transport modeling including Prof. Ashish Mehta, University of Florida, Gainesville and Prof. Paul Komar, Oregon State University, Corvallis. As referenced Jenkins and Wasyl (2014) and Jenkins et al. (2015), model algorithms were published in peer reviewed journals and the parameters chosen are specific to the floodplain soils and wash load of the watersheds in the Peninsular Range of Southern California (refer to Inman and Jenkins 1999). The

		need for a sensitivity study to gain confidence in the overall calculation results is considered unnecessary because predictive sensitivity is not relevant to the modeling objectives (see Response 2.5) so long as worst case has been captured, which was accomplished by confining all post-flood sediment yield within the model boundaries.
	2.11	The changing concentrations associated with initial and final configuration of deposited materials are based on the proportion that the anticipated initial and final depositional thicknesses comprise in sediment depths used by a range of benthic organisms. We chose three depths of use to represent this range of benthic organisms: 20 mm, 40 mm, and 80 mm. As the newly deposited material (whether it be a 1-, 2-, or 3-foot depth that has been eroded) from the contaminated site settles and consolidates (becoming thinner), the proportion of the active benthic horizon that is contaminated decreases. Note the majority of the settling is expected to occur in the first three months. The overall (i.e., depth-integrated) concentration for that benthic horizon thus decreases with consolidation. The concentration of the contaminated material itself does not change, but the exposure of benthic organisms becomes more limited as the layer thins and becomes a smaller proportion of their habitat. The initial and final concentrations provided in the table are the result of that proportional

	change relative to the use of a consistent sediment horizon (depth) by benthic organisms. **2.12** The analysis presented in the Draft EIS was conducted to assess the potential for adverse effects in the event there is an uncontrolled release of DDT-contaminated soil during a 100-year flood. The "screening levels" derived here are better termed "assessment levels" intended to help characterize potential for adverse effects from an unintended release, and they are not the same as screening levels used as first cut, conservative thresholds for management actions such as cleanups under Superfund or dredging projects. To that end, we considered multiple assessment thresholds that ranged from one based on a no observed adverse effect level for most sensitive species using worst-case exposure estimates to the same for less sensitive species. Given our species of concern are not among those for which experimental results are available, this range reasonably brackets the range of risk we anticipate to those species with a flood event of this magnitude. **2.13** It is agreed that the watershed scaling approach utilized in the DDT analysis represents a conservative estimate of sediment dilution, which likely leads to a significant overestimate of final DDT concentrations in the scenarios where upstream sediment are included.

	2.14 When characterizing contaminant levels in soils or sediments that are below detection limits, the Service routinely uses 0.5 x detection limit as the surrogate for non-detects. **2.15** We agree, modeling indicates that tidal redistribution of DDT-contaminated sediment within the ORERP will not result in a final uniform depth throughout the marsh and lower watershed, but the observed variability is systematic and process-based, and therefore, does not add to uncertainty. Post-flood deposition varied with the subtidal depths and the proportion of intertidal area in the various tidal basins, with the deepest basins receiving greater deposition. For example, maximum post-100-year flood deposition in the shallow Otay Intertidal Alternative floodplain basins (depth = 0 feet NAVD88) was about 3.5 mm of unconsolidated mud, while the deeper basins of Pond 15 that had proportionally less intertidal area received more than twice as much, about 8 mm of unconsolidated mud deposition. Deposition flux is the result of two competing processes, settling under gravity, and resuspension by bottom shear stresses. Tidally induced bottom shear stress over the shallow intertidal marsh planes in the ORERP were generally sufficient to re-suspend fluid mud and retard deposition, and the preponderance of

	deposition occurred in the more tranquil subtidal portions of the ORERP where tidal induced velocities were low (refer to equation 3, page 18 of Appendix I; Jenkins et al. 2015). Table 5 in Appendix I presents various deposition scenarios along with the predicted range of deposition thicknesses and Section 7.4 (Risk Assessment of DDT Deposition in the ORERP for the 100-Year Flood) of Appendix I takes this range of deposition thickness into consideration in assessing risk to identified wildlife receptors. (Note that Appendix H has been revised in the Final EIS to address the changes associated with adding a minimum 1-foot ERC over the area of contaminated soil, which will further reduce the potential downstream impacts should erosion occur in association with a significant storm event.)
	2.16 See Response 1.17.



Comment Letter on the Draft EIS for the Otay River Estuary Restoration Project
Page 4 of 7

v. The choice of the Light-footed Ridgeway Rail and the Snowy Egret as the wildlife receptors for this study are good choices, but may not tell the whole story of DDT risk in the ORERP. But the reasons for using these two species are not well explained. In addition, no equations are included, making it very difficult to check assumptions and calculations. For example, it is unclear what body weight is used for the Rail (attempts to recreate calculations resulted in a body weight of 315g which is much higher than the 270g weight communicated by the authors in a subsequent email and can have a significant effect on the final screening concentrations for sediment). 2.17

vi. The study's development of an NOAEL for eggshell thinning for brown pelican and double-crested comorant was appropriate and well justified. However, converting this NOAEL to a dietary concentration to determine a reference dose (TRV) for the rail and egret is poorly described and assumptions made to achieve the results are not well-justified. In addition, no equations or example calculations were provided. Please provide the relevant formulas and at least one example calculation. Also, please provide additional justification for assumptions made to determine the TRV (see page 13-14 of Dr. Schwarzbach's report for additional details and comments). 2.18

vii. The assumption that receiving sediments in the Otay basin will be at background levels is not supported by the results of the Zeeman 2008a that report elevated levels of DDT in mudsuckers in the Oay River as compared to the salt ponds. However, the likely underestimation of diluting upstream sediments (by scaling with Buena Vista watershed) may outweigh this factor. 2.19

viii. Dr Scharzbach was able to duplicate most of the risk assessment calculations. However, he believes that the weight of evidence suggests that exposure to rails to sediment with DDT concentrations in the upper end screening levels reported (i.e., 240 ug/kg) would have disastrous consequences and should be discarded as guidelines for safe levels of DDT in tidal marsh sediment. 2.20

ix. Dr Schwartzbach developed an excel tool first as an attempt to reproduce the results presented in the DDT study. In addition, he used the tool to expand the analysis to several different species and to assess the sensitivity of the results to several parameters (i.e., body weight, dietary DDT/sediment ratio, etc). His results indicate a safe level of exposure that ranges from 6 to 11ug/kg for rails and from 4 to 8 ug/kg for egrets. Results for additional species are included on pages 20-24 of Dr. Schwarzbach's report. 2.21

x. Based on the results described above, Dr. Schwarzbach concludes that for Rails, the species of greatest vulnerability and management interest, there may be some toxic risk from DDT bioaccumulation in the short term after a 50 or 100 year flood event. However, the risk appears to be very small in the long term. Thus, the benefits of the project to the Rail population as a whole would appear to outweigh impacts from potential DDT contamination. 2.22

As part of the CDP process, Commission staff will be analyzing the information presented in the DDT Analysis (Appendix I) as well as the findings of the reviews described above, to determine if the project is consistent with the Coastal Act and with the requirements of the approved MLMP. We have not completed our analysis but our initial review of information provided in the EIS and by the expert reviewers suggests that in the event of a major 50 to 2.23

2.17 a) The reasons for focusing on the light-footed Ridgway's rail (LFRR) and snowy egret are given in the technical memorandum, provided as Appendix I in the Draft EIS. To summarize, the species were selected to represent worst-case scenario with regard to potential for exposure to DDT in marsh habitat. Primary considerations are that they (1) forage in marshes; (2) are upper trophic level consumers that forage on aquatic food web organisms with high concentrations of DDT in their tissues; and (3) as smaller representatives of similar avian species, have greater nutritional needs and therefore ingest more potentially contaminated food per unit body weight than other larger bodied species.

Basing sediment assessment thresholds on risks to potentially most exposed (worst case) receptors is expected to result in conclusions that address exposure potential by other species as well (see also part "e" of this response). This is a screening level approach that makes calculations for other species unnecessary. As a note, western snowy plover was considered initially, even though it forages more in mudflats than marsh habitat. Although small bodied, the diet of the plover is 100% invertebrates, making risks to plover less than those for species that consume fish. Risks to snowy plover are less than those estimated for snowy egret.

b) Terms and Units: Units and abbreviations

g = grams
kg = kilograms (= 1 g x 1,000)
mg = milligram (= 1 g / 1,000)
µg = microgram (= 1 mg / 1,000)
ww = wet weight
dw = dry weight
dose rate = estimated daily intake normalized to body weight (mg_{DDT}/kg_{BW}-d)
TRV = Toxicity Reference Value, also known as a reference dose
Biota-sediment ratio = DDT concentration in biota / DDT concentration in sediment ((mg_{DDT}/kg_{biota} ww) ÷ ($mg_{DDT}/kg_{sediment}$))

c) Assumptions: Because some of the calculations provided by one of the reviewers suggested the need for lower assessment values, some of the assumptions have been changed to reflect consideration of additional data sources. They are as follows: a change in the assumed body weight for LFRR from 271 g (Dunning 1984; for East Coast rails) to 227 g (based on low end data for female LFRR from SeaWorld San Diego, which maintains LFRR in a captive breeding facility), estimated biota to sediment ratio for invertebrates was raised from 3 to 5 (ww to ww values; Zeeman et al. 2008b), the estimated biota to sediment ratio for fish was raised from 27 to 35

(Zeeman et al. 2008b), and the reference dose for reproductive effects in sensitive species was reduced from 0.014 mg_{DDT}/kg_{BW}-d to 0.009 mg_{DDT}/kg_{BW}-d (based on the pelican as the most sensitive species). Note that the use of the lower end of the range of weights for female LFRR (females are smaller than males on average) is advantageous for two reasons: the low end of the weight range is preferred for risk analysis because it is protective of a broader range of individuals, and females are of greater concern with respect to reproductive effects of DDT exposure.

The assumptions used for the calculations are now:

- LFRR factors: Body weight 227 grams; diet composition 82% invertebrates and 18% fish (as assumed previously by USFWS 2003)
- Snowy egret factors: Body weight 371 g (as used previously from Dunning 1984) diet 100% forage fish
- Biota/sediment ratios (mg_{DDT}/kg_{biota} ww/$mg_{DDT}/kg_{sediment}$ ww)
- forage fish/sediment = 35 $kg_{sediment}/kg_{biota}$ ww (from Zeeman et al. 2008b)
- invertebrates/sediment = 5 $kg_{sediment}/kg_{biota}$ ww (from Zeeman et al. 2008b)

d) Equations

(1) Estimating daily food ingestion rate (FIR) starting with regression for Charadriiformes from Nagy (2001):

FIR (g_{food}/g_{BW}-d) = FMR/BW
FMR (fresh matter intake per day; g/d) = $1.914(BW)^{0.769}$
BW = body weight in grams (g), assumed LFRR = 227g and snowy egret = 371g
For LFRR, FMR = $1.914(227)^{0.769}$ or 124 g_{food}/d; FIR = 124 g_{food}/d ÷ 227 g_{BW} = 0.546 g_{food}/g_{BW}-d
For snowy egret, FMR = $1.914(371)^{0.769}$ or 181 g_{food}/d; FIR = 181 g_{food}/d ÷ 371 g_{BW} = 0.488 g_{food}/g_{BW}-d
g_{food}/g_{BW}-d is the same as kg_{food}/kg_{BW}-d

Note: To simplify, the regression for Charadriiformes was used for both the egret and the LFRR. It is one of the more conservative of multiple regressions derived by Nagy (2001), and results in a very conservative estimate for snowy egret as compared with regressions developed specifically for wading birds by other authors.

(2) Estimate dietary concentrations (mg_{DDT}/kg_{diet} ww) from literature reference doses (mg_{DDT}/kg_{BW}-d ww). Premise: target daily dose (mg_{DDT}/kg_{BW}-d ww) is the TRV-Low (mg_{DDT}/kg_{BW}-d ww) (see

	"e" below) Target concentration in diet (mg_{DDT}/kg_{diet} ww) = TRV (mg_{DDT}/kg_{BW}-d) ÷ FIR (kg_{diet}/kg_{BW}-d ww) For LFRR, 0.009 mg_{DDT}/kg_{BW}-d ÷ 0.546 kg_{food}/Kg_{BW}-d = 0.016 mg_{DDT}/kg_{food} ww For snowy egret 0.009 mg_{DDT}/kg_{BW}-d ÷ 0.488 kg_{food}/Kg_{BW}-d = 0.018 mg_{DDT}/kg_{food} ww (3) Compute sediment assessment level (mg/kg ww) from target dietary concentration. Sediment assessment level ($mg_{DDT}/kg_{sediment}$ ww) = Target dietary concentration ÷ biota-sediment ratio, and diet = food = biota (fish and/or invertebrates for this assessment) For LFRR, 0.016 $mg_{DDT}/kg_{food\ ww}$ ÷ ((0.82 x 5 $kg_{sediment}/kg_{biota}$ ww) + (0.18 x 35 $kg_{sediment}/kg_{biota}$ ww)) = 0.016 $mg_{DDT}/kg_{food\ ww}$ ÷ (4.1 $kg_{sediment}/kg_{biota}$ ww + 6.3 $kg_{sediment}/kg_{biota}$ ww) = 0.016 $mg_{DDT}/kg_{food\ ww}$ ÷ 10.4 $kg_{sediment}/kg_{biota}$ ww = 0.0015 $mg_{DDT}/kg_{sediment}$ ww For snowy egret, 0.018 mg_{DDT}/kg_{food} ww ÷ 35 $kg_{sediment}/kg_{biota}$ ww = 0.00051 $mg_{DDT}/kg_{sediment}$ ww (4) Convert sediment assessment level from wet weight to dry weight based value (see also Response 1.17): Dry weight concentrations from wet weight

concentrations in sediment:

mg_{DDT}/kg dry = mg_{DDT}/kg wet ÷ $kg_{solids}/kg_{sediment}$ where kg_{solids} = weight of a dried sediment sample
$kg_{solids}/kg_{sediment}$ = 0.54 for San Diego Bay (Stansky et al. 2016; Zeeman et al. 2008b)
LFRR, 0.0015 $mg_{DDT}/kg_{sediment}$ ww ÷ 0.54 = 0.0028 $mg_{DDT}/kg_{sediment}$ dw = 2.8 $\mu g_{DDT}/kg_{sediment}$ dw
egret, 0.00051 $mg_{DDT}/kg_{sediment}$ ww ÷ 0.54 = 0.00094 $mg_{DDT}/kg_{sediment}$ dw = 0.94 $\mu g_{DDT}/kg_{sediment}$ dw

e) **Use of the reference dose (TRV)**: Our assessment included the use of readily available reference doses (TRVs) as another means for identifying sediment assessment thresholds. Reference doses are developed using No Observed Adverse Effect Levels (NOAELs) and Lowest Observed Adverse Effect Levels (LOAELs) that may be adjusted for uncertainties about (1) species differences in sensitivity, (2) duration of exposure in the benchmark study, (3) extrapolating from LOAEL to NOAEL, and (4) effects in lab tests versus effects under field conditions. We recognized limitations of this approach, which are discussed in detail by the technical reviewer (comments noted here).

Multiple TRVs were considered for a range of assessment thresholds, to evaluate the potential for

	occurrence of adverse effects. Adverse effects may range from any effect (e.g., biochemical changes) to effects that are more readily detected in the field where populations of birds may be influenced by factors such as exposure to other contaminants, fluctuations in diet composition, and predation. A number of adverse effects have been related to specific DDT isomers. The one most commonly considered effect in risk assessment is eggshell thinning associated with the p,p'-DDE isomer. One goal of this analysis was to identify a range of sediment assessment thresholds to which estimated post-flood DDT concentrations could be compared for determining not just whether a threshold has been exceeded, but also for a sense of the level of concern and potential for detectable effects in the field. The sediment threshold derived from the highest TRV is provided for some perspective, but we acknowledge that the lower end values are more directly applicable for use in salt marsh habitats, and especially for assessing risks to the LFRR, which is a listed species and appears to be among the more sensitive species to adverse effects of DDT. In response to concerns raised about how the upper end assessment value was derived, we re-evaluated risks by considering published, commonly used, and peer reviewed reference doses (TRVs). Two represent No Observed Adverse Effects (NOAELs) for a most

sensitive species (i.e., brown pelican) and a least sensitive species (e.g., chickens). The third is a Lowest Observed Adverse Effect Level (LOAEL) for sensitive effects in a most sensitive species.

- The low-end NOAEL (TRV-Low; 0.009 mg/kgBW-d) was derived by the U.S. Navy and EPA Region 9 Biological Technical Assistance Group (DTSC/HERD 2000 and 2009) to provide consistency in the assessment of risks posed to wildlife at contaminated sites in California. It is termed a TRV-Low and represents a lowest credible estimated NOAEL, below which no observable adverse effect is expected for the wildlife receptor of concern.
    - The TRV-low was estimated from a LOAEL for sensitive reproductive effects (eggshell thinning) in a chronically exposed wild population of a sensitive avian species (brown pelican). The LOAEL is lower than any of the NOAELs and LOAELs considered by EPA (2007) in their review of data on 19 other avian species, including white pelican and double-crested cormorant. The NOAEL was estimated by adjusting the LOAEL (0.027 mg_{DDT}/kg_{BW}-d) downward by a factor of 3.
- The upper end NOAEL (0.224 mg_{DDT}/kgBW-d) is a value adopted by EPA (2007) for development of

Ecological Soil Screening Levels (Eco-SSLs).

- The upper TRV is based on a NOAEL for effects other than eggshell thinning in chickens, a least sensitive species. It was derived from a review of lab-based studies on 19 species of birds, and as such addresses some of the uncertainty about potential thresholds for avian species that are less sensitive than pelicans to DDT. It is lower than LOAELs, and in most cases NOAELs, for effects ranging from biochemical changes to mortality in studies on all species of birds considered in the review.
- Concerns about this TRV include that (1) it is primarily based on upland bird species, (2) it is between NOAELs and LOAELs reported in some studies for reproductive effects in mallards and American kestrel, (3) species considered in the review range from less to least sensitive, (4) not all of the NOAELs and LOAELs are for studies that involved chronic exposure, and (5) there are no adjustments for uncertainties mentioned at the beginning of this discussion.

- An intermediate TRV used in this analysis (0.027 mg_{DDT}/kg_{BW}-d) is the LOAEL used as the source of the low-end NOAEL. EPA (1995; cited in original technical memorandum) derived the reference dose

for DDT effects on brown pelican. They identified a dietary effect level of 0.15 mg_{DDT}/kg_{fish} ww for the sensitive reproductive effect of eggshell thinning. They assumed a body weight of 3.5 kilograms (kg) for brown pelican, which was used to estimate an FMR of 0.62 kg_{food}/ day (ww) using a regression developed by Nagy (1984) for seabirds. The FIR (as previously defined) and daily dose can be calculated as follows:

FIR = FMR (kg_{food}/d) ÷ Body weight (kg_{BW}) = 0.62/3.5 = 0.177 kg_{food}/kg_{BW}-d
Daily dose from the identified dietary effect level = 0.15 mg_{DDT}/kg_{food} x 0.177 kg_{food}/kg_{BW}-d = 0.027 mg_{DDT}/kg_{BW}-d

As such, it is an effect level for sensitive effects in a most sensitive species. LOAELs for less sensitive species will be higher.

f) Recalculated sediment assessment thresholds: Exposure factors, equations and assumptions used in the initial assessment were reviewed and re-evaluated. The low end TRV was changed in response to concerns raised by the technical reviewer, now using a lower value that is publicly available and peer reviewed. The LOAEL for eggshell thinning in brown pelican (most sensitive species) was included for estimates of an actual effect level for sensitive species. In addition, body weight for LFRR was lowered, and biota/sediment factors were changed to reflect values

that can be obtained from publicly available reports. We also refined assessment thresholds to better reflect the mixed composition of the LFFR diet. Given these changes, the revised range of sediment assessment thresholds become the following:

Revised TRV-Based Sediment Assessment Thresholds for DDT ($\mu g_{DDT}/kg_{sediment}$ dw)		
LFRR	*Snowy Egret*	*Basis*
(82% inverts/18% fish)	(100% fish)	
2.8	0.94	**NOAEL** – lowest estimated; most sensitive
8.7	3.0	**LOAEL** – lowest for most sensitive species
72	24	**NOAEL** – lowest bounded; least sensitive species

g) Question regarding Table 8 in the DDT sensitivity analysis: Table 8 in the DDT sensitivity analysis presents a summary of estimated tissue thresholds. Those based on a screening level concentration in eggs combined with egg/prey biota ratios are discussed in Section 2a. Basically, the screening level concentration for eggs was set at 1.5 mg_{DDT}/kg ww. The corresponding concentrations in diet were estimated as follows:

Egg screening level (mg_{DDT}/kg_{egg} ww) ÷ DDT concentration in egg/DDT concentration in prey (mg_{DDT}/kg_{egg} ww / mg_{DDT}/kg_{prey} ww)

For LFRR

As described in Section 2a, egg/prey ratios were assumed to be the following:

The rail egg/crab ratio was assumed to be 25. The rail egg/snail ratio was assumed to be 73. The average ratio, assuming "invertebrates" are 50% snails and 50% crabs, is 49.

The estimated dietary concentration for LFRR, assuming a diet of 100% invertebrates is ~0.03 $mg_{DDT}/kg_{invertebrates}$. Rails consume both fish and invertebrates. Contributions from fish can be factored into estimates indirectly, but that was not done here due to time constraints. The dietary screening level estimated for LFRR using the egg threshold-based approach is based on consumption of invertebrates, and would be lower if consumption of fish were factored in to the calculation.

For Snowy egret

Egg/prey ratios used for snowy egrets are discussed in Section 2a. The seabird egg/fish tissue ratios that could be found are comparable to those found in the literature for rail/invertebrate ratios and an overall average ratio based on data from San Diego Bay is 25 (Zeeman et al 2008a; Seabird Study). The estimated dietary target based on a screening level for eggs is 1.5 mg_{DDT}/kg_{egg} ww ÷ 25 = 0.06 mg_{DDT}/kg_{fish}.

We recognize that snowy egrets have a mixed diet,

and invertebrates were not factored into this calculation. This dietary screening level may apply for seabirds that consume fish only, but the actual dietary screening level for egrets may be lower than indicated.

Dietary screening levels in Table 8 were converted to sediment threshold levels using the revised biota/sediment ratios applied to estimates of TRV-based sediment thresholds. The following are revisions to Table 10 in the DDT sensitivity analysis:

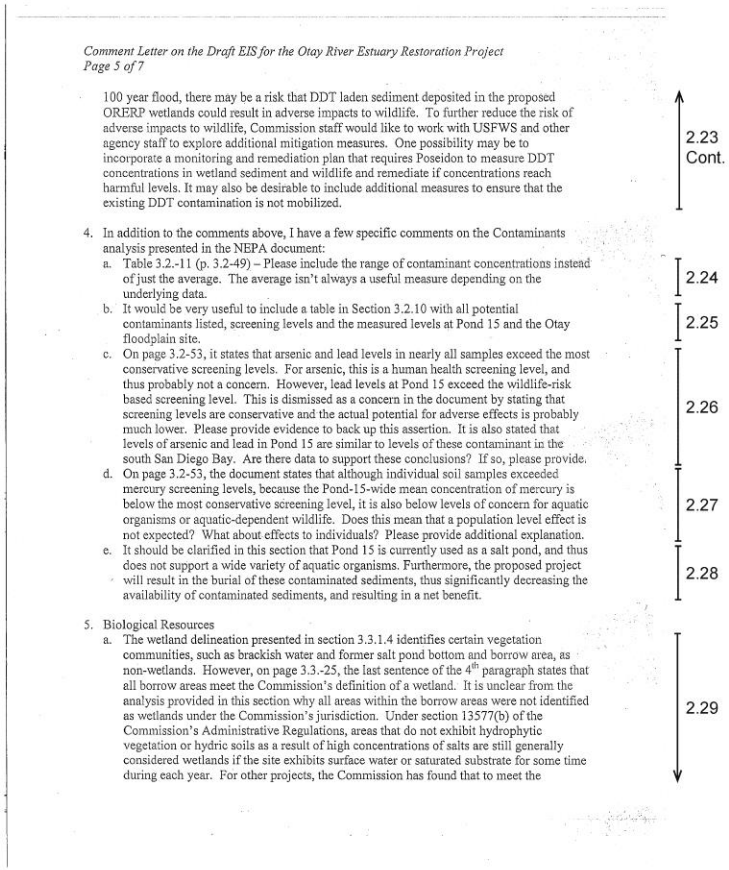
Revised Sediment Assessment Thresholds Based on Dietary Screening Levels From Table 8 ($\mu g_{DDT}/kg_{sediment}dw$)	
LFRR	*Snowy egret*
(82% inverts/18% fish)	(100% fish)
3.0	3.2

2.18 This issue is addressed in Response 2.17.

2.19 This issue is addressed in Response 1.18.

2.20 A range of values was derived to provide context to the consideration of risk. As a result of reconsideration of our assumptions, the high end assessment threshold is significantly lower and is one that would result from estimates using one of EPA's peer reviewed NOAEL-based reference doses. We have rechecked our own analysis and have been unable to duplicate the "error" highlighted in the peer review.

	2.21	We have not had the opportunity to thoroughly review Dr. Schwarzbach's calculations for species beyond those considered in our own analysis, but we appreciate his efforts to develop a tool for analyzing risks to wildlife associated with contaminated sediment. USFWS also plans to update an existing tool (Zeeman 2004) that uses the same procedures as Dr. Schwarzbach's, but with more recently collected data on DDT that supports estimates of biota/sediment factors specific to DDT in San Diego Bay.
	2.22	We concur with Dr. Schwarzbach's conclusions based on our re-analysis. It should be noted that the integration depths in the analysis were conservative, and average exposures would drop for organisms using a thicker sediment horizon. This would be expected to transfer up the associated trophic levels. We also agree that the long-term benefits of the project would outweigh the short-term risk that has been identified.
	2.23	Based on the analysis provided in the Draft EIS and Appendix I, there is no apparent need for additional mitigation; however, to further reduce the potential for erosion of contaminated soils into the restoration area and/or the Bay during a significant flood event, the project has been revised to eliminate the temporary stockpiles and instead use excess soil from the northern portion of Pond 20A to create an ERC. See Responses 1.5 and 1.6 for additional details.



Comment Letter on the Draft EIS for the Otay River Estuary Restoration Project
Page 5 of 7

100 year flood, there may be a risk that DDT laden sediment deposited in the proposed ORERP wetlands could result in adverse impacts to wildlife. To further reduce the risk of adverse impacts to wildlife, Commission staff would like to work with USFWS and other agency staff to explore additional mitigation measures. One possibility may be to incorporate a monitoring and remediation plan that requires Poseidon to measure DDT concentrations in wetland sediment and wildlife and remediate if concentrations reach harmful levels. It may also be desirable to include additional measures to ensure that the existing DDT contamination is not mobilized.

4. In addition to the comments above, I have a few specific comments on the Contaminants analysis presented in the NEPA document:
   a. Table 3.2.-11 (p. 3.2-49) – Please include the range of contaminant concentrations instead of just the average. The average isn't always a useful measure depending on the underlying data.
   b. It would be very useful to include a table in Section 3.2.10 with all potential contaminants listed, screening levels and the measured levels at Pond 15 and the Otay floodplain site.
   c. On page 3.2-53, it states that arsenic and lead levels in nearly all samples exceed the most conservative screening levels. For arsenic, this is a human health screening level, and thus probably not a concern. However, lead levels at Pond 15 exceed the wildlife-risk based screening level. This is dismissed as a concern in the document by stating that screening levels are conservative and the actual potential for adverse effects is probably much lower. Please provide evidence to back up this assertion. It is also stated that levels of arsenic and lead in Pond 15 are similar to levels of these contaminant in the south San Diego Bay. Are there data to support these conclusions? If so, please provide.
   d. On page 3.2-53, the document states that although individual soil samples exceeded mercury screening levels, because the Pond-15-wide mean concentration of mercury is below the most conservative screening level, it is also below levels of concern for aquatic organisms or aquatic-dependent wildlife. Does this mean that a population level effect is not expected? What about effects to individuals? Please provide additional explanation.
   e. It should be clarified in this section that Pond 15 is currently used as a salt pond, and thus does not support a wide variety of aquatic organisms. Furthermore, the proposed project will result in the burial of these contaminated sediments, thus significantly decreasing the availability of contaminated sediments, and resulting in a net benefit.

5. Biological Resources
   a. The wetland delineation presented in section 3.3.1.4 identifies certain vegetation communities, such as brackish water and former salt pond bottom and borrow area, as non-wetlands. However, on page 3.3.-25, the last sentence of the 4th paragraph states that all borrow areas meet the Commission's definition of a wetland. It is unclear from the analysis provided in this section why all areas within the borrow areas were not identified as wetlands under the Commission's jurisdiction. Under section 13577(b) of the Commission's Administrative Regulations, areas that do not exhibit hydrophytic vegetation or hydric soils as a result of high concentrations of salts are still generally considered wetlands if the site exhibits surface water or saturated substrate for some time during each year. For other projects, the Commission has found that to meet the

2.23 Cont.
2.24
2.25
2.26
2.27
2.28
2.29

2.24 Table 3.2-11 has been revised to present the total DDT levels in the soil composite samples taken from the Otay River floodplain.

2.25 The tables prepared by Anchor QEA, LP (March 2013, April 2013) listing the results of the physical and chemical analyses of sediment samples taken from the affected ponds and the Otay River floodplain have been provided as Attachment A to the Response to Comments. The extent of information and the format in which the information is provided makes it difficult to insert into the EIS. As a result, we have summarized the sampling results in the Draft EIS and provided references for the full sampling reports, which are available for review upon request.

2.26 Multiple questions are raised in this comment. Reference is to aquatic biota and wildlife risk-based screening levels developed by Zeeman (2004) for contaminants in sediments from San Diego Bay. At that time there were data that enabled computation of risk-based screening levels for arsenic, lead, and mercury, among other contaminants (unfortunately not DDT). The referenced "most conservative values" are the lowest of the screening levels identified or derived for benthic invertebrates, fish, aquatic vegetation, and multiple aquatic-dependent wildlife species. Screening levels derived by Zeeman (2004) were developed "to help decide if contaminant levels measured in

	sediments are low enough to be of no further concern, or elevated enough to warrant additional consideration. The screening levels have conservative elements to minimize the chance of concluding that there is no risk when there is risk." As derived, the screening levels are for risks to individual organisms. While exceedance of a screening level indicates a need for further consideration (e.g., of site-specific factors), it is not necessarily a threshold beyond which adverse effects will be observed, even in directly exposed benthic invertebrates (see Response 1.9). Concentrations of lead and arsenic in sediments of Pond 15 are within ranges found in sediments from outside Pond 15, based on data from the USFWS mudflats study (report in progress). Similar ranges are reported by Stransky et al. (2016) for samples collected from south San Diego Bay in 2013. Arsenic concentrations observed in the mudflats study (N=27) range from 0.91 to 10.8 mg/kg dw, and those reported by Stransky et al (2016; N=28) ranged from 1.9 to 14.7 mg/kg dw. Lead concentrations observed in the mudflats study range from 2.48 to 26.9 mg/kg dw and those reported by Stransky et al. (2016) ranged from 4.7 to 49.0 mg/kg dw. The reference for the report by Stransky et al. (2016) is Stransky, C., K. Tait, C. Sheredy, R. Schottle, R. Kolb and B. Bernstein. 2016. Aquatic food web bioaccumulation study of San Diego Bay, Final Report. Amec Foster Wheeler Environment

	and Infrastructure Inc. San Diego California. Appendix B (Chemistry Summary Tables) and can be obtained at http://www.waterboards.ca.gov/ sandiego/water_issues/ programs/sdbay_strategy/index.shtml.
	2.27 Risks posed by mercury in Pond 15 sediments were determined to be below levels of concern because the average concentration was below the lowest of the screening levels identified in Zeeman (2004; see Response 2.26), which is for California least tern. Considering an average concentration for receptors such as the California least tern is appropriate because birds do not forage over one station, and the fish they consume move around as well.
	2.28 Page 3.2-53 of the Final EIS has been revised to include clarification as suggested by the commenter. The revisions clarify the fact that Pond 15 is currently used as a salt pond and that once the contaminated sediments are buried as part of the project, a net benefit will result in that contaminated sediment will become less accessible than with pre-project conditions.
	2.29 All wetlands and non-wetlands waters are designated as CCC jurisdiction and treated as CCC wetlands for mitigation. The distinction between wetlands and non-wetland waters is part of the standard delineation and definition as conducted for the ACOE jurisdictional delineation. Regardless of the definition of an area as non-wetland waters, it was considered the jurisdiction of

Comment Letter on the Draft EIS for the Otay River Estuary Restoration Project
Page 6 of 7

hydrology criteria, a site must be saturated for at least two weeks in an average water year. Unless there is solid evidence that these areas do not meet the wetland hydrology criteria, the assumption, based on the 2011 surveys, should be that these areas are CCC wetlands and should be indicated as such on the figures and throughout the text of the EIR. I will note that in section 4, the borrow areas, although described as non-wetlands, are essentially treated as wetlands in regards to determining impacts and mitigation. I agree that this is the right approach, but it makes the designation of wetlands and non-wetlands more confusing (at least from a CCC perspective). 2.29 Cont.

b. Land cover type "SPBB" is not included in the legend on Figure 3.3-6 2.30

c. To ensure that impacts to eelgrass, fish and other marine species are minimized, we recommend that MM-HYD-1 require installation of a silt fence for the first 24 hours after the Pond 15 breach or until turbidity levels recede to ambient conditions instead of making it optional. 2.31

d. Section 4.2 (p. 4.2-53) describes the potential for deposition at the mouth of the Pond 15 opening because of the relatively low tidal velocities. However, because of the lack of a sediment source nearby, the impact is described as less than significant. Although this may be the case, in the unlikely event that sediment is deposited at the mouth of Pond 15, tidal flows to the wetland could be muted or cut-off, thus endangering the habitat the project is designed to create. I recommend including a mitigation measure that requires monitoring of the inlet and remediation in the event that tidal flows are significantly altered. 2.32

e. MM-BIO-8 requires that estuary seablite (*Suaeda esteroa*) be planted at a 2:1 mitigation ration in newly created mid-high marsh areas. Is it feasible to remove existing individual plants and transplant them into the new wetland? If so, we would recommend incorporating this into the mitigation measure. In addition, although California Box-thorn (*Lycium californicum*) and wooly seablite (*Suaeda taxifolia*) are lower on the rarity index and thus may not require the same level of mitigation, is it feasible and/or desirable to include these species in the planting palette for the new wetland areas as well? If so, we would recommend incorporating these species into MM-BIO-8 at a 1:1 ratio. 2.33

6. Mitigation measures

a. MM-VIS-1 – Please insert "Executive Director of the" before "California Coastal Commission" in the third line. We also recommend explicitly including a requirement that the revegetation plan include a monitoring plan (with specific methodologies identified), interim and final success criteria, and adaptive management measures. 2.34

b. MM-HYD-1 – we recommend requiring a silt fence for the first 24 hours after the Pond 15 breach or until turbidity levels recede to ambient conditions (see 5.c. above). At a minimum, please clarify who determines if a silt curtain is necessary after the Pond 15 breach. 2.35

c. MM-HYD-4 – we recommend editing the second sentence as follows: "The soil transport monitoring plan shall include ~~monitoring~~ operational protocols to ensure that unanticipated spills of transported soil material ~~would~~ do not occur from conveyor belt or slurry pipeline operations and monitoring protocols to detect any spills that do occur." 2.36

d. MM-BIO-2, 3, 5, 6 and 7 – we recommend revising these mitigation measures to delete the specific acreages associated with Alternative B and C in the event that an alternative other than Alternative B or C, or a slight variation of either alternative is implemented. 2.37

the CCC. Per Section 3.3 of the Draft EIS, Section 30121 of the California Coastal Act defines wetlands as "lands within the coastal zone which may be covered periodically or permanently with shallow water and include saltwater marshes, swamps, mudflats, and fens." These areas are all designated as coastal wetlands per the CCC. Also, as stated in the Draft EIS, "although the borrow areas are not physically connected to tidal channels or freshwater channels due to the presence of perimeter berms, the Corps classified them as jurisdictional for the Preliminary Jurisdictional Delineation (JD report). The portions of these areas that support hydrophytic vegetation were classified as wetlands, and the remaining areas below the ordinary high water mark were classified as non-wetland waters of the United States." However, the following sentence in that paragraph incorrectly stated that "all the borrow areas met the Commission's definition of a wetland (Appendix J)." The Final EIS has been corrected to state that "all the borrow areas <u>below the ordinary high water mark were classified as non-wetland waters per</u> the Commission's definition of a wetland (Appendix J)." Table 3.3-4, Wetland Delineation Existing Acreage Summary for the Otay River Floodplain Site, correctly identifies that 3.52 acres of former salt pond bottom and borrow area are non-wetland waters (which are Commission jurisdictional due to being below the ordinary high water mark) and 0.87 acres are wetlands due to presence of hydrophytic vegetation. The

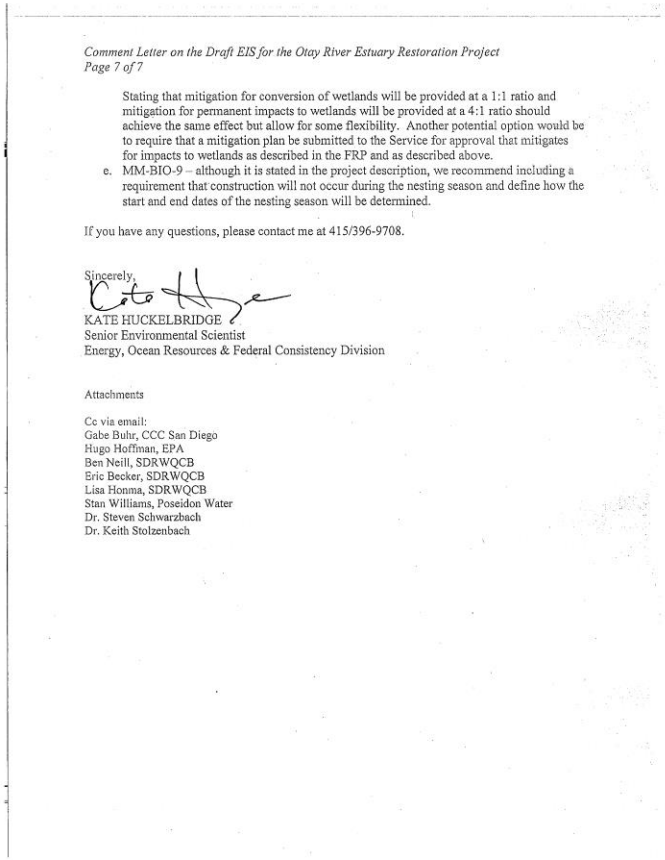
	remaining 6.44 acres of former salt pond bottom and borrow area are not Commission jurisdictional due to lack of any one of the three parameters used by the Commission. Table 3.3-1 of the Final EIS summarizes the acreage of the vegetation communities regardless of whether they are jurisdictional. In addition, a sentence clarifying the acreage of wetlands or non-wetlands waters versus upland for the former salt pond bottom and borrow area has been added to Section 3.3.1.1.
	2.30 Figure 3.3-6 has been updated in the Final EIS to include SPBB land cover type in the legend per the commenter's suggestion.
	2.31 It is anticipated that no adverse effects to water quality in the Bay or to eelgrass, fish, or other marine species would occur if the turbidity levels in Pond 15 are within 20% of the ambient conditions in the Bay at the time of breach. Turbidity impacts to Bay waters and associated resources were a concern raised for the proposal to breach Pond 11 as part of the restoration of the western salt ponds (Ponds 10A, 10, and 11). For that project, an analysis was conducted to determine the likelihood of sediment resuspension and to estimate the extent of any sediment resuspension. The results of that analysis indicated that resuspension was not likely; therefore, a silt fence was not deployed. Construction monitoring of the Western Salt Pond Restoration Project did not reveal any turbidity impacts to Bay waters. The same

	process would be utilized for this project to estimate the potential for sediment resuspension prior to breaching. To minimize the potential for increased turbidity levels in the Bay as a result of breaching Pond 15, Mitigation Measure MM-HYD-1 has been revised in the Final EIS. This mitigation measure requires that prior to the breaching of Pond 15, the Service shall ensure the turbidity levels in Pond 15 and in the Bay in the area adjacent to Pond 15 are measured and that the turbidity level in Pond 15 does not exceed 20% of the turbidity level measured in the Bay. If turbidity levels in Pond 15 are found to exceed the 20% threshold, breaching shall be delayed until turbidity levels in Pond 15 are consistent with the 20% threshold. In addition, breaching of Pond 15 would be scheduled to start during an incoming neap tide to minimize water velocities, thereby minimizing resuspension of sediment within Pond 15. During breaching, it is possible that some scour and associated resuspension could occur within the two channels located within Pond 15. If such scour is observed, then silt curtains would be installed across these interior channels to minimize turbidity by reducing the amount of resuspended sediment that would exit Pond 15 and enter San Diego Bay. Implementation of the project also includes extending the inlet channel for Pond 15 into San Diego Bay

		beyond the pond's outer levee. The work area associated with this portion of the inlet channel construction would be located in the open Bay (i.e., not isolated by the salt pond levees) so there is the potential for excavation work in this area to impact Bay water turbidity. Consequently, a silt curtain would be deployed around the work area to minimize turbidity impacts from excavation occurring in Bay waters, and monitoring would be conducted to verify that turbidity levels are within acceptable levels outside of the area enclosed by the silt curtain. The presence of eelgrass in the Bay to the west of the project site also necessitates that the project comply with the Southern California Eelgrass Mitigation Policy, which includes requirements for pre- and post-construction monitoring of eelgrass beds and appropriate mitigation measures for activities that threaten eelgrass vegetated habitats. The requirement for conformance with this policy was addressed in the Draft EIS as Mitigation Measure MM-BIO-11.
	2.32	If we adopt the unlikely premise that sediment from some unidentified source might be deposited at the mouth of Pond 15, the tidal velocities at the inlet to Pond 15 would immediately increase in proportion to the loss of inlet area resulting from that deposition event. Therefore, the hypothetical deposition event must involve a sandy sediment since the newly

		deposited fine-grained sediment would be immediately re-suspended and flushed out of the inlet because it would not remain immobile long enough to compact and develop sufficient shear strength to resist scour by the increased tidal currents. Nonetheless, a monitoring and remediation plan will be prepared as part of the restoration plan to identify any sedimentation in the inlet channel to Pond 15 that might result in substantial, adverse impacts to tidal exchange between San Diego Bay and Pond 15. It is anticipated that the restoration monitoring will include tide range monitoring in Pond 15 and inlet cross section monitoring in the channel that connects Pond 15 to San Diego Bay. If observed inlet channel sedimentation is determined to be adversely impacting tidal exchange (i.e., tide range) then remediation consisting of excavation/dredging would be conducted in areas of "problematic" sedimentation.
	2.33	It is generally not feasible to transplant mature native shrubs both from a logistics and survivorship perspective. We will attempt to transplant as many specimens as possible; however, as a backup to salvage, we will also take cuttings from all three species present on the project site to produce nursery stock suitable for incorporation into the restoration design. *Suaeda esteroa* will be planted at a 2:1 mitigation ratio in newly created mid to high marsh areas, and *Lycium californicum* and *Suaeda taxifolia*

	will be included in the planting palette for the new wetlands at a 1:1 ratio. MM-BIO-8 has been revised accordingly in the Final EIS.
	2.34 Mitigation Measure MM-VIS-1 has been revised accordingly in the Final EIS. In addition, Section 2.3.2.5 (Planting Program) of the Final EIS and Appendix D (Planting Plan for Uplands) have been reviewed and revised as necessary to ensure adequate discussion of specific monitoring methodologies, interim and final success criteria, and adaptive management measures.
	2.35 Refer to Response 2.31.
	2.36 Edits to MM-HYD-4, as suggested by the commenter, have been incorporated in the Final EIS. MM-HYD-4 will now read as follows: "The soil transport monitoring plan shall include operational protocols to ensure that unanticipated spills of transported material do not occur from conveyor belt or truck transport operations, as well as monitoring protocols to detect any spills that do occur." Note that use of a slurry pipeline to transport material has been eliminated from consideration.
	2.37 The specific acreages for Alternatives B and C have been deleted from Mitigation Measures MM-BIO 2, 3, 5, 6, and 7 as suggested by commenter. This change has been incorporated into the Final EIS.



Comment Letter on the Draft EIS for the Otay River Estuary Restoration Project
Page 7 of 7

Stating that mitigation for conversion of wetlands will be provided at a 1:1 ratio and mitigation for permanent impacts to wetlands will be provided at a 4:1 ratio should achieve the same effect but allow for some flexibility. Another potential option would be to require that a mitigation plan be submitted to the Service for approval that mitigates for impacts to wetlands as described in the FRP and as described above. 2.37 Cont.

e. MM-BIO-9 – although it is stated in the project description, we recommend including a requirement that construction will not occur during the nesting season and define how the start and end dates of the nesting season will be determined. 2.38

If you have any questions, please contact me at 415/396-9708.

Sincerely,

KATE HUCKELBRIDGE
Senior Environmental Scientist
Energy, Ocean Resources & Federal Consistency Division

Attachments

Cc via email:
Gabe Buhr, CCC San Diego
Hugo Hoffman, EPA
Ben Neill, SDRWQCB
Eric Becker, SDRWQCB
Lisa Honma, SDRWQCB
Stan Williams, Poseidon Water
Dr. Steven Schwarzbach
Dr. Keith Stolzenbach

2.38 Although avoidance of the nesting season is already addressed through the project design and construction schedule, the Final EIS has been revised to more clearly define the various measures that will be implemented to avoid adverse effects to avian species. A mitigation measure has been added to address avoidance of the nesting season, as well as the need for monitoring of special-status species during construction. The implementation of these measures will be overseen the San Diego Bay NWR Manager. Note that the nesting season varies somewhat between years and for various species. The community of nesting avian species also may vary between years and locations in the South San Diego Bay Unit. Refuge biological staff would be responsible for determining specific work closure periods and locations in relation to particular species occurrences and the differing seasonal behavioral propensities and life history needs of each species in relation to discrete or cumulative disturbance sources.

KEITH D. STOLZENBACH, PH.D., P.E.
Environmental Engineering Consultant

3257 Earlmar Drive
Los Angeles, California 90064

310-206-7624
fax 310-206-2222
stolzenb@ucla.edu

December 1, 2016

Kate Huckelbridge
California Coastal Commission
Energy, Ocean Resources & Federal Consistency Division
45 Fremont St. Ste. 2000
San Francisco, CA 94105

Re: Review of DDT dispersion calculations

Dear Kate:

This letter is to convey my review of material in connection with the estimation of DDT dispersion and deposition in the OTAY River Floodplain as a result of a large flood event. I reviewed the following documents:

Everest. Otay River Estuary Restoration Project Fluvial Hydraulics Study. Prepared by Everest International Consultants, Inc. for Poseidon Water LLC, October 2014.

Jenkins, S. and J. Wasyl. Tidal Hydraulics of Wetlands Restoration Alternatives In the Otay River Flood Plain, Carlsbad Desalination Project Marine Life Mitigation Plan. Jenkins Consulting. September 2010.

Jenkins, S., Y. Poon, C. Zeeman, C. Roberts. Sensitivity Analysis of Potential DDT Deposition in the Otay River Estuary Restoration Plan (ORERP) Post-100 Year and 50-Year Floods. October 2015.

2.39

My review focused on the Jenkins et al. (2015) report. I did review the other two reports and have some comments I can include in a more detailed report.

The Jenkins et al. (2015) report calculates the dispersal of DDT contaminated sediments as a result of 100 and 50-year floods on the Otay River. DDT accumulation was specifically calculated in the Floodplain Tidal Basin of the Intertidal and Subtidal Alternatives and in the Pond 15 Tidal Basin of the Intertidal and Subtidal Alternatives. Attention was paid to the differences in DDT deposition between the Intertidal and Subtidal Alternatives.

The following is a summary and critique of the dispersion calculation assumptions methodology:

- Fine sediment loads carried by the floodwaters from the watershed are estimated on the basis of calculated loads from another watershed flooding study. This calculation uses only the relative areas of the two watersheds to make the extrapolation, and did not consider other factors such as land use differences. In addition, the percent of fine material in the discharge is assumed to be 50% for the 50-year flood and 60% for the 100-year flood, based on limited evidence. Calculations of DDT dispersal were made with and without the inclusion of fine sediment discharge from the watershed. When the fine sediments were included they were assumed to be free of DDT. These results indicated that inclusion of the watershed discharge results in greater overall sediment

2.40

2.39 This comment does not address the content or adequacy of the EIS; therefore, no response is required.

2.40 It is agreed that the simplified methodology involves a high degree of error. However, given the similarity in behavior of the two project alternatives relative to existing conditions and each other, this error did not affect the ability of the analysis to delineate impacts between the alternatives and existing conditions or between the two alternatives. It is agreed that the potential error would be of more concern if the differential impact between alternatives were higher and/or if the differential impact between the alternatives and existing conditions were higher.

deposition and lower DDT concentrations because of the dilution of eroded contaminated sediments from the Otay River Floodplain (ORF) by the clean upstream material. However, the calculated difference between the two project alternatives is relatively small. This is not surprising given the relatively simplified assumptions about DDT erosion and initial dispersion within the ORF (see below) that cannot resolve the morphologic differences between the two alternatives. The potential error in this calculation of the fine sediment discharge would be of more concern if this differential impact between project alternatives were greater. 2.40 Cont.

- The Everest (2014) report calculates that 100 and 50-year flood flow velocities would be sufficient to erode all size fractions of the sediments. For this reason the calculation of DDT dispersion assumes that erosion occurs uniformly over the entire Otay River Floodplain (ORF). Calculations were made for assumed erosion depths of 1, 2, and 3 ft, based on measured depths to less erodible material. These are highly simplifying assumptions, but are consistent with the overall resolution of the approach used in the DDT dispersion calculations. For each assumed depth of erosion measured values of percent fine material are used to compute the total mass of fine sediments eroded from the ORF. 2.41

- DDT contamination is assumed to be present only in a portion of the ORF where sediment sampling shows significant DDT calculations relative to background. DDT is assumed to exist only sorbed to fine sediments, a reasonable assumption, but it is not clear whether it is supported by the if the sediment DDT samples. Two separate data sets are used to quantify vertical DDT profiles in the contaminated area. Once the vertical profiles have been established the total mass of DDT and the average dry weight concentration of the sorbed DDT in the eroded material can be calculated for each assumed depth of erosion. These assumptions seem reasonable, although highly simplified. 2.42

- The calculation of the dispersal of the eroded DDT during the flood period assumes that all of the fine sediments are carried as suspended load with a uniform suspended solids concentration, and a uniform DDT dry weight concentration determined by assuming that the sorbed DDT is redistributed between the fine sediments eroded in the watershed and fine sediments eroded in the ORF. Furthermore, it is assumed that at the end of the flood period the floodwater volume occupies a region "throughout the floodplain and adjacent South San Diego Bay as far north as nodal points at the Chule Vista Wildlife Reserve." No justification is given for the assumed extent of the floodwater volume in San Diego Bay. It is certainly possible that some of the sediment eroded by a flood is transported beyond this region and does not deposit in the study area, but it is a conservative assumption to assume that it does. Deposition of eroded fine sediment is assumed negligible during the flooding period, which is likely to be a good assumption given the high velocities computed by in Everest (2014). 2.43

- As acknowledged in the report, the calculations of DDT dispersal do not include a representation of any contaminated sediment by bedload processes, i.e. by movement of sediment without sediment resuspension. Given the uncertainties in computing bedload sediment transport and the high tendency fine sediments to be resuspended, this is a reasonable and useful simplifying assumption. 2.44

Page 2

2.41 It is agreed that the methodology used to estimate erosion across the DDT-contaminated soil areas was based on the assumption of uniform erosion across this area, and it is acknowledged that this represents a high degree of simplification. It is further agreed that this degree of simplification is consistent with the overall resolution of the DDT analysis approach.

2.42 It is agreed that the methodology used to estimate DDT contamination concentrations was based on a simplified analysis of limited site data. It is further agreed that this degree of simplification is reasonable given the overall resolution of the DDT analysis approach.

2.43 It is agreed that the methodology used to estimate dispersal of the eroded DDT-contaminated soil during the flood period represents a simplification of the relevant processes. The assumption regarding the extent of the floodwaters and the limitation of the DDT-contaminated soils remaining within the study area was done to provide a conservative estimate with regards to the amount of such sediment that could be trapped within the restored wetlands. It is agreed that this represents a conservative assumption.

2.44 It is agreed that the DDT dispersion calculations do not include a representation of any contaminated sediment transported via bedload processes so that all such transport is assumed to be associated with suspended load transport. It is agreed that this represents a reasonable assumption.

- The fate of the DDT contaminated sediments after the flooding period is calculated using a numerical model that represents the tidal currents in the study area. The numerical model is described in Jenkins and Waysl (2014) and is an example of a general flow modeling technique that is well-accepted and appropriate for this kind of flow environment, although no site-specific validation is presented for the flow calculations. 2.45
- The numerical model contains terms representing the following sediment transport processes: i) horizontal advection by tidal currents, ii) deposition to the sediment surface, iii) resuspension from the sediment surface, iv) consolidation to a partially consolidated fluid mud layer from which resuspension does not occur (at least that is what I think they assume - I recommend obtaining more clarity about this), and v) long-term complete consolidation to a fluid mud layer. The deposition calculation is based on a single value of the settling velocity based on an assumed characteristic sediment size. The resuspension (Equation 3) and initial consolidation (Equation 8) of sediment are calculated using empirical approaches from the literature involving assumed values of parameters. The final consolidation does not involve a calculated rate so the layer thicknesses before and after consolidation are determined by the assumed values of bulk sediment density, which appear to be reasonable. 2.46
- I am concerned about several aspects of the sediment transport calculations. First, the boundary conditions at the open boundary with San Diego Bay do not seem to represent any possible return on an incoming tide of sediment transported out of the domain on earlier outgoing tides. This area is at the end of San Diego Bay where I suspect tidal flushing is weak, so it is important to represent this return process in some way. Second, I am afraid that I have no quick way to estimate the likely error introduced by the assumptions about sediment resuspension and consolidation. These assumptions are critical to the calculation of the fraction of the eroded DDT that is deposited in the study area and the depth of the deposited layer. It would seem to me that some sort of sensitivity study to the parameter values would be appropriate to gain confidence in the overall calculation results. Given the publication dates of the key literature sources of the equations for resuspension and consolidation, I am also wondering whether more recent studies might have developed more robust predictive equations. 2.47
- The ecosystem impact of the deposited DDT depends on the exposure to DDT to organisms feeding on an "active layer" of sediment. For this study, calculations were made for assumed active layer depths of 20mm, 40mm, and 80mm. Average DDT concentrations (dry weight) were computed by averaging the DDT present in the actual layer deposited during the flood over the active depth. This seems to be a reasonable procedure, however, the results presented in Table 11 include both "initial" and "final" values of average DDT concentration that are different, with the final values being smaller than the initial values. The report says clearly on page 27 that as the deposited layer consolidates no sediment mass is lost or gained, so the dry weight concentration of DDT stays the same. The consolidation just converts a thicker layer of less concentrated mud (200 g/L) into a thinner layer of more concentrated mud (1200 g/L), but the sediment mass and thus the DDT mass in the layer stays the same. I get that averaging this DDT over 20 mm (as a feeding organism does) will reduce the average dry weight concentration of DDT by dilution with clean sediments. This is why the concentrations in the last 6 columns of Table 11 are lower than 70.2 ug/kg (the average dry weight 2.48

Page 3

2.45 Refer to Response 2.7.

2.46 This comment outlines the terms representing the sediment transport processes, which the commenter states "appear to be reasonable." The discussion of consolidation to a partially consolidated fluid mud layer is clarified in Appendix I.

2.47 Refer to Responses 2.9 and 2.10.

2.48 The calculated concentrations are simply averages of the concentrations over the stated depth, with the contaminated portion forming a different proportion based on the initial and final deposition thicknesses. These depositional thicknesses were based on initial settlement to a wet density of 200 mg/L and final settlement to a wet density of 1,200 mg/L. The commenter is correct that dry bulk concentrations do not change. This was a convenient tool to express exposures to benthic organisms in the range of conditions resulting from such an event. Weight-based calculations would not yield different results for initial and final concentrations, but those calculations would require specific parameters for the weight of the sediments in the receiving area. Sampling to support those calculations was not conducted, so the depth-integrated approach was used to estimate those exposures (see also Response 2.11).

concentration of the DDT in the deposited layer). What I don't get is the "initial" vs "final" values given that nothing is changing the amount of DDT to be averaged over the 20 mm. I have been unable to reproduce the calculated initial and final values, so I recommend obtaining clarification on this point.

- As discussed above, the calculation of DDT dispersion makes a number of assumptions that greatly simplify the actual sediment transport processes and/or utilize highly empirical, and possibly dated, parameterizations of transport processes without exploring the sensitivity of the results to parameter values. With additional time and effort I could try to determine if there are more recently developed representations that would be significantly more reliable.
- One way to get a perspective on the importance of potential errors in the DDT dispersion calculations is to consider the inherent range of possible results. The assumptions and methods underlying the dispersion calculations are equivalent to the following steps: 1) Specifying the quantity of fine sediment entering or eroded from the ORF during a flood, 2) Specifying the mass of DDT eroded from the ORF, 3) Assuming that all of the fine sediments and DDT initially remain in the project area after the flood, but then are either flushed out to San Diego Bay or deposited in the sediments, 4) The exposure of organisms to the DDT is assumed to be related to the DDT concentration calculated by assuming the remaining mass of DDT in the deposited sediments is mixed over a specified active layer depth. The detailed numerical model calculations in Step 3 could be completely replaced by an assumption about what fraction of the total mass of fine sediments and DDT are deposited rather than flushed away (the fraction would be the same for both). Once this fraction is specified, the mass of DDT in the sediments is determined and Step 4 can be completed. My point is that if the fraction of sediment and DDT that deposits is large, say 50%, uncertainties in the DDT concentrations could be low by no more than a factor of two. But if the fraction is small, say 1% or less, then the calculated value could underestimate the total value by as much as a factor of 100 or more. I was unable to calculate the fraction of fine sediment and DDT that deposits because I did not have a value for the total surface area on which deposition occurs. I recommend that the authors of the Jenkins et al. (2015) report be asked to provide this fraction for the different cases analyzed.

Please let me know if you need any additional information in this regard at this point. I would be happy to answer any questions you have and to discuss additional analyses that might be useful.

Submitted by,



Keith D. Stolzenbach, Ph.D., P.E.

Page 4

2.48 Cont.

2.49

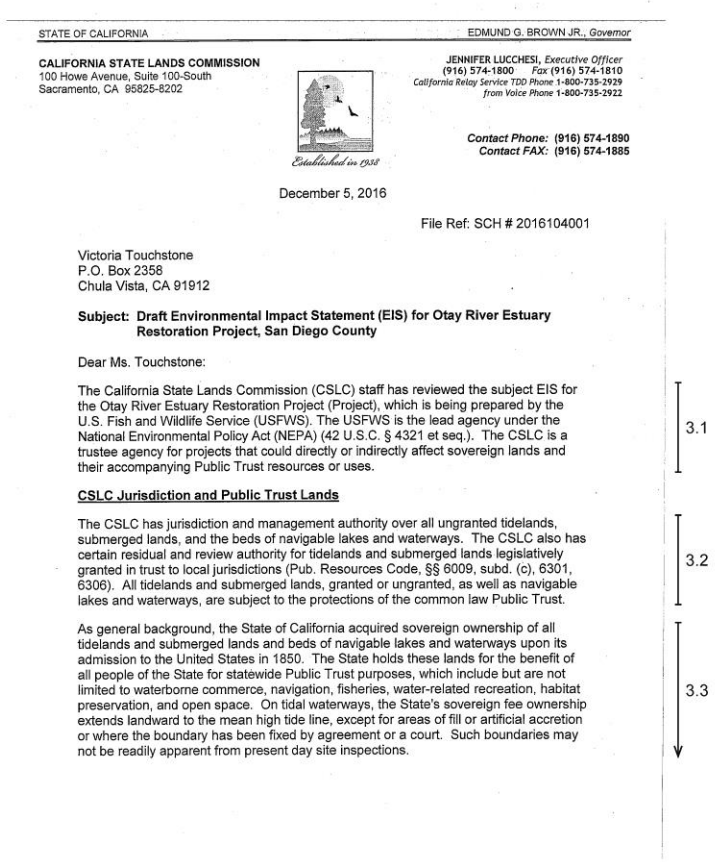
2.50

2.49 Refer to Response 2.10.

2.50 The model domain includes the ORERP and the adjacent southern end of San Diego Bay (referred to as the South Bay Shelf). The model domain ends along an open water kinematic boundary that extends from the northern end of the Chula Vista Wildlife Reserve across the Bay to Spinnaker Point (adjacent Spinnaker Way). This domain includes 109 acres to 113 acres of the ORERP (depending on restoration alternative), and an additional 1,822 acres of receiving water outside the ORERP on the South Bay Shelf. Within this model domain, the fraction of the total mass of fine sediments that are deposited rather than flushed away is exactly unity because the entire assumed maximum sediment yield resulting from the 24-hour long Otay River flood hydrographs is either deposited on the South Bay Shelf or within the ORERP. The preponderance of this sediment yield is deposited within the South Bay Shelf portion of the model because water depths are substantially deeper there, and the proportion of subtidal area is substantially greater than in the ORERP. Consequently re-suspension of fluid mud by tidal circulation was proportionally less on the South Bay Shelf versus in the ORERP. As a result, the South Bay Shelf becomes the primary sediment sink at the end of the model simulations, and that modeled

	outcome is virtually unchanged, with or without the presence of the ORERP. In the absence of the ORERP, modeled deposition thickness of unconsolidated mud on the South Bay Shelf is increased by only 3.4 mm, indicating that the ORERP has a *de minimis* (yet favorable) impact on the dispersion DDT-contaminated sediments beyond the project boundaries.

Comment Letter 3



STATE OF CALIFORNIA — EDMUND G. BROWN JR., *Governor*

CALIFORNIA STATE LANDS COMMISSION
100 Howe Avenue, Suite 100-South
Sacramento, CA 95825-8202

Established in 1938

JENNIFER LUCCHESI, *Executive Officer*
(916) 574-1800 *Fax* (916) 574-1810
California Relay Service TDD Phone 1-800-735-2929
from Voice Phone 1-800-735-2922

Contact Phone: **(916) 574-1890**
Contact FAX: **(916) 574-1885**

December 5, 2016

File Ref: SCH # 2016104001

Victoria Touchstone
P.O. Box 2358
Chula Vista, CA 91912

Subject: Draft Environmental Impact Statement (EIS) for Otay River Estuary Restoration Project, San Diego County

Dear Ms. Touchstone:

The California State Lands Commission (CSLC) staff has reviewed the subject EIS for the Otay River Estuary Restoration Project (Project), which is being prepared by the U.S. Fish and Wildlife Service (USFWS). The USFWS is the lead agency under the National Environmental Policy Act (NEPA) (42 U.S.C. § 4321 et seq.). The CSLC is a trustee agency for projects that could directly or indirectly affect sovereign lands and their accompanying Public Trust resources or uses. 3.1

CSLC Jurisdiction and Public Trust Lands

The CSLC has jurisdiction and management authority over all ungranted tidelands, submerged lands, and the beds of navigable lakes and waterways. The CSLC also has certain residual and review authority for tidelands and submerged lands legislatively granted in trust to local jurisdictions (Pub. Resources Code, §§ 6009, subd. (c), 6301, 6306). All tidelands and submerged lands, granted or ungranted, as well as navigable lakes and waterways, are subject to the protections of the common law Public Trust. 3.2

As general background, the State of California acquired sovereign ownership of all tidelands and submerged lands and beds of navigable lakes and waterways upon its admission to the United States in 1850. The State holds these lands for the benefit of all people of the State for statewide Public Trust purposes, which include but are not limited to waterborne commerce, navigation, fisheries, water-related recreation, habitat preservation, and open space. On tidal waterways, the State's sovereign fee ownership extends landward to the mean high tide line, except for areas of fill or artificial accretion or where the boundary has been fixed by agreement or a court. Such boundaries may not be readily apparent from present day site inspections. 3.3

Response to Comment Letter 3

California State Land Commission
Cy R. Oggins, Chief
December 5, 2016

3.1 The Service appreciates the California State Land Commission's review of the Draft EIS.

3.2 The comment does not address a deficiency in the Draft EIS; therefore, no response is required.

3.3 The comment does not address a deficiency in the Draft EIS; therefore, no response is required. Should project changes occur that would require further lease approval, the CSLC will be notified.

A review of the CSLC's records indicates that the Otay River floodplain restoration site is located within sovereign lands that the State acquired from Western Salt Co. under a title settlement agreement recorded April 1, 1999. The Pond 15 restoration site is located within sovereign tide and submerged lands. The subject sites are located within lands currently leased to the USFWS. Lease No. PRC 8075.9 is a General Lease - Public Agency Use for the creation and continued maintenance of the South San Diego Bay Unit of the San Diego National Wildlife Refuge, which expires on April 30, 2048.

At this time, the Project does not appear to require further lease approval from the CSLC. However, if Project details change and include activities that are not authorized by Lease No. PRC 8075.9, then please contact Lucien Pino, Public Land Management Specialist, at (916) 574-1858 or via e-mail at Lucien.Pino@slc.ca.gov, to discuss the extent of the CSLC's jurisdiction and application requirements.

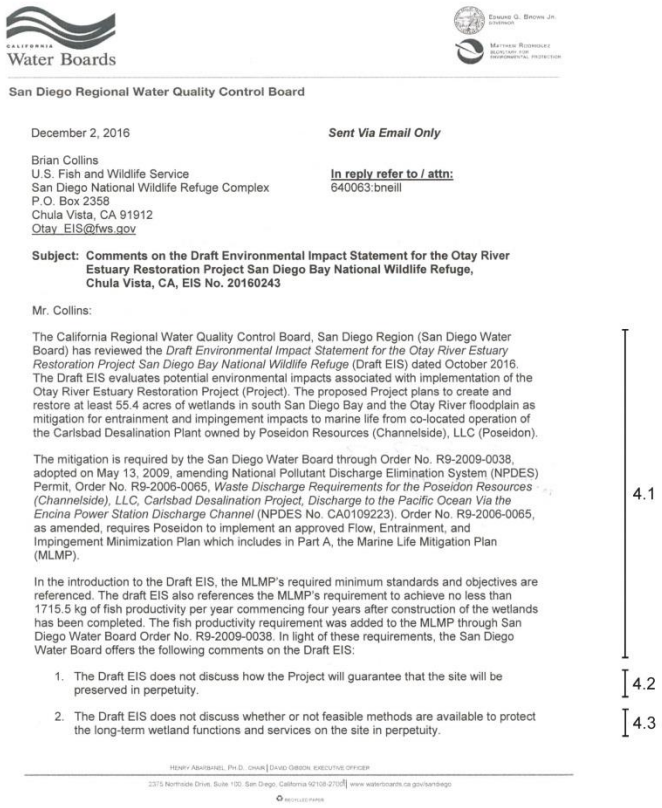
3.3 Cont.

Sincerely,

Cy R. Oggins, Chief
Division of Environmental Planning
and Management

cc: Office of Planning and Research
L. Pino, CSLC

Comment Letter 4



Water Boards

San Diego Regional Water Quality Control Board

December 2, 2016 *Sent Via Email Only*

Brian Collins
U.S. Fish and Wildlife Service
San Diego National Wildlife Refuge Complex
P.O. Box 2358
Chula Vista, CA 91912
Otay_EIS@fws.gov

In reply refer to / attn:
640063:bneill

Subject: Comments on the Draft Environmental Impact Statement for the Otay River Estuary Restoration Project San Diego Bay National Wildlife Refuge, Chula Vista, CA, EIS No. 20160243

Mr. Collins:

The California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) has reviewed the *Draft Environmental Impact Statement for the Otay River Estuary Restoration Project San Diego Bay National Wildlife Refuge* (Draft EIS) dated October 2016. The Draft EIS evaluates potential environmental impacts associated with implementation of the Otay River Estuary Restoration Project (Project). The proposed Project plans to create and restore at least 55.4 acres of wetlands in south San Diego Bay and the Otay River floodplain as mitigation for entrainment and impingement impacts to marine life from co-located operation of the Carlsbad Desalination Plant owned by Poseidon Resources (Channelside), LLC (Poseidon).

The mitigation is required by the San Diego Water Board through Order No. R9-2009-0038, adopted on May 13, 2009, amending National Pollutant Discharge Elimination System (NPDES) Permit, Order No. R9-2006-0065, *Waste Discharge Requirements for the Poseidon Resources (Channelside), LLC, Carlsbad Desalination Project, Discharge to the Pacific Ocean Via the Encina Power Station Discharge Channel* (NPDES No. CA0109223). Order No. R9-2006-0065, as amended, requires Poseidon to implement an approved Flow, Entrainment, and Impingement Minimization Plan which includes in Part A, the Marine Life Mitigation Plan (MLMP).

In the introduction to the Draft EIS, the MLMP's required minimum standards and objectives are referenced. The draft EIS also references the MLMP's requirement to achieve no less than 1715.5 kg of fish productivity per year commencing four years after construction of the wetlands has been completed. The fish productivity requirement was added to the MLMP through San Diego Water Board Order No. R9-2009-0038. In light of these requirements, the San Diego Water Board offers the following comments on the Draft EIS:

1. The Draft EIS does not discuss how the Project will guarantee that the site will be preserved in perpetuity.
2. The Draft EIS does not discuss whether or not feasible methods are available to protect the long-term wetland functions and services on the site in perpetuity.

4.1

4.2

4.3

HENRY ABARBANEL, PH.D., CHAIR | DAVID GIBSON, EXECUTIVE OFFICER

2375 Northside Drive, Suite 100, San Diego, California 92108-2700 | www.waterboards.ca.gov/sandiego

RECYCLED PAPER

Response to Comment Letter 4

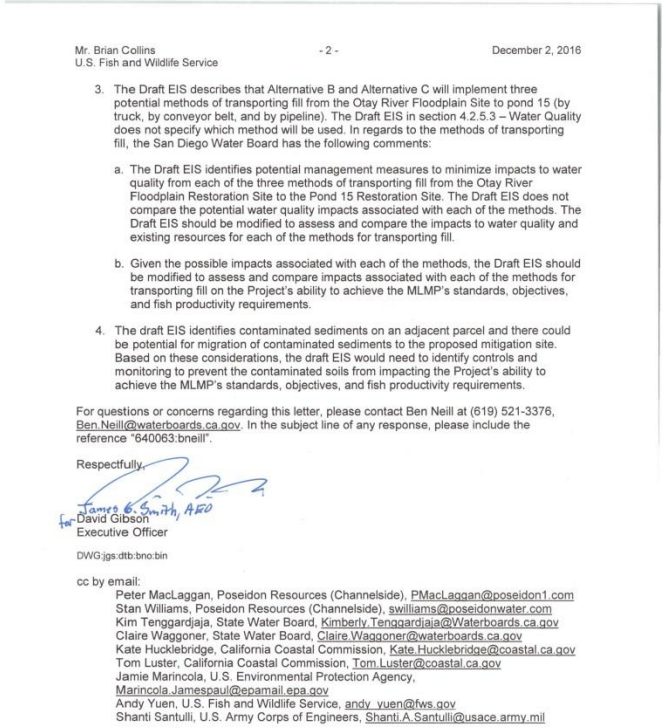
San Diego Regional Water Quality Control Board
James G. Smith, AED for
Dave Gibson
December 2, 2016

4.1 The Service appreciates the San Diego Regional Water Quality Control Board's participation in the review of this proposal and for providing comments on the Draft EIS.

4.2 Section 1.4 (Purpose and Need for the Action) of the Final EIS has been expanded to address the relationship of the project to the long-term goals of the San Diego Bay NWR and its consistency with the management goals and objectives presented in the San Diego Bay NWR CCP. Also addressed is the relationship of the San Diego Bay NWR to the California State Lands Commission.

4.3 The restoration design takes in consideration sea-level rise through 2050, based on currently accepted projections. It is not possible to predict to what extent sea-level rise will affect wetland functions and services, but as sea-level rises, existing habitats will transition into other habitat types. Even with sea-level rise, the restoration sites will continue to support a range of wetland organisms and provide wetland functions and services that, in the case of the Otay River Floodplain Site, are not currently being

	provided and are only partially provided in Pond 15 in its current state (e.g., no fish habitat is currently available and invertebrate diversity is low). As both restoration sites are included within the boundaries of a National Wildlife Refuge, long-term management will be the responsibility of the Service. Although Poseidon will monitor and maintain the two sites until its obligations are met, once completed, the Service will adaptively manage the site in accordance with the National Wildlife Refuge System Improvement Act and San Diego Bay NWR purposes. Refer also to Response 4.2.



Mr. Brian Collins - 2 - December 2, 2016
U.S. Fish and Wildlife Service

3. The Draft EIS describes that Alternative B and Alternative C will implement three potential methods of transporting fill from the Otay River Floodplain Site to pond 15 (by truck, by conveyor belt, and by pipeline). The Draft EIS in section 4.2.5.3 – Water Quality does not specify which method will be used. In regards to the methods of transporting fill, the San Diego Water Board has the following comments:

   a. The Draft EIS identifies potential management measures to minimize impacts to water quality from each of the three methods of transporting fill from the Otay River Floodplain Restoration Site to the Pond 15 Restoration Site. The Draft EIS does not compare the potential water quality impacts associated with each of the methods. The Draft EIS should be modified to assess and compare the impacts to water quality and existing resources for each of the methods for transporting fill.

   b. Given the possible impacts associated with each of the methods, the Draft EIS should be modified to assess and compare impacts associated with each of the methods for transporting fill on the Project's ability to achieve the MLMP's standards, objectives, and fish productivity requirements.

4. The draft EIS identifies contaminated sediments on an adjacent parcel and there could be potential for migration of contaminated sediments to the proposed mitigation site. Based on these considerations, the draft EIS would need to identify controls and monitoring to prevent the contaminated soils from impacting the Project's ability to achieve the MLMP's standards, objectives, and fish productivity requirements.

4.4
4.5
4.6
4.7

For questions or concerns regarding this letter, please contact Ben Neill at (619) 521-3376, Ben.Neill@waterboards.ca.gov. In the subject line of any response, please include the reference "640063:bneill".

Respectfully,

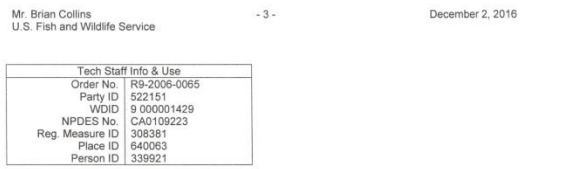
for David Gibson
Executive Officer

DWG:jgs:dtb:bno:bin

cc by email:
Peter MacLaggan, Poseidon Resources (Channelside), PMacLaggan@poseidon1.com
Stan Williams, Poseidon Resources (Channelside), swilliams@poseidonwater.com
Kim Tenggardjaja, State Water Board, Kimberly.Tenggardjaja@Waterboards.ca.gov
Claire Waggoner, State Water Board, Claire.Waggoner@waterboards.ca.gov
Kate Hucklebridge, California Coastal Commission, Kate.Hucklebridge@coastal.ca.gov
Tom Luster, California Coastal Commission, Tom.Luster@coastal.ca.gov
Jamie Marincola, U.S. Environmental Protection Agency, Marincola.Jamespaul@epamail.epa.gov
Andy Yuen, U.S. Fish and Wildlife Service, andy_yuen@fws.gov
Shanti Santulli, U.S. Army Corps of Engineers, Shanti.A.Santulli@usace.army.mil

4.4 The Draft EIS considered and analyzed all three soil transport methods; however, the slurry option has been eliminated from any further consideration in the Final EIS, as addressed in Response 1.24. Of the two remaining options, each has different issues to be considered, but measures have been incorporated into the scope of the project to avoid any significant adverse effects from either option. The specific method of sediment transport between the floodplain site and Pond 15 will be determined as part of the construction bid process. As noted in Response 2.3, the Final EIS has been revised to include the requirement for the use of catchment tarps under the conveyor belts where impacts could occur to natural water areas and/or commercial salt ponds.

4.5 As stated in Section 4.2.5.3.2 and Section 4.2.5.3.3 of the Draft EIS, impacts to water quality from all three soil transport options would include the potential for spillage of soil into waters within the project site. Mitigation was proposed to ensure that such impacts would not result in any significant adverse effects to water quality. Similarly, the transport options were evaluated for potential impacts to visual quality (Section 4.2.1), air quality (Section 4.2.6), noise (Section 4.2.7), and greenhouse gases (Section 4.2.9). Through the implementation of specific conservation measures, none of the transport options would result in



Mr. Brian Collins - 3 - December 2, 2016
U.S. Fish and Wildlife Service

Tech Staff Info & Use	
Order No.	R9-2006-0065
Party ID	522151
WDID	9 000001429
NPDES No.	CA0109223
Reg. Measure ID	308381
Place ID	640063
Person ID	339921

significant adverse effects; therefore, project implementation could involve either the use of a conveyor belt or truck transport system (as addressed in Response 1.24, the slurry transport option has been eliminated).

4.6 As stated in Response 4.5, all the transport methods analyzed in the Draft EIS were evaluated to determine the potential for adverse effects to the environment, and none of the transport methods were determined to result any unmitigated significant adverse effects. The ability to achieve the MLMP's standards, objectives, and fish productivity requirements related directly to the successful implementation of the restoration design for Pond 15 and the Otay River floodplain, not on the methods used to transport material to the site to achieve the desired habitat elevations.

4.7 Appendix I, which accompanied the Draft EIS, established that no significant adverse effects to downstream resources from the deposition of DDT-contaminated soils following a 100-year flood event are anticipated. The analyses and conclusions addressing the potential effects of mobilization of DDT-contaminated soils on downstream resources were peer-reviewed at the request of the CCC. Both peer reviewers found the modeling approaches and methodologies used in the analyses to be appropriate with some comments regarding assumptions and

	uncertainties. These comments have been addressed in Responses 2.5–2.28 and 2.39–2.50. Although no adverse effects associated with the DDT-contaminated soils are anticipated, the scope of the selected alternative has been revised to include placing clean fill (excess material from excavation of the Otay River Floodplain that was previously proposed for stockpiling on the San Diego Bay NWR) over the 23.4-acre contaminated site and planting or seeding the site with native scrub vegetation. Fill placement and the establishment of native vegetation on the site will further reduce the potential for mobilization of contaminated soils as a result of a significant flood event.

Comment Letter 5

From: andy_yuen@fws.gov on behalf of Otay EIS, FWS
To: Stan Williams (swilliams@poseidonwater.com); Brian Grover; Jennifer Sucha
Cc: Brian Collins
Subject: Fwd: Otay Estuary EIS
Date: Thursday, December 08, 2016 9:53:05 AM

---------- Forwarded message ----------
From: **Michael Walker** <MWalker@ci.chula-vista.ca.us>
Date: Mon, Dec 5, 2016 at 4:07 PM
Subject: Otay Estuary EIS
To: "Otay_EIS@fws.gov" <Otay_EIS@fws.gov>

Thank you for the opportunity to review the DEIS for the Otay River Estuary Restoration Project. The City of Chula Vista does not have any comments as the project area appears to be entirely within the City of San Diego's jurisdictional boundary. 5.1

Michael W. Walker, MUP, MA

Zoning Administration

Historic Preservation Program

Development Services Department

City of Chula Vista

619.409.5472

mwalker@chulavistaca.gov

Response to Comment Letter 5

City of Chula Vista
Michael W. Walker, MUP, MA
December 5, 2016

5.1 The Service appreciates the City of Chula Vista's participation in the review of this proposal.

Comment Letter 6

From: andy_yuen@fws.gov on behalf of Otay EIS, FWS
To: Stan Williams (swilliams@poseidonwater.com); Brian Grover; Jennifer Sucha
Cc: Brian Collins
Subject: Fwd: Otay Estuary EIS - extension of public comment period
Date: Thursday, December 08, 2016 9:52:37 AM

---------- Forwarded message ----------
From: **Tylke, Melanie** <Melanie.Tylke@sdcounty.ca.gov>
Date: Mon, Dec 5, 2016 at 5:01 PM
Subject: Otay Estuary EIS - extension of public comment period
To: "Otay_EIS@fws.gov" <Otay_EIS@fws.gov>
Cc: "Mosley, Deborah" <deborah.mosley@sdcounty.ca.gov>

Brian,

The County of San Diego, Department of Parks and Recreation intends to comment on the Otay River Estuary Restoration Project DEIS as we just received the project information. It is our understanding that the public comment period is being extended to December 30th, of which our comments will be provided before then. 6.1

Thank you in advance,
Melanie Tylke, LEED AP ND
Land Use & Environmental Planner II
County of San Diego, Parks and Recreation
5500 Overland Ave., Ste. 410
San Diego, CA. 92123
(858) 966-1377[X]
www.sdparks.org<https://webmail.sdcounty.ca.gov/owa/UrlBlockedError.aspx>

Response to Comment Letter 6

County of San Diego
Melanie Tylke
December 5, 2016

6.1 The Service appreciates the County of San Diego's participation in the review of this proposal.

Comment Letter 7

From: brian_collins@fws.gov on behalf of Otay_EIS, FWS
To: Stan Williams (swilliams@poseidonwater.com); Brian Grover
Subject: Fwd: Otay Estuary EIS
Date: Thursday, January 12, 2017 9:08:12 AM
Attachments: image001.jpg

---------- Forwarded message ----------
From: **Darwin Vasquez** <dvasquez@portofsandiego.org>
Date: Tue, Dec 27, 2016 at 5:33 PM
Subject: Otay Estuary EIS
To: "Otay_EIS@fws.gov" <Otay_EIS@fws.gov>

Mr. Brian Collins,

The Otay River Estuary Restoration Project (ORERP), will require additional review and approval from the San Diego Unified Port District (District). The restoration of Pond 15 requires dredging of a 0.70 acre portion of District's jurisdiction located immediately to the north of Pond 15 levee. The need to remove approximately 4,300 cubic yards of material within the District's jurisdiction to facilitate tidal exchange within the pond, requires the approval of a Coastal Development Permit (CDP) from the District. A completed project application including plans and environmental documentations must be submitted to the District for review and approval. 7.1 7.2 7.3

Thank you,

Darwin Vasquez , Project Architect

Real Estate Development Services
PORT OF SAN DIEGO
3165 Pacific Highway Ŷ San Diego, CA 92101
Office: 619.686.6478

Port administration offices are open Monday-Thursday and every other Friday from 8am-5pm.

This email is public information and may be viewed by third parties upon request.

Response to Comment Letter 7

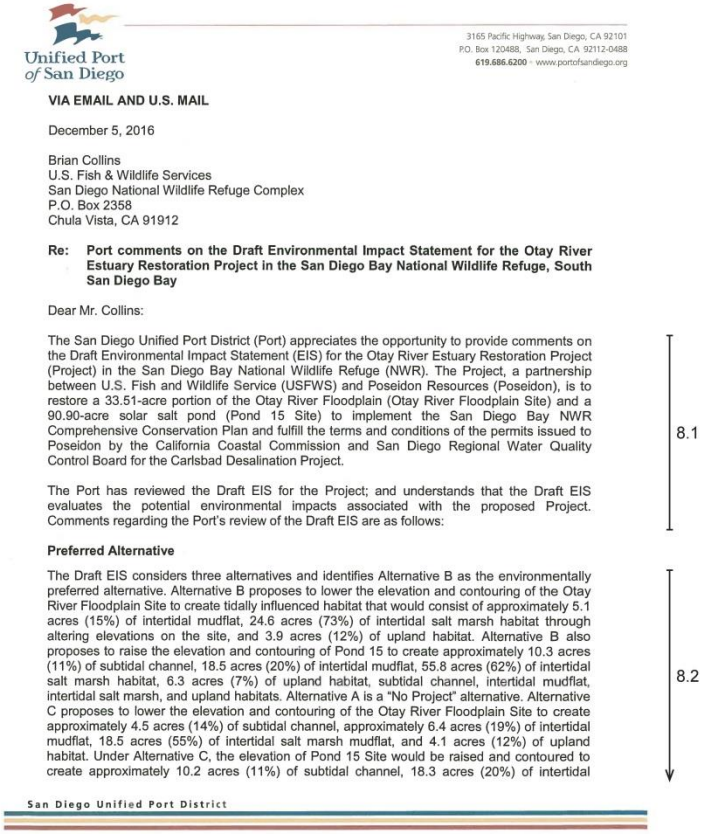
Port of San Diego
Darwin Vasquez
December 27, 2016

7.1 The Port permitting process has been initiated.

7.2 As stated in Section 2.3.2.1 of Chapter 2, Alternatives of the EIS, it is noted that a Coastal Development Permit, Right-of-Entry Permit, long-term agreement, and other agreements or approvals must be obtained from the Port before the proposed excavation can occur.

7.3 See Response 7.2.

Comment Letter 8



Unified Port of San Diego

3165 Pacific Highway, San Diego, CA 92101
P.O. Box 120488, San Diego, CA 92112-0488
619.686.6200 · www.portofsandiego.org

VIA EMAIL AND U.S. MAIL

December 5, 2016

Brian Collins
U.S. Fish & Wildlife Services
San Diego National Wildlife Refuge Complex
P.O. Box 2358
Chula Vista, CA 91912

Re: Port comments on the Draft Environmental Impact Statement for the Otay River Estuary Restoration Project in the San Diego Bay National Wildlife Refuge, South San Diego Bay

Dear Mr. Collins:

The San Diego Unified Port District (Port) appreciates the opportunity to provide comments on the Draft Environmental Impact Statement (EIS) for the Otay River Estuary Restoration Project (Project) in the San Diego Bay National Wildlife Refuge (NWR). The Project, a partnership between U.S. Fish and Wildlife Service (USFWS) and Poseidon Resources (Poseidon), is to restore a 33.51-acre portion of the Otay River Floodplain (Otay River Floodplain Site) and a 90.90-acre solar salt pond (Pond 15 Site) to implement the San Diego Bay NWR Comprehensive Conservation Plan and fulfill the terms and conditions of the permits issued to Poseidon by the California Coastal Commission and San Diego Regional Water Quality Control Board for the Carlsbad Desalination Project. 8.1

The Port has reviewed the Draft EIS for the Project; and understands that the Draft EIS evaluates the potential environmental impacts associated with the proposed Project. Comments regarding the Port's review of the Draft EIS are as follows:

Preferred Alternative

The Draft EIS considers three alternatives and identifies Alternative B as the environmentally preferred alternative. Alternative B proposes to lower the elevation and contouring of the Otay River Floodplain Site to create tidally influenced habitat that would consist of approximately 5.1 acres (15%) of intertidal mudflat, 24.6 acres (73%) of intertidal salt marsh habitat through altering elevations on the site, and 3.9 acres (12%) of upland habitat. Alternative B also proposes to raise the elevation and contouring of Pond 15 to create approximately 10.3 acres (11%) of subtidal channel, 18.5 acres (20%) of intertidal mudflat, 55.8 acres (62%) of intertidal salt marsh habitat, 6.3 acres (7%) of upland habitat, subtidal channel, intertidal mudflat, intertidal salt marsh, and upland habitats. Alternative A is a "No Project" alternative. Alternative C proposes to lower the elevation and contouring of the Otay River Floodplain Site to create approximately 4.5 acres (14%) of subtidal channel, approximately 6.4 acres (19%) of intertidal mudflat, 18.5 acres (55%) of intertidal salt marsh mudflat, and 4.1 acres (12%) of upland habitat. Under Alternative C, the elevation of Pond 15 Site would be raised and contoured to create approximately 10.2 acres (11%) of subtidal channel, 18.3 acres (20%) of intertidal 8.2

San Diego Unified Port District

Response to Comment Letter 8

Unified Port of San Diego
Eileen Maher
December 5, 2016

8.1 The Service appreciates the Unified Port of San Diego's detailed review of the Draft EIS.

8.2 The comment does not address a deficiency in the Draft EIS; therefore, no response is required.

Re: Port comments on the Draft Environmental Impact Statement for the Otay River Estuary Restoration Project in the San Diego Bay National Wildlife Refuge, South San Diego Bay

mudflat, 54.6 acres (60%) of intertidal salt marsh, 7.85 (9%) of upland habitat. District staff is supportive of either Alternative B or Alternative C, as both alternatives would restore and enhance coastal wetlands to benefit native wildlife species, and provide habitat for migratory seabirds, shorebirds, and other saltmarsh dependent species. 8.2 Cont.

California Environmental Quality Act Compliance

The Draft EIS states that implementation of the Project requires approvals, permits, and/or certifications from the Port as well as several state agencies, all of which are subject to compliance with the California Environmental Quality Act (CEQA). The EIS has been prepared in compliance with Section 15221 of the CEQA Guidelines, which requires the EIS to include discussion of mitigation measures and potential for growth inducing impacts. The compliance with Section 15221 is necessary for state agencies as well as the Port to utilize the EIS as an Environmental Impact Report (EIR) under CEQA. Additionally there are other requirements under CEQA (such as circulation of the document, noticing, findings, etc.) that must be satisfied before the Port can adopt the EIS as an EIR. Therefore, the Port recommends the Draft EIS be prepared as a joint EIS/EIR to aid in expediting the entitlement process for implementation of the Project. 8.3

If the document cannot be a joint EIS/EIR, as discussed below, the EIS does not adequately analyze construction-related noise impacts to biological resources from the Project. The EIS also does not analyze environmental impacts from the construction of the conveyor belts or pipelines for transporting soil from the Otay River Floodplain Site to the Pond 15 Site. If there are any unavoidable environmental impacts, a Statement of Overriding Considerations must be prepared and adopted, pursuant to Section 15093 of the CEQA Guidelines. Therefore, the Port recommends that a joint Draft EIS/ EIR be prepared and processed to avoid future delays in obtaining approvals from the Port and other state agencies. 8.4 8.5 8.6

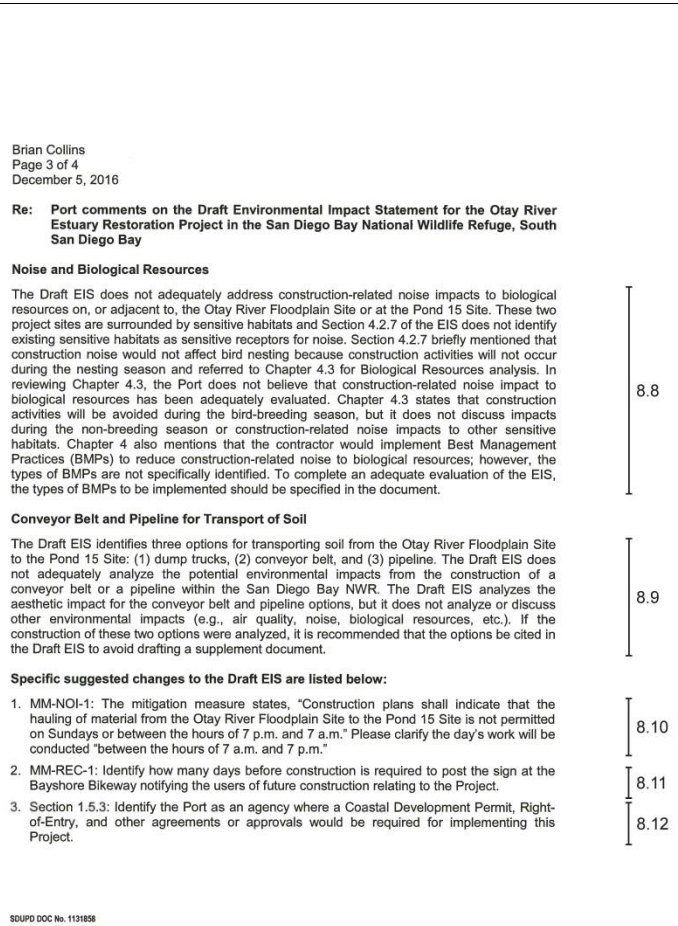
Levee Breach at Pond 15 and Port's Approval

Section 2.4.2 of the Draft EIS states that the alternative breach site, along the westerly boundary of Pond 15 and outside of the Port's justification, was considered but eliminated in order to minimize impacts to sensitive intertidal mudflat habitat, which was not feasible under this alternative. It appears that the implementation of this Project would require approval from the Port because there is no other alternative. Therefore, USFWS and Poseidon must contact the Port's Real Estate Development Department to initiate the project review process and negotiate a long-term real estate agreement for the portion of the Project within the Port's jurisdiction. 8.7

8.3 As described in Section 1.5.5 of the Draft EIS, the National Environmental Policy Act (NEPA) document was prepared in a manner that addresses the requirements of the California Environmental Quality Act (CEQA) so various agencies, including the San Diego Unified Port District (Port) and Regional Water Quality Control Board, could use the document pursuant to Section 15221 of the CEQA Guidelines. Circulation of the Draft EIS was conducted to comply with the notification requirements of both NEPA and CEQA. Specifically, in addition to noticing the availability of the document in the Federal Register, a notice was also published in the San Diego Union Tribune (UT) on October 20, 2016. Approximately 340 Restoration Planning Updates (Update) were distributed to elected officials, agencies, organizations, and individuals. The Update included the statement that "implementation of the ORERP not only requires compliance with the National Environmental Policy Act (NEPA), it will also require various permits and approvals from other State agencies and the San Diego Unified Port District. Listed below are the primary permits or approvals that will be required prior to construction . . . Coastal Development Permit, Right-of-Entry Permit, long-term agreement, and other agreements or approvals required from the San Diego Unified Port District for encroachment into Port jurisdiction associated with breaching Pond 15." The Update also provided contact information for

		obtaining a CD of the draft document, contact information for questions, website information, and three library locations where the document could be reviewed. The Update and UT notice also provided information about the public meeting held on November 7, 2016, to accept comments. The Draft EIS was also filed with the State Clearinghouse and distributed to relevant State agencies. When the public review period was extended, post cards were sent to the original distribution list and the State Clearinghouse was officially notified. These public outreach efforts for the Draft EIS have been added to Section 7.3.1 of the Final EIS, and the UT notice, Restoration Planning Update, and State Clearinghouse materials have been added to Appendix B.
	8.4	Construction-related noise impacts to nesting birds are addressed in the Draft EIS in Sections 4.3.2.2 and 4.3.3.2. The discussion of construction-related noise impacts to birds on page 4.3-74 has been expanded in the Final EIS. In addition, the construction method presented in Section 2.3.2.4 that involves phasing construction to avoid impacts to nesting birds is now also presented as a mitigation measure (MM-BIO-12). Note that the slurry option has been eliminated from further consideration; therefore, the discussion of potential noise impacts occurring for 3 to 7 years is no longer applicable.

	8.5	The discussion of impacts associated with the use of conveyor belts to transport sediment from the Otay River floodplain to Pond 15 were addressed in the following locations in the Draft EIS: Section 4.2.1 (Topography/Visual Quality), pages 4.2-2, 4.2-6, and 4.2-7; Section 4.2.5.3.2 (Water Quality), pages 4.2-63 and 4.2-67 (MM-HYD-4); Section 4.2.6 (Air Quality), page 4.2-75 and Tables 4.2-4, -5, -7, and -8; Section 4.2.7 (Noise), Table 4.2-9; Section 4.2.9 (Greenhouse Gases), Tables 4.2-15, -16, -18, and -19 and page 4.2-98; and Section 4.5.2 (Traffic), page 4.5-14. Additional discussion of those actions to be taken to avoid potential impacts to biological resources has been added to the Final EIS. Of note, to avoid impacts to nesting birds, conveyor belts, if used to transport material, would be in place during the two construction periods, but between construction periods, the equipment would be removed, and the surfaces of the salt pond levees returned to conditions appropriate for accommodating plover and seabird nesting prior to each nesting season.
	8.6	As addressed in Chapter 6, Section 6.1.1, of the draft and Final EIS, all identified mitigation measures have been incorporated into the scope of the project; therefore, project implementation will not result in any unavoidable significant impacts.
	8.7	The Port permitting process will be initiated upon completion of the Final EIS.



Brian Collins
Page 3 of 4
December 5, 2016

Re: Port comments on the Draft Environmental Impact Statement for the Otay River Estuary Restoration Project in the San Diego Bay National Wildlife Refuge, South San Diego Bay

Noise and Biological Resources

The Draft EIS does not adequately address construction-related noise impacts to biological resources on, or adjacent to, the Otay River Floodplain Site or at the Pond 15 Site. These two project sites are surrounded by sensitive habitats and Section 4.2.7 of the EIS does not identify existing sensitive habitats as sensitive receptors for noise. Section 4.2.7 briefly mentioned that construction noise would not affect bird nesting because construction activities will not occur during the nesting season and referred to Chapter 4.3 for Biological Resources analysis. In reviewing Chapter 4.3, the Port does not believe that construction-related noise impact to biological resources has been adequately evaluated. Chapter 4.3 states that construction activities will be avoided during the bird-breeding season, but it does not discuss impacts during the non-breeding season or construction-related noise impacts to other sensitive habitats. Chapter 4 also mentions that the contractor would implement Best Management Practices (BMPs) to reduce construction-related noise to biological resources; however, the types of BMPs are not specifically identified. To complete an adequate evaluation of the EIS, the types of BMPs to be implemented should be specified in the document. 8.8

Conveyor Belt and Pipeline for Transport of Soil

The Draft EIS identifies three options for transporting soil from the Otay River Floodplain Site to the Pond 15 Site: (1) dump trucks, (2) conveyor belt, and (3) pipeline. The Draft EIS does not adequately analyze the potential environmental impacts from the construction of a conveyor belt or a pipeline within the San Diego Bay NWR. The Draft EIS analyzes the aesthetic impact for the conveyor belt and pipeline options, but it does not analyze or discuss other environmental impacts (e.g., air quality, noise, biological resources, etc.). If the construction of these two options were analyzed, it is recommended that the options be cited in the Draft EIS to avoid drafting a supplement document. 8.9

Specific suggested changes to the Draft EIS are listed below:

1. MM-NOI-1: The mitigation measure states, "Construction plans shall indicate that the hauling of material from the Otay River Floodplain Site to the Pond 15 Site is not permitted on Sundays or between the hours of 7 p.m. and 7 a.m." Please clarify the day's work will be conducted "between the hours of 7 a.m. and 7 p.m." 8.10
2. MM-REC-1: Identify how many days before construction is required to post the sign at the Bayshore Bikeway notifying the users of future construction relating to the Project. 8.11
3. Section 1.5.3: Identify the Port as an agency where a Coastal Development Permit, Right-of-Entry, and other agreements or approvals would be required for implementing this Project. 8.12

SDUPD DOC No. 1131858

8.8 MM-NOI-1 has been revised in the Final EIS to state that construction activities will be permitted to occur Monday through Saturday between the hours of 7 a.m. and 7 p.m.

8.9 As addressed in Response 8.4, the slurry option has been eliminated as a potential sediment transport option; therefore, references to potential impacts from this option have been removed from the Final EIS and are now summarized in Section 2.4, Alternatives Considered but Eliminated from Detailed Analysis. Response 8.5 lists the locations within the Draft EIS where the potential impacts to the environment (e.g., topography/visual quality, water quality, air quality, noise, greenhouse gases, traffic) associated with the use of a conveyor belt to transport material from the Otay River Floodplain Site to the Pond 15 Site are addressed. To further avoid any potential for impacts to biological resources as a result of implementing the conveyor belt option, additional measures have been incorporated into the scope of the project to address predator perching during the nesting season.

8.10 Mitigation Measure MM-NOI-1 has been revised in the Final EIS to clarify that construction work may only be conducted between 7 a.m. and 7 p.m. Monday through Saturday.

8.11 MM-REC-1 has been revised in the Final EIS (Section 4.5.4) to clarify when notices informing bicyclists of

	upcoming construction activities affecting the Bayshore Bikeway shall be posted. **8.12** Section 1.5.3 has been revised in the Final EIS to indicate that a Coastal Development Permit will also be required from San Diego Unified Port District for the breaching of Pond 15, as discussed in Section 1.5.4. Note that the Draft EIS also addressed the requirement for a Coastal Development Permit from the Port in Section 2.3.2.1 under "Pond 15 Levee Modification."

Brian Collins
Page 4 of 4
December 5, 2016

Re: Port comments on the Draft Environmental Impact Statement for the Otay River Estuary Restoration Project in the San Diego Bay National Wildlife Refuge, South San Diego Bay

4. Section 2.3.2: Need to illustrate the following on Figure 2-1a: 8.13
   - The location of the levee breach for Pond 15
   - Pond numbers
   - The location of existing levees and proposed modification around Pond 15 and the removal of the levee extending from Nestor Creek to the bridge that crosses the Otay River.
5. Section 2.3.2.2: Note that the proposed location for the conveyor belt is shown on Figure 2-4 and the pipeline on Figure 2-5. 8.14
6. Figure 2-1b: Show the location and the boundary of the opening for the levee breach. 8.15
7. Table 2-11: The table shows that the anticipated truck trips for Alternative C is 67,000, which is not consistent Section 2.3.4 that states approximately 52,000 total truck trips would be necessary for Alternative C — please clarify. 8.16
8. Tables 2-12 to 2-15: Identify the measurement for the numbers in the second and third columns. 8.17
9. Section 4.2.1.2: State the timeframe in which the conveyor belts will be in place, if using this construction option. 8.18

The Port appreciates the opportunity to provide comments on the draft EIS and anticipates ongoing notifications regarding the Project and associated EIS. Please contact Kanika Kith at (619) 686-6540 or kkith@portofsandiego.org or Eileen Maher at (619) 686-6254 or emaher@portofsandiego.org with any questions regarding the information detailed above.

Sincerely,

Eileen Maher
Principal, Environmental Conservation
Planning & Green Port

EM/te
CC: Kanika Kith

SDUPD DOC No. 1131858

8.13 Figure 2-1a has been revised in the Final EIS.

8.14 Section 2.3.2.2 has been revised to indicate which figures illustrate the proposed pipeline and conveyor belt.

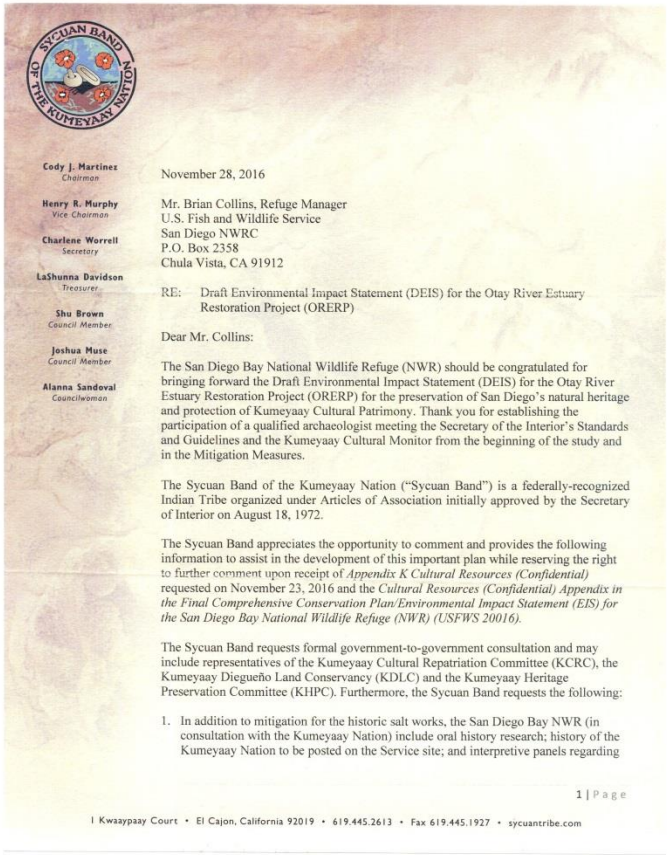
8.15 Figure 2-1b has been revised in the Final EIS.

8.16 Section 2.3.2.4 of Chapter 2 has been updated to clarify that 56,000 trips and 67,000 trips, respectively, for Alternatives B and C are analyzed in Chapter 4.

8.17 Tables 2-12 through 2-15 have been updated to clarify the unit of measure in acres.

8.18 Table 2-3 provided in Chapter 2, Alternatives of the EIS provides construction schedules for each soil transport option. Conveyor belts, if used to transport material, would be in place during the two construction periods, but between construction periods, the equipment would be removed and the salt pond levees prepared for plover and seabird nesting prior to the nesting season.

Comment Letter 9



SYCUAN BAND OF THE KUMEYAAY NATION

Cody J. Martinez, Chairman
Henry R. Murphy, Vice Chairman
Charlene Worrell, Secretary
LaShunna Davidson, Treasurer
Shu Brown, Council Member
Joshua Muse, Council Member
Alanna Sandoval, Councilwoman

November 28, 2016

Mr. Brian Collins, Refuge Manager
U.S. Fish and Wildlife Service
San Diego NWRC
P.O. Box 2358
Chula Vista, CA 91912

RE: Draft Environmental Impact Statement (DEIS) for the Otay River Estuary Restoration Project (ORERP)

Dear Mr. Collins:

The San Diego Bay National Wildlife Refuge (NWR) should be congratulated for bringing forward the Draft Environmental Impact Statement (DEIS) for the Otay River Estuary Restoration Project (ORERP) for the preservation of San Diego's natural heritage and protection of Kumeyaay Cultural Patrimony. Thank you for establishing the participation of a qualified archaeologist meeting the Secretary of the Interior's Standards and Guidelines and the Kumeyaay Cultural Monitor from the beginning of the study and in the Mitigation Measures.

The Sycuan Band of the Kumeyaay Nation ("Sycuan Band") is a federally-recognized Indian Tribe organized under Articles of Association initially approved by the Secretary of Interior on August 18, 1972.

The Sycuan Band appreciates the opportunity to comment and provides the following information to assist in the development of this important plan while reserving the right to further comment upon receipt of *Appendix K Cultural Resources (Confidential)* requested on November 23, 2016 and the *Cultural Resources (Confidential) Appendix in the Final Comprehensive Conservation Plan/Environmental Impact Statement (EIS) for the San Diego Bay National Wildlife Refuge (NWR) (USFWS 20016).*

The Sycuan Band requests formal government-to-government consultation and may include representatives of the Kumeyaay Cultural Repatriation Committee (KCRC), the Kumeyaay Diegueño Land Conservancy (KDLC) and the Kumeyaay Heritage Preservation Committee (KHPC). Furthermore, the Sycuan Band requests the following:

1. In addition to mitigation for the historic salt works, the San Diego Bay NWR (in consultation with the Kumeyaay Nation) include oral history research; history of the Kumeyaay Nation to be posted on the Service site; and interpretive panels regarding

1 | Page

1 Kwaaypaay Court • El Cajon, California 92019 • 619.445.2613 • Fax 619.445.1927 • sycuantribe.com

9.1

9.2

9.3

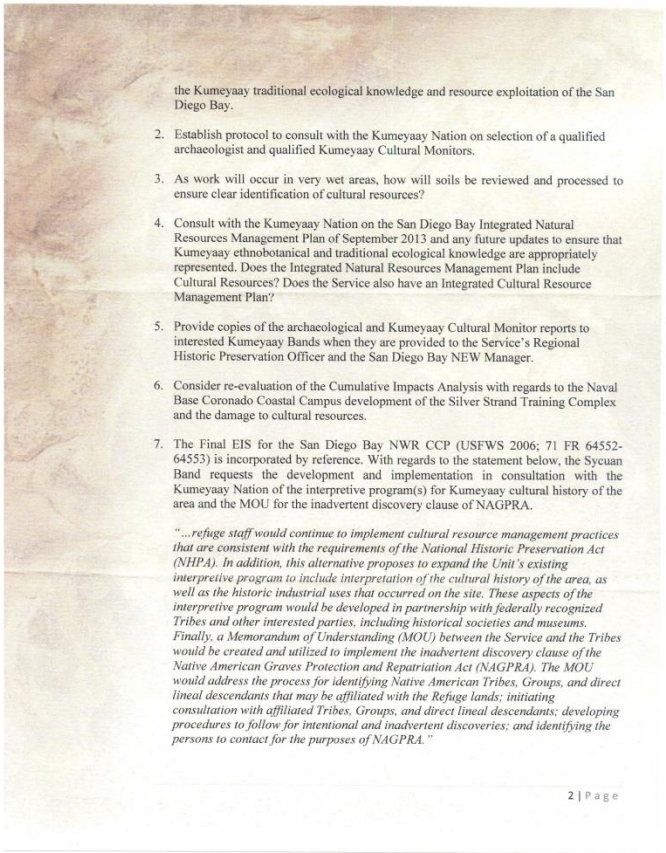
Response to Comment Letter 9

Sycuan Band of the Kumeyaay Nation
Chairman Cody J. Martinez
November 28, 2016

9.1 The Service appreciates the Sycuan Band of the Kumeyaay Nation for taking the time to review the EIS and provide comments. The confidential appendices were provided to the Sycuan Band on November 29, 2016.

9.2 We acknowledge that the Sycuan Band of the Kumeyaay Nation has an interest in the region and requests formal government-to-government consultation. We will continue our formal consultation with the Sycuan Band as has occurred throughout the life of this project, including in March 2013 when USFWS coordinated with the most likely decedent (identified through Section 106 consultation with the Kumeyaay Cultural Reparation Committee (KCRC), who designated Clint Linton) for treatment of human remains.

9.3 A letter has been provided to the Sycuan Band requesting additional direction related to the request for oral history research and the preparation of an interpretive panel that addresses Kumeyaay traditional ecological knowledge and resource exploitation of the San Diego Bay. We look forward to working with the



the Kumeyaay traditional ecological knowledge and resource exploitation of the San Diego Bay. 9.3 Cont.

2. Establish protocol to consult with the Kumeyaay Nation on selection of a qualified archaeologist and qualified Kumeyaay Cultural Monitors. 9.4

3. As work will occur in very wet areas, how will soils be reviewed and processed to ensure clear identification of cultural resources? 9.5

4. Consult with the Kumeyaay Nation on the San Diego Bay Integrated Natural Resources Management Plan of September 2013 and any future updates to ensure that Kumeyaay ethnobotanical and traditional ecological knowledge are appropriately represented. Does the Integrated Natural Resources Management Plan include Cultural Resources? Does the Service also have an Integrated Cultural Resource Management Plan? 9.6

5. Provide copies of the archaeological and Kumeyaay Cultural Monitor reports to interested Kumeyaay Bands when they are provided to the Service's Regional Historic Preservation Officer and the San Diego Bay NEW Manager. 9.7

6. Consider re-evaluation of the Cumulative Impacts Analysis with regards to the Naval Base Coronado Coastal Campus development of the Silver Strand Training Complex and the damage to cultural resources. 9.8

7. The Final EIS for the San Diego Bay NWR CCP (USFWS 2006; 71 FR 64552-64553) is incorporated by reference. With regards to the statement below, the Sycuan Band requests the development and implementation in consultation with the Kumeyaay Nation of the interpretive program(s) for Kumeyaay cultural history of the area and the MOU for the inadvertent discovery clause of NAGPRA. 9.9

"...refuge staff would continue to implement cultural resource management practices that are consistent with the requirements of the National Historic Preservation Act (NHPA). In addition, this alternative proposes to expand the Unit's existing interpretive program to include interpretation of the cultural history of the area, as well as the historic industrial uses that occurred on the site. These aspects of the interpretive program would be developed in partnership with federally recognized Tribes and other interested parties, including historical societies and museums. Finally, a Memorandum of Understanding (MOU) between the Service and the Tribes would be created and utilized to implement the inadvertent discovery clause of the Native American Graves Protection and Repatriation Act (NAGPRA). The MOU would address the process for identifying Native American Tribes, Groups, and direct lineal descendants that may be affiliated with the Refuge lands; initiating consultation with affiliated Tribes, Groups, and direct lineal descendants; developing procedures to follow for intentional and inadvertent discoveries; and identifying the persons to contact for the purposes of NAGPRA."

2 | Page

Sycuan Band on the development of the interpretive panel and propose to install that panel along the Bayside Birding and Walking Trail that extends along the southern edge of San Diego Bay.

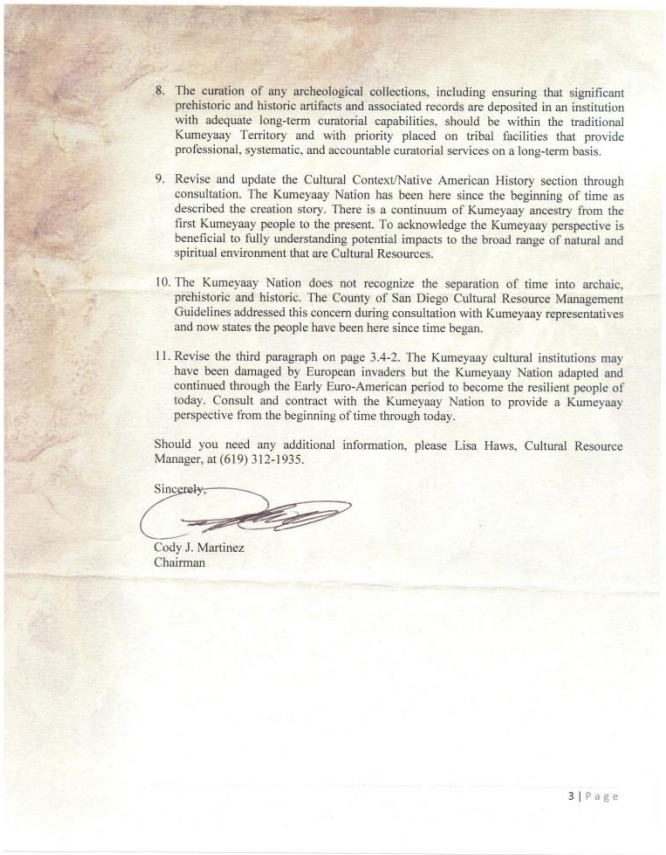
9.4 The Service selects qualified archaeological monitors in accordance with the 2016 FWS Cultural Resources Policy (FW614). The term "qualified professional" in Part 614 refers to an individual who meets the applicable professional qualifications standards described in the following:

- The Secretary of the Interior's Archeology and Historic Preservation; Secretary of the Interior's Standards and Guidelines (48 FR 44716–44742)
- 43 CFR 7.8 for the excavation and removal of archaeological resources
- 36 CFR 79 for the curation of cultural resources
- Other professional standards, as required

These standards apply to any archaeological monitors, including Service staff, involved in the protection of cultural, historic, and paleontological resources and the execution of our compliance responsibilities. Within these standards, we will work with the Kumeyaay Nation on a protocol to review qualified archaeologists and qualified Kumeyaay Cultural Monitors.

	9.5	In addition to standard monitoring techniques, the archaeological and Native American monitors will select 5-gallon samples of excavated sediment to be screened through 1/8 inch wire mesh screen. If artifacts or other resources are identified, then the project archaeologist will determine, in consultation with the USFWS, if the discovery constitutes a potential intact resource. If potential intact resources are discovered, then the notification and treatment methods outlined in Mitigation Measure MM-CUL-4 would be implemented. Wet sediments may be stockpiled and dried prior to sampling by the monitors before sediments are re-compacted as fill on site or hauled off site.
	9.6	The U.S. Navy and Port of San Diego (Port) are the primary authors of the San Diego Bay Integrated Natural Resources Management Plan (INRMP). The Service provides information related to natural resources within the Bay. Any questions related to the San Diego Bay INRMP should be directed to the U.S. Navy and the Port. The Service does not have an Integrated Cultural Resources Management Plan. The Service's policy for managing cultural resources for lands, facilities, and programs, which is consistent with all applicable Federal laws, regulations, and Executive Orders, can be found at https://www.fws.gov/policy/614fw1.html.

	9.7	Monitoring reports will be required from both the archaeological monitor and the Kumeyaay cultural monitor. Copies of these reports will be provided to the Sycuan Band, as well as to the Inter-Tribal Cultural Resource Protection Council, which can then distribute the reports to other interested Kumeyaay Bands.
	9.8	The project has been designed to avoid impacts to identified cultural resources and will include monitoring during excavation and adherence to all applicable regulations and policies related to the discovery of previously unrecorded sites; therefore, the project would not contribute to existing or future cumulative impacts to cultural resources. Therefore, no further analysis is required.
	9.9	The Service proposes to consult with the Sycuan Band on the development of an interpretive panel. We are also currently working with the Kumeyaay Cultural Repatriation Committee on the preparation of the MOU for the inadvertent discovery clause of Native American Graves Protection and Repatriation Act (NAGPRA).



8. The curation of any archeological collections, including ensuring that significant prehistoric and historic artifacts and associated records are deposited in an institution with adequate long-term curatorial capabilities, should be within the traditional Kumeyaay Territory and with priority placed on tribal facilities that provide professional, systematic, and accountable curatorial services on a long-term basis. 9.10

9. Revise and update the Cultural Context/Native American History section through consultation. The Kumeyaay Nation has been here since the beginning of time as described the creation story. There is a continuum of Kumeyaay ancestry from the first Kumeyaay people to the present. To acknowledge the Kumeyaay perspective is beneficial to fully understanding potential impacts to the broad range of natural and spiritual environment that are Cultural Resources. 9.11

10. The Kumeyaay Nation does not recognize the separation of time into archaic, prehistoric and historic. The County of San Diego Cultural Resource Management Guidelines addressed this concern during consultation with Kumeyaay representatives and now states the people have been here since time began. 9.12

11. Revise the third paragraph on page 3.4-2. The Kumeyaay cultural institutions may have been damaged by European invaders but the Kumeyaay Nation adapted and continued through the Early Euro-American period to become the resilient people of today. Consult and contract with the Kumeyaay Nation to provide a Kumeyaay perspective from the beginning of time through today. 9.13

Should you need any additional information, please Lisa Haws, Cultural Resource Manager, at (619) 312-1935.

Sincerely,

Cody J. Martinez
Chairman

3 | Page

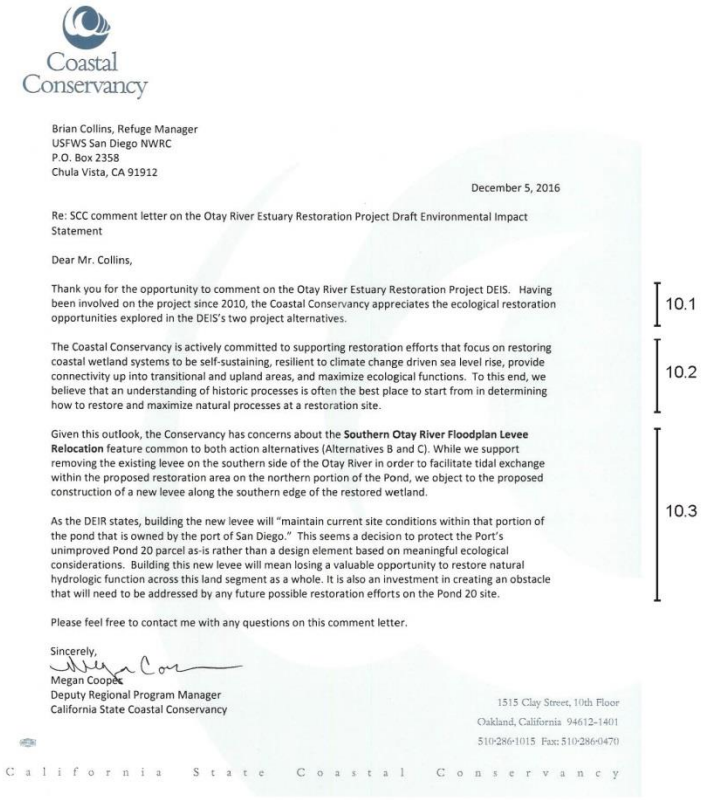
9.10 Long-term curation of assemblages and documents associated with this project, as required by Section 106 of the National Historic Preservation Act, will occur at the San Diego Archaeological Center, a Federally recognized curatorial facility for San Diego County.

9.11 The Final EIS has been revised to acknowledge the Kumeyaay Nation's perspective on the continuum of Kumeyaay ancestry.

9.12 Refer to Response 9.11.

9.13 This paragraph has been revised in the Final EIS to address this comment.

Comment Letter 10



Coastal Conservancy

Brian Collins, Refuge Manager
USFWS San Diego NWRC
P.O. Box 2358
Chula Vista, CA 91912

December 5, 2016

Re: SCC comment letter on the Otay River Estuary Restoration Project Draft Environmental Impact Statement

Dear Mr. Collins,

Thank you for the opportunity to comment on the Otay River Estuary Restoration Project DEIS. Having been involved on the project since 2010, the Coastal Conservancy appreciates the ecological restoration opportunities explored in the DEIS's two project alternatives. 10.1

The Coastal Conservancy is actively committed to supporting restoration efforts that focus on restoring coastal wetland systems to be self-sustaining, resilient to climate change driven sea level rise, provide connectivity up into transitional and upland areas, and maximize ecological functions. To this end, we believe that an understanding of historic processes is often the best place to start from in determining how to restore and maximize natural processes at a restoration site. 10.2

Given this outlook, the Conservancy has concerns about the **Southern Otay River Floodplan Levee Relocation** feature common to both action alternatives (Alternatives B and C). While we support removing the existing levee on the southern side of the Otay River in order to facilitate tidal exchange within the proposed restoration area on the northern portion of the Pond, we object to the proposed construction of a new levee along the southern edge of the restored wetland.

As the DEIR states, building the new levee will "maintain current site conditions within that portion of the pond that is owned by the port of San Diego." This seems a decision to protect the Port's unimproved Pond 20 parcel as-is rather than a design element based on meaningful ecological considerations. Building this new levee will mean losing a valuable opportunity to restore natural hydrologic function across this land segment as a whole. It is also an investment in creating an obstacle that will need to be addressed by any future possible restoration efforts on the Pond 20 site. 10.3

Please feel free to contact me with any questions on this comment letter.

Sincerely,

Megan Cooper
Deputy Regional Program Manager
California State Coastal Conservancy

1515 Clay Street, 10th Floor
Oakland, California 94612-1401
510-286-1015 Fax: 510-286-0470

California State Coastal Conservancy

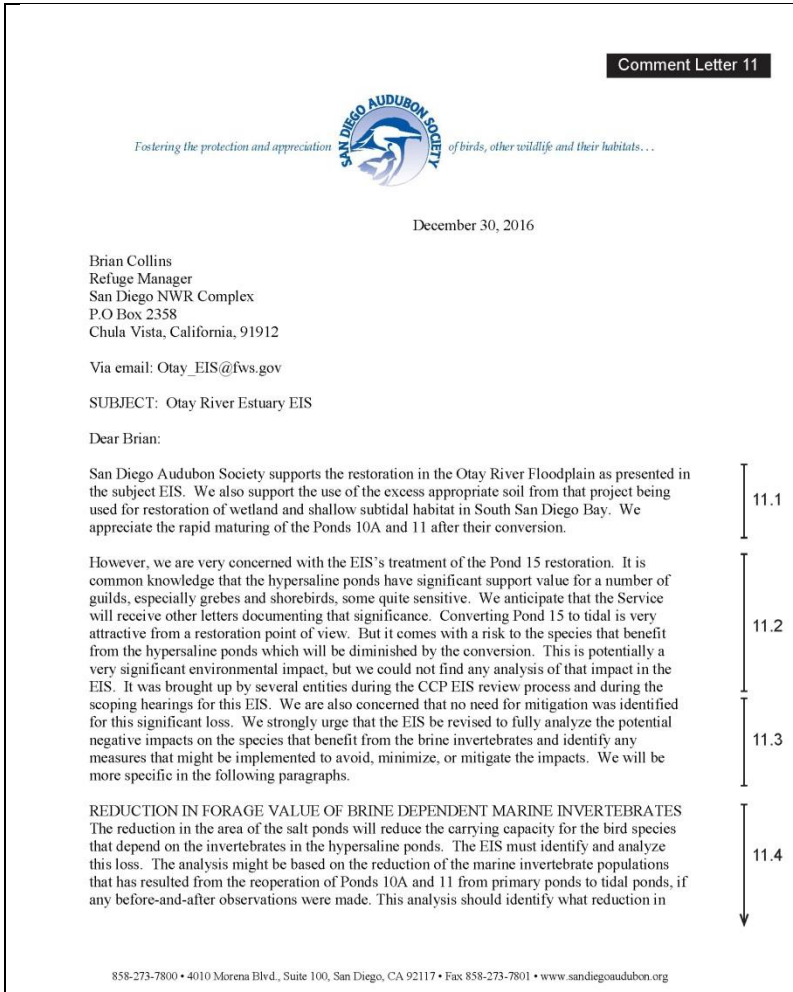
Response to Comment Letter 10

Coastal Conservancy
Megan Cooper
December 5, 2016

10.1 The Service appreciates the California Coastal Conservancy for taking the time to review the EIS and provide comments.

10.2 This comment does not challenge the adequacy of the EIS or dispute the content disclosed in the EIS. No response is required.

10.3 The berm proposed for placement on the south side of the restored wetlands in the Otay River floodplain area was included as a project feature at the request of the Port of San Diego, which owns the adjacent parcel. The purpose of the berm is to provide the same level of flood protection to Pond 20a that currently exists such that the Port can continue to pursue restoration options for Pond 20a and avoid adverse effects to the future restoration area while planning and construction phases of the project are being conducted. It is agreed that this project feature represents tradeoffs between future development opportunities and ecological values and functions. The Service will continue to coordinate with the Port on this issue.



Comment Letter 11

Fostering the protection and appreciation of birds, other wildlife and their habitats…

December 30, 2016

Brian Collins
Refuge Manager
San Diego NWR Complex
P.O Box 2358
Chula Vista, California, 91912

Via email: Otay_EIS@fws.gov

SUBJECT: Otay River Estuary EIS

Dear Brian:

San Diego Audubon Society supports the restoration in the Otay River Floodplain as presented in the subject EIS. We also support the use of the excess appropriate soil from that project being used for restoration of wetland and shallow subtidal habitat in South San Diego Bay. We appreciate the rapid maturing of the Ponds 10A and 11 after their conversion. 11.1

However, we are very concerned with the EIS's treatment of the Pond 15 restoration. It is common knowledge that the hypersaline ponds have significant support value for a number of guilds, especially grebes and shorebirds, some quite sensitive. We anticipate that the Service will receive other letters documenting that significance. Converting Pond 15 to tidal is very attractive from a restoration point of view. But it comes with a risk to the species that benefit from the hypersaline ponds which will be diminished by the conversion. This is potentially a very significant environmental impact, but we could not find any analysis of that impact in the EIS. It was brought up by several entities during the CCP EIS review process and during the scoping hearings for this EIS. We are also concerned that no need for mitigation was identified for this significant loss. We strongly urge that the EIS be revised to fully analyze the potential negative impacts on the species that benefit from the brine invertebrates and identify any measures that might be implemented to avoid, minimize, or mitigate the impacts. We will be more specific in the following paragraphs. 11.2 11.3

REDUCTION IN FORAGE VALUE OF BRINE DEPENDENT MARINE INVERTEBRATES
The reduction in the area of the salt ponds will reduce the carrying capacity for the bird species that depend on the invertebrates in the hypersaline ponds. The EIS must identify and analyze this loss. The analysis might be based on the reduction of the marine invertebrate populations that has resulted from the reoperation of Ponds 10A and 11 from primary ponds to tidal ponds, if any before-and-after observations were made. This analysis should identify what reduction in 11.4

858-273-7800 • 4010 Morena Blvd., Suite 100, San Diego, CA 92117 • Fax 858-273-7801 • www.sandiegoaudubon.org

Response to Comment Letter 11

San Diego Audubon Society
James A. Peugh
December 30, 2016

11.1 The Service appreciates the San Diego Audubon Society for taking the time to review the EIS and provide comments.

11.2 The effects to avian species of converting Pond 15 to intertidal wetlands was addressed on page 4.3-72 of the Draft EIS for the ORERP. The analysis concluded that, although brine invertebrates would no longer be available in this pond, this foraging resource would continue to be available in other ponds within the salt works pond system. Therefore, no significant adverse effects to avian species are anticipated.

As stated in Section 1.1 of the Draft EIS for the ORERP, the proposal to convert Pond 15 to intertidal wetland habitat was previously addressed in the programmatic EIS and Record of Decision (ROD) prepared for the San Diego Bay NWR CCP, which are incorporated into this EIS by reference. Under the approved CCP, the conditions that maintain a hypersaline gradient of evaporated sea water within the salt ponds system are planned to continue after Pond 15 and other ponds in the system are restored to tidal circulation.

		It is correct that the overall area of the salt pond system after the restoration of Pond 15 would be reduced by 84.6 acres to 783 acres, a reduction of approximately 11%. However the saline gradient within the ponds would remain on this reduced footprint with an estimated 305 acres of ponds holding solute concentrations in the ponded water that range between 34 parts per thousand (ppt) salt concentration (essentially seawater salinity) to approximately 120 ppt (the higher end salt concentrations where brine shrimp and brine fly larvae and pupae can survive). The CCP identifies possible future conditions where commercial salt production would continue on a smaller pond footprint or a future condition where the ponds are managed by the San Diego Bay NWR in a way that does not lead to the production of large amounts of precipitated salt in the bottoms of the ponds but retains the hypersaline and ponded character within a portion of the existing salt works site. Section 4.3.2.2 of the Final EIS for the ORERP has been revised to further address this topic.
	11.3	As described in Response 11.2, the conversion of existing salt ponds to tidally influenced habitat was addressed in the Final EIS and ROD for the San Diego Bay NWR CCP. No significant adverse effects were identified. The CCP proposes a range of habitat types within the area occupied by the salt works, including ponds set aside for the production of brine

		invertebrates. The current project is consistent with the proposals in the CCP, and no significant impacts to the birds that utilize Pond 15 have been identified. Brine invertebrates will continue to be available to foraging birds within other portions of the salt works following restoration of Pond 15. Because no significant adverse effects have been identified as a result of the restoration of Pond 15, no mitigation for the conversion of the pond to tidally influenced habitat is required.
	11.4	The present carrying capacity of the salt ponds for supporting brine invertebrates far exceeds the foraging pressure upon those resources that the migratory bird community presently exploits. No significantly impactful alterations to brine invertebrate populations or foraging activities by avian species that exploit those resources was noted in the 5 year post-restoration period after the western salt ponds (Ponds 10, 10a, and 11) were restored to tidal influence in October 2011. Based on our experience with restoring the western salt ponds and its overall effect on the bird activity within the salt ponds, restoring Pond 15 to intertidal habitats will provide a non-identical but more naturally resilient and varied forage base for most of the shorebirds, passerines, and larid species that presently may utilize Pond 15 and the brine invertebrate resources associated with that pond. The conversion of Pond 15 to intertidal habitat will also serve to increase the fish productivity of the area, thus

populations of brine oriented invertebrates occurred and then determine what reduction in wildlife support value occurred for the birds that depend on those invertebrates. This information should then be used to provide a projection of the impact that the conversion of Pond 15 will have on the support value for the birds which benefit from the hypersaline inverts. 11.4 Cont.

If information from the impacts of Ponds 10A and 11 is not adequate for a projection, some other realistic and conservative projection should be made of what reduction in support value will occur for these bird species from the conversion of Pond 15 from a primary pond to a tidal pond. The EIS must include such a projection to actually assess the environmental impact of the project. Such an analysis should also be made prior to planning any future modifications to the salt ponds. 11.5

DETERMING AN ALLOWABLE LEVEL OF REDUCTIONS, IF ANY
Independently, some estimate must be made to see what reductions in hypersaline ponds, if any, can be made without negative impacts on the species of birds that depend on them or will depend on them in the future. 11.6

The EIS, on page 5.6, states that implementation of alternatives B and C "will not result in any significant direct impacts to nesting birds in or adjacent to the Pond 15 site." It provides no hint of what analysis that conclusion is based on. Further, our concern is about the impact of the conversion of Pond 15 on the wildlife support value of the entire remaining primary and secondary pond system – not about just the site of Pond 15. Also, our concern is for birds using the ponds for foraging, wintering, migratory stop-over, shelter, and nesting - not just nesting. We could find no analysis or information on the full wildlife support impacts of reducing the productivity of hypersaline ponds. 11.7

SEA-LEVEL RISE
As sea-level rise occurs, the mud flats and marshes of the bay will be inundated a higher percentage of time. For more of the time, the Bay's water level will be up to the engineered structures around the bay which have no foraging value. That means that shorebirds will have a decreasing amount of time to forage. The salt ponds can provide foraging opportunities during those high tides to offset this loss of foraging opportunities around the Bay. The EIS does not address the need to offset this progressive loss. The analysis of allowable reductions should take into account the need to offset this progressive loss. 11.8

SALTON SEA
This analysis should consider that many of the species that depend on brine invertebrates at the Salton Sea will need to relocate as it continues to degrade. So, an excess carrying capacity should be included to accommodate that increased demand. 11.9

ALTERNATIVES
We are very concerned that this EIS did not include a reasonable set of alternatives and a robust analysis of those alternatives that might have provided fisheries and marsh habitat without sacrificing benefits to other guilds of birds. 11.10

2

benefiting fish eating birds. We acknowledge that for certain species, such as northern phalarope and eared grebe, the altered conditions in Pond 15 post restoration will not support their foraging in the salt ponds similarly to the many other species of shorebirds that probe in mudflats for mollusks, crustaceans, and marine worms (many of which also presently exploit the brine invertebrates in the hypersaline ponds); therefore, the forage base and locations for phalaropes and grebes to forage on brine invertebrates within the salt pond system will be displaced physically into the adjacent ponds within the remaining hypersaline pond system post restoration.

11.5 Ponds 10a and 11 never supported large populations of brine-oriented invertebrates because the salinities in those ponds were relatively low. Brine invertebrates are present in Pond 15, as well as within various other ponds in the system, as described in the Final EIS for the San Diego Bay NWR CCP. The San Diego Bay NWR CCP addresses the need to preserve areas within the salt works that will continue to support brine invertebrates. The conversion of Pond 15 to tidal influence is consistent with the proposals in the CCP, and other ponds in the system will continue to support brine invertebrates following the restoration of Pond 15. The San Diego Bay NWR's intent is to preserve the artificial but highly productive hypersaline ponds within south San Diego Bay as other portions of the

	system are restored to more natural estuarine and riparian habitats that existed there historically. Refer to Response 11.4.
	11.6 None of the avian species that utilize the salt ponds in the San Diego Bay NWR can be described as being discretely dependent upon the ponds. We recognize and highly value the fact that the salt ponds provide a unique and highly productive and attractive set of environmental conditions for many species of waterbirds that may utilize them seasonally in addition to their utilization of many other locations within San Diego Bay and throughout the Pacific Flyway depending on the species and season or given year. This is why, as identified in the San Diego Bay NWR CCP and Final EIS, the Service has stated its intent to plan for continuing salt pond management into the future and to manage and maintain the salt ponds in some physical form depending on the availability of resources and various potential changes to ecosystem drivers, as opposed to restoring the entire salt pond system to intertidal marine habitats. It should be noted that there are no guarantees that the production of salt will continue to be commercially viable at the site. If commercial production ceases, then the San Diego Bay NWR would need to identify a new permittee (who would operate under the terms and conditions of a Refuge Special Use Permit) to operate the existing system or take on the management of the ponds

	directly. The management of hypersaline ponds in the South Bay in the absence of a commercial salt production operation would require significantly more financial resources than managing for an intertidal system. The programmatic EIS and ROD prepared for the San Diego Bay NWR CCP identifies the preferred plan for management of the salt ponds as maintaining some ponded saline and hypersaline conditions within the South Bay Unit.
	11.7 A summary of the conclusions provided within the Final Programmatic EIS for the San Diego Bay NWR CCP related to the effects of salt pond restoration on avian species has been added to the Final EIS for this project. Note that the environmental analysis provided in the Programmatic EIS has been incorporated by reference into the current document.
	11.8 Sea-level rise is an important part of our projected future conditions analyses (see Final EIS, Section 4.2.8). It should be noted that extreme high tides presently breach across the perimeter levee of Pond 15 at a few locations along the pond's northwest levee. The predicted increase in storm activity and intensity associated with climate change may also increase the likelihood that a significant fluvial event may impact the salt pond levee system, which happened previously when the salt ponds that existed at that time were blown out by the flood of 1916. Should a similar event occur

		again, coupled with sea-level rise, it would be difficult for the Service to acquire enough funding to recreate the salt pond system in its present configuration. Based on consideration of a variety of uncertainties, the San Diego Bay NWR plans for various future scenarios and how we may optimize the value of the entire ecosystem in San Diego Bay NWR as best we are able to. In our best professional judgment, the removal of Pond 15 from the hypersaline pond system is not likely to critically impact any existing functionalities of the remaining salt pond system. In the absence of a ponded Pond 15, avian foraging, nesting, brooding, and other life history support functions will continue to be present within the system albeit on a partially altered landscape.
	11.9	The current primary concern at the Salton Sea is not the loss of brine invertebrates; it is the loss of fish. Salinity in the Salton Sea is expected to exceed 60 ppt by 2022, which is too saline to support fish (CDFW 2017, USGS 2017). The loss of fish will have an impact on a range of fish-eating migratory birds, including pelicans, double-crested cormorants, and black skimmers. Pileworms and barnacles, primary components of the Salton Sea food web, already appear to be impacted by deteriorating water quality (CDFW), and the reduction in the availability of these organisms is impacting shorebirds. USGS (2017) estimates that the loss of reproduction in brine flies will begin to occur in 2031, and the loss of brine

	shrimp will begin in 2038. As identified in the San Diego Bay NWR CCP and Final EIS, long-term management of the salt works will include the restoration of some salt ponds to intertidal and tidal wetlands, the retention of some ponds as managed shallow water areas to support shorebirds, and the retention of other ponds to support brine invertebrates.
	11.10 The current EIS tiers from the Programmatic EIS prepared for the San Diego Bay NWR CCP (USFWS 2006). This Programmatic EIS analyzed a range of alternatives for how the San Diego Bay NWR should be managed, as well as for how restoration of the salt ponds should proceed. The approved CCP recommends the restoration of Pond 15 and the other primary ponds following restoration of the western salt ponds. The western salt ponds were subsequently restored, and the current project would begin the implementation of the next phase of salt pond restoration in accordance with the recommendations of the CCP.

We understand that adjacency and connectivity is an important factor for enhancing the value of habitat. Since Pond 15 is quite a distance from the Otay River floodplain restoration and from the previous Pond 10A and Pond 11 restoration, it seems a strange choice for inclusion in this project. Could the excavated soil from the floodplain restoration site be used to fill some other area within the Refuge or within the Refuge's acquisition boundary closer to the floodplain restoration or Ponds 10A and 11 and restore it to marsh habitat instead of Pond 15? This would provide a productive use of the removed soil, expanded intertidal habitat for marsh birds and fish, and still conserve the environmentally beneficial salt ponds to a broad range of birds. The EIS does not provide any information to explain this apparent fragmentation or present other alternatives that might not be limited by this fragmentation. 11.11

Using the soil removed from the floodplain area for raising dredged areas of South Bay to eelgrass elevations would benefit fish populations and fish-eating birds and not have a negative impact on birds that depend on the ponds. We urge that such an alternative be addressed in the EIS. 11.12

CONCLUSION

This project, as proposed would provide significant benefits for marsh dependent birds such as Ridgway's rails, Belding's savannah sparrows, and many fish species. We do not know how much of a loss the proposed project would cause on the support value of the ponds for a broad range of other guilds, such as shorebirds and grebes, though we anticipate that the loss will be significant. Also, we do not know what amount of reduction in brine invertebrates can occur and not cause serious negative impacts to the species of birds that benefit from the current ponds. We were not able to find any indication that the designers of this project know, or have considered it, either. The document will not provide decision makers, who will decide the future of this project, any of this essential information. It is absolutely essential that this vital trade-off information and the rationale and data on which it is based be included in this EIS. As a result, we urge that this EIS be withdrawn and augmented to include a thorough analysis of the impacts of the conversion of Pond 15 from salt pond to tidal habitat on the species that depend on the entire pond system and that it be distributed again to the public for review. In its present state, this EIS falls far short of meeting the standards of an EIS. 11.13 11.14

In case of questions or feedback, I can be reached at peugh@cox.net and 619-224-4591.

Sincerely,

James A. Peugh

James A. Peugh
Conservation Chair

3

11.11 To achieve the mitigation requirements for Carlsbad Desalination Plant (as identified in the California Coastal Commission Marine Life Mitigation Plan and the fish productivity requirements added by the San Diego RWQCB), Poseidon must restore 66.4 acres of coastal wetlands. Originally, all of the required mitigation was to be achieved through restoration of the Otay River floodplain. However, based on discoveries made during the investigative process of developing this EIS, we identified the need to avoid creating wetland habitats within the formerly farmed areas in the Otay River floodplain. A reevaluation of available restoration opportunities on the San Diego Bay NWR was then initiated. We determined that Pond 15 was the most viable available area on the San Diego Bay NWR to achieve all of the MLMP requirements while also achieving the goals and objectives identified in the San Diego Bay NWR CCP.

The only other sites within the San Diego Bay NWR available for wetland restoration are the salt ponds, and as addressed in Response 11.10, restoration phasing, as described in the CCP, proposes the restoration of Ponds 12–15 following the restoration of the western salt ponds. Of the primary ponds, Pond 15 was selected because water movement between the remaining primary ponds could be easily redirected around Pond 15, and establishing a tidal connection to Pond 15 would not impact the significant mudflat

habitat that occurs on the Bay side of Ponds 12 and 14.

The effects to the viability of the salt works operation of filling secondary ponds or ponds used for harvesting salt would be greater than removing another primary pond from the system. Our intent is to ensure that the salt works remains in operation, and water is moved through the system to maintain ponds that provide habitat for a range of avian species. This can be achieved and still restore Pond 15. Taking one or more of the higher salinity ponds out of the system would likely disrupt the commercial management of the pond system and would deviate from the restoration phasing recommended in the CCP.

11.12 See Response 11.11. Also see Section 2.4, Alternatives Considered but Eliminated from Detailed Analysis.

11.13 The project would provide approximately 66 acres of tidally influenced wetland habitat to support foraging and roosting shorebirds, seabirds, waterfowl, and other resident and migratory avifauna. No significant adverse effects to any avian species that frequents the salt ponds are anticipated. In addition, the loss of existing nesting opportunities on the levees would be limited to the breach proposed in Pond 15, an area that has not historically supported a significant number of nests. Brine invertebrates will continue to be available within the adjacent solar salt pond system.

	11.14	We do not concur with the conclusion that the restoration of Pond 15 would result in a significant adverse effect to any of the avian species currently observed foraging at this location. A range of intertidal wetland habitats will be provided in Pond 15 that will support shorebirds and seabirds, and several of the remaining salt ponds would continue to support grebes, phalaropes, and a variety of shorebirds. Refer to Responses 11.2 and 11.3. Note that not all of the existing ponds provide habitat for bird foraging because brine concentrations over approximately 120 parts per thousand (ppt) (~3.5 times saltier than seawater) become too great for brine invertebrates to survive within them. There are microorganisms that live in the higher density ponds, but they are not prey items for birds. In the present configuration of the salt pond system, salinity densities over this concentration limit of 120 ppt generally occur in Ponds 23, 24, 25, 26, 28, 29, 30, 40, 41, 42, 44, 45, 46, 47, and 48. (Note that Ponds 50 through 54 are not included within the San Diego Bay NWR boundary and are in private ownership but are similarly hypersaline.) Following the removal of Pond 15 from the system, the salinity gradient within the remaining primary Ponds 12, 13, and 14 would continue to provide a source of brine invertebrates for migratory shorebirds and grebes. The reduced evaporative area would require some adaptation

	on the part of the salt ponds managers in the timing and frequency of how water is moved between ponds and in how an individual pond or ponds may be managed. It may be that the salinity gradient would physically migrate within the system so that individual ponds may serve differing functions than they do presently. The salinity may be reduced enough (in Pond 23 for example) so ponds that are currently managed to be over 120 PPT may have salinities in the future that may support brine invertebrates when they do not currently do so. The reduction in the total acreage of existing ponds supporting brine invertebrates is in our best professional judgment not considered to be a significant decrease in the habitat available for shorebirds and grebes within and surrounding the salt ponds in ways that may significantly impact their populations. See Responses 11.2 and 11.6.

Comment Letter 12

San Diego County Archaeological Society, Inc.
Environmental Review Committee

3 December 2016

To: Mr. Brian Collins, Refuge Manager
San Diego NWR Complex
P.O. Box 2358
Chula Vista, California 91912

Subject: Draft Environmental Impact Statement
Otay River Estuary Restoration Project

Dear Mr. Collins:

I have reviewed the cultural resources aspects of the subject DEIS on behalf of this committee of the San Diego County Archaeological Society. 12.1

Usually a version of the cultural resources report, with sensitive information removed, is provided for a project. However, no public version of Appendix K was provided for this project, so our review was based only on the information and impact analysis contained in the DEIS, itself. 12.2

We concur with the detailed cultural resources mitigation program contained in the DEIS. Our only suggested change would be to explicitly, rather than implicitly, state in MM-CUL-4 that the curation institution must meet the standards of 36CFR79. 12.3

SDCAS appreciates the opportunity to participate in the public review period for this DEIS.

Sincerely,

James W. Royle, Jr., Chairperson
Environmental Review Committee

cc: Dudek
SDCAS President
File

P.O. Box 81106 San Diego, CA 92138-1106 (858) 538-0935

Response to Comment Letter 12

San Diego County Archaeological Society
James W. Royle Jr.
December 3, 2016

12.1 The Service appreciates the San Diego Archaeological Society for taking the time to review the EIS and provide comments.

12.2 The full cultural resources technical report, including confidential data, is available for review for qualified parties from the USFWS.

12.3 Per the commenter's request, the following sentence specifically stating the regulation (36 CFR 79) has been added to the end of MM-CUL-4: The curation institution will meet the Federal curation standards as required in 36 CFR 79.

Comment Letter 13

Save Our Heritage Organisation
Saving San Diego's Past for the Future

Tuesday, December 20, 2016

Brian Collins, Refuge Manager
US Fish and Wildlife Service (US FWS)
San Diego NWR Complex
P. O. Box 2358
Chula Vista, CA 91912

Re: Otay River Estuary Restoration Project EIS

Mr. Collins and the US Fish & Wildlife Service,

Save Our Heritage Organisation (SOHO) understands the purpose of the Otay River Estuary Restoration Project is to create, restore, and enhance coastal wetlands to benefit native fish, wildlife, and plant species, and to provide habitat for migratory shorebirds and other salt Marsh dependent species within the South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge, and to be consistent with the goals and objectives of the Final Comprehensive Conservation Plan (CCP). We also understand that Alternative B is identified within the EIS as the preferred alternative to implement the Project, due to increased habitat value and smaller excavation requirements. While this alternative does impact cultural resources (and Alternative C impacts are nearly the same), SOHO acknowledges that mitigation measures proposing a Memorandum of Agreement to photo document the Ponds, collect oral history, and further interpret and publish about the historical significance of the salt works would reduce impacts to below a level of significance. Although SOHO prefers an alternative without any impacts to cultural resources, we recognize the importance of restoring the Otay River Estuary, that Alternative B achieves the project goals and, upon implementation of the mitigation measures proposed, impacts to cultural resources would be minimal.

13.1

13.2

Thank you for the opportunity to comment,

Bruce Coons
Executive Director
Save Our Heritage Organisation

BOARD OF DIRECTORS
Jaye MacAskill, President • David Goldberg, Vice President • Jessica McGee, Treasurer • John Eisenhart, Secretary
M. Wayne Donaldson • Erik Hanson • Paul Johnson • Nancy Moors • John Rush • Scott Sandel • Sandor Shapery • David Swarens • Kiley Wallace
Bruce Coons, Executive Director

2476 San Diego Avenue • San Diego CA 92110 • www.sohosandiego.org • 619/297-9327 • 619/291-3576 fax

Response to Comment Letter 13

Save Our Heritage Organisation
Bruce Coons
December 20, 2016

13.1 The Service appreciates the Save Our Heritage Organisation for taking the time to review the EIS and provide comments.

13.2 This comment is in support of the project. No further response required.

Comment Letter 14

From: andy_yuen@fws.gov on behalf of Otay EIS, FWS
To: Stan Williams (swilliams@poseidonwater.com); Brian Grover; Jennifer Sucha
Cc: Brian Collins
Subject: Fwd: Otay Estuary EIS - Otay River Estuary Restoration Project
Date: Thursday, December 08, 2016 9:54:15 AM
Attachments: pastedImage.png

---------- Forwarded message ----------
From: **George Courser** <gcourser@hotmail.com>
Date: Mon, Dec 5, 2016 at 10:59 AM
Subject: Otay Estuary EIS - Otay River Estuary Restoration Project
To: "Otay_EIS@fws.gov" <Otay_EIS@fws.gov>

12 - 05 - 2016

Mr. Brian Collins

Refuge Manager

USFWS, San Diego NWRC,

P.O. Box 2358, Chula Vista

CA. 91912

Via email

Otay River Estuary EIS Support Comments for Alternative Action B

Sierra Club San Diego endorses Alternative Action B, associated with the Otay River Restoration Project. This action restores 125 acres of coastal wetlands and associated uplands at two locations on the San Diego Bay National Wildlife Refuge. Alternative Action B supports subtidal and intertidal wetlands within the Otay River floodplain site, including habitat restoration of a 91-acre solar salt pond. 14.1

Response to Comment Letter 14

Sierra Club
George Courser
December 5, 2016

14.1 The Service appreciates the Sierra Club for taking the time to review the EIS and provide your comments.

We appreciate this opportunity to comment, Sierra Club San Diego George Courser Conservation Chair gcourser@hotmail.com	

Comment Letter 15

SOUTH BAY SALT WORKS

December 5, 2016

Mr. Brian Collins
US Fish and Wildlife Service
San Diego NWRC
PO Box 2358
Chula Vista, CA 91912
Via email: Otay_EIS@fws.gov

Subject: Otay Estuary EIS

Dear Mr. Collins,

Thank you for the opportunity to comment on the Draft Environmental Impact Statement for the Otay Estuary. GGTW LLC dba South Bay Salt Works (GGTW) has worked in partnership with the United States Fish & Wildlife Service (USFWS) since the establishment of the South San Diego Bay Wildlife Refuge to retain and create habitat on the portion of the refuge which has operated as a solar salt operation since the 1870's. We have recognized from the outset, that our operations exist solely because they are beneficial to the flora and fauna of the Refuge. With regard to the Otay Estuary EIS, we look forward to cooperating with the USFWS to achieve the goals you have set out for portions of the Refuge even as it downsizes the acreage of ponds we will operate as part of our solar salt facility. 15.1

While there are potential impacts to the Salt Works ponds from activities in the Otay Estuary south and west of the current Otay river alignment, the greatest impacts will be around the removal of Pond 15 from the Salt Works pond system. The process of removing Pond 15 from the salt works pond system will require a great deal of cooperation between the USFWS and GGTW in order to be successful for all parties. The work presented in the Draft EIS is conceptual. Meanwhile the actual implementation will require more extensive design elements, which have not been fully developed or presented. We would like to work with you and your team as they are developed. 15.2

The EIS identifies environmental compliance and reporting for the construction work to protect the habitat. It also needs to protect the integrity of the solar salt operation and GGTW's economic interests throughout the construction process. While production of solar salt on the Refuge may not be part of the ultimate goal of USFWS, neither the Service nor GGTW want to have a premature or unintended termination of salt production. Our greatest concern about implementation of the EIS, lies in damage to the pond system, which either interrupts processing or creates contamination within the ponds or levees. Spills of dirt or slurry from the proposed material conveyance systems may have minor environmental impacts, while creating large effects on solar salt production and products, especially depending on where and when they occur. Protections against such "environmentally" non-hazardous impacts during construction, but still highly problematic to our solar salt operation, did not appear to be addressed in the EIS. Integrating protections for our solar salt production into the requirements of the construction project, also protects the synergy between solar salt production and habitat creation for many species 15.3

1470 BAY BOULEVARD, CHULA VISTA, CALIFORNIA 91911
(619) 423-3388, FAX (619) 423-0513

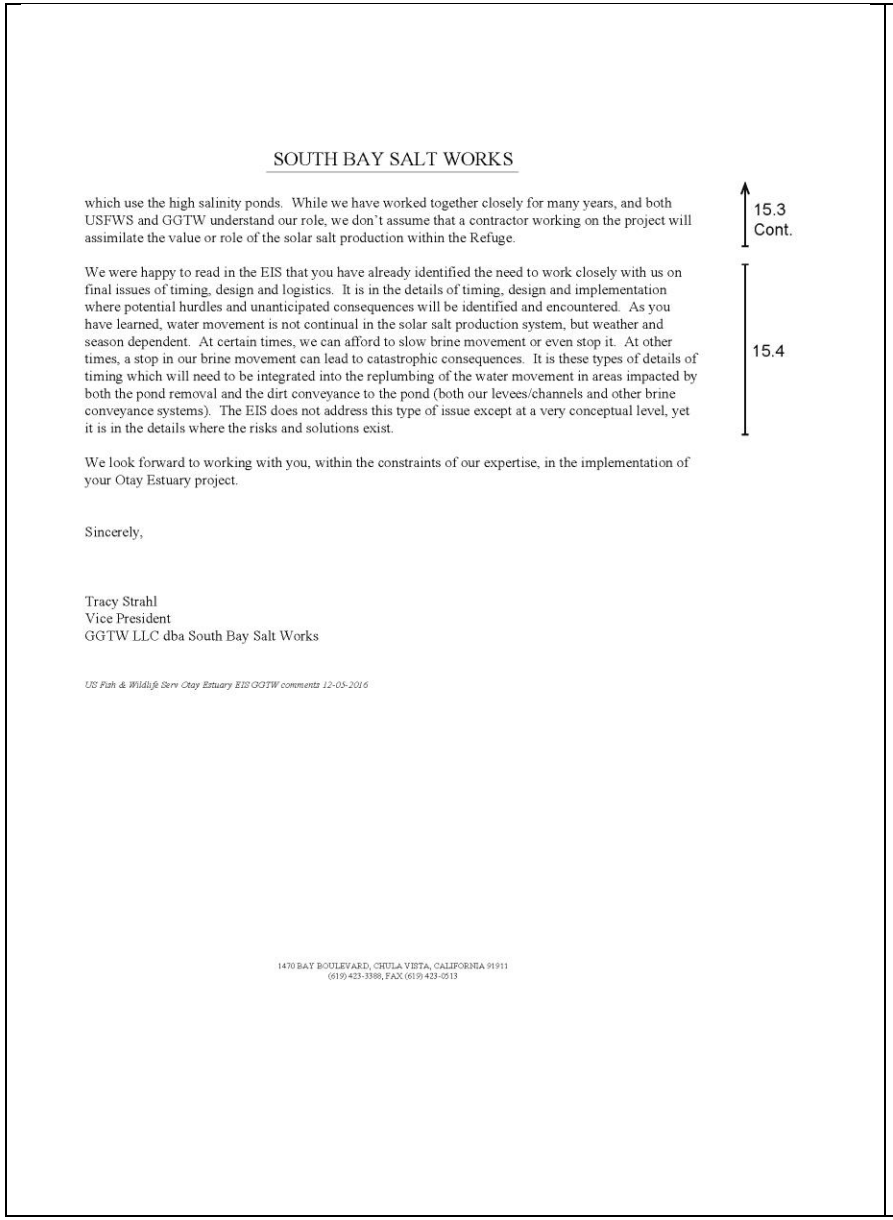
Response to Comment Letter 15

South Bay Salt Works
Tracy Strahl
December 5, 2016

15.1 Thank you for your comments and your commitment to continue to work closely with the Service for the benefit of San Diego Bay NWR resources.

15.2 We agree that close coordination will be essential for this significant project to be accomplished successfully to the satisfaction of both the Service and other interested parties associated with the mitigation project, as well as to the salt pond operators. It is in the mutual interest of the San Diego Bay NWR and the South Bay Salt Works that solar salt production successfully continue during the implementation of the construction phase of the project and post construction.

The need to ensure the continuing benefits to wildlife that are provided by the operation of the salt works is an essential component of the proposed project. The Service is committed to involving the South Bay Salt Works in the detailed planning for the reconfiguration of the salt pond system that will result in the elimination of the Pond 15 from the system with the least disruption possible to the remainder of the system. See Responses 11.2 and 11.11.



SOUTH BAY SALT WORKS

which use the high salinity ponds. While we have worked together closely for many years, and both USFWS and GGTW understand our role, we don't assume that a contractor working on the project will assimilate the value or role of the solar salt production within the Refuge.

15.3 Cont.

We were happy to read in the EIS that you have already identified the need to work closely with us on final issues of timing, design and logistics. It is in the details of timing, design and implementation where potential hurdles and unanticipated consequences will be identified and encountered. As you have learned, water movement is not continual in the solar salt production system, but weather and season dependent. At certain times, we can afford to slow brine movement or even stop it. At other times, a stop in our brine movement can lead to catastrophic consequences. It is these types of details of timing which will need to be integrated into the replumbing of the water movement in areas impacted by both the pond removal and the dirt conveyance to the pond (both our levees/channels and other brine conveyance systems). The EIS does not address this type of issue except at a very conceptual level, yet it is in the details where the risks and solutions exist.

15.4

We look forward to working with you, within the constraints of our expertise, in the implementation of your Otay Estuary project.

Sincerely,

Tracy Strahl
Vice President
GGTW LLC dba South Bay Salt Works

US Fish & Wildlife Serv Otay Estuary EIS GGTW comments 12-05-2016

1470 BAY BOULEVARD, CHULA VISTA, CALIFORNIA 91911
(619) 423-3388, FAX (619) 423-0513

15.3 The project description has been expanded to include a discussion of the need to ensure that no adverse effects to the existing solar salt operation or its facilities would occur during project construction. To minimize the potential for adverse effects, specific conditions and specifications related to the protection of ongoing operations within the salt works, as well as its facilities, will be incorporated into the construction specifications and contract; an initial site orientation, followed by quarterly refresher discussions, involving representatives from South Bay Salt Works and construction personnel, including subcontractors, will be required for all individuals working on the salt works; and ongoing monitoring of construction activities will be implemented to review construction activities and identify and address any potential issues that could impact facilities associated with or the operation of the salt works.

15.4 The revisions to the project description in the Final EIS address the need to coordinate the timing of water movement with ongoing operations at the salt works. The Service acknowledges the need to begin the discussion of water movement well before construction begins; therefore, the timing of the replumbing of water can be incorporated into the construction specifications and contract.

Comment Letter 16

December 2, 1016

To: The United States Fish and Wildlife Service and US Army Corps of Engineers

From: The Southwest Wetlands Interpretive Association (SWIA)

Re: Comments on the Draft Environmental Impact Statement for the Otay River Estuary Restoration Project

Our comments on the DEIS for the Otay River Estuary Restoration are as follow:

1) We want to ensure that the project enables reinforcement of resiliency to sea level rise insuring adequate high tide refugia for the Ridgway Rail and other species dependent on this habitat. 16.1
2) Reconsider the stock pile plan for use in Pond 15 and adjacent areas to deal with sea level rise in the future. 16.2
3) It is important to make sure this plan does not interfere with the salt production operation. The hyper-salinity in the ponds maintains the brine shrimp and the ecosystem dependent upon them. The viability of the tern colonies and other species are dependent upon this special habitat. 16.3
4) Insure that the area between Nestor Creek and the River Partners Restoration Project is restored to Native Coastal Sage Scrub as an upland transition zone. 16.4

We appreciate this opportunity to comment on the DEIS for the Otay River Estuary Restoration

Sincerely,

Michael A. McCoy, DVM

President Southwest Wetlands Interpretive Association

Response to Comment Letter 16

Southwest Wetlands Interpretive Association
Michael A. McCoy, DVM
December 2, 2016

16.1 Recovery of the endangered light-footed Ridgway's rail population in San Diego Bay is an important objective of the management of the San Diego Bay NWR. We are working to include functional vegetated high tide refugia in all potential restored habitats that may best support light-footed Ridgway's rails and other marsh dependent species, including the State-endangered Belding's Savannah sparrow.

16.2 As described in Response 1.7, the material previously proposed to be stockpiled on the site for future use will instead be placed over an area on the San Diego Bay NWR located to the east of Nestor Creek where high levels of DDT are present in the soils.

16.3 Refer to Responses 11.2 and 15.3.

16.4 After soils are added to the upland area east of Nestor Creek and properly compacted, the area will be seeded and/or planted with appropriate native upland species.

Comment Letter 17



February 7, 2013
Brian Collins, Refuge Manager
U.S. Fish and Wildlife Service
Post Office Box 2358
Chula Vista, CA 91912- 2358
FAX - (619) 476- 9149

RE: Poseidon Resources Otay River Estuary Restoration Project

Dear Mr. Collins,

On behalf of WILDCOAST, I write in support of the Otay River Estuary Restoration Project by Poseidon Resources and the USFWS. It will significantly improve the habitat value of the Otay River Delta and the south San Diego Bay for native species, increase the public's access to wildlife viewing, and enhance nature recreation activities. The proposed restoration of salt ponds will both expand tidal wetland habitat for fish, birds and marine invertebrates and restore a tidal connection between the salt ponds. 17.1

WILDCOAST suggests that Poseidon Resources and the USFWS incorporate a community outreach component into the project to communicate to the public the value of the restoration work that will be done and can be done in other areas. Public outreach such as media communications and site tours could increase the visibility of the project as something that enhances the quality of life for South Bay San Diego residents and visitors. WILDCOAST can offer support for this project. We are already active and integrated into similar projects in the South San Diego Bay, such as community outreach in support of the restoration of Pond 20. Strategic community outreach is crucial to a public understanding and recognition of the ecological significance of the South San Diego Bay. 17.2

We look forward to working with you on this.

Sincerely,

Serge Dedina, Ph.D.
Executive Director

Response to Comment Letter 17

Wildcoast
Serge Dedina, Ph.D.
February 7, 2013

17.1 Thank you for your comments and support of the restoration proposed on the San Diego Bay NWR as part of the ORERP.

17.2 We concur that community outreach is an important component of the overall success of these restoration proposals. We will be implementing community outreach prior to and during construction to keep adjacent residents, users of the Bayshore Bikeway and other trails in the area, and the surrounding communities up to date on construction schedules, activity details, and trail reroutes and/or access control. A project hotline will also be established. Once the project is completed, the San Diego Bay NWR will focus public outreach efforts on environmental education and interpretation. Support from WILDCOAST in this effort would be much appreciated.

Comment Letter 18

From: andy_yuen@fws.gov on behalf of Otay EIS, FWS
To: Stan Williams (swilliams@poseidonwater.com); Brian Grover; Jennifer Sucha
Cc: Brian Collins
Subject: Fwd: Otay estuary E I S
Date: Thursday, December 08, 2016 10:00:00 AM

---------- Forwarded message ----------
From: **Ron Rowe** <drronrowe@icloud.com>
Date: Fri, Oct 21, 2016 at 11:01 AM
Subject: Otay estuary E I S
To: Otay_EIS@fws.gov

We have frequently hiked on the Otay River Valley Trail. From the trailhead at Swiss Park, going east at about 100 yards there is a horrible sewage odor. Yuck! Will the sewage problem be addressed? 18.1
Ron Rowe, 619-847-3864

Sent from my iPhone

Response to Comment Letter 18

Ron Rowe
October 21, 2016

18.1 It is likely the odors you are experiencing are associated with existing trunk sewer facilities maintained by the City of San Diego and located in the vicinity of the existing trail. The project would not exacerbate existing odors and is not expected to create any new odors that would require mitigation.

Comment Letter 19

3NOV16

Kurt Flynn
190 Sandpiper Rd.
Midway, GA 31320
NEPA70@YMAIL.COM

Brain Collins
US Fish and Wildlife Service
Project Manager
Otay Estuary EIS

Subject: Comments on the Draft Environmental Impact Statement for the Otay River Estuary Restoration Project (ORERP).

Dear Mr. Collins,

As mentioned in the DEIS introduction, the proposed ORERP provides mitigation for the operation of Poseidon Resources' (Poseidon) Desalination Facility (Facility). The mitigation is apparently required by the State and it is necessary to ensure operation of the facility would not adversely impact fisheries. 19.1

The DEIS does not provide additional information regarding the Facility. The DEIS should have described the Facility's level of dependence on the Service's approval of the ORERP and it should have explained why the Facility's operation is not included as part of the project purpose, the affected environment, and the environmental consequences of the action alternatives or the no action alternative.

The lack of discussion regarding the Facility is most obvious in the description of the no action alternative. The no action alternative needs to describe what Poseidon would do if the ORERP was not approved. Would the Facility be operated differently or not at all? Would other mitigation be used? Is other mitigation available that would be acceptable to the State? What are the impacts of this mitigation? What about the State's approval of the alternative mitigation? The Poseidon's actions in the absence of the ORERP, need to be described and the impacts of the option (construction and operation) needs to be described in the environmental consequences of the no action alternative. 19.2

I would appreciate direct responses to the following.

1. Please provide information regarding the Facility's dependence on the Service's ability to provide the mitigation for the Facility's operation. 19.3
2. Please provide information regarding the specific impacts of the Facility that would be mitigated by the ORERP. 19.4

Response to Comment Letter 19

Kurt Flynn
November 3, 2016

19.1 That is correct. The NEPA analysis provided in the Draft EIS addresses restoration of coastal wetlands on the San Diego Bay NWR that would be implemented to satisfy conditions imposed on the Carlsbad Desalination Plant Project by the CCC and the San Diego RWQCB.

19.2 An Environmental Impact Report (EIR) was prepared for the Carlsbad Desalination Plant Project by the City of Carlsbad pursuant to the California Environmental Quality Act (CEQA) (California Public Resources Code 21000 et. seq.) and the CEQA Guidelines (California Code of Regulations, Section 15000 et. seq.) to evaluate the environmental effects of the proposed Carlsbad Seawater Desalination Facility and its related water conveyance facilities. The EIR is available for review online at http://www.carlsbaddesal.com/eir.html.

The relationship of the Carlsbad Desalination Plant Project to the current restoration proposal was presented in Chapter 1 of the Draft EIS. The discussion, which starts on page 1-11 of the Draft EIS, describes the project's need to fulfill Special Condition 8 of the desalination projects Coastal Development Permit (CDP) and the fish productivity

		requirements imposed on the project by the San Diego RWQCB. The site selection process for where the required mitigation would be implemented is also presented in Chapter 1. The Carlsbad Desalination Plant Project is not an action being considered by the Service. Restoration on the San Diego Bay NWR is however a Federal action, and it is that action addressed in the Draft EIS. As stated in the Draft EIS, the proposed restoration of the Otay River floodplain and Pond 15 would implement restoration proposals described in the San Diego Bay NWR CCP, approved by the Service in 2006, as well as fulfill the CCC and San Diego RWQCB conditions of approval for the Carlsbad Desalination Plant Project. If the proposed ORERP is not implemented to fulfill the permit conditions for the Carlsbad Desalination Plant Project, the Service will continue to pursue restoration of the Otay River floodplain and Pond 15 in accordance with the approved CCP and programmatic EIS that was prepared for the CCP. The effects of the No Action Alternative on the Carlsbad Desalination Plant Project would be addressed by the permitting agencies for that project.
	19.3	See Response 19.2.
	19.4	As stated in Response 19.1, the ORERP proposes restoration on the San Diego Bay NWR in accordance with the approved San Diego Bay NWR CCP (USFWS 2006). A discussion of the permit conditions

	that resulted in the proposal by Poseidon to restore wetland habitat on the San Diego Bay NWR are presented in Chapter 1 of the Draft EIS. For more information about impacts related to the Carlsbad Desalination Plant Project refer to the EIR prepared by the City of Carlsbad, staff reports prepared by the CCC for Coastal Development Permit #E-06-013, and discharge requirements from the San Diego RWQCB (Order No. R9-2006-0065 as amended by Order No. R9-2009-0038 and Order No. R9-2010-0073 [NPDES NO. CA0109223]).

3. Please describe why providing the mitigation for the Facility is not part of the project purpose. 19.5

4. Please describe why the Facility and its impacts are not included as part of the affected environment or the environmental consequences. 19.6

5. As part of the no action alternative, please describe Poseidon's actions and their impacts. 19.7

Thank you taking the time to consider my concerns and I look forward to your response. Please contact me if you would like to discuss. Also, I would appreciate an email response indicating you have you have received this email. 19.8

Kurt Flynn

19.5 Refer to Response 19.1.

19.6 Refer to Response 19.1.

19.7 As discussed in Response 19.1, the action addressed in the Draft EIS is restoration of wetlands within the San Diego Bay NWR in accordance with the approved San Diego Bay NWR CCP; therefore, the discussion in the No Action Alternative is limited to addressing the effects of not implementing restoration within the Otay River floodplain and Pond 15. Analysis of the effect on the Carlsbad Desalination Plant Project of implementing the No Action Alternative is not required as part of the Draft EIS. If the No Action Alternative were to be selected, the CCC and San Diego RWQCB would have to address the effects of that decision on their current permit conditions for the Carlsbad Desalination Plant Project.

19.8 The Service appreciates your taking the time to provide comments on the Draft EIS.

Comment Letter 20

From: andy_yuen@fws.gov on behalf of Otay_EIS, FWS
To: Stan Williams (swilliams@poseidonwater.com); Brian Grover; Jennifer Sucha
Cc: Brian Collins
Subject: Fwd: Otay Estuary EIS comments
Date: Thursday, December 08, 2016 9:59:19 AM

---------- Forwarded message ----------
From: **Paul Lehman** <lehman.paul1@verizon.net>
Date: Sun, Nov 6, 2016 at 4:22 PM
Subject: Otay Estuary EIS comments
To: Otay_EIS@fws.gov
Cc: "lehman.paul@verizon.net" <lehman.paul@verizon.net>

Dear Otay Estuary EIS Interested Parties,

Almost all people interested in biology and the environment are keenly interested in, and generally supportive of, projects which restore and enhance wetland habitats. However, I am writing to express my concerns regarding potential and real negative impacts on important segments of the birdlife in south San Diego Bay as a result of some mitigation and restoration work. Vegetated marsh is a critical habitat that supports several species of threatened birds, including Ridgway's (Clapper) Rail and Belding's Savannah Sparrow. But overall avian species diversity in such habitats is fairly low. A habitat that is even more threatened in San Diego County and many other regions globally is tidal open mudflat and seasonally flooded salt, brackish, and freshwater mudflat. And this open mudflat and shallow water habitat supports a far greater volume and variety of bird species, including most waterfowl and shorebirds which frequent the region, including many shorebirds that are now showing serious declines in their regional and worldwide populations due to habitat loss and other factors. These include several threatened species found on south San Diego Bay in important numbers, such as the Western Snowy Plover and Red Knot. A similarly very important habitat used by thousands of shorebirds is the periodically drawn-down (lowered) salt ponds at the south end of the Bay. 20.1

But recent "restoration" projects such as the South San Diego Bay Wetlands Restoration Project in 2011 actually greatly REDUCED critical open mudflat habitat used by thousands of shorebirds for both foraging and as especially critical high-tide roosts. The prime example of this loss is on refuge property along the southwestern section of the Bay, immediately north and west of the end of 7th St. in Imperial Beach. A formerly critical high-tide shorebird roost is now mostly covered is salicornia (pickleweed) and the numbers of birds have plummeted. Ditto large foraging areas immediately to the north, where once there were very large numbers of shorebirds and waterfowl, now there are relatively few birds, with an increase in just Belding's Savannah Sparrows. Other "restoration" projects in San Diego County such as at Bataquitos Lagoon and San Elijo Lagoon have resulted in the improvement in some important fish and Ridgway's Rail/Belding's Savannah Sparrow habitat, while also at the same time the ruining of prime shorebird (and much waterfowl) habitat and in substantial declines in numbers. This has quickly become a very serious regional issue. 20.2

These declines are well known to all active field observers who census (and even just regularly observe) the birdlife in these areas. But published material concerning the Salt Pond Restoration states that "Other evidence of success includes the establishment of pickleweed 20.3

Response to Comment Letter 20

Paul Lehman
November 6, 2016

20.1 Refer to Responses 11.2, 11.3, 11.4, and 11.6.

20.2 The Western Salt Ponds Restoration Project restored significant acreage of intertidal mudflats in the former Pond 11 and former Pond 10 that were not previously available to shorebird foraging. The present ecological functionality of those ponds is now driven by the tides, with substrates that support prey species for a wide variety of waterbirds, including but not limited to shorebirds, waders, waterfowl (e.g., diving duck, dabbling ducks), and larids. Since the systems are now tidal, the usage cycles by various guilds of birds are driven by the natural semi-diurnal tide series in San Diego Bay. As a result, it is possible that the commenters impression that foraging opportunities have diminished is driven by the timing and location of observations made. It is true that bird viewing opportunities from areas normally accessible to members of the public are now altered from the conditions prior to restoration, so detectability for bird observations may be more obscure than the previous condition of the western salt ponds prior to restoration.

We plan restoration projects with due consideration made towards existing conditions and usage for a

	variety of species. We assess whether and how an ecosystem structural and/or functional alteration may affect individual species and species groups. We consider whether any given alteration may enhance, reduce, displace or eliminate given habitat conditions for various species, many of which have differing life history needs and seasonality of uses within San Diego Bay. We also may prioritize one functionality or species group over others based on the relative level of habitats lost to development, our understanding of the relative condition of a species population status (such as endangered, threatened, sensitive, or common) and its relative dependence on the specific habitats that may be created or altered by habitat management projects on San Diego Bay NWR.
	20.3 Restored mudflat habitats and intertidal habitats benefit a broad array of shorebird species prey bases by restoring the productivity of benthic invertebrates and fish communities. Refer also to Response 20.2.

and cordgrass along the higher portions of the marsh plain and the incredible numbers of shorebirds that forage at the site during low and mid tides." What is the basis for this statement, which appears to contradict what has actually happened. The announcement of the public hearing and comment period for the Otay River Estuary Restoration Project states that "The proposed restoration would benefit a variety of coastal species, including native fish and migratory shorebirds and seabirds." Which migratory shorebirds? Which "seabirds"? 20.3 Cont.

Based on the map showing the proposed restoration sites, the "Otay River Floodplain Restoration Site" indeed should benefit from such restoration. Current bird use of that site is fairly limited. Such habitat enhancement is applauded. The effects of the planned restoration of "Pond 15" is not so clear cut, however, given that very large numbers of such species as Wilson's and Red-necked Phalaropes and Eared Grebes will be displaced by the habitat change. 20.4

In sum, I think virtually everyone applauds restoration work that improves sites for almost all wildlife species. But many of us are alarmed by other "restoration" work that is having serious negative affects on large groups of species, especially shorebirds, many of which are already or will soon become threatened on a regional and global scale--work that removes critical foraging and high-tide roost sites of open mudflat and shallow open water. Such projects, which certainly improve the habitat for important fish species as well as for Ridgway's Rail and Belding's Savannah Sparrow are then reducing habitat for Western Snowy Plover, Red Knot, and thousands of other shorebirds and ducks. In a way, robbing Peter to pay Paul. 20.5

--PAUL LEHMAN, 11192 Portobelo Drive, San Diego, CA 92124
<lehman.paul@verizon.net>
--conducting many years of bird surveys on south San Diego Bay and at other coastal wetland sites in San Diego County
--former editor of BIRDING magazine, chief publication of the American Birding Association
--chief range-map preparer and consultant for almost every major North American bird field-guide on the market

20.4 Refer to Response 11.4.

20.5 Refer to Responses 11.2, 11.3, 11.4, 11.6, and 20.2.

Comment Letter 21

From: andy_yuen@fws.gov on behalf of Otay EIS, FWS
To: Stan Williams (swilliams@poseidonwater.com); Brian Grover; Jennifer Sucha
Cc: Brian Collins
Subject: Fwd: Otay Estuary EIS
Date: Thursday, December 08, 2016 9:59:01 AM

---------- Forwarded message ----------
From: **maynard ogot** <maynardogot@yahoo.com>
Date: Sat, Nov 19, 2016 at 1:02 AM
Subject: Otay Estuary EIS
To: "Otay_EIS@fws.gov" <Otay_EIS@fws.gov>

Hello,

Thank you for submitting this document for public review. I am a student majoring in Aviation Management and just learned about environmental impact statements in my Airport Planning class. Although I have missed the public comment period, I would love to view the your physical EIS for the Otay River Estuary Restoration Project so that I may apply what I have learned in class. I will be making a trip to the library soon! 21.1

Kind regards,
Maynard Ogot

Response to Comment Letter 21

Maynard Ogot
November 19, 2016

21.1 This comment does not challenge the adequacy of the EIS, or dispute the content disclosed in the EIS. No further response is required. Hard copies of the Draft EIS were provided for public review at the Chula Vista Public Library's Civic Center Branch and South Chula Vista Branch and the San Diego County Library's Imperial Beach Branch.

Comment Letter 22

From: andy_yuen@fws.gov on behalf of Otay EIS, FWS
To: Stan Williams (swilliams@poseidonwater.com); Brian Grover; Jennifer Sucha
Cc: Brian Collins
Subject: Fwd: Otay Estuary EIS
Date: Thursday, December 08, 2016 9:55:28 AM

---------- Forwarded message ----------
From: **Kate Goodenough** <kate.goodenough@gmail.com>
Date: Sun, Dec 4, 2016 at 8:12 PM
Subject: Otay Estuary EIS
To: Otay_EIS@fws.gov

To whom it may concern,

I am writing to ask for an extension to the comment period for the Otay Estuary EIS to the end of January. There is a considerable amount of information to be read and assimilated in a short period of time for this document. 22.1

Sincerely,
Katharine Goodenough

--

Katharine S. Goodenough
PhD Student
Biology Department/Oklahoma Biological Survey
University of Oklahoma
(619)808-1847

Response to Comment Letter 22

Katherine S Goodenough
December 4, 2016

22.1 The comment period began on October 21, 2016, and was planned to end on December 5, 2016. The comment period was extended to December 30, 2016.

Comment Letter 23

Katharine Goodenough
Oklahoma Biological Survey
University of Oklahoma
111 E. Chesapeake St.
Norman, OK 73019
December 5, 2016

Brian Collins, USFWS
San Diego NWRC
PO Box 2358
Chula Vista, CA 91912
RE: Otay Estuary EIS

Mr. Collins,

My name is Katharine Goodenough, and I am a seabird ecologist. I have had a long standing relationship with the USFWS-San Diego Bay National Wildlife Refuge. The Refuge is a field site for my academic research investigating diet and movement ecology of colonial, ground nesting seabirds and has been for the last seven years. My M.S. thesis at San Diego State University focused on diet and movements of Gull-billed Terns nesting at the South Bay Unit (Saltworks), and I am currently a doctoral student at the University of Oklahoma focusing my thesis research upon climate change and its influences upon migration strategies of colonial seabirds. 23.1

While I applaud the efforts of restoration to the Otay Estuary and South San Diego Bay, I am highly concerned by the lack of careful consideration of potential impacts to breeding, colonial, ground nesting seabirds that are protected under the Migratory Bird Treaty Act of 1912 and are addressed in the USFWS Seabird Conservation Plan-Pacific Region. I would like to voice three areas of potential impact that I am concerned about: 1) contaminant issues in soils to be used for restoration, 2) alteration of levee systems within the Saltponds, and 3) results of hydrological models provided by Poseidon Resources. 23.2 23.3 23.4-5

First and foremost is my concern over the presence of elevated contaminants within soils of the Otay River plain. These soils contain elevated amounts of Dichlorodiphenyltrichloroethane (DDT) and agricultural pesticides such as chordane and polychlorinated biphenyl (PCB). All of these compounds have documented impacts to reproductive success in birds, amphibians, and fish. By using these contaminated soils in the restoration, the project poses the potential impact of re-releasing these toxicants to inhabitants within the Saltworks and the restoration site. Even Poseidon Resources has raised these concerns. According to 14W address to the Coastal Commission- "the documentation of substantial soil contamination in the eastern portion of the Otay site and the discovery of significant cultural resources on the site - creates uncertainty about how best to proceed with the mitigation project." Please allow me to remind you of the harmful effects of DDT to birds, mammals, amphibians, and fish. DDT was responsible for the decline and subsequent listing of the Brown Pelican *Pelecanus occidentalis* and Peregrine Falcon *Falco peregrinus* under the US Endangered Species Act because of its impacts to reproductive success, 23.6

Response to Comment Letter 23

Katherine Goodenough
December 5, 2016

23.1 The Service appreciates your taking the time to review the EIS and provide comments.

23.2 It is the opinion of the Service that the restoration of Pond 15 to habitats that support tidally influenced wetlands would not result in significant adverse effects to colonial nesting seabirds protected under the Migratory Bird Treaty Act of 1912. Although the restoration of Pond 15 would require breaching a portion of the existing outer berm, the remainder of the levees surrounding the pond would be available for nesting seabirds both during the construction phase of the project and after the restoration process has been completed.

23.3 The commenter's concerns regarding contaminated soils are addressed in Responses 23.6–23.7.

23.4 The alteration of levee systems within salt ponds is addressed in Response 23.2.

23.5 The results of the hydrologic models are addressed in Responses 23.8–23.12.

23.6 The potential impacts from DDT that are described in the comment are the primary reason the restoration

e.g. egg thinning, declining chick survival. DDT, chlordane, and PCBs impact the reproduction of all bird species including the endangered Ridgway's Rail (formerly the Light-footed Clapper Rail *Rallus obsoletus*). These toxicants are currently locked in the soil, but here is a high degree of uncertainty as to what will happen when these soils become bioturbated. I do not know if we would see problems like when locations in San Francisco were restored up north with the methyl mercury, BUT the metabolites of DDT, dichlorodiphenyldichloroethylene (DDE) and dichlorodiphenyldichloroethane (DDD) are present in the Otay soils and are much more reactive and dangerous than the original compound they are derived from. 23.6 Cont.

When Poseidon Resources tested soils in the project area of the Otay Estuary three years ago, they ran into locations with high levels of DDT (and metabolites DDE and DDD), Chlordane, and PCBs. Poseidon has provided results of scattered bore samples that provide a composite toxicant level that is not entirely accurate. The soils profile for a project location is actually an average of two closely related bore locations that average out the toxicant measures and assume that is what would likely be found between the two locations. In this situation, you can have a very high toxicant load at one site and a low toxicant at the next bore site. Overall, the results are lower and can mislead management into thinking that there is no need to worry about toxicant loads for a particular area. When evaluated on map, it seems plausible that Poseidon did enough bore samples to back their results; BUT when you visit the site and look at the distances between bore locations, there is a big risk that not enough locations were sampled within the project site to provide an accurate evaluation of toxicant loads in the soils. In areas where the site was not sampled, most companies, including Poseidon Resources, use GIS techniques that average values, which may not be representative of the actual toxicant loads of the proposed project location. 23.7

Second, the project proposes to remove a significant portion of the Pond 15 (P15) levee to create marsh habitat and to raise Dike VII to counter future sea level rise. Levees 3,2,8, and sections of the southern levee of P15 are prime nesting area for colonial, ground-nesting seabirds. There is no mention in the draft EIS that addresses potential impacts to historical nesting grounds of species covered under the Migratory Bird Treaty Act of 1912; nor is there mention of how harassment of these species would be prevented during project activities that would entail several years of disturbance to nesting species, e.g. the Elegant Tern Thalasseus elegans, Caspian Tern *Hydroprogne caspia*, Gull-billed Tern *Gelochelidon nilotica*, Black Skimmer *Rynchops niger*, Red Knot *Calidris canutus*, Royal Tern *Thalasseus maximus*, California Least Tern *Sternula antillarum browni*, and the Western Snowy Plover *Charadrius nivosus nivosus* just to mention a few. While Poseidon Resources comments that they will negate impacts to nesting birds by not working during the breeding season, there will still be impacts to the nesting locations evidenced by lack of nesting location. No mention has been made on how Poseidon resources would address the removal of nesting habitat. Even though this is a fisheries project, any impacts to species with federal conservation concern should be addressed. 23.8

Also, the Comprehensive Conservation Plan of the San Diego Bay NWR was completed in 2006. In the interim, changes have occurred in seabird use of the saltpond levees that is not addressed by either the CCP nor the Otay DEIS. Over the past six years, the Elegant Tern has begun to nest in significant numbers within the Saltworks due to changes in oceanographic conditions and overfishing in the Gulf of California (Velarde et al. 2015). In 2016, there were over 100,000 Elegant Terns present in San Diego producing well over 20,000 chicks. The Elegant Tern is listed as an IUCN near-threatened species and a USFWS Bird of Conservation Concern because 23.9

project was redesigned to avoid the highly contaminated area east of Nestor Creek. The portion that is now proposed for use in the restoration has been sampled and deemed appropriately clean for the restoration activity. The analyses and conclusions addressing the potential effects of mobilization of DDT-contaminated soils on downstream resources that were presented in the Draft EIS and described in greater detail in Appendix I of the Draft EIS were the subject of peer review at the request of the CCC. Both peer reviewers found the modeling approaches and methodologies used in the analyses to be appropriate with some comments regarding assumptions and uncertainties. For more information related to this topic, see Responses 2.5–2.23.

23.7 The sampling results provided adequate information to determine what areas should be restored and what areas were not appropriate for wetland restoration (as indicated above). While additional sampling is always beneficial, standard practices were used to assess the nature and extent of contamination for the purposes of modeling sediment mobilization in the case of a major flood event. Note that additional sampling would be required if material was to be excavated and re-used elsewhere. See also Response 1.11.

23.8 The Service is responsible for managing the construction activities associated with the proposed project in ways

		that adhere to the various statutes, regulatory processes and policies that address impacts to wildlife resources, including the Federal Endangered Species Act and the Migratory Bird Treaty Act and other applicable and relevant appropriate requirements, including the San Diego Bay NWR Manager's best professional judgment. Where levees are affected by construction, those levees will have to be restored to acceptable conditions. In some instances, the levees will need to support vehicle use necessary for salt works operations and biological monitoring, as well as seasonal use by nesting seabirds. Where vehicular access is not necessary, levees will be decompacted and/or topped with appropriate substrate suitable for supporting nesting seabirds.
	23.9	San Diego Bay NWR management and biological staff are cognizant of the significant seabird nesting resources that the present configuration of the salt works provides to a variety of avian species. Seabird nesting will continue to be supported and levee conditions will be managed into the future as identified in the San Diego Bay NWR CCP programmatic EIS and ROD prepared for the San Diego Bay NWR CCP. The historic use of the salt pond levees for seabird nesting is understood to be based on a number of ecosystem drivers such as relative isolation from the urban environment; ponded or tidal water and mudflats

it has a limited breeding range and breeding populations are highly sensitive to oceanic change. Climate predictions for migratory bird populations is that they will increase their northward distribution (Velarde et al. 2015). There are only three locations in Southern California that Elegant Terns breed at: Saltworks in San Diego Bay, Bolsa Chica Ecological Reserve, and Pier 400 at the Port of Los Angeles. Removal of the P15 levee poses a problem because close to 60% of the nesting of Elegant Terns occurs on levees that will be impacted by the proposed mitigation activities.

23.9 Cont.

Larger bodied, colonial, ground nesting seabirds have specific requirements for breeding. They require areas that are isolated in open ground or light vegetated areas with UNRESTRICTED visual access in to the surrounding area. That is why these levees are essential to breeding seabirds- they resemble linear islands that are surrounded by water where seabirds can visually inspect for predators. They do not nest in saltmarsh habitat. By altering P15 levees, managers will be altering seabird nesting patterns by eliminating open water areas around traditional nesting sites. While it might be proposed that the terns can nest elsewhere, by crowding the terns into smaller areas of the levee system, managers run the risk of impacting reproductive success of other species and altering predator-prey dynamics of the Saltworks. Elegant Terns have been documented to crowd out other nesting species, e.g. the Gull-billed Tern and the Black Skimmer. Both of these species are listed as California Species of Special Concern (Gardali and Shuford 2008). Since 2010, I have documented Gull-billed Tern nest abandonment due to Elegant Tern encroachment. In 2016, 11 Gull-billed Tern nests were abandoned due to Elegant Tern encroachment. While this may seem inconsequential, Gull-billed Tern populations in San Diego are not stable (Palacios et al. 2015). There are only 33 breeding pairs (R. Patton unpub data) and any impact to the current population may influence survival of the San Diego breeding population. Encroachment can also influence other behaviors such as delayed length of the breeding period and reduced reproductive success through increased nest and offspring defense from conspecifics. More densely packed breeding bird colonies can also lead to increased levels of predation by both avian and mammalian predators. Green et al. (1998) has found that a majority of waterbirds tend to avoid smaller wetlands surrounded by heavy vegetation that make it harder for them to detect predators.

23.10

Lastly in regards to hydrodynamic modeling of the proposed wetland, Poseidon's modeling suggests there would only be a small net increase of biomass to the South Bay- about 1,500 individuals to the south bay- to mitigate their proposed changes. They make the assumption that the biomass provided by the saltponds does not matter because the project is for a fish mitigation project and that any increase in biomass to the South Bay is a beneficial. While I support increased fish biomass because it can improve food resources within the Bay, the amount of biomass increase seems trivial in comparison to what the hypersaline ponds provide in food resources to many bird species within and adjacent to the Saltworks. Although the California Coastal Commission has ruled it is not necessary to have to calculate the pond biomass, we can use calculations done in San Francisco and Europe to show that these hypersaline ponds are significant contributors of food biomass for many migratory species. By not having enough food resources during the non-breeding season and migration, a lack limitation can delay movements northward that impact breeding success of the species (Baker et al. 2004).

23.11

San Diego County is within the Pacific Flyway of migrating shorebirds and waterfowl. Hundreds of thousands of shorebirds and waterfowl visit annually. Indeed, the American Bird Conservancy calls San Diego a globally important bird area due to significant numbers of breeding Gull-billed

23.12

adjacent to the nesting levees; proximity to productive fisheries; proximity to invertebrate foraging resources in the ponds, San Diego Bay, and the nearby Pacific Ocean; low levels of vegetated ground cover and clear sight lines; distance buffers of relatively unsupportive habitat for many common predatory species; its location along the Pacific flyway; and active resource and wildlife community management actions conducted by the San Diego Bay NWR such as human access controls and targeted and selective predator control. Based on our review of these factors, none of these conditions will change significantly post intertidal restoration of the Otay River floodplain or Pond 15. We believe that avian community usage of the pond system and the South Bay wetland environs will be altered but not significantly negatively impacted as a result of the restoration of Pond 15. We also note that the project activities identified within the Draft EIS do not limit future alterations of the San Diego Bay NWR lands and waters in ways intended to benefit particular life history needs of the species that may occur on the San Diego Bay NWR into the future. We identify substrate enhancement and nesting habitat creation as potential future management enhancements on the San Diego Bay NWR in the CCP. We attempt to manage adaptively whenever feasible to continue to provide an optimal mix of resilient habitat conditions on the San Diego Bay NWR based on practicable options that we may identify through continued monitoring of wildlife

responses to our management actions and as changes to the ecosystem, populations, and wildlife communities occur over time.

23.10 See Response 23.9.

23.11 On November 15, 2007, the Coastal Commission approved CDP NO. E-06-013 for Poseidon Resources' ("Poseidon") proposal to construct and operate a desalination facility in Carlsbad, San Diego County. Special Condition 8 of that permit required Poseidon to submit a Marine Life Mitigation Plan (MLMP) addressing the impacts that will be caused by the Carlsbad Desalination Plant's use of estuarine water and entrainment of marine organisms. On August 8, 2008, the Commission approved Poseidon's MLMP, which requires Poseidon to achieve certain acreages and measured ecosystem functionalities to ensure it provides adequate mitigation for potential project effects.

The MLMP, along with an additional fish productivity standard, was adopted by the San Diego RWQCB on May 13, 2009, as part of Order No. R9-2009-0038. A fish productivity rate of 1,715.5 kg/year was imposed based on an impingement estimate of 4.7 kg/day at the Carlsbad Desalination Plant. To demonstrate that the mitigation wetlands meet this requirement, the Regional Board required Poseidon to develop a Productivity Monitoring Plan, subject to review by the Commission's Science Advisory Panel, which

Terns, Caspian Terns, and Western Snowy Plovers. The decided lack of information on the contributing invertebrate biomass of the Saltponds inhibits the ability of managers to be able to make informed decisions on restoration matters. I quote Takekawa et al. (2001) in reference to the San Francisco South Bay Salt Ponds, "Saltponds are shown to have unique trophic and physical attributes that support large numbers of migratory birds." These hypersaline environments support more shorebird, waterbird, and colonial seabird use than in natural coastal habitats. Restoring natural habitat is not the only viable solution to management and conservation of species of concern. Hypersaline environments have beneficial qualities to conservation as is shown by research in Europe. Masero (2003) and Sanchez et al. (2006) found salt pond maintenance, not restoration, to be vital to provide alternate habitat for shorebird populations to ensure their conservation. This is especially important in light of the fact that we are evidencing unprecedented declines in shorebird populations in North America (USFWS Shorebird Conservation Plan) and reduction of natural habitat due to urbanization of the coastline (Schlacher et al. 2008).

Goal 3 of the San Diego Bay National Wildlife Refuge CCP is to provide high quality forage, nesting, and breeding habitat for colonial nesting seabirds, migrating shorebirds and waterfowl, and saltmarsh dependent species. San Diego continues to be a center of urbanization with increasing impacts to the coastal system. There are few places as unique and as important as the South Bay Unit of the San Diego Bay NWR as a resting, foraging, and breeding resource for many species of conservation concern. I urge managers to carefully weigh the benefits of increasing habitat for a few native tidal marsh species with the costs of losing these unique hypersaline systems for species that are already and will become a conservation concern in light of climate change impacts in the next 20 years. While I understand that coastal resiliency is a useful tool to combat climate change impacts, I also understand that research must go hand-in hand with restoration intent. Restoration implies the act of returning something back to its original condition, but how can that occur when there are continuing imbalances to the ecological system with increased urban development of the Bay? There are avenues to balancing restoration to a more natural environment, but that requires significantly more research into the potential impacts such changes might have upon existing use. In reviewing the Otay Estuary EIS, I feel that I must voice my opinion that not enough investigation into the impacts of this proposed restoration has occurred. I will be happy to provide papers for research activities and hypersaline environments and their benefit to conservation and management that I referenced in my letter.

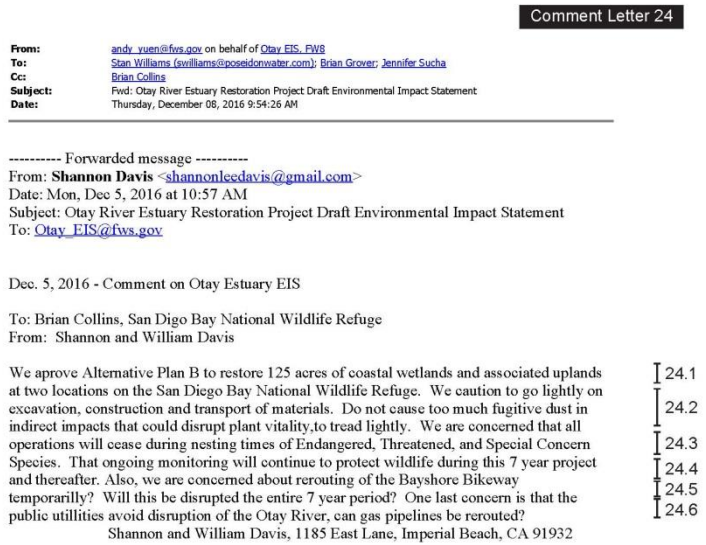
23.12 Cont.

Sincerely,

Katharine S. Goodenough

incorporates the productivity measurement methodologies presented in Allen, "Seasonal Abundance, Composition, and Productivity . . ." Fishery Bulletin, Vol. 80, No. 4, 1982, pages 769–790. Fish productivity monitoring will be conducted once per month for a 13-month period, beginning 4 years after the completion of construction of the wetlands. The wetland habitat parameters that the restoration project is intended to achieve are driven by these specific requirements. See Responses 11.3 and 11.4.

23.12 As addressed in Responses 11.3 and 11.4, the San Diego Bay NWR CCP recommends a range of habitat types for the salt works, including areas that will continue to support brine invertebrates. We will continue to monitor bird use within the salt ponds following the restoration of Pond 15 and adaptively manage the area to support the range of migratory and resident birds present in the area with an emphasis on listed and sensitive species, consistent with the purposes for which the San Diego Bay NWR was established. Note that the data collected and presented within this EIS is not intended or required to provide an exhaustive summary of all potentially informative biological references. Refer to Responses 11.2, 11.5, 11.6, and 23.9.



Comment Letter 24

From: andy_yuen@fws.gov on behalf of Otay EIS, FWS
To: Stan Williams (swilliams@poseidonwater.com); Brian Grover; Jennifer Sucha
Cc: Brian Collins
Subject: Fwd: Otay River Estuary Restoration Project Draft Environmental Impact Statement
Date: Thursday, December 08, 2016 9:54:26 AM

---------- Forwarded message ----------
From: **Shannon Davis** <shannonleedavis@gmail.com>
Date: Mon, Dec 5, 2016 at 10:57 AM
Subject: Otay River Estuary Restoration Project Draft Environmental Impact Statement
To: Otay_EIS@fws.gov

Dec. 5, 2016 - Comment on Otay Estuary EIS

To: Brian Collins, San Digo Bay National Wildlife Refuge
From: Shannon and William Davis

We aprove Alternative Plan B to restore 125 acres of coastal wetlands and associated uplands at two locations on the San Diego Bay National Wildlife Refuge. We caution to go lightly on excavation, construction and transport of materials. Do not cause too much fugitive dust in indirect impacts that could disrupt plant vitality,to tread lightly. We are concerned that all operations will cease during nesting times of Endangered, Threatened, and Special Concern Species. That ongoing monitoring will continue to protect wildlife during this 7 year project and thereafter. Also, we are concerned about rerouting of the Bayshore Bikeway temporarilly? Will this be disrupted the entire 7 year period? One last concern is that the public utillities avoid disruption of the Otay River, can gas pipelines be rerouted?
Shannon and William Davis, 1185 East Lane, Imperial Beach, CA 91932

24.1 24.2 24.3 24.4 24.5 24.6

Response to Comment Letter 24

Shannon Davis
December 5, 2016

24.1 This comment is in support of the project. No response is required.

24.2 As analyzed in Section 4.2.6 of the Draft EIS, the action is subject to SDAPCD Rule 55, Fugitive Dust Control. This rule requires that the project take steps to restrict visible emissions of fugitive dust. The construction specifications will include requirements for watering excavation areas and haul roads at least three times per day during construction. The Final EIS has been expanded to require that the following specifications be included in the construction contract to control fugitive dust:

> To control fugitive dust during construction and truck transport of excavated material, the following procedures will be followed:
>
> a. While material is being loaded into the trucks, the Contractor will perform dust suppression in accordance with Rule 55 or per more detailed requirements outlined in the specifications, whichever is more restrictive.
>
> b. After the excavated material is loaded into the transport trucks, it will be covered and

	otherwise contained while being transported to prevent material from blowing or spilling out of the truck during transport. For trucks traveling on public streets, prior to entering the public right-of-way each truck will be inspected to verify that the load is properly covered (tarped) and the truck is free of excessive dust and mud. For moving excavated material from the floodplain to Pond 15 through conveyor belt, the following procedures will be followed: a. While excavated material is being loaded onto the conveyor belt for transport to Pond 15, the Contractor will ensure that dust suppression is performed in accordance with Rule 55 or per more detailed requirements outlined in the specifications, whichever is more restrictive. b. During or after the excavated material is loaded onto the conveyor belt, the excavated material shall be sprayed with water to prevent material from blowing off the conveyor belt and if necessary, the material will be tarped to prevent dust emission and/or the spilling of excavated material from belt. Tarps or catchment aprons will be installed below the belt where it crosses the Otay River.

c. The process will be continually monitored to ensure that excavated material is not entering any water bodies, including the Otay River and nearby salt ponds. If necessary to protect water quality, additional measures will be implemented to minimize the loss of excavated material from the belt.

24.3 Although avoidance of the nesting season is already addressed through the project design, we have added Mitigation Measure MM-BIO-12 to address avoidance of impacts to nesting birds. Refer to Response 2.38 for additional details.

24.4 Monitoring of wildlife during construction, as described in Mitigation Measure MM-BIO-9, would be implemented throughout the construction process. Sediment transport is anticipated to occur over a 2-year period, generally between September and February of each year. The slurry transport option has been eliminated from consideration in the Final EIS; therefore, the 7-year timeframe associated with the compaction of the slurried material is no longer applicable.

24.5 The Bayshore Bikeway will not be rerouted; however, traffic control will be necessary at two locations: along Bay Boulevard where construction access to Pond 15 will occur and at Main Street where the Bikeway turns west to travel along the

	south end of San Diego Bay. Traffic control would be required when construction vehicles are present (which will occur over a 2-year period outside of the nesting season), and the extent of construction vehicle activity will be dependent upon the manner in which material from the Otay River Floodplain Site is transported to Pond 15, as described in Chapter 2 of the Draft EIS. The bike path that will be rerouted is the City of San Diego's pathway that extends south from the end of Main Street to Saturn Boulevard (see page 4.5-15 of the Draft EIS for more information).
	24.6 As described in Section 4.5.3.2 of the Draft EIS, coordination with the various utility entities will be conducted prior to the completion of final project construction plans. Any utility infrastructure to be crossed by construction vehicles would be protected in place and/or relocated as needed to maintain function. The project does not include modification of any existing utility infrastructure as a result of construction.

Comment Letter 25

From: andy_yuen@fws.gov on behalf of Otay EIS, FWS
To: Stan Williams (swilliams@poseidonwater.com); Brian Grover; Jennifer Sucha
Cc: Brian Collins
Subject: Fwd: Request for an extension to the comment period for the Otay Estuary EIS
Date: Thursday, December 08, 2016 9:54:39 AM

---------- Forwarded message ----------
From: **Elizabeth Copper** <ecopper@san.rr.com>
Date: Mon, Dec 5, 2016 at 9:10 AM
Subject: Request for an extension to the comment period for the Otay Estuary EIS
To: Otay_EIS@fws.gov

I am writing to request that the comment period for the Draft Environmental Impact Statement for the *Otay River Estuary Restoration Project* be extended at least until the of January 2017. The comment period currently ends on December 5. 25.1

The current project is the most significant step in the dismantling of the South Bay Saltworks and is currently in the Draft Environmental Impact (DEIS) stage - the last opportunity for the public fully to voice their opinion. 25.2

The DEIS is more than 600 pages long, the Biological Existing Conditions Technical Report is 352 pages long, and these are only a small part of a tangled process involving the Coastal Commission approval for the Poseidon Desalination Project, a Special Permit for Poseidon requiring a Marine Life Mitigation Plan, review and rejection of multiple alternate site, Memorandum of Understanding with the U.S. Fish and Wildlife Service which has become the foundation and funding mechanism for the *Otay River Estuary Restoration Project*. The finding in this DEIS of less than significant environmental impact is asserted, based on the approval of the 2006 Final Environmental Impact Statement for the Comprehensive Conservation Plan (3 Volumes) in 2006 requiring a reading of that document as well. 25.3

The assertion of less than significant impacts is not supported by available data which has been omitted from this document. 25.4

South San Diego Bay is one of only four areas in California identified by the Western Hemisphere Shorebird Reserve Network for its significance to shorebirds (1999).

South San Diego Bay is Identified as an area of Global Priority in the Important Bird Area program by Audubon and BirdLife International in its existing condition. 25.5

More time is needed for the public to be able to evaluate these documents and understand the potentially devastating environmental impacts of this project. 25.6

Elizabeth Copper

227 F Avenue

Coronado, CA 92118

ecopper@san.rr.com

Response to Comment Letter 25

Elizabeth Copper
December 5, 2016

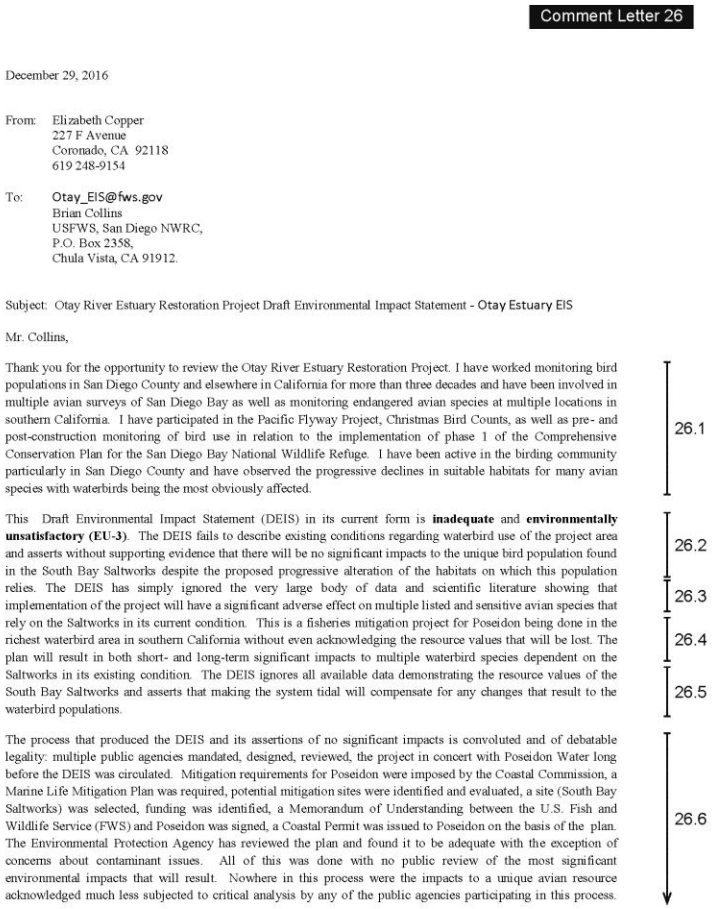
25.1 The comment period began on October 21, 2016, and was planned to end on December 5, 2016. The comment period was extended to December 30, 2016.

25.2 This comment does not challenge the adequacy of the EIS, or dispute the content disclosed in the EIS. No response is required.

25.3 This comment identifies the length of the document and does not challenge the adequacy of the EIS or dispute the content disclosed in the EIS.

25.4 The Final EIS has been revised to include supporting data regarding the acreage of impact to the salt works and the acreage remaining that will provide foraging opportunities for species that forage on brine invertebrates (e.g., brine flies, brine shrimp). No significant loss of nesting areas within the salt works will occur as a result of project implementation. The project will not result in a net loss of wetlands suitable for foraging; rather, the project will increase the availability of a range of foraging habitat for coastal avian species, including additional mudflat habitat, intertidal salt marsh, and subtidal habitats, each of which will support a range of avian species. Areas supporting brine

	invertebrates will continue to be present within the salt works. Refer to Response 11.2. **25.5** According to the Western Hemisphere Shorebird Reserve Network (WHSRN) website (http://www.whsrn.org/sites/list-sites), there are eight areas in California identified as WHSRN sites for their significance to shorebirds, including south San Diego Bay. Recognition of south San Diego Bay as a WHSRN site, as well as the site's designation as an Important Bird Area of Global Priority by Audubon and Bird Life International, was addressed on page 3.1-2 of the Draft EIS. **25.6** In order to allow the public more time to evaluate and review the Draft EIS and supporting documentation, the public review period was extended from December 5, 2016, to December 30, 2016.



Comment Letter 26

December 29, 2016

From: Elizabeth Copper
227 F Avenue
Coronado, CA 92118
619 248-9154

To: Otay_EIS@fws.gov
Brian Collins
USFWS, San Diego NWRC,
P.O. Box 2358,
Chula Vista, CA 91912.

Subject: Otay River Estuary Restoration Project Draft Environmental Impact Statement - Otay Estuary EIS

Mr. Collins,

Thank you for the opportunity to review the Otay River Estuary Restoration Project. I have worked monitoring bird populations in San Diego County and elsewhere in California for more than three decades and have been involved in multiple avian surveys of San Diego Bay as well as monitoring endangered avian species at multiple locations in southern California. I have participated in the Pacific Flyway Project, Christmas Bird Counts, as well as pre- and post-construction monitoring of bird use in relation to the implementation of phase 1 of the Comprehensive Conservation Plan for the San Diego Bay National Wildlife Refuge. I have been active in the birding community particularly in San Diego County and have observed the progressive declines in suitable habitats for many avian species with waterbirds being the most obviously affected. 26.1

This Draft Environmental Impact Statement (DEIS) in its current form is **inadequate** and **environmentally unsatisfactory (EU-3)**. The DEIS fails to describe existing conditions regarding waterbird use of the project area and asserts without supporting evidence that there will be no significant impacts to the unique bird population found in the South Bay Saltworks despite the proposed progressive alteration of the habitats on which this population relies. 26.2 The DEIS has simply ignored the very large body of data and scientific literature showing that implementation of the project will have a significant adverse effect on multiple listed and sensitive avian species that rely on the Saltworks in its current condition. 26.3 This is a fisheries mitigation project for Poseidon being done in the richest waterbird area in southern California without even acknowledging the resource values that will be lost. 26.4 The plan will result in both short- and long-term significant impacts to multiple waterbird species dependent on the Saltworks in its existing condition. The DEIS ignores all available data demonstrating the resource values of the South Bay Saltworks and asserts that making the system tidal will compensate for any changes that result to the waterbird populations. 26.5

The process that produced the DEIS and its assertions of no significant impacts is convoluted and of debatable legality: multiple public agencies mandated, designed, reviewed, the project in concert with Poseidon Water long before the DEIS was circulated. Mitigation requirements for Poseidon were imposed by the Coastal Commission, a Marine Life Mitigation Plan was required, potential mitigation sites were identified and evaluated, a site (South Bay Saltworks) was selected, funding was identified, a Memorandum of Understanding between the U.S. Fish and Wildlife Service (FWS) and Poseidon was signed, a Coastal Permit was issued to Poseidon on the basis of the plan. The Environmental Protection Agency has reviewed the plan and found it to be adequate with the exception of concerns about contaminant issues. All of this was done with no public review of the most significant environmental impacts that will result. Nowhere in this process were the impacts to a unique avian resource acknowledged much less subjected to critical analysis by any of the public agencies participating in this process. 26.6

Response to Comment Letter 26

Elizabeth Copper
December 5, 2016

26.1 Refer to Responses 11.2 through 11.6 and 23.9.

26.2 Refer to Responses 11.2 through 11.6 and 23.9.

26.3 Refer to Responses 11.2 through 11.6 and 23.9.

26.4 Refer to Responses 11.2 through 11.6 and 23.9.

26.5 Refer to Responses 11.2 through 11.6 and 23.9.

26.6 As described in Response 19.1, the evaluation of impacts associated with Carlsbad Desalination Plant was conducted by the City of Carlsbad, initially in 2005, with addendums prepared in 2009 and 2012. A number of permitting actions were also required, including permitting by the California Coastal Commission and the San Diego RWQCB (see Response 23.11). The impacts associated with the project were addressed through the CEQA process. The action considered in the Draft EIS for the ORERP is restoration of two areas within the San Diego Bay NWR, areas that are proposed for restoration in the San Diego Bay NWR CCP (USFWS 2006).

The programmatic EIS and associated Record of Decision prepared in 2006 for the San Diego Bay

	NWR CCP includes an analysis of the potential effects to avian species of restoring portions of the South Bay Salt Works to intertidal wetland habitat. The document concluded that implementation of the CCP, including restoration of various salt ponds, would not result in significant adverse effects to avian species. The current EIS for the Poseidon project tiers from the 2006 programmatic EIS. The public review process for San Diego Bay NWR CCP and accompanying programmatic EIS is provided in Section 5.2 of the Final EIS. The public review process for the Draft EIS is provided in Section 7.3 of the Draft and Final EIS. The potential effects to avian resources, including listed and sensitive species, resulting from the restoration of Pond 15 and the northern portion of Pond 20a are also addressed in the Draft and Final EIS for the ORERP. Refer to Responses 11.3, 11.4, 11.6, 11.14, and 23.9. The decision to allow Poseidon Water to implement wetland mitigation on the San Diego Bay NWR was made based on the proposal's consistency with the restoration proposals included in the Final San Diego Bay NWR CCP, which was processed in accordance with NEPA, the National Wildlife Refuge System Improvement Act, and all other applicable Federal regulations and Executive Orders.

The DEIS appears simply to be an opportunity for the public to rubber-stamp deals that have already been cut. The precedents set by this project will set environmental protection back to the pre-Endangered Species Act days - the environmental stone age. 26.6 Cont.

The process for selecting mitigation alternatives for the Carlsbad Project was determined by criteria provided by the California Coastal Commission. Those criteria did not take into account the existing wildlife values of the Otay River/South Bay Saltworks. Supporting work (Nordby 2010, Josselyn 2011) found that there would be no effects to endangered species in the Otay River selection which is misleading as both California Least Terns and Western Snowy Plovers nest on the levees and forage and roost in the interior salt ponds as well as along the shore. However, other species of concern including other tern species and multiple shorebird species identified as requiring protection by varying entities were not considered at all. The primary considerations appeared to be immediacy of availability and adequate acreage. The assertions of maximum ecosystem benefits and minimum wetland impacts indicate a lack of awareness of the ecosystem supported in the Saltworks, reliance on the vegetated definition of wetlands, and enthusiasm for the easiest solution. 26.7

The DEIS addresses briefly only the listed avian species occurring in the Saltworks dismissing any possible impacts as insignificant and ignores the majority of the species and individuals relying on the site.

Examples of the avian resources of the South Bay Saltworks ignored by the DEIS and in the alternatives selection include:

- 115 species of waterbirds were found in the Saltworks survey area during the pre- and post-construction surveys, 2009-2015, including 35 species of shorebirds (FWS).
- Saltworks has supported in recent years most of the world population of Elegant Terns (they have nested in varying numbers the saltworks for decades).
- Saltworks acquired as mitigation for the loss of California Least Tern (*Sternula antillarum browni*) (federal endangered) nesting habitat to Lindbergh Field expansion. Because Least Tern nesting populations elsewhere in the Bay support a greater number of nests, impacts to the species at the Saltworks are considered less than significant. The Least Tern population in California in 2015 had declined to a little more than half the peak of more than 7,000 pairs between 2005-2009, so adverse effects to any component of the nesting range is of concern.
- The only coastal area in California supporting a significant nesting population of a rapidly declining subspecies of the Gull-billed Tern (*Sterna nilotica vanrossemi*). As the Salton Sea disappears, this will be the only significant population in California.
- Supports one of only two significant populations of migratory and wintering Pacific Red Knots *(Calidris canutus roselaari)* along the coast of California, a subspecies with a population estimated to be under 17,000 individuals world-wide (Pacific Flyway Shorebird Survey, Migratory Shorebird Project). This subspecies was proposed for listing as endangered. It has received a highly imperiled designation from WHSRN. The construction-related monitoring showed the saltworks and adjacent bay to support as many as 200-300+ birds in the saltworks impoundments in the winter and during spring migration, and the disappearance from the western ponds following the vegetation efforts.,
- The Saltworks in 2016 supported the second highest nesting population of the federally threatened Western Snowy Plover (*Charadrius alexandrinus nivosus)* in San Diego County. The North American population has received a highly imperiled designation from WHSRN.
- The Saltworks supports the largest winter population of Black Turnstones (*Arenaria melanocephala*) south of San Francisco Bay (Pacific Flyway Shorebird Project). Identified as a global species of high concern (WHSRN).
- One of the two largest winter populations of Dunlin (*Calidris alpina*) in southern California (Pacific Flyway Shorebird Project). The Dunlin is one of two focus species of the Migratory Shorebird Project. It is a species with a North American population of high concern (WHSRN)
- Supports one of two largest winter populations of Ruddy Turnstones (*Arenaria interpres*) on the Pacific Coast of the United States (Pacific Flyway Shorebird Survey). The North American population is identified as of high concern (WHSRN). 26.8

26.7 The effects of the proposed restoration to existing resources have been considered by both the Service and the Coastal Commission. Adequate measures have been incorporated into the project to ensure that no significant adverse effects to listed or sensitive species will occur both during and following the restoration process. The existing wildlife values of the Otay River floodplain and the salt ponds are considered in the both the programmatic EIS prepared for the San Diego Bay NWR CCP and in the current EIS for the ORERP. See also Responses 11.2 and 23.9.

26.8 The Service is aware of and possesses the informational resources referenced herein and San Diego Bay NWR staff provided funding for, supported, enabled, and/or took part in many of the referenced biological surveys. The changes proposed to Pond 15 will not significantly alter existing nesting areas within the salt works. Measure have been incorporated into the project design to ensure that all levees disturbed during restoration will be restored to surface conditions equal to or better what existed on the site prior to restoration. See Responses 23.12 and 26.6.

- The Saltworks is one of very few areas in coastal California supporting wintering Short-eared Owls (*Asio flammeus*). (FWS, Pacific Flyway Shorebird Project)
- Long-billed Curlew (*Numenius americanus*), identified by WHSRN as globally highly imperiled is present throughout the year in the Saltworks with wintering numbers ranging between 30 and 50 individuals.
- Marbled Godwit (*Limosa fedoa*) is a global species of high concern (WHSRN). More than 300 were observed during multiple survey sets within the Saltworks ponds during the 5-year survey period.
- Short-billed Dowitcher (*Limnodromus griseus*) is a global species of high concern (WHSRN). During the 5-year surveys dowitchers were rarely identified to species but call alone showed the majority of the birds observed to be Short-billed. Between 100 and 200 were observed during single survey sets in the interior ponds but
- Western Sandpiper (*Calidris mauri*) a global species of high concern (WHSRN) along with the Elegant Terns were the most abundant species observed during the five-year monitoring period. As many as 12,000 Western sandpipers were observed in a single survey set in the interior ponds alone. This cannot be regarded as insignificant.
- Wilson's Phalarope (*Phalaropus tricolor)*a global species of high concern (WHSRN) relies during migration on the availability of hypersaline wetlands which are provided by the primary and secondary ponds within the Saltworks. The Red-necked Phalarope (*Phalaropus robatus)* has essentially the same habitat requirements
- Whimbrel (*Numenius phaeopus* North American population species of high concern (WHSRN). In North America, a single subspecies breeds in disjunct areas of the high arctic. Little is known about the basic life-histories or staging during migration of this long-distance migrant.
- Birds breeding in the Saltworks deserve their own chapter in the DEIS. The levees used for nesting should be identified relative to the proposed construction activity. Isolation or connectivity of existing levees can change their suitability for nesting.

26.8
Cont.

Available data ignored:

San Diego Bay Bird Data

- San Diego Natural History Museum and Avian Research Associates. 2013. Final summary report South San Diego Bay Wetland Restoration Project post-construction biological monitoring: avian use of salt evaporation ponds October 2011 to September 2012. Final report dated March 2013 for Southwest Wetlands Interpretive Association.
- San Diego Natural History Museum and Avian Research Associates. 2013. Final summary report South San Diego Bay Wetland Restoration Project post-construction biological monitoring: avian use of salt evaporation ponds October 2012 to September 2013. Final report dated March 2013 for Southwest Wetlands Interpretive Association.
- San Diego Natural History Museum and Avian Research Associates. 2016. Final summary report South San Diego Bay Wetland Restoration Project post-construction biological monitoring: avian use of salt evaporation ponds October 2013 to September 2014. Final report dated July 2016 for Southwest Wetlands Interpretive Association.
- San Diego Natural History Museum and Avian Research Associates. Monthly Updates provided to U.S. Fish and Wildlife Service and the Southwest Wetlands Interpretive Association. 2009-2010; 2011-2016.
- FWS - Annual Monitoring of Avian Species nesting in the Saltworks
- Tierra Data Incorporated. 2009. San Diego Bay Avian Species Surveys 2006-2007. Final report dated April 2009 for Naval Facilities Engineering Command Southwest and San Diego Unified Port District.
- Tierra Data Incorporated. 2011. San Diego Bay Avian Species Surveys 2009-2010. Final report dated May 2011 for Naval Base Coronado and San Diego Unified Port District.

This body of data much of it generated at least in part by FWS identifies the resources using the Saltworks and documents the adverse effects on multiple waterbird species occurring from implementation of Phase 1 of the

Comprehensive Conservation Plan implementation. Why is that information not available for public review along with proper analysis of the potential impacts of the current proposal? Instead, the determination of environmental suitability relies on a limited number of visits by personnel charged with looking for listed sensitive species, a CRAM report, lift analysis, and review only of compliance with conditions identified in the Coastal Commission Permit which apparently shares no concern for the consequences of its mitigation choice.

26.8 Cont.

Saltworks

The assumption that anthropogenic structures are inherently bad and that the creation of "natural" tidal conditions produces habitat of equal or greater overall value regardless of adverse effects to the large number of species and individuals relying on the man-made conditions is wholly unsupported. There exists a substantial body of literature addressing the value of saltworks to shorebirds all of which has been ignored in this document and the CCP FEIS. Among the issues that should have been raised is the potential benefit of supra tidal salt works to shorebirds in the face of sea level rise, the importance of salt works as high tide refugia which has become critical in the absence of adjacent undeveloped uplands, the salt works equivalence to natural saltpan, and the importance for extended foraging by smaller shorebird species such as the Western Sandpiper at high tides. As unvegetated intertidal shoreline is increasingly reduced to narrow steeply sloped habitat the need for suitable foraging broad shallow unvegetated habitat increases. Salt works ponds can provide that habitat.

Sampling of literature that examines the importance of salt works to shorebirds:

Carmona, Roberto, et al. "Use of saltworks by Red Knots at Guerrero Negro, Mexico." *BULLETIN-WADER STUDY GROUP* 111 (2006): 46.

Danemann, G.D.,Carmona, R.& Fernfindez, G. 2002. Migratory shorebirds in the Guerrero Negro Saltworks, Baja California Sur, Mexico. Wader Study Group Bull. 97: 36-41. San Diego

Fonseca, V.G., Grade, N. & Cancela da Fonseca, L. 2004. Patterns of association and habitat use by migrating shorebirds on intertidal mudflats and saltworks on the Tavira Estuary, Ria Formosa, southern Portugal. Wader Study Group Bull.105: 50–55.

Fonseca, V.G., Grade, N. & Cancela da Fonseca, L. 2004. Patterns of association and habitat use by migrating shorebirds on intertidal mudflats and saltworks on the Tavira Estuary, Ria Formosa, southern Portugal. Wader Study Group Bull.105: 50–55.

Masero, J.A. Assessing alternative anthropogenic habitats for conserving waterbirds: salinas as buffer areas against the impact of natural habitat loss for shorebirds. Biodiversity and Conservation (2003) 12: 1157. doi:10.1023/A:1023021320448

Masero, J.A. & Pérez-Hurtado, A. Importance of the Supratidal Habitats for Maintaining Overwintering Shorebird Populations: How Redshanks Use Tidal Mudflats and Adjacent Saltworks in Southern Europe. The Condor Vol. 103, No. 1 (Feb., 2001), pp. 21-30 Published by: American Ornithological Society Stable URL: http://www.jstor.org/stable/1369674.

Pedro, Patricia, and Jaime A. Ramos. "Diet and prey selection of shorebirds on salt pans in the Mondego estuary, western Portugal." *Ardeola* 56.1 (2009): 1-11.

Sripanomyom, Siriya, et al. "Traditional salt-pans hold major concentrations of overwintering shorebirds in Southeast Asia." *Biological Conservation* 144.1 (2011): 526-537.

26.9

26.9 We are aware of the contextual information available on this subject, which is why the San Diego Bay NWR CCP (USFWS 2006) includes a range of habitat proposals for the salt works. These include restoring a number of salt ponds to intertidal wetlands in an effort to reclaim some of the intertidal wetland acreage that has been lost in San Diego Bay, providing shallow water ponds in a portion of the salt works to support shorebirds, and retaining some high salinity ponds to continue to provide brine invertebrates for species such as phalaropes and grebes. These proposals are similar to those being implemented and under consideration in San Francisco Bay, although the pond acreages there are considerably larger, and the species composition, including the presence of fish and a more diverse range of invertebrates, differ from the San Diego Bay ponds. With respect to sea-level rise, the heights of the outer levees are not adequate to protect the salt ponds from the effects of sea-level rise.

Species Data

The DEIS provides such limited data regarding bird use of the Saltworks that it is not possible to evaluate the impacts of changes to existing conditions. An expected standard for environmental review is to provide context for the existing conditions identifying the species relying on the Saltworks and their local, regional, and national status - information essential to the evaluation process but omitted from the DEIS. Much of the contextual information is readily available but missed by the regulators. Sources include the following:

Bird Distribution

Ebird
http://ebird.org/content/ebird/

Unitt, P. San Diego County Bird Atlas. 2004.

Species of Concern

Birds of Management Concern
https://www.fws.gov/migratorybirds/pdf/management/BMCFocalSpecies.pdf

Birds of Conservation Concern
https://www.fws.gov/migratorybirds/pdf/management/BCC2008.pdf

Waterbirds
Migratory Shorebird Project
http://www.migratoryshorebirdproject.org/en/home

North American Waterfowl Management Plan
https://www.fws.gov/migratorybirds/pdf/management/NAWMP/2012NAWMP.pdf

Northern Pacific Shorebird Conservation Plan
http://www.shorebirdplan.org/wp-content/uploads/2013/01/NPACIFIC4.pdf

Pacific Flyway Shorebird Survey
http://data.prbo.org/apps/pfss/

Pacific Seabird Conservation Plan
https://www.fws.gov/Pacific/migratorybirds/PDF/Seabird%20Conservation%20Plan%20Complete.pdfSouthern

Pacific Shorebird Conservation Plan
http://www.shorebirdplan.org/wp-content/uploads/2013/01/SoPacificRev04.pdf

United States Shorebird Conservation Plan
http://www.shorebirdplan.org/wp-content/uploads/2013/01/USShorebirdPlan2Ed.pdf

United States Shorebird Conservation Plan - High Priority Shorebirds 2004
http://www.shorebirdplan.org/wp-content/uploads/2013/01/Priority-Shorebirds-Aug-04.pdf

Western Hemisphere Shorebird Reserve Network
http://www.whsrn.org/

26.9 Cont.

Environmental Protection Agency (EPA) the oversight reviewer has only identified concerns about the adequacy of information about potential mobilization of contaminants that might result from the Otay River Restoration.

26.10

26.10 See Responses 26.8 and 26.9.

However, EPA supports the habitat "enhancements" and "restoration" goals of the project. This support comes without any apparent awareness of the lack of data supporting the replacement of high value waterbird habitat with fisheries mitigation habitat. The ignorance of resource values evident in the environmental review casts doubt on the entire process. 26.10 Cont.

Range of Alternatives is Inadequate

The range of alternatives is inadequate offering only No Action or massive change. The Otay River component of the project would appear to be beneficial taking what is currently habitat with limited resources and creating habitat able to support a greater number and diversity of species. If this were the only component of the restoration plan it is likely that it would be readily supported, though concern about contaminants should be fully addressed. The Otay River component is the only part of the plan addressed in the FWS-Poseidon Memorandum of Understanding (MOU). Will another MOU be produced to address work on the Saltworks interior and Pond 15? 26.11

Unfortunately, there is a need to dispose of the resulting spoil and no alternatives are identified for disposal of the spoil except near the excavation site and Pond 15. In addition, Poseidon's fisheries mitigation needs require the use of the whole of Pond 15 to eventually be made tidal. Pond 15 is the largest of the primary ponds and the most saline in the primary system. Its removal is likely to affect the function of the other primary ponds as well as the secondary ponds affecting a significant piece of a system that happens to function extremely well now for large number of waterbirds currently found there. That contaminants may be found in the soil to be deposited in Pond 15 raises additional questions about the prudence of the project and quality of data available. 26.12 26.13 26.14

The project is expected to take 5-7 years during which time pond 15 will be drained and there will be significant disruption to the interior of the saltworks. A proposed halt to construction during the nesting season to accommodate the unique breeding populations does not provide protection for birds using the Saltworks at other times of year nor does it protect the habitats on and along the dikes used by nesting waterbirds. 40,000+ truck trips will affect the many wintering and migratory birds that roost and feed on the dikes. Stabilizing of some dikes may result in additional loss of waterbird habitat. Rip-rap, if used, is potentially a lethal trap for young birds as well as a haven for rodents. 26.15

Contaminant Issue

The one regulatory question mark was raised by EPA concerning the potential for mobilization of contaminants, both during construction as well as by moving of potentially contaminated soils to Pond 15. How will EPA concerns be addressed? Will more intensive testing be done and how will potential erosion of contaminated soils be dealt with. Will long-term monitoring of contaminant levels be required. Is it known how the contaminants present might affect the invertebrates on which the shorebirds feed? 26.16

Historical Preservation

The Saltworks buildings qualify for National Historic Registry and are already included in the California Register of Historical Places. Will these buildings be preserved despite dismantling of the Saltworks? 26.17

Cost-benefit Analysis

What is the anticipated loss of local income as the Saltworks is slowly reduced to an inoperable condition? How much tax is lost, how many jobs, and is there an effect on the cost of salt? 26.18

Review Process

Why were no 5-year reviews and accompanying adaptive management efforts in response to monitoring applied as promised in the original CCP EIS. 26.19

26.11 The current proposal is intended to implement the restoration objectives previously addressed and vetted in the Final Programmatic EIS for the San Diego Bay NWR CCP and the accompanying CCP. The document explored various alternatives for how coastal wetlands could be restored at the south end of San Diego Bay. Proposals to restore the Otay River floodplain and Pond 15 are included in the approved CCP. The current project steps down from the CCP, and the range of alternatives provided for the ORERP project focus on differing restoration designs for the areas designated for restoration in the CCP. The No Action Alternative was also considered for both the Programmatic EIS and the Draft EIS. Refer to Section 4.2.10 of the Final EIS and Responses 1.9, 1.11, 1.16, 1.18, 1.19, and 1.22 for information related to contaminants. The Service will issue a Special Use Permit and/or prepare another appropriate agreement to authorize Poseidon to implement, maintain, and monitor the two restoration sites until all of the permit conditions imposed on Poseidon by the California Coastal Commission and Regional Water Quality Control Board have been met. Another MOU will not be prepared.

26.12 Much of the soil generated from the restoration of the Otay River floodplain will be transported to Pond 15. The remainder of the soil will be used to cover a 25.5-acre area located to the east of Nestor Creek. Refer to Response 1.6 for additional details.

	26.13	As addressed in Response 11.11, Pond 15 was selected for restoration as part of the Poseidon mitigation project because Pond 15 was determined to be the most viable available area to achieve Poseidon's MLMP goals. The restoration of Pond 15 would also assist in achieving the goals and objectives identified in the San Diego Bay NWR CCP for Pond 15. The restoration of Pond 15, which is currently the most saline pond in the primary system, but slightly smaller than Pond 12, would result in the redistribution of salinity levels within the remaining solar salt ponds. However, one or more of the ponds would continue to support salinity levels similar to those currently found in Pond 15 and that pond or ponds would support brine invertebrates and the bird species that forage on them. The restoration of Pond 15 will result in the creation of a range of habitat types from subtidal to low, mid, and high intertidal salt marsh. Refer to Response 11.2.
	26.14	Contaminant testing of the soils that would be transported from the Otay River Floodplain Site to achieve the desired tidal wetland elevations within Pond 15 have been deemed appropriately clean for the restoration activity and do not pose a threat to the environment or the species that will be supported by the proposed restoration. Refer also to Responses 23.6 and 23.7.
	26.15	The scope of the project has been revised and no longer includes the slurry option. Therefore, all work at the site

	is expected to be completed during a 2-year period that excludes any construction activity when nesting is occurring in the area. Halting construction during the nesting season will avoid noise and other disturbance to nesting birds. No need for riprap has been identified in association with the restoration of Pond 15.
	26.16 Refer to Responses 1.5–1.22 and 2.5–2.28.
	26.17 The 16.99-acre parcel and related salt works buildings are not owned by the Service but are within the approved San Diego Bay NWR acquisition boundary. Despite the statement made on Wikipedia, neither the salt works buildings nor the ponds are included on the California Historical Resources List (http://ohp.parks.ca.gov/ListedResources/). The evaporative salt industry ponds associated with the Western Salt Company, now the South Bay Salt Works, are eligible for inclusion on the National Register of Historic Places (NRHP) but have not been listed. Nevertheless, because the ponds are eligible for listing on the NRHP, the Service has fully evaluated the effects of the current proposal on the salt ponds and has coordinated the implementation of mitigation measures with the State Historic Preservation Officer (SHPO) through a Memorandum of Agreement. For more information regarding current and past conformance with the National Historic Preservation Act with respect to this site, see Section 4.4 of the Final EIS. The salt

works buildings are not affected by this project and we expect that the South Bay Salt Works to continue producing salt after this project is implemented.

26.18 The economic effects of shutting down the solar salt operations on the San Diego Bay NWR were addressed in the EIS prepared for the San Diego Bay NWR CCP (USFWS 2006). The analysis in that EIS estimated that approximately 22 jobs would be lost when the operation closes. It should be noted that the closure of the salt works as a result of the implementation of the current proposal is not anticipated.

If the salt works were to close at some point in the future, the effects of its closure on the overall economy would be minimal. Locally sourced salt would no longer be available in the region, but there would be little, if any, effect on the overall cost of salt within the region. The reduction in annual earnings as a result of eliminating the salt works was estimated in the environmental assessment prepared for establishment of the South San Diego Bay Unit (USFWS 1999) at $670,000, and the annual loss in sales was estimated to be in the range of $5 million dollars (in constant 1992 dollars). Losses to the regional economy would be slightly higher in 2016 dollars. With a forecasted $58.3 billion in total taxable sales in San Diego County in 2016,[1] the effect on the

[1] http://www.dot.ca.gov/hq/tpp/offices/eab/socio_economic_files/2015/Final%20Forecasts/San%20Diego.pdf

economy of eliminating revenue associated with the salt works operation would be inconsequential.

26.19 The Final EIS for the San Diego Bay NWR CCP states that to ensure that the objectives of the salt pond restoration are being met, monitoring of the effects to avian species of restoring, enhancing, or managing salt ponds for fish and wildlife would be implemented. Only one restoration project has been implemented to date, the Western Salt Ponds Restoration Project, and this restoration project included both pre-restoration monitoring and 5 years of post-restoration monitoring. In addition, monitoring of some aspects of the project will continue beyond 5 years. Monitoring results are being evaluated and the lessons learned from this effort will be applied to future restoration projects. The restoration of Pond 15 will also involve pre- and post-monitoring activities. In addition, funding continues to be provided for bird monitoring on the salt works and adjacent open water areas of the Bay.

What entity does the final review and has the final decision-making authority?

Conclusion

Given that this is the first of what is likely to be multiple desalination projects in California, all presumably requiring mitigation, it is important that this first one be done right. We can't continue to sacrifice existing high-value wetlands to support projects needing destructive mitigation. Instead, an honest and open evaluation of the options is critical and must rely on a basic understanding by the regulators of the existing values of potential mitigation sites and rely on fact-based species and habitat goals. The mitigation need cannot be allowed to the driver ignoring the existing values. 26.20

Had FWS not long ago determined that the only positive goal for the Saltworks was restoration of tidal conditions and tidal saltmarsh and instead recognized the wealth of resources available in the Saltworks and the potential for genuine enhancement we would not be continuing a battle that has been going on for more than two decades over habitat for shorebirds and seabirds. Unfortunately, unvegetated wetlands have essentially no regulatory mandate because of the Corps of Engineers Wetlands definition, i.e., wetlands are by definition vegetated. And species that are not given a formal protective designation are left to rely on the Migratory Bird Treaty Act which is applied infrequently and inconsistently Consequently, wetland enhancement and restoration, funded almost entirely by mitigation needs for fisheries habitat and tidal vegetated wetlands, is consuming the estuarine systems and rapidly eliminating foraging and roosting habitat for all but a few waterbird species. 26.21

This DEIS provides a template for what should not be done and should not be allowed. The review process becomes a sham if decisions are predetermined and there is nothing to review. If assertion is substituted for fact the public cannot be well-served. Volume cannot take the place of substance. The document is intended to enlighten not obfuscate. Ignorance has no place in the process. Transparency rather than opacity is the government's obligation. This DEIS fails on all counts. 26.22

26.20 The current proposal would implement restoration within the San Diego Bay NWR that was approved in 2006 as part of the San Diego Bay NWR CCP. The areas proposed for restoration as part of the ORERP are pieces of a larger restoration proposal for the salt works and adjacent floodplain that will restore some of the significant intertidal habitats that historically occurred in San Diego Bay.

26.21 See Responses 11.2 through 11.6.

26.22 Public input has been an important aspect of restoration planning in south San Diego Bay for many years, beginning with the establishment of the San Diego Bay NWR itself. The CCP process involved multiple public meetings, and the circulation of a programmatic EIS to address the restoration and management proposals in the CCP. Public meetings and completion of the NEPA process also occurred for the restoration of the western salt ponds. There have also been multiple public meetings, public hearings, and the circulation of an EIS for the Carlsbad Desalination Plant permitting process and the specific ORERP proposals.

FWS and the environmental documents have asserted that the birds that will be displaced can just go somewhere else. All wetland restoration and enhancement projects are founded

, not

In its current form the DEIS is not adequate for the purposes of the National Environmental Policy Act and should be formally revised to include the status of waterbirds in the South Bay Saltworks and expected impacts to sensitive waterbird species in a supplemental or revised draft EIS to then be circulated for public review.

26.23

26.23 The current EIS for the ORERP has been prepared in accordance with NEPA and the Council on Environmental Quality's NEPA Guidelines. The current EIS also tiers from programmatic EIS that was prepared for the San Diego Bay NWR CCP and addresses the comprehensive restoration of the salt works.

Issues

Fundamental decisions made without benefit of public review I26.24

Self-regulation by environmental agencies - I26.25

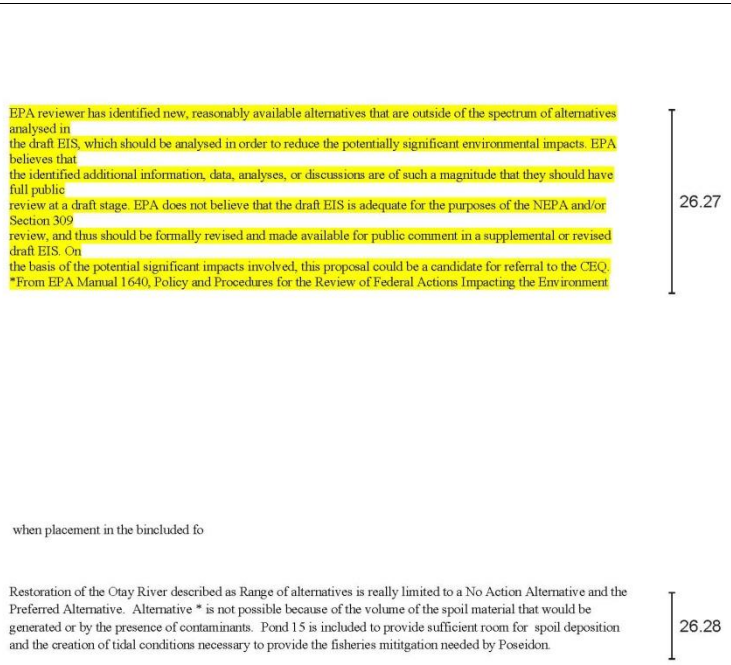
What is the review process I26.26

Has self-review by Federal agencies led to regul, a disturbing conclusion that casts doubt on the entire process.

26.24 Numerous opportunities for public involvement and comment have been provided since the Poseidon proposal was first heard by the CCC in 2007. On November 15, 2007, the CCC approved at a public hearing CDP No. E-06-013 which addressed Poseidon's proposal to construct and operate a desalination facility in Carlsbad, San Diego County. As part of this approval, the Commission required Poseidon, through Special Condition 8, to submit for additional Commission review and approval a Marine Life Mitigation Plan (MLMP). The MLMP, developed jointly by staff and Poseidon, was approved by the CCC at a public hearing on August 8, 2008. The Commission approved the Otay River floodplain mitigation site and preliminary restoration plan for that site at a public hearing on February 9, 2011. The first scoping meeting for the Draft EIS was held on December 6, 2011. A complete discussion of the public outreach process for the Draft EIS was provided in Section 7.3.1 of the Draft EIS.

26.25 The project is a joint effort between the Service, U.S. Army Corps of Engineers, San Diego Regional Water Quality Control Board, and the Port of San Diego. Additionally, the project is the result of a lengthy wetland design process, as described in Chapter 2, Section 2.2. See also Response 26.21.

	26.26 The review process included the preparation of a publicly available Draft EIS, which included environmental analysis of the project, and collection of input from the public to inform the analysis, as was conducted here. The Draft EIS also tiered from a previously prepared programmatic EIS that addressed restoration and management of the entire San Diego Bay NWR.


EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in
the draft EIS, which should be analysed in order to reduce the potentially significant environmental impacts. EPA believes that
the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public
review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309
review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On
the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.
*From EPA Manual 1640, Policy and Procedures for the Review of Federal Actions Impacting the Environment

26.27

when placement in the bincluded fo

Restoration of the Otay River described as Range of alternatives is really limited to a No Action Alternative and the Preferred Alternative. Alternative * is not possible because of the volume of the spoil material that would be generated or by the presence of contaminants. Pond 15 is included to provide sufficient room for spoil deposition and the creation of tidal conditions necessary to provide the fisheries mititgation needed by Poseidon.

26.28

26.27 The comment letter from the EPA did not request additional alternatives. It did, however, address the Clean Water Act's requirement for 404(b)(1) alternatives should be proposal be required to obtain an Individual Permit rather than a Nationwide Permit. Currently, the project is expected to be reviewed under a Nationwide 27 Permit.

26.28 All alternatives analyzed in the EIS are feasible. The restoration of Pond 15 is not proposed simply to dispose of excavated material. It is proposed to meet the requirements of the CCC Special Condition 8, which requires mitigation for impacts related to the use of estuarine water and the entrainment of marine organisms.

The DEIS is Environmentally Unsatisfactory - Inadequate (EU-3)

The DEIS is Environmentally Unsatisfactory because it does not adequately assess potentially significant environmental impacts to the waterbird species relying on the South Bay Saltworks. 26.29

The importance of the project area to waterbirds and the absence of data supporting the assertion of no significant impact which is contradicted by an overwhelming body of available evidence renders the DEIS environmentally unsatisfactory. The document in its thousands of pages does not address potentially significant environmental impacts to the waterbird species relying on the South Bay Saltworks. The effects to significant waterbird populations cannot be adequately evaluated with the near absence of data provided in the DEIS. It is remarkable that EPA can gloss over this so blithely. 26.30

This is only the surface of information that indicates the high resource value of the South Bay Saltworks in its current condition with its current function. These data are readily available to the regulatory agencies but have been ignored and excluded from the environmental review process. The importance of saltworks habitat to many shorebird and waterbird species is well-documented in scientific literature. Replacement of these highly valued habitats with habitat to support fish cannot be justified under current environmental regulation.

The purposeful exclusion of this information from the DEIS in order to be able to approve the Poseidon mitigation is a clear indication of the inadequacy of the document. 26.31

Process Failure

an extension to the comment period for the Otay River Estuary Restoration Project Draft Environmental Impact Statement (DEIS) until the end of January 2017 was requested as this project can only begin to be fairly reviewed by careful evaluation of the tomes provided with the DEIS, time to research the regulatory actions that preceded the publication of the DEIS, and time to compile the avian use data which should have been incorporated into the document. The comment period was extended to 30 December - a token extension at best. The limited comment period given the complexity of the issues is one of the failings of the process. 26.32

Failure to describe existing conditions - waterbird species relying on the saltworks 26.33

Failure to acknowledge significance of the saltworks to multiple waterbird species of concern - context 26.34

26.29 Refer to Responses 8.4, 2.17, 20.2, and 23.9.

26.30 We do not agree that the proposed restoration will result in significant adverse effects to the avian species currently supported within the salt works. The project will result in the restoration of habitats that historically occurred in the area, and will retain, albeit in an altered salinity gradient within a range of ponds, the availability of brine invertebrates for migratory and resident birds. Finally, the proposal will not result in a significant change to the availability of nesting habitat for within the salt works. The analysis of impacts is provided in both the programmatic EIS prepared for the San Diego Bay NWR CCP and in the project-specific EIS for the ORERP. Refer to Response 11.2.

26.31 The importance of the salt works to seabirds, shorebirds, and other avian species is also documented in the project EIS.

26.32 The comment period began on October 21, 2016, and was planned to end on December 5, 2016 (a period of 46 days). The comment period was then extended to December 30, 2016 (an additional 25 days), for a total of 71 days, which we considered an adequate amount of time for the public to review and provide comments on a Draft EIS. The regulatory actions of the CCC were described in the Draft EIS, and public outreach for the NEPA process was provided as Section 7.3 of the Draft EIS. Refer to Response 26.23.

	26.33 As addressed in Response 26.6 and elsewhere throughout these Responses to Comments, the programmatic EIS for the San Diego Bay NWR CCP (USFWS 2006) included information about importance of the salt works to breeding seabirds and shorebirds. The current EIS tiers from that programmatic document, and as such, the impacts analysis for the current project considered all the information and issues addressed in the 2006 Final EIS. Data related to recent bird use and nesting locations has been updated in the Final EIS for the ORERP. **26.34** Refer to Responses 8.4, 2.17, 20.2, 23.9, and 26.29.

Comment Letter 27

From: andy_yuen@fws.gov on behalf of Otay EIS, FWS
To: Stan Williams (swilliams@poseidonwater.com); Brian Grover; Jennifer Sucha
Cc: Brian Collins
Subject: Fwd: Otay Estuary EIS
Date: Thursday, December 08, 2016 9:55:02 AM

---------- Forwarded message ----------
From: **Handa Ornithology Lab** <handaornithologylab@gmail.com>
Date: Mon, Dec 5, 2016 at 8:55 AM
Subject: Otay Estuary EIS
To: Otay_EIS@fws.gov

To Whom It May Concern,

I would like to request an extension to the comment period to the end of January 2017 for the Draft Environmental Impact Statement for the Otay River Estuary Restoration Project as the deadline to comment is today, December 5, 2016. As the documents are quite lengthy and this is a complex situation, more time is needed for the public to be able to evaluate these documents and understand the potentially devastating environmental impacts of this project. 27.1

Respectfully,

Lesley Handa
Handa Ornithology Lab

Response to Comment Letter 27

Handa Ornithology Lab
Lesley Handa
December 5, 2016

27.1 Refer to Response 26.31.

Comment Letter 28

From: brian_collins@fws.gov on behalf of Otay EIS, FWS
To: Stan Williams (swilliams@poseidonwater.com); Brian Grover
Subject: Fwd: Otay Estuary EIS
Date: Thursday, January 12, 2017 9:06:18 AM

---------- Forwarded message ----------
From: **Handa Ornithology Lab** <handaornithologylab@gmail.com>
Date: Fri, Dec 30, 2016 at 10:36 AM
Subject: Otay Estuary EIS
To: Otay_EIS@fws.gov

December 30, 2016

To Brian Collins,

Thank you for extending the deadline to submit comments for the proposed Otay River Estuary Restoration Project Draft Environmental Impact Statement. I am an ornithologist and geographer who studies abundance and biodiversity of waterbirds in San Diego at the following study sites: Mission Bay, the San Diego Rivermouth, and Famosa Slough. Additionally, I study the Double-crested Cormorant throughout San Diego County which presented the opportunity to survey all inland lakes and reservoirs in the county providing foundational knowledge of how waterbirds use areas throughout the county. I volunteer for the annual San Diego Christmas Bird Count by assisting with waterbird counts in the bay and volunteer at the San Diego Natural History Museum in the Bird and Mammal Department. In the past, I was fortunate to have worked four field seasons during breeding in South San Diego Bay assisting with studies involving the Gull-billed Tern, Black Skimmer and productivity surveys of waterbirds. Observing species that use the salt ponds and surrounding areas taught me how invaluable these managed areas in South San Diego Bay are for the species I highlight below, as the current sum of resources in South San Diego Bay provide a diversity of resources that restored wetlands alone may not be able to provide. Conservation is most effective when we protect areas that species select because try as we may, humans cannot understand all specific suitable requirements for a given species. There have been too many examples where we failed to understand requirements of target species as the species did not find these areas suitable - even though these areas were prepared to the best of our knowledge. As South San Diego Bay is prime habitat for many waterbirds, any action reducing or changing resources to this area will greatly impact species dependent on this area. The DEIS for the proposed Otay Restoration Project requires further evaluation and scrutiny of potential impacts as the proposed actions will adversely affect several populations of waterbird species that heavily rely on these areas throughout the year for breeding, migration and winter. The current plans do not acknowledge potential direct and indirect impacts to waterbirds that currently use the area and it fails to acknowledge the current and historical data. Further investigation and full declaration of these impacts is needed prior to proceeding with this mitigation project.

28.1

28.2

San Diego County has the highest documented bird biodiversity in the United States with South San Diego Bay central to the highest recorded volume and biodiversity of waterbirds compared to any area in the county (Unitt et al. 2004, San Diego Natural History Museum and Avian Research Associates 2013, Tierra Data Incorporated 2009 and 2010). As South San

28.3

Response to Comment Letter 28

Handa Ornithology Lab
Lesley Handa
December 30, 2016

28.1 See Responses 11.2 through 11.6, 23.2, and 26.8.

28.2 See Responses 11.2 through 11.6, 23.2, and 26.8.

28.3 See Responses 11.2 through 11.6, 23.2, and 26.8.

Diego Bay is geographically situated along the Pacific Flyway, it hosts many thousands of waterbirds throughout the year including 18,000 shorebirds in the fall, 11,000 in winter and 13,000 in spring (Terp 1989, Page et al. 1999). South San Diego Bay is a regional importance for shorebirds designated by Western Hemisphere Shorebird Reserve Network (WHSRN) as of 1989 and an important area for waterbirds as it is designated as an Important Bird Area by Audubon. Coastal salt ponds provide important nesting, foraging and roosting habitat to waterbirds around the world (Warnock et al. 2002, Rufino et al. 1984, Sampath and Krisnamurthy 1989, Velasquez 1993, Masero and Perez-Hurtado 2001) and the salt ponds of South San Diego Bay is a critical site for waterbirds (Terp 1989). The different levels of salinity in the managed salt ponds support a high biodiversity of species of waterbirds (Warnock et al. 2002) and this combination of resources: tidally influenced wetland areas, proximity to the ocean, and managed salt ponds are unique to the county. The salt ponds attract brine shrimp, brine flies and other potential prey species which are invaluable resources to many waterbirds year-round, any alteration to the ponds will negatively affect species that rely on this area as change in salinity levels could dramatically affect the fauna of the ponds. Little research has been put forth to assess prey base in individual ponds or carrying capacity of the entire system as whole and it is unknown how the birds may respond to these changes. Per the Migratory Shorebird Project, similar concentration in prey are geographically distant from San Diego with the next closest locations being San Quintin Bay - located in Baja California and San Francisco Bay. Absence of this resource in San Diego, may deter waterbirds with a preference for this resource from the area.

28.3 Cont.

Due to the restricted public access of South San Diego Bay, many waterbirds sensitive to disturbance including shorebirds, larids, Eared Grebe and Double-Crested Cormorant, find this area amenable for breeding, wintering, and migration. This unique combination of resources without human disturbance are rare in in the county and South San Diego Bay is prime real estate for many waterbirds during breeding. Sensitivity for many species of waterbirds is heightened during breeding and eliminating preferred areas that species consistently use year after year will cause a direct impact on the following species of conservation concern that use the area during breeding: the Federally Endangered California Least Tern, Federally Threatened Snowy Plover, California bird species of special concern (2008) Western Gull-billed Tern and Black Skimmer, and the IUCN Near Threatened species Elegant Tern, a species that is also included in the 2016 State of North America's Birds Watch List. Raising the height of dike VII for flood control would alter nesting area directly affecting Black Skimmer and California Least Tern and loss of northern pond 20A to construction of a new flood control berm in addition to the dike VII and Pond 15 conversions would eliminate or alter nesting areas used by Snowy Plover. Altering these areas will cause displacement for non-breeding birds as the levees around Pond 15 are large gull roosts and loss of this area would cause relocation to other levees, increasing predation on smaller species including Snowy Plover, California Least Tern, and Gull-billed Tern by increasing frequency of interaction between species in adjustment to smaller available area.

28.4

Several species that use South San Diego Bay during breeding should be top conservation priority as some already demonstrate restricted geography to the area. South San Diego Bay is the only location where all species of terns found in the county breed and is the only location in the world where this assemblage of terns: California Least Tern, Gull-billed Tern, Forster's Tern, Caspian Tern, Royal Tern, and Elegant Tern breed. Historically, the Elegant Tern bred in only five areas as this species is geographically restricted to the Pacific Coast (Unitt et al. 2004), however, in 2016, South San Diego Bay was only one of two locations where this species nested and estimates state that South San Diego Bay supported 85% of the entire

28.5

28.4 See Responses 11.2 through 11.6, 23.2, and 26.8.

28.5 See Responses 11.2 through 11.6, 23.2, and 26.8.

population of the species. This species displays extreme sensitivity towards intensity of El Nino-Southern Oscillation (ENSO) events (Velarde et al. 2015) and further concern is warranted as ENSO is expected to occur with more frequency and intensity with climate change in the future (Cai et al. 2014). Due to events from this past year alone that have confirmed that this species responds to the changing oceanographic conditions year to year, it is imperative that there are enough areas for this species to breed in South San Diego Bay as the world's population of Elegant Tern may depend on it. Additionally, the subspecies of Western Gull-billed Tern exclusively uses only two sites in the United States during breeding: South San Diego Bay and the Salton Sea. Concern for this species is warranted as recruitment from the Salton Sea has been minimal and the South San Diego Bay population is still recovering from the massive die-off event in May of 2013 that eliminated the majority of the population, with a loss of 70 individuals (USGS 2013). Since the 1940's, San Diego Bay has been the site of a major colony of Caspian Tern due to lack of suitable sites elsewhere in San Diego (Unitt et al. 2004) and South San Diego Bay is the only location where Royal Tern nest in the county (Unitt et al. 2004). It is crucial that all three terns are protected together as the breeding success of Royal Tern and Elegant Tern depend on the Caspian Tern as it provides defense of the colony (Schaffner 1985). South San Diego Bay may be a greater importance for Forster's Tern during nesting due to the species reliance upon local reservoirs (Unitt et al. 2004). Many of the inland reservoirs are at extremely low levels or are currently dry resulting from actions to ameliorate drought conditions for San Diego County (San Diego County Water Authority 2016). The Black Skimmer population in San Diego is heavily dependent on the managed areas in South San Diego Bay for breeding (Unitt et al. 2004) and this area is the larger of the two colonies in the county. Black Skimmer are vulnerable in comparison to other waterbirds to nesting disturbance (Erwin 1989) and would be adversely affected if areas for nesting are eliminated and the area is too crowded. Black-necked Stilt and American Avocet would also be directly affected as these species nest along the perimeter of Pond 15. The population of American Avocet in San Diego is reliant on South San Diego Bay for breeding as this species has already been affected by loss of natural habitat (Unitt et al. 2004) and South San Diego Bay is the primary breeding site that hosts a third or half of the Black-necked Stilt in the county (Unitt et al. 2004). Deteriorating conditions inland at lakes and reservoirs place a greater significance on South San Diego Bay and coastal areas from further concern of the ongoing drought in Southern California. Several lakes and reservoirs may not support breeding habitat to the same capacity prior to the drought with Lake Hodges a prime example as it is currently at 37% water capacity (San Diego County Water Authority 2016) and was a breeding area for both species
(Unitt et al. 2004). The dredge in Pond 15 in South San Diego Bay is the location of only one of two active breeding colonies for Double-Crested Cormorant in San Diego County (Handa 2016 manuscript), as it has been recently reported that the third colony at Sweetwater Reservoir is no longer active (Handa 2016 manuscript). Altering Pond 15 may have consequences to the colony during breeding as the water surrounding the dredge creates an island providing protection from disturbance of land predators. Individuals from this colony are a genetically distinct from the rest of the Pacific coast subspecies of Phalacrocorax auritus albociliatus (Mercer et al. 2013) and more closely related to birds from Baja California, meaning that South San Diego Bay is the only location in the United States where this genetic line breeds.

28.5 Cont.

South San Diego Bay provides favorable habitat outside of breeding season for species of birds that use this area in winter and during migration. South San Diego Bay is prime winter habitat for Eared Grebe (Unitt et al. 2004) as this species prefers the hypersaline conditions of the salt ponds (Unitt et al. 2004). Eared Grebe are vulnerable to bottlenecks during migration

28.6

28.6 See Responses 11.2 through 11.6, 23.2, and 26.8.

as it only uses a few sites in North America (Unitt et al. 2004) and are sensitive to ENSO conditions that have resulted in food shortages in the past (Jehl 1996). The impact on this species could be significant if Pond 15 is altered, as this species has occurred in the thousands with a high count of 4,100 in 1998 (Unitt et al. 2004). Further concern is warranted as the numbers of Eared Grebe have suffered this past year in 2016 at the Salton Sea (per manager Chris Schoneman) and with the expectation of the frequency and intensity of ENSO events in the future (Cai et al. 2014). Shorebird species that use San Diego Bay, almost all which are declining, could also be negatively impacted by mitigation actions as well as numbers have declined in the past few years post ongoing restoration in South San Diego Bay. The pacific coast Red-Knot (Calidris canutus roselaari) is little studied, and South San Diego Bay may have more of a significance than what is currently understood with existing research (Carmona et al. 2013). This species has a reputation of selectivity in terms of migratory and wintering habitat (Unitt et al. 2004) and there are only a few locations along the Pacific coast where this species winters (Unitt et al. 2004). Winter data from Mission Bay from 2013-2015 (Handa 2016) and the San Diego Rivermouth 2015-2016 (Manuscript in progress) confirm that the South San Diego Bay continues to hold the highest number of individuals in the winter (Unitt et al. 2004) as this area is the main site in the county for this species. The Red-necked Phalarope and the Wilson's Phalarope, a Global Species of High Concern (US Shorebird Conservation Plan 2004), is an abundant migrant in San Diego that relies heavily on the South San Diego Bay during migration (Unitt et al. 2004). The Red-necked Phalarope occur in numbers up to 12,000 in South San Diego Bay (Unitt et al. 2004) and it is unknow if this species will shift locations to other unmanaged ponds with the proposed mitigation.

28.6 Cont.

28.7

In addition to waterbirds, other species of birds may be impacted. According to a 2010 population survey, South San Diego Bay has contributed the second highest number of individuals of State Endangered Belding's Savannah Sparrow in San Diego County (Zembal and Hoffman 2010). As they are narrowly restricted to coastal marshes dominated with pickleweed (Unitt et al. 2004), destruction of habitat may affect the birds that use the area. Other birds that will be affected are Northern Rough-winged swallows, Tree Swallows, Barn Swallows and Cliff Swallows that gather in large numbers due to the concentration of brine flies in the area.

28.8

Many of these waterbirds that use South San Diego Bay have been identified as vulnerable to changes with climate change (North American Bird Conservation Initiative 2010) due to dependence on coastal areas and marine resources. As resources beyond our control change rapidly with climate change, it is imperative that South San Diego Bay remain as stable as possible, as many of these species that only spend part of the year in San Diego for winter, migration or breeding will be exposed to dramatic change in other geographical areas around the world. I am requesting no further action until impacts to the birds that depend on this area are addressed as the proposed mitigation may result in a negative impact or worse - extirpation for certain species if current resources are no longer available. Thank you for your time and consideration.

28.9

Respectfully,

Lesley Handa
Handa Ornithology Lab

28.7 See Responses 11.2 through 11.6, 23.2, and 26.8.

28.8 See Responses 11.2 through 11.6, 23.2, and 26.8.

28.9 See Responses 11.2 through 11.6, 23.2, and 26.8.

REFERENCES

Cai, Wenju, et al. "Increasing frequency of extreme El Niño events due to greenhouse warming." *Nature climate change* 4.2 (2014): 111-116.

Carmona, Roberto, et al. "Red Knot (Calidris canutus roselaari) migration connectivity, abundance and nonbreeding distribution along the Pacific coast of the Americas." *Wader Study Group Bull* 120.3 (2013): 168-180.

Erwin, R. Michael. "Responses to human intruders by birds nesting in colonies: experimental results and management guidelines." *Colonial Waterbirds* (1989): 104-108.

Jehl Jr, Joseph R. "Mass Mortality Events of Eared Grebes in North America (Mortandad en Masa de Individuos de Podiceps Nigricollis en Norte América)." *Journal of Field Ornithology* (1996): 471-476.

Handa, Lesley Mika. *A study of waterbirds wintering in Mission Bay combining field methods and GIS*. Diss. SAN DIEGO STATE UNIVERSITY, 2016.

Masero, J., A. Pérez-Hurtado, M. Castro and G. M. Arroyo. Complementary use of intertidal mudflats and adjacent salinas by foraging waders. *Ardea* 88 (2000): 177- 191.

Mercer, Dacey M., Susan M. Haig, and Daniel D. Roby. "Phylogeography and population genetic structure of double-crested cormorants (Phalacrocorax auritus)." *Conservation Genetics* 14.4 (2013): 823-836.

North American Bird Conservation Initiative, and US Committee. "The state of the birds 2010 report on climate change, United States of America." *Washington, DC: US Department of the Interior* (2010).

Page, Gary W., Lynne E. Stenzel, and Janet E. Kjelmyr. "Overview of shorebird abundance and distribution in wetlands of the Pacific Coast of the contiguous United States." *Condor* (1999): 461-471.

Rufino, R., A. Araujo, J. P. Pina and P. Miranda. The use of salinas by waders in the Algarve, south Portugal. *Wader Studies Group* Bulletin 42 (1984): 41-42.

Sampath, K. and K. Krishnamurthy. Shorebirds of the salt ponds at the Great Vedaranyam Salt Swamp, Tamil Nadu, India. *Stilt* 15 (1989): 20-23.

San Diego County Water Authority 2016. http://www.sdcwa.org/reservoirs

San Diego Natural History Museum and Avian Research Associates. 2013. Final summary report South San Diego Bay Wetland Restoration Project post-construction biological monitoring: avian use of salt evaporation ponds October 2011 to September 2012. Final report dated March 2013 for Southwest Wetlands Interpretive Association.

Schaffner, Fred C. "Trends in Elegant Tern and northern anchovy populations in

California." *Condor* (1986): 347-354.

Terp, Jill Morgan. *Habitat use patterns of wintering shorebirds: the role on salt evaporation ponds in south San Diego Bay*. 1998.

Tierra Data Incorporated. 2009. San Diego Bay Avian Species Surveys 2006-2007. Final report dated April 2009 for Naval Facilities Engineering Command Southwest and San Diego Unified Port District.

Tierra Data Incorporated. 2011. San Diego Bay Avian Species Surveys 2009-2010. Final report dated May 2011 for Naval Base Coronado and San Diego Unified Port District.

Warnock, Nils, et al. "Management and conservation of San Francisco Bay salt ponds: effects of pond salinity, area, tide, and season on Pacific Flyway waterbirds." *Waterbirds* (2002): 79-92.

Velarde, Enriqueta, et al. "Warm oceanographic anomalies and fishing pressure drive seabird nesting north." *Science advances* 1.5 (2015): e1400210.

Velasquez, C. 1993. The ecology and management of waterbirds at commercial saltpans in South Africa. Unpublished Ph.D. dissertation. University of Capetown, South Africa.

Unitt, Philip, Anthony Mercieca, and Ann E. Kovstad. *San Diego county bird atlas*. San Diego Natural History Museum, 2004.

Zembal, Richard, et al. "A Survey of the Belding's Savannah Sparrow (Passerculus sandwichensis beldingi) in California 2010." (2010).

USGS 2013 https://www.nwhc.usgs.gov/publications/quarterly_reports/2013_qtr_2.jsp

Comment Letter 29

From: brian_collins@fws.gov on behalf of Otay EIS, FWS
To: Stan Williams (swilliams@poseidonwater.com); Brian Grover
Subject: Fwd: Otay River Estuary Restoration
Date: Thursday, January 12, 2017 9:07:32 AM

---------- Forwarded message ----------
From: **Christopher Adler** <christopheradlerdotcom@gmail.com>
Date: Wed, Dec 28, 2016 at 9:46 AM
Subject: Otay River Estuary Restoration
To: Otay_EIS@fws.gov
Cc: Christopher Adler <christopheradlerdotcom@gmail.com>

Dear Mr. Collins,

I am writing concerning the Draft EIS for the ORERP. I am concerning that the proposed changes do not adequately address the waterbirds that currently use the areas proposed for renovation. While I do support habitat restoration for Ridgway's Rail and Belding's Savannah Sparrow, I also recognize the broad diversity of waterbirds that currently use these sites, including for breeding.

The species include many that are of conservation concern at the national, state, or local level, and many which are potentially at risk due to climate change and impacts along the Pacific flyway outside of the United States. These sites are presently important for Snowy Plover, Least Tern, Gull-billed Tern, Black Skimmer and Elegant Tern. The value of these sites to these species is clear, and it is not made clear how the disruption of these sites will affect these species. Even though protection of nest sites for Least Tern and Snowy Plover takes places elsewhere, it is clear that individuals of these species prefer sites in South San Diego Bay, possibly because it is protected from public access. 29.1

South San Diego Bay is recognized by the Audubon Society as an Important Bird Area and widely understood to be a critical migration and wintering stopover for a broad array of shorebirds, gulls and terns. The salt ponds provide a diversity of habitat that supports that array of species, and the fact that the sites are largely undisturbed and have no public access contribute to their tremendous value. 29.2

I urge you to reconsider implementation of this restoration project until impacts are better understood, and to reconsider whether or not the loss of actively used nesting sites for species of present conservation concern is a responsible action. 29.3

Thank you,
Christopher Adler

Response to Comment Letter 29

Christopher Adler
December 28, 2016

29.1 See Responses 11.2 through 11.6, 23.2, and 26.8.

29.2 See Responses 11.2 through 11.6, 23.2, and 26.8.

29.3 See Responses 11.2 through 11.6, 23.2, and 26.8.

Comment Letter 30

From: brian_collins@fws.gov on behalf of Otay EIS, FWS
To: Stan Williams (swilliams@poseidonwater.com); Brian Grover
Subject: Fwd: Otay_EIS@fws.gov
Date: Thursday, January 12, 2017 9:07:27 AM

---------- Forwarded message ----------
From: **Guy McCaskie** <guymcc@pacbell.net>
Date: Wed, Dec 28, 2016 at 2:31 PM
Subject: Otay_EIS@fws.gov
To: Otay_EIS@fws.gov

Brian Collins, USFWS

San Diego NWRC

PO Box 2358

Chula Vista, CA 91912

RE: Otay Estuary EIS

Email: Otay_EIS@fws.gov

Mr. Collins,

I have been active in the ornithological community since I moved to San Diego in 1962. I am active in the field and have published numerous articles and authored or contributed to various works on status and distribution of birds in California. 30.1

I have watched the results of the "restoration" of the western ponds to tidal condition and seen a dramatic reduction in shorebird numbers in these ponds as well as the nearly complete disappearance of diving ducks from this area. Shorebird habitat of any kind is at a premium throughout southern California as is protected open water for "bay" ducks. The previous management efforts dealt a serious blow to both groups relying on San Diego Bay one of the most important waterbird areas on the Pacific Coast. I could find none of the data documenting those results in the current Draft Environmental Impact Statement and the assurance that dismantling of the interior of the saltworks will have no significant impacts to the birds dependent on the area for foraging and refugia is not only unsupported by data but contradicted by observation. 30.2 30.3

The absence of data supporting the assertion of no significant impacts renders the DEIS wholly inadequate. The document needs to be revised to include the large body of data available to allow unbiased evaluation of the project. 30.4

Thank you for the opportunity to comment,

Response to Comment Letter 30

Guy McCaskie
December 28, 2016

30.1 The Service appreciates you taking the time to review the EIS and provide comments.

30.2 Refer to Response 20.2.

30.3 Refer to Response 23.2.

30.4 Refer to Responses 8.4, 2.17, 20.2, and 23.9.

Guy McCaskie

954 Grove Avenue

Imperial Beach, CA 91932

Comment Letter 31

From: brian_collins@fws.gov on behalf of Otay EIS, FWS
To: Stan Williams (swilliams@poseidonwater.com); Brian Grover
Subject: Fwd: Otay Estuary EIS
Date: Thursday, January 12, 2017 9:21:50 AM

---------- Forwarded message ----------
From: **annie s** <anne.stockley@gmail.com>
Date: Thu, Dec 29, 2016 at 11:55 PM
Subject: Otay Estuary EIS
To: Otay_EIS@fws.gov

I would like to make the following comments with respect to the Otay River Estuary restoration project. 31.1

I am concerned about the impact of the project on the resident and migrating waterbirds in this area.

The draft EIS does not cover this issue and I think it is a serious omission that the effect of the project on resident and visiting waterbirds has not been considered.

The habitat in the area is located on a major migration route and is critical to migrating birds. The land is also a precious and ever dimishing resource for the resident and semi resident birds. Any change to the area will impact the waterbirds. A number of papers listed below support my statements. 31.2

I request that the draft EIS address the impact of the project on resident and migrating birds using imput from local birding experts such as the authors of the papers listed below.

Thank you

Annie Stockley

REFERENCES

Erwin, R. Michael. "Responses to human intruders by birds nesting in colonies: experimental results and management guidelines." *Colonial Waterbirds* (1989): 104-108.

Jehl Jr, Joseph R. "Mass Mortality Events of Eared Grebes in North America (Mortandad en Masa de Individuos de Podiceps Nigricollis en Norte América)." *Journal of Field Ornithology* (1996): 471-476.

Handa, Lesley Mika. *A study of waterbirds wintering in Mission Bay combining field methods and GIS*. Diss. SAN DIEGO STATE UNIVERSITY, 2016.

Masero, J., A. Pérez-Hurtado, M. Castro and G. M. Arroyo. Complementary use of intertidal mudflats and adjacent salinas by foraging waders. Ardea 88 (2000): 177- 191.

Mercer, Dacey M., Susan M. Haig, and Daniel D. Roby. "Phylogeography and population genetic structure of double-crested cormorants (Phalacrocorax auritus)." *Conservation Genetics* 14.4 (2013): 823-836.

North American Bird Conservation Initiative, and US Committee. "The state of the birds 2010 report on climate change, United States of America." *Washington, DC: US Department of the Interior* (2010).

Page, Gary W., Lynne E. Stenzel, and Janet E. Kjelmyr. "Overview of shorebird abundance and distribution in wetlands of the Pacific Coast of the contiguous United States." *Condor* (1999): 461-471.

Rufino, R., A. Araujo, J. P. Pina and P. Miranda. The use of salinas by waders in the Algarve, south

Response to Comment Letter 31

Anne Stockley
December 29, 2016

31.1 The Service appreciates you taking the time to review the EIS and provide comments.

31.2 Refer to Responses 8.4, 2.17, 20.2, 23.9, and 26.11.

Portugal. *Wader Studies Group* Bulletin 42 (1984): 41-42.

Sampath, K. and K. Krishnamurthy. Shorebirds of the salt ponds at the Great Vedaranyam Salt Swamp, Tamil Nadu, India. *Stilt* 15 (1989): 20-23.

San Diego County Water Authority 2016. http://www.sdcwa.org/res ervoirs

Schaffner, Fred C. "Trends in Elegant Tern and northern anchovy populations in California." *Condor* (1986): 347-354.

Terp, Jill Morgan. *Habitat use patterns of wintering shorebirds: the role on salt evaporation ponds in south San Diego Bay*. 1998.

Warnock, Nils, et al. "Management and conservation of San Francisco Bay salt ponds: effects of pond salinity, area, tide, and season on Pacific Flyway waterbirds." *Waterbirds* (2002) : 79-92.

Velarde, Enriqueta, et al. "Warm oceanographic anomalies and fishing pressure drive seabird nesting north." *Science advances* 1.5 (2015): e1400210.

Velasquez, C. 1993. The ecology and management of waterbirds at commercial saltpans in South Africa. Unpublished Ph.D. dissertation. University of Capetown, South Africa.

Unitt, Philip, Anthony Mercieca, and Ann E. Kovstad. *San Diego county bird atlas*. San Diego Natural History Museum, 2004.

Zembal, Richard, et al. "A Survey of the Belding's Savannah Sparrow (Passerculus sandwichensis beldingi) in California 2010." (2010).

USGS 2013 https://www.nwhc.usgs.gov /publications/quarterly_report s/2013_qtr_2.jsp

Comment Letter 32

From: brian_collins@fws.gov on behalf of Otay EIS, FWS
To: Stan Williams (swilliams@poseidonwater.com); Brian Grover
Subject: Fwd: Otay Estuary EIS
Date: Thursday, January 12, 2017 9:04:26 AM

---------- Forwarded message ----------
From: **Dalia Ruiz** <d.ruiz9@yahoo.com>
Date: Fri, Dec 30, 2016 at 9:06 PM
Subject: Otay Estuary EIS
To: Otay_EIS <Otay_EIS@fws.gov>

To Whom It May Concern:

I just want to share my personal experience of how lucky I was to have completed my internship at the South San Diego Bay National Wildlife Refuge (Salt Works) during the breeding season of 2012. I worked on the Gull-billed Tern migratory project with Kate Goodenough and also assisted on other projects. The South San Diego Bay is already so condensed that altering it would be detrimental to both migrating and resident birds. 32.1 32.2

Prior to my internship, I had never witnessed such an abundance of shorebirds besides documentaries on television. It was quite the experience to see how male Gull-billed Terns would start performing their mating rituals of "head bobbing" as they tried to woo females with a lizard from nearby fields or a mole crab from the Silver Strand State Beach. As days turned into weeks, I knew the importance of this hidden jewel. The alkaline water which was soon filled with brine flies that attracted various birds to a satisfying buffet was one of my favorite sights. It was hard not to smile when I would see Belding's Savannah Sparrows jumping around to catch brine flies, to American Avocets swinging their head side-to-side as they ran for this feeding frenzy. The coexistence of both migrating and resident birds in South San Diego Bay have such a delicate structure where every niche is filled from nesting location to food source.

While carefully driving and walking on the dikes, it was evident that most spaces were occupied. Snowy Plovers nested where they disappeared into the salty grains and white pebbles near the entrance. Least Terns nested and fished near adjacent ponds. I remember the first rule before even entering this paradise, "Make sure to watch your step because there might be nests or chicks nearby." This soon became a very important rule once we started noticing the first scrapes of the season. Gull-billed Terns, Royal Terns, Elegant Terns, and even aggressive Caspian Terns soon began to lay their eggs. Besides the huge flocks of terns there were also American Avocets, Black- necked Stilts, Killdeers, Double-crested Cormorants, and even Black Skimmers that joined in a few weeks later. Not to mention wintering waterfowl. 32.3

While interning, I soon discovered that chick productivity counts on Wednesdays were one of my favorite days of the week. We would walk the dikes with Robert Patton and count eggs

Response to Comment Letter 32

Dalia Ruiz
December 30, 2016

32.1 The Service appreciates your taking the time to review the EIS and provide comments.

32.2 The EIS has adequately disclosed and provided mitigation for potential impacts to nesting and migrating seabirds. See Responses 2.17, 8.4, 11.8, and 23.9.

32.3 The proposed restoration will not significantly alter the observations you have made on the salt works. San Diego Bay NWR staff manages the salt works for nesting seabirds and will continue to do so in accordance with the San Diego Bay NWR CCP (USFWS 2006).

and chicks while he banded certain species of chicks. We labeled nests along the way and the sight of watching a white cloud of terns fly and try to dive bomb us as we quickly moved along was so impressive. I returned to assist in attaching satellite transmitters on Gull-billed Terns in 2013 and 2014 and watching these terns reveal their nests and chicks as they took off will never get old. The impact of so many terns flying over us was so great that we could feel the wind they produced from the flapping of their wings.

In spring 2017, it will be five years since I completed my internship. As the years go by, I still hope in returning to the South San Diego Bay National Wildlife Refuge to witness the almost magical coexistence of these shorebirds. Many of them have traveled from various parts of Mexico just to breed here in San Diego. If it has worked for these birds for so long, why should we alter it and disrupt their breeding season? It is up to us to preserve and protect so many species of birds, let's not let them down.

Thank you-

32.3 Cont.

32.4

32.4 See Response 25.4. It should also be noted that there will be no change in the number of berms available for nesting, and there will be a net increase in habitat for salt marsh species including Belding's Savannah sparrow.

Comment Letter 33

30 December 2016

Brian Collins

Manager

South Bay NWR

And, generally, to:

The Fish and Wildlife Service:

I am writing to express my opinion that the Draft EIS for the Otay River Estuary Restoration Project is deficient on its face and should be revised by authors other than those who prepared this document. 33.1

My deepest objection is to the underlying premise of this EIS, which is that it is acceptable mitigation for the Poseidon Project to take something that is good (the South Bay) and change it from one state to another in order to make up for something bad (the "impingement" by Poseidon). By any basic calculation, the World is not ending up a better place. This Draft EIS is not remotely a zero-sum mitigation, rather it is set up to be a net loss. As will be further noted below, I object to the change in character as well: One type of habitat is being sacrificed for another, and it is the rarer one that is being lost, ironically, to mitigate for "impingement" in the area of Agua Hedionda lagoon, where shallow-water habitats have already been sacrificed for deep-water ones. 33.2 33.3

Even were a zero-sum approach proposed or appropriate, the Draft EIS is spectacularly short on material from which it can be concluded that the mitigation is likely to be zero sum. The history of mitigation projects is, as The Service wells knows, a history with many, many failures. If you take something that is "good" (the South Bay) and you change it, in order to have a reasonable probability of reaching the goal of something equally good, you are going to need to undertake a substantial multiplier to be sure of ending up in even rough equivalency (I am not conceding that it is appropriate to sacrifice the status quo, just commenting on the risks of human tinkering that are not considered in this Draft EIS). 33.4

The Service should be ecstatic that it manages part of a Western Hemisphere Shorebird Reserve Network Site. How many such sites are there in Southern California? The Service knows very well how few there are, and yet its Draft EIS barely acknowledges the fact the areas involved are part of such a rare and special location. One example of how facially deficient this Draft EIS is can be found in the lack of any analysis of the effect of the mitigation on the quality of this WHSRNS. For further example of the inadequacy of the Draft EIS simply try searching for "Red Knot," a species that The Service knows is of global concern. The analysis is also deficient in not assessing how important South Bay NWR (and sites such as Pond 15 in particular) is as a roosting area that is integral to the overall WHSRNS; The Service is certainly aware that safe roosting areas are encroached upon even more often than inter-tidal feeding areas. 33.5 33.6

Response to Comment Letter 33

Richard E. Webster
December 30, 2016

33.1 Your opinion about the accuracy of the Draft EIS is noted. Numerous responses provided throughout this Response to Comments document address the adequacy of the environmental analysis. We appreciate your taking the time to review the EIS and provide your comments.

33.2 We do not concur with your conclusion that the proposed action will not benefit wildlife. The current project implements restoration proposals that were evaluated and approved for the San Diego Bay NWR in the Comprehensive Conservation Plan and accompanying Final EIS (USFWS 2006). The proposed action will restore areas of San Diego Bay that historically supported intertidal wetland habitat while retaining salt pond levees that support nesting seabirds and shorebirds. Large areas of the salt works will continue to support brine invertebrates along with the wetland bird species that forage on them. Salt ponds will also be available loafing, while restored areas will include a greater diversity of foraging opportunities for seabirds, shorebirds, and other waterbirds.

33.3 The restoration of Pond 15 will not result in the complete loss of brine invertebrate foraging

	opportunities and open water habitat within the salt works system. It will reduce the total acreage of this habitat but will restore some of the important native wetland habitat that has been lost to development in San Diego Bay over the past 100 years. Refer to Response 11.2. **33.4** Refer to Responses 11.2 and 23.9. **33.5** The San Diego Bay NWR supports the goals and objectives of the Western Hemisphere Shorebird Reserve Network (WHSRN) through a voluntary agreement to manage the site as part of WHSRN. **33.6** Roosting areas will not be significantly impacted by the restoration of Pond 15. Refer to Sections 3.3.2.2 and 4.3 of the Final EIS for additional details.

Although I no longer live in the area, I lived in San Diego County for two decades and I am familiar with not only all the wetlands in the region, but also many elsewhere in the Western Hemisphere. Earlier in this letter I have simply referred to "something that is 'good' (the South Bay)". My overall objection to this Draft EIS is that it has been written as though, somehow, South Bay NWR is not something that is good, but something that is bland or neutral or undistinguished, and hence little analysis is needed to do whatever suits the needs for mitigation for a project elsewhere. Rather, South Bay NWR is spectacular, often full of thousands of birds (as an example of conspicuous biota), one of the last places where such numbers of so many species can be found in Southern California. The Service should be required to provide an EIS that starts from the premise that South Bay NWR is special before it messes with any of it (and I use "special" and "messes" as my most deliberate choices of words in this letter). 33.7

Sincerely,

Richard

Richard E Webster

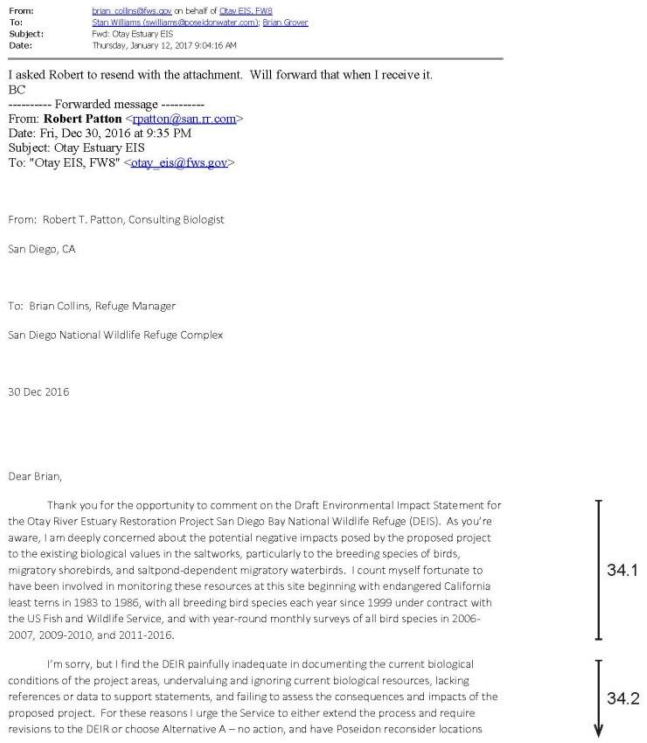
P.O. Box 16412

Portal AZ 85632

webster.re@gmail.com

33.7 The importance of the resources within the San Diego Bay NWR is presented in detail in the San Diego Bay NWR CCP and the Final Programmatic EIS for the CCP (USFWS 2006) and summarized in the Final EIS for the ORERP.

Comment Letter 34



From: brian_collins@fws.gov on behalf of Otay EIS, FW8
To: Stan Williams (swilliams@poseidonwater.com); Brian Grover
Subject: Fwd: Otay Estuary EIS
Date: Thursday, January 12, 2017 9:04:16 AM

I asked Robert to resend with the attachment. Will forward that when I receive it.
BC
---------- Forwarded message ----------
From: **Robert Patton** <rpatton@san.rr.com>
Date: Fri, Dec 30, 2016 at 9:35 PM
Subject: Otay Estuary EIS
To: "Otay EIS, FW8" <otay_eis@fws.gov>

From: Robert T. Patton, Consulting Biologist

San Diego, CA

To: Brian Collins, Refuge Manager

San Diego National Wildlife Refuge Complex

30 Dec 2016

Dear Brian,

Thank you for the opportunity to comment on the Draft Environmental Impact Statement for the Otay River Estuary Restoration Project San Diego Bay National Wildlife Refuge (DEIS). As you're aware, I am deeply concerned about the potential negative impacts posed by the proposed project to the existing biological values in the saltworks, particularly to the breeding species of birds, migratory shorebirds, and saltpond-dependent migratory waterbirds. I count myself fortunate to have been involved in monitoring these resources at this site beginning with endangered California least terns in 1983 to 1986, with all breeding bird species each year since 1999 under contract with the US Fish and Wildlife Service, and with year-round monthly surveys of all bird species in 2006-2007, 2009-2010, and 2011-2016.

34.1

I'm sorry, but I find the DEIR painfully inadequate in documenting the current biological conditions of the project areas, undervaluing and ignoring current biological resources, lacking references or data to support statements, and failing to assess the consequences and impacts of the proposed project. For these reasons I urge the Service to either extend the process and require revisions to the DEIR or choose Alternative A – no action, and have Poseidon reconsider locations

34.2

Response to Comment Letter 34

Robert T. Patton
December 30, 2016

34.1 Well before the San Diego Bay NWR was established, the Service played an important role in the protection of the migratory and resident birds supported within the salt works and throughout the southern end of San Diego Bay. Avian monitoring, which has been conducted for many years in the South Bay, continues to inform San Diego Bay NWR staff decisions, including the current proposal to restore tidally influenced habitats in San Diego Bay. We do not agree that the current proposal will negatively impact the existing biological values provided by the salt works. Rather, the restoration will increase biological diversity while continuing to provide nesting habitat for ground-nesting birds and brine invertebrate foraging areas for various avian species.

34.2 Proposals to restore portions of the salt works to tidal habitat were previously addressed during the preparation of the San Diego Bay NWR Comprehensive Conservation Plan (CCP) (USFWS 2006). The Programmatic EIS prepared for the CCP analyzed the potential effects on the environment of implementing the CCP, including the effects of converting many of the salt ponds to tidally influenced wetland habitats. The ORERP will implement restoration proposals described in the CCP and evaluated in the associated

other than pond 15 for mitigation efforts.

Attached are my detailed comments on the DEIR.

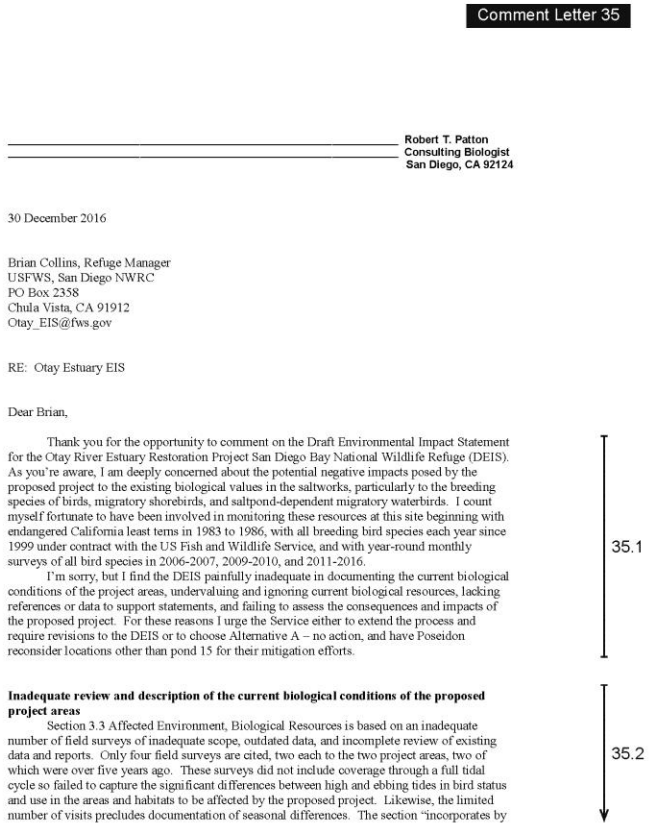
Sincerely,

Robert

34.2
Cont.

Programmatic EIS. As presented in the Final EIS for the ORERP, the proposal to restore the Otay River floodplain and Pond 15 will not result in significant adverse effects to avian species.

The San Diego Bay NWR, including the areas within the salt works, will continue to be adaptively managed to address the changing status of the range of species supported within the San Diego Bay NWR and adjacent areas, as well as the effects of sea-level rise on existing habitats and the salt works operation. Also to be considered is the potential that the South Bay Salt Works could cease operations at some point in the future, leaving the Service with the task of managing water movement in the ponds to avoid adverse effects to avian species due to degraded water quality within the ponds.



Comment Letter 35

Robert T. Patton
Consulting Biologist
San Diego, CA 92124

30 December 2016

Brian Collins, Refuge Manager
USFWS, San Diego NWRC
PO Box 2358
Chula Vista, CA 91912
Otay_EIS@fws.gov

RE: Otay Estuary EIS

Dear Brian,

Thank you for the opportunity to comment on the Draft Environmental Impact Statement for the Otay River Estuary Restoration Project San Diego Bay National Wildlife Refuge (DEIS). As you're aware, I am deeply concerned about the potential negative impacts posed by the proposed project to the existing biological values in the saltworks, particularly to the breeding species of birds, migratory shorebirds, and saltpond-dependent migratory waterbirds. I count myself fortunate to have been involved in monitoring these resources at this site beginning with endangered California least terns in 1983 to 1986, with all breeding bird species each year since 1999 under contract with the US Fish and Wildlife Service, and with year-round monthly surveys of all bird species in 2006-2007, 2009-2010, and 2011-2016.

I'm sorry, but I find the DEIS painfully inadequate in documenting the current biological conditions of the project areas, undervaluing and ignoring current biological resources, lacking references or data to support statements, and failing to assess the consequences and impacts of the proposed project. For these reasons I urge the Service either to extend the process and require revisions to the DEIS or to choose Alternative A – no action, and have Poseidon reconsider locations other than pond 15 for their mitigation efforts.

35.1

Inadequate review and description of the current biological conditions of the proposed project areas

Section 3.3 Affected Environment, Biological Resources is based on an inadequate number of field surveys of inadequate scope, outdated data, and incomplete review of existing data and reports. Only four field surveys are cited, two each to the two project areas, two of which were over five years ago. These surveys did not include coverage through a full tidal cycle so failed to capture the significant differences between high and ebbing tides in bird status and use in the areas and habitats to be affected by the proposed project. Likewise, the limited number of visits precludes documentation of seasonal differences. The section "incorporates by

35.2

Response to Comment Letter 35

Robert T. Patton
December 30, 2016

35.1 Please refer to Responses 34.1 and 34.2.

35.2 As stated on page 3.3-74 of the Draft EIS, "a total of 23 visits were made to the [Otay River floodplain] site to conduct protocol surveys for Belding's Savannah sparrow, burrowing owl, least Bell's vireo, California gnatcatcher, northern harrier, and light-footed Ridgway's rail." For the Pond 15 Site, various sources of observation data were used including annual monitoring in the South Bay and the results from nesting surveys conducted for the Service on the salt works. The Draft EIS acknowledges the potential for impacts during the nesting season. To avoid such impacts, the timing of project construction will be scheduled to avoid any impacts to nesting birds. As indicated previously, the potential effects to avian species as a result of converting salt ponds to intertidal wetlands was addressed in the Final EIS for the San Diego Bay NWR CCP and the current EIS tiers from that document. A discussion of the use of the salt ponds and the salt pond levees by various avian species is presented on page 3.3-37. In addition, a discussion regarding seabird nesting within the salt works has been added to Section 3.3.3.2 of the Final EIS.

reference" the 2006 Comprehensive Conservation Plan (CCP), but whose most recent data were from 2005. At times, the section references the 2011 SDNHM/ARA report on the 2010 SWIA pre-construction surveys and the 2012 SWIA post-construction data, but the data of those surveys are not reflected in the tables or text of the DEIS. Nesting locations of sensitive species are provided for a single breeding season (2015), which fails to reflect the long-term extent of habitat use for nesting.

Even without more recent and comprehensive field surveys, a wealth of references and data exist which could have been used to construct an accurate description of the current biological conditions of the project area, but the DEIS failed to review them. Review should have included:

Macdonald, KB, RF Ford, EB Copper, P Unitt, JP Haltiner. 1990. South San Diego Bay Enhancement Plan, Resources Atlas, Volume Two: Birds of San Diego Bay, Historical Data and 1988-89 Surveys. Rept. by Michael Brandman Associates for San Diego Unified Port District and California State Coastal Conservancy.

Stadtlander, D, and J Konecny. 1994. Avifauna of South San Diego Bay: the Western Salt Works 1993-1994. Coastal Ecosystem Program, US Fish & Wildlife Service, Carlsbad, CA.

San Diego County Bird Atlas:
Mar 1997 - Feb 2002 dataset
Unitt, P. 2004. San Diego County Bird Atlas. San Diego Natural History Museum and Ibis Publ. Co.

Baywide surveys:
Mar 2006 – Feb 2007 dataset
Tierra Data Incorporated. 2009. San Diego Bay Avian Species Surveys 2006-2007, Final April 2009. Rept. to Naval Facilities Engineering Command Southwest and San Diego Unified Port District.

Mar 2009 – Feb 2010 dataset
Tierra Data Inc. 2011. San Diego Bay Avian Species Surveys 2009-2010, Final May 2011. Rept. to NAVFAC Southwest and San Diego Unified Port District.

Western Ponds Restoration surveys:
Mar – Sep 2010 dataset
San Diego Natural History Museum & Avian Research Associates. 2011. Draft Final Summary Report, South San Diego Bay Wetland Restoration Project, Preconstruction Biological Monitoring, Avian Use of Salt Evaporation Ponds. Jan. 2011 rept. to Southwest Wetlands Interpretive Association.
(referenced in DEIS)

Oct 2011 – Sep 2012 dataset
San Diego Natural History Museum & Avian Research Associates. 2013. Final Summary Report, South San Diego Bay Wetland Restoration Project, Post-construction Biological

35.2 Cont.

35.3

35.3 The older references listed have been considered and were cited in the 2006 Final EIS for the San Diego Bay NWR CCP. The references from 2009 through 2016 contain information generated as a result of ongoing monitoring on the San Diego Bay NWR and staff is well aware of these datasets and their relationship to the current project.

Monitoring, Avian Use of Salt Evaporation Ponds, October 2011 to September 2012. Mar. 2013 rept. to Southwest Wetlands Interpretive Association.

Oct 2012 – Sep 2013 dataset
San Diego Natural History Museum & Avian Research Associates. 2014. Final Summary Report, South San Diego Bay Wetland Restoration Project, Post-construction Biological Monitoring, Avian Use of Salt Evaporation Ponds, October 2012 to September 2013. Nov. 2014 rept. to Southwest Wetlands Interpretive Association.

Oct 2013 – Sep 2014 dataset
San Diego Natural History Museum & Avian Research Associates. 2016. Final Summary Report (Draft), South San Diego Bay Wetland Restoration Project, Post-construction Biological Monitoring, Avian Use of Salt Evaporation Ponds, October 2013 to September 2014. Jul. 2016 rept. to Southwest Wetlands Interpretive Association.

Oct 2014 – Sep 2015 dataset & monthly summaries
Oct 2015 – Sep 2016 dataset & monthly summaries

35.3 Cont.

I do not have the time to correct every mistake and inaccuracy in the DEIS on birds and bird use resulting from the lack of adequate research and review. Repeatedly the DEIS negatively refers to "significant change in natural habitats" over the past 100 years due to construction of levees for saltponds, yet nowhere does it acknowledge the significant positive change in breeding seabird status as a result of levee construction. With the possible exceptions of least tern and snowy plover, **none** of the species that comprise the current multispecies breeding colonies bred within San Diego County until after establishment of the saltpond levees.

35.4

The DEIS describes the Otay Floodplain Site as being of "moderate habitat value for wildlife" (p. 3.3-32), but fails to mention sensitive species western snowy plover and Belding's savannah sparrow nesting in pond 20A, burrowing owl wintering there, and gull-billed tern regularly foraging there. There has been documented nesting by snowy plovers within the proposed project area of pond 20A at least seven times in four years (1 in 2004, 2 in 2012, 1 in 2014, 3 in 2016).

35.5

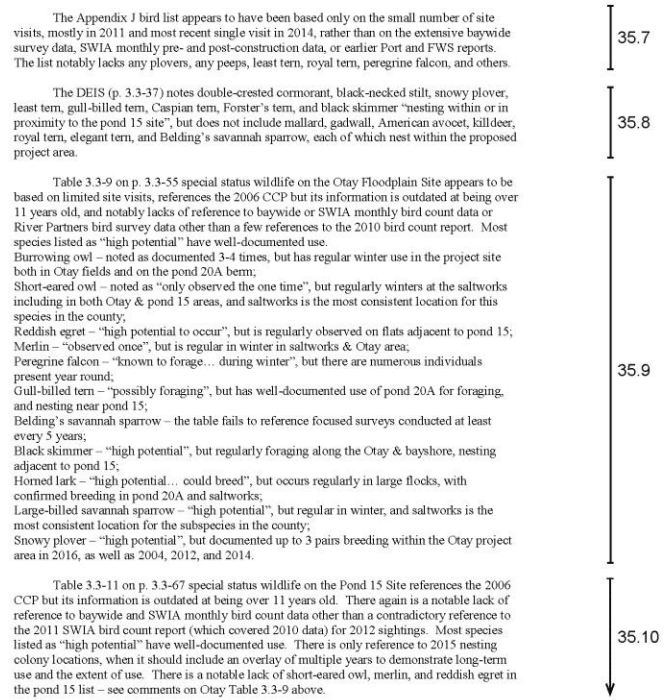
As indication of the inadequacy of the field surveys conducted for the DEIS, the DEIS (p. 3.3-32) claims that "although the number of birds on the pond 15 site was high, the species richness was low. In comparison, immediately adjacent to the pond 15 site in the San Diego Bay, species richness was very high, as species respond to the tidal influence cycles and foraging opportunities in the periodically exposed mudflat". The DEIS fails to acknowledge that all those birds observed on the bay mudflats at low tide shift to the salt ponds and levees at high tide. The DEIS assertion that species richness is higher on the bayshore than in pond 15 is **not** supported by the data – the reports on the SWIA monthly bird counts conducted 2011-12, 2012-13, and 2013-14 each note higher species diversity (57-63 species) in pond 15 than on adjacent bay flats (20-54 species). At least 15% more species were documented within pond 15 than on bayshore during the monthly surveys.

35.6

35.4 The importance of the salt pond levees to seabird nesting is addressed in detail in the Final EIS for the San Diego Bay NWR CCP and is summarized in the Final EIS for this project in Section 3.3.3.2. Note that the Final EIS concludes that the restoration of Pond 15 will not have a significant adverse effect on nesting seabirds and that measures have been incorporated into the scope of the project to minimize impacts to all nesting birds on the salt works as a result of the project.

35.5 The description of the habitat value for the Otay River Floodplain Site as moderate is supported by the current conditions on the site. Historically, the site supported coastal salt marsh habitat, an important wetland habitat that has been severely depleted in San Diego Bay. Table 3.3-9 of the Draft EIS acknowledges the presence of western snowy plover, Belding's Savannah sparrow, burrowing owl, and gull-billed terns within the area. Revisions have been made to Table 3.3-9 in the Final EIS to expand the discussion species status on the site. This added information does not, however, alter our conclusion that restoration of the Otay River floodplain would result in benefits to the avian species known to occur in the area.

35.6 The discussion in Section 3.3.2.2 has been expanded in the Final EIS to include data from recent bird surveys conducted within and adjacent to the salt ponds.



The Appendix J bird list appears to have been based only on the small number of site visits, mostly in 2011 and most recent single visit in 2014, rather than on the extensive baywide survey data, SWIA monthly pre- and post-construction data, or earlier Port and FWS reports. The list notably lacks any plovers, any peeps, least tern, royal tern, peregrine falcon, and others. 35.7

The DEIS (p. 3.3-37) notes double-crested cormorant, black-necked stilt, snowy plover, least tern, gull-billed tern, Caspian tern, Forster's tern, and black skimmer "nesting within or in proximity to the pond 15 site", but does not include mallard, gadwall, American avocet, killdeer, royal tern, elegant tern, and Belding's savannah sparrow, each of which nest within the proposed project area. 35.8

Table 3.3-9 on p. 3.3-55 special status wildlife on the Otay Floodplain Site appears to be based on limited site visits, references the 2006 CCP but its information is outdated at being over 11 years old, and notably lacks of reference to baywide or SWIA monthly bird count data or River Partners bird survey data other than a few references to the 2010 bird count report. Most species listed as "high potential" have well-documented use.
Burrowing owl – noted as documented 3-4 times, but has regular winter use in the project site both in Otay fields and on the pond 20A berm;
Short-eared owl – noted as "only observed the one time", but regularly winters at the saltworks including in both Otay & pond 15 areas, and saltworks is the most consistent location for this species in the county;
Reddish egret – "high potential to occur", but is regularly observed on flats adjacent to pond 15;
Merlin – "observed once", but is regular in winter in saltworks & Otay area;
Peregrine falcon – "known to forage… during winter", but there are numerous individuals present year round;
Gull-billed tern – "possibly foraging", but has well-documented use of pond 20A for foraging, and nesting near pond 15;
Belding's savannah sparrow – the table fails to reference focused surveys conducted at least every 5 years;
Black skimmer – "high potential", but regularly foraging along the Otay & bayshore, nesting adjacent to pond 15;
Horned lark – "high potential… could breed", but occurs regularly in large flocks, with confirmed breeding in pond 20A and saltworks;
Large-billed savannah sparrow – "high potential", but regular in winter, and saltworks is the most consistent location for the subspecies in the county;
Snowy plover – "high potential", but documented up to 3 pairs breeding within the Otay project area in 2016, as well as 2004, 2012, and 2014. 35.9

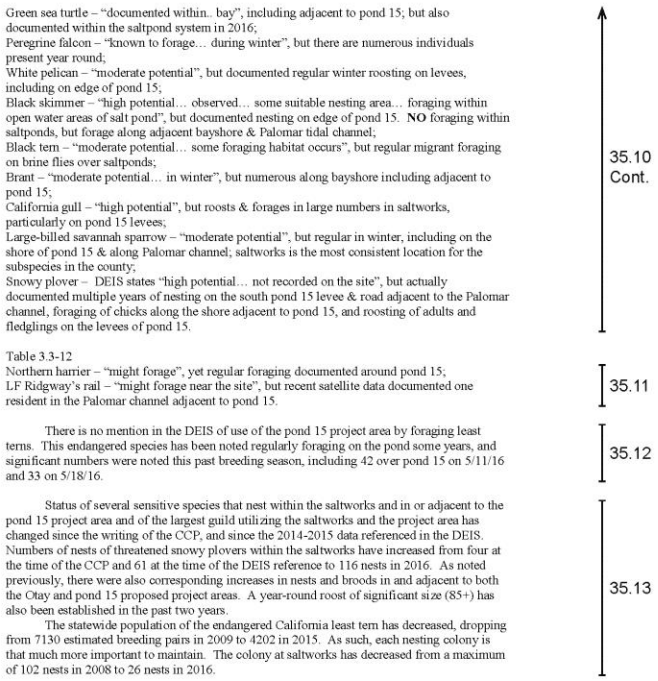
Table 3.3-11 on p. 3.3-67 special status wildlife on the Pond 15 Site references the 2006 CCP but its information is outdated at being over 11 years old. There again is a notable lack of reference to baywide and SWIA monthly bird count data other than a contradictory reference to the 2011 SWIA bird count report (which covered 2010 data) for 2012 sightings. Most species listed as "high potential" have well-documented use. There is only reference to 2015 nesting colony locations, when it should include an overlay of multiple years to demonstrate long-term use and the extent of use. There is a notable lack of short-eared owl, merlin, and reddish egret in the pond 15 list – see comments on Otay Table 3.3-9 above. 35.10

35.7 The species list (Avian Species Observed or Detected During the Focused Survey) provided in Appendix J is not intended to provide a comprehensive list of species within the salt works. It provides a list of species observed during focused surveys. The EIS acknowledges other studies that have been conducted, and additional information has been added to Section 3.3.

35.8 The discussion of the use of the salt ponds and the salt pond levees by various avian species was presented on page 3.3-37 of the Draft EIS. The discussion has been expanded in the Final EIS, and historic information about species use of the salt ponds was presented in the Final EIS for the San Diego Bay NWR CCP. The presence of nesting Belding's Savannah sparrows around Pond 15 is acknowledged in the Draft EIS on Figure 3.3-16.

35.9 Table 3.3-9 has been revised in the Final EIS to include this information as appropriate.

35.10 As indicated in Table 3.3-11, the table includes data from the 2006 Final EIS, as well as from surveys conducted from 2010 to 2012. The table has been updated in the Final EIS to include information provided by the commenter. The sea turtle observed in the salt ponds accidentally entered the ponds during a very high tide. It had to be rescued and rehabilitated. Sea turtles cannot survive within the salt ponds.



Green sea turtle – "documented within.. bay", including adjacent to pond 15; but also documented within the saltpond system in 2016;
Peregrine falcon – "known to forage… during winter", but there are numerous individuals present year round;
White pelican – "moderate potential", but documented regular winter roosting on levees, including on edge of pond 15;
Black skimmer – "high potential… observed… some suitable nesting area… foraging within open water areas of salt pond", but documented nesting on edge of pond 15. **NO** foraging within saltponds, but forage along adjacent bayshore & Palomar tidal channel;
Black tern – "moderate potential… some foraging habitat occurs", but regular migrant foraging on brine flies over saltponds;
Brant – "moderate potential… in winter", but numerous along bayshore including adjacent to pond 15;
California gull – "high potential", but roosts & forages in large numbers in saltworks, particularly on pond 15 levees;
Large-billed savannah sparrow – "moderate potential", but regular in winter, including on the shore of pond 15 & along Palomar channel; saltworks is the most consistent location for the subspecies in the county;
Snowy plover – DEIS states "high potential… not recorded on the site", but actually documented multiple years of nesting on the south pond 15 levee & road adjacent to the Palomar channel, foraging of chicks along the shore adjacent to pond 15, and roosting of adults and fledglings on the levees of pond 15.

35.10 Cont.

Table 3.3-12
Northern harrier – "might forage", yet regular foraging documented around pond 15;
LF Ridgway's rail – "might forage near the site", but recent satellite data documented one resident in the Palomar channel adjacent to pond 15.

35.11

There is no mention in the DEIS of use of the pond 15 project area by foraging least terns. This endangered species has been noted regularly foraging on the pond some years, and significant numbers were noted this past breeding season, including 42 over pond 15 on 5/11/16 and 33 on 5/18/16.

35.12

Status of several sensitive species that nest within the saltworks and in or adjacent to the pond 15 project area and of the largest guild utilizing the saltworks and the project area has changed since the writing of the CCP, and since the 2014-2015 data referenced in the DEIS. Numbers of nests of threatened snowy plovers within the saltworks have increased from four at the time of the CCP and 61 at the time of the DEIS reference to 116 nests in 2016. As noted previously, there were also corresponding increases in nests and broods in and adjacent to both the Otay and pond 15 proposed project areas. A year-round roost of significant size (85+) has also been established in the past two years.

The statewide population of the endangered California least tern has decreased, dropping from 7130 estimated breeding pairs in 2009 to 4202 in 2015. As such, each nesting colony is that much more important to maintain. The colony at saltworks has decreased from a maximum of 102 nests in 2008 to 26 nests in 2016.

35.13

35.11 Northern harrier has been removed from Table 3.3-12 and added to Table 3.3-11 in the Final EIS. Section 3.3.3.2 in the Final EIS has also been updated to note the recent observation of a light-footed Ridgway's rail in the Palomar Channel. Note that Mitigation Measure MM-BIO-9 (see page 4.3-65 in the Draft EIS) requires daily surveys for the presence of rails at the Otay River crossing, in the Palomar Channel, and in other potential rail habitat areas in the vicinity of the project.

35.12 We concur that California least terns have been observed foraging for brine flies over Pond 15. However, brine flies are a relatively insignificant source of nutrition for this primarily piscivorous species.

35.13 San Diego Bay NWR management is aware of the between year variability and ongoing changes to population trends given available data for various avian taxa that may utilize San Diego Bay NWR habitats. Additional information about nesting in and around Pond 15, as well as in areas of the salt works where conveyor belt equipment could be placed, has been added to Section 3.3 of the Final EIS.



With warmer than usual sea surface temperatures and corresponding declines in fisheries in the Gulf of California, the entire breeding population of elegant terns has shifted from nesting at five sites in California and Mexico to nesting at only two sites in the world, the largest of which is at saltworks. As a result, nest numbers at saltworks have increased from an annual average of 2861 and a maximum at the time of the CCP of 10,500 to at least 59,458 nests in 2016, including a significant proportion on the levees within the pond 15 proposed project area.

Overall populations of shorebirds have decreased in recent years, with several species relying on the saltworks being added to watch and conservation concern lists. The two most numerous species to rely on the pond 15 project area, eared grebe and red-necked phalarope, have been considered at moderate risk by the North American Bird Conservation Initiative.

35.14

35.15

Undervaluing and ignoring current biological resources

As a result of inadequate surveys and review of reports and data, the DEIS fails to acknowledge the value of current biological resources. As noted previously, the DEIS asserts that species richness is higher on the bayshore than in pond 15, but table 4 in each of the annual summary reports of SWIA monthly pre- and post-construction bird surveys indicates the opposite that species diversity is higher in pond 15 than in survey cells on the bayshore.

35.16

Page 4.3-27 states that "the restoration of the pond 15 site to intertidal habitats would improve diversity and productivity", but there are no data presented to support this claim, no analysis presented comparing saltpond to intertidal productivity, and the bird data both from San Francisco Bay and from monthly surveys at saltworks suggest that saltpond productivity for shorebirds is as high or higher than intertidal habitat. Colwell (2010. Shorebird ecology, conservation, and management. Univ. Calif. Press) countered that "Stralberg et al. (2009) used empirical data on waterbird abundance and habitat use… to understand the consequences of varying degrees of salt pond conversion to salt marsh… They determined that shallowly managed salt ponds provided the greatest benefit for the greatest diversity of bird species." Similarly, Bluso-Demers et al (Bluso-Demers, JD, JT Ackerman, JY Takegawa, SH Peterson. 2016. Habitat selection by Forster's terns (*Sterna forsteri*) at multiple spatial scales in an urbanized estuary: the importance of salt ponds. Waterbirds 39(4):375-387) noted that "salt ponds provide important habitat for breeding waterbirds, and restoration efforts to convert former salt ponds to tidal marsh may reduce the availability of preferred breeding and foraging areas." "…tidal marsh was the least preferred habitat for wintering and migrating western sandpipers (*Calidrus mauri*) in the estuary." "Typically, the greatest diversity and abundance of waterbirds are associated with high salinity salt ponds…where biomass of invertebrates, such as brine flies and brine shrimp, is greatest."

35.17

Despite the above references and the lack of any data or references to support the contrary, the DEIS repeatedly undervalues the existing conditions. In referring to the no action alternative A on p. 2-4, it notes that "pond 15 would not be restored… would remain as an active part of the existing solar salt operation", with no mention of the existing biological values. On p. 1-16, it portrays the saltworks as if having no existing habitat value, focusing only on the "loss of natural habitats due to the construction of solar salt ponds", and on p. 3.1-3 stating that the "natural environment… was altered more than 100 years ago to accommodate commercial salt evaporation ponds". The DEIS fails to note that this "natural environment" was altered but not

35.18

35.14 Colonial nesting seabirds such as elegant terns move their nesting colonies opportunistically based on responses to ecological and oceanographic conditions. These species are adapted to continually changing conditions and will adapt to nest site availability throughout their breeding range according to conditions in a given year. Based on our review of post-restoration monitoring reports for the Western Salt Ponds Restoration Project, significant field experience with these species, and our management of the salt ponds, we believe alterations to portions of the existing salt works pond management area, as identified in the EIS, will not substantially affect seabird nesting opportunities on the San Diego Bay NWR or throughout the range of the various species that presently utilize the San Diego Bay NWR.

35.15 The overall effects to avian species of restoring tidal influence to various ponds within the salt works complex was provided in the Final EIS for the San Diego Bay NWR CCP, and no significant adverse effects were identified. The conversion of Pond 15 to tidal influence will continue to provide foraging habitat for a variety of shorebirds, as the restored pond will support approximately 17 acres of frequently exposed and frequently flooded mudflat habitat, along with approximately 56 acres of salt marsh habitat. In addition, the salinity levels in Pond 15 that currently support brine invertebrates exploited by eared grebes

		and red-necked phalaropes will transfer to adjacent ponds within the salt works system, as salt will continue to be produced following the implementation of the project.
	35.16	We assess the relative importance of individual San Diego Bay NWR habitat features or units for specific taxa or guilds based on the phenological potential for use by various species at varying life history stages. The degree that a non-migratory species of restricted range such as the light-footed Ridgway's rail may be reliant on a given habitat type and location versus the same location's relative importance to the life history needs of migratory species with extensive ranges, such as eared grebes or red-necked phalaropes, informs our management decisions for discrete management units. We also evaluate the degree to which species life history support may be directly or indirectly provided by a particular target habitat type that we consider to manage for on the San Diego Bay NWR. We also take into consideration how important that habitat support function may be to a given population using the best available information we may obtain. As part of our decision-making process, we also evaluate whether species support functions (i.e., foraging, breeding, roosting) may be present in proximity to the habitats we consider altering and whether we think in our best professional judgement that the displacement of certain functions for certain species is a significant or

	insignificant consideration. We make a number of these evaluations for each project feature or target habitat type in relation to various native wildlife taxa and the ecosystem support our existing or proposed restored habitat units may provide. See also Response 35.8.
	35.17 Species diversity assessments made within the Draft EIS are not restricted to avian species and include all communities of native organisms that make up the overall natural community for various habitat areas and provide much of the functional and structural attributes of a given habitat type. Also refer to Response 35.7.
	35.18 Species diversity is much greater in intertidal systems for all species of fish and vascular plants and most invertebrates as compared to the existing condition within the hypersaline Pond 15. We understand that the high densities of brine associated invertebrates within the salt ponds in San Diego Bay provide a significant attractant for foraging by a variety of avian taxa. This is why, as identified in the Final Programmatic EIS for the San Diego Bay NWR CCP, a hypersaline system of ponds is retained within the overall South Bay pond system even after certain ponds (such as Pond 15) are restored to tidal habitats. Quantified measures of simple avian species diversity numbers associated with sightings made at discrete locations within a larger more complex wetland and terrestrial geographic area may be misleading if the assumption is made that the measured

destroyed - hypersaline ponds are naturally occurring native habitat and management for them on a scale larger than historically occurring is no different than creating and managing for "restored" saltmarsh or other habitats. On p. 1-15, the DEIS states that "the natural coastal habitats that remain provide habitat… for three federally listed endangered species", but only three of the 15 least tern and snowy plover nesting sites within SD County are "natural coastal habitats" (the beaches of Tijuana Estuary, Silver Strand/Naval Amphib Base, and MCB Camp Pendleton), all others are "highly altered". There are no historical records detailing ratios of non-vegetated intertidal flats, saltmarsh, saltpond/saltpanne, or other habitats in San Diego Bay pre-European contact, but records do indicate the existence of naturally occurring saltponds and native American use of them (Cuero, D & F Shipek. 1970. The Autobiography of Delfina Cuero: A Diegueno Indian. Malki Museum Press, Morongo Reservation). Historic maps did not detail habitats, but simply indicated tidal areas generally as marsh (California State Lands Commission. 1976. San Elijo Lagoon Boundary Study). P. 3.1-2 notes "important foraging habitat for migratory shorebirds and other waterbirds", "qualities of the salt works… including limited human disturbance, isolation from human development, the availability of exposed or lightly vegetated open ground, and unrestricted visual access, make it important nesting area for 16 bird species", but does not note the value of the brine fly and brine shrimp preybase, nor water-surrounded levees for nesting and foraging (as opposed to saltmarsh-vegetated levee edges).

The significant current waterbird use and recognition of the saltworks by the Western Hemisphere Shorebird Reserve Network and as a Globally Important Bird Area are not due to what habitats had been there 100 years ago or to what habitats could potentially be restored there, but are due to the current habitats there and the conditions of recent decades. This is the only place on the planet where this assemblage of species nest together. The significant multispecies nesting colonies that the area was recognized for and protected as a Refuge for did not exist before the saltponds and levees were created; and other than possibly least tern and snowy plover, none of the key breeding species in those colonies bred in the area or even in the county before the saltworks created appropriate habitat for them to breed on.

35.18 Cont.

35.19

Inadequate methodology in analysis of potential negative impacts

Repeatedly, the DEIS claims that the project will increase diversity and productivity, and that any possible negative impacts will be offset by the creation of tidal habitats (e.g. p. 4.3-27, "The restoration of the pond 15 site to intertidal habitats would improve diversity and productivity"; and p. 4.3-66, "The loss of fish and wildlife species habitat… would be more than offset by the restoration of… tidally influenced and transitional habitat"). The only references cited to support these claims are the CRAM analysis (California Rapid Assessment Method, App. E within App. J) and the "functional lift" analysis (WRA. 2013. Poseidon mitigation credit analysis marine life mitigation plan – integrated restoration plan. Technical memorandum prepared for Poseidon Resources, Mar 2013). However, neither of these analyses are applicable to assessing biological diversity, productivity, nor impacts.

The CRAM report (p. 13) states, "CRAM was not designed for use in the assessment of subtidal habitats and intertidal areas with less than 5% vegetated cover of emergent marsh (CWMW 2009). Thus, much of the Project area composed of open water and mud flats could not be assessed using CRAM. However, the functions and services of these areas before and after the proposed Project were evaluated separately in the Poseidon Mitigation Credit Analysis Marine Life Mitigation Plan – Integrated Restoration Plan (WRA 2013)." So the CRAM report itself

35.20

35.21

location discretely functions to support said diversity. The San Diego Bay NWR works to manage across a range of potential support functions for a variety of species and guilds for seasonal and within or between year usage. The San Diego Bay NWR works to balance management targets and activities towards optimizing support for a diversity of native species and species of special conservation concern.

35.19 Your comments are noted. But it should also be noted that losses of natural nesting and foraging habitat are identified as contributing factors in the listing of the California least tern (USFWS 1985) and western snowy plover (USFWS 2007). The loss and degradation of wetlands has also contributed to deceases in the total numbers of other avian species of concern. In San Diego Bay alone, 70% of the salt marsh habitat that historically occurred there has been lost. The salt ponds provide an opportunity to recover a portion of the historic habitats that were once abundant in San Diego Bay and, in so doing, provide habitat for a range of species. The San Diego Bay NWR CCP (USFWS 2006) presents a restoration plan for the salt works that includes restoration of tidal wetlands in some ponds while maintaining the salt pond levees, the conversion of some salt ponds to shallow water habitat, and the management of other ponds in a manner that will continue to support brine invertebrates. The restoration of Pond 15 is consistent with this proposal.

	35.20 The San Diego Bay NWR manages for wildlife and habitats in multiple temporal scales. We work to maximize the resiliency of the ecological functionality of the systems we manage while taking into consideration the historical and ongoing alterations to ecosystem drivers and the composition of wildlife communities. We work to implement studies aimed at understanding the likely effects of climate change–induced alterations to ecosystem structure and function and attempt to balance our historical understanding, current habitat usage data, and predictive models to inform management actions. We consider management actions based on evaluations of available data, determine if the available data is adequate in our best professional judgment to make an informed decision, follow all pertinent public and regulatory review and permitting processes, and implement projects based on this process. **35.21** CRAM and Functional Lift analyses were required by the CCC. These are not the sum total of the professional evaluations conducted in reference to conceptualizing a restoration project on the site. The restoration of Pond 15 was previously evaluated and documented through the programmatic EIS and ROD prepared for the San Diego Bay NWR CCP, as described in Response 35.18.

states that it is not applicable to salt ponds, levees, nor mudflats, and defers to the functional lift analysis.

The functional lift analysis WRA 2013 reference does not appear readily available to the public: I was unable to find it through online searches and it was not included as an appendix in the DEIS. As a result, there is no public transparency of the process involved in the functional lift analysis nor of the quantitative values assigned to its criteria. However, in describing the analysis, Appendix C (p. 163) states, "The salt evaporator ponds do not support tidal wetland vegetation and since salinities in the ponds quickly exceed those tolerable to marine life, do not support fish or invertebrates typical or similar to that found in San Diego Bay. The restoration of these basins to intertidal habitats will likely improve the diversity and productivity of these ponds and provide increased fish production to San Diego Bay. Because the Pond 15 Site does support some migratory birds and contains some plankton that are tolerant of high salinities; there are existing biological values. As a result, the Science Advisory Panel to the Commission recommended that an analysis be conducted to determine the functional lift associated with the restoration of the Pond 15 Site to determine the number of acreage credits that can be attributed to those activities." So the analysis does not present a quantitative data-based comparison of biological diversity or productivity between salt pond and intertidal habitats, nor address assessment of impacts, but simply assigns acreage credits for proposed mitigation actions.

The summary of the functional lift analysis of Appendix C (p. 164-165) states, "In the before condition, the high salinities of the brines contained in the Pond 15 Site preclude establishment of wetland vegetation and are above the salinity tolerance of either estuarine fish or invertebrates (with the notable exception of brine flies and brine shrimp). Therefore, the before values for vegetation, fish, and invertebrates is zero; whereas the expected improvements for the restoration must be at least the same as the tidal reference wetlands. Assuming that the Pond 15 Site does is similar to the tidal reference wetlands (which by definition it must be for the site to be determined successful, the functional lift for these variables is 1. On the other hand, there are a considerable number of migratory birds that use the solar evaporation ponds and therefore the before condition can be compared to the expected after condition as found in the reference tidal wetlands. The data on bird use was reviewed and converted to annual numbers to compare to the data generated by the Coastal Commission from the reference tidal wetlands. The functional lift for birds was determined to be 0.43." So given that each of the four criteria are ranked from 0 to 1 for pre-project conditions, and each is assigned the top value of 1 for post-project conditions, the basic outcome of the analysis is a foregone conclusion since regardless of pre-construction values, post-construction values will be the maximum and thus higher. Even if that wasn't the case, since at least two (vegetation and fish) of the four criteria used in the analysis are each assigned values of 0 for salt pond and 1 for intertidal, the outcome is a given, regardless of values assigned to the other two criteria (invertebrates and birds). One can argue that the analysis application is invalid since two of the criteria (vegetation and fish) are not applicable to pre-construction conditions of salt pond and levee habitat.

Regardless, the functional lift analysis does nothing to change the facts that no quantitative comparison of diversity or productivity between salt pond and intertidal habitats has been conducted nor is presented in the DEIS, nor is any assessment of impacts to existing biological values, particularly invertebrates and birds. There can be no basis to the assertion that the project will result in increased diversity and productivity with no significant impacts without: 1) quantitative sampling and comparison of invertebrate abundance, density, biomass, and energetic value between salt pond and intertidal habitats; and 2) quantitative comparison of bird

35.21 Cont.

35.22

35.23

35.22 The Science Advisory Panel assessed the likelihood that the restoration of Pond 15 would result in benefits to aquatic life based on performance standards that the restoration must meet in order to be in compliance with the MLMP. The variables assessed under the functional lift were vegetation, benthic invertebrates, birds, and fish. The conclusion from this effort was that, should Pond 15 meet all the performance standards related to biological communities, the SAP recommended that the Commission provide 0.75 acres of credit to Poseidon for every acre of Pond 15 restored to tidal wetland. This recommendation will be forwarded to the CCC as part of the application for a Coastal Development Permit to be issued on the Final Restoration Plan.

35.23 The functional lift analysis was completed by the SAP solely to establish the amount of potential mitigation credit provided to Poseidon to meet its obligations under the MLMP. Appendix J of the Draft EIS provides biological information within the project site. This information was used to prepare mitigation measures for impacts to habitats and sensitive species for each restoration alternative. In addition, Appendix E (CRAM Report) of Appendix J contains a functional lift analysis that is broader than that used by the SAP in order to assess the quality of the habitat before and after restoration.

abundance, density, and diversity between intertidal habitats and saltpond and levees, and of breeding, roosting, and foraging use. At least the latter should be readily accomplished given the availability of on-site data for comparison between pond 15, bayshore mudflats, and restored marsh and flats in the western ponds.

35.23 Cont.

Inadequate assessment of potential negative impacts

The failure to recognize existing biological values in turn leads to a failure to address potential negative impacts. As noted previously, snowy plover use of pond 20A within the Otay proposed project site was not included in the DEIS. Likewise, there is no discussion of potential impacts to plover nesting, foraging, and brood-rearing along dike VII where sediment is proposed to be deposited to increase the height of the levee, or to plover use including roosting, foraging, nesting, and brood-rearing in and adjacent to pond 15, nor along proposed truck access routes to pond 15. Similarly, there is no discussion of potential impacts to least tern foraging in pond 15, nor to roosting, nesting, and chick-rearing along dike VII, on pond 15 levees, adjacent levees, nor along proposed truck routes. There is also a lack of discussion of potential impacts to black skimmers nesting on dike VII nor of skimmers and other species nesting, roosting, and/or feeding in and around pond 15.

35.24

DEIS p. 4.1-6 states that "impact to wildlife… would be considered significant if the proposed action would substantially change the amount or quality of available habitat" and "impact to… special status species…would be considered significant if the action would substantially alter species presence, species reproductive success… or the availability of appropriate habitat". Table ES-1 summary of impacts states that the project would include "adequate measures … to avoid or minimize potential adverse impacts" and p. ES-16 concludes that "no significant adverse effects…are anticipated". I strongly disagree with this conclusion of no significant adverse impacts. Using the criteria of significance stated above, there will be significant negative impacts to existing wildlife and habitat values, including to sensitive species, and the DEIS fails to propose mitigation possibilities to reduce these impacts.

35.25

The Otay floodplain project site eliminates threatened snowy plover nesting, chick-rearing, and foraging habitat in pond 20A where plover use has been documented over multiple years, where up to three pairs of plovers have been documented, and where hatching and fledging has been successful. No similar replacement habitat is proposed for the project and there is no discussion in the DEIS of ensuring continued circulation and function of the shallow channel that provides foraging habitat in the portion of pond 20A not affected by the project. It does not address the need to re-establish channels in pond 20A that will be buried by the new berm. Such channels are needed to collect water to provide foraging for plovers, stilts, and avocets. The proposed planting of saltmarsh habitat around any created or "restored" tidal channel or flats would preclude use by snowy plovers since they require extensive non-vegetated flats or shoreline for foraging, and for breeding require open access routes for chicks to run between nesting and foraging areas.

35.26

The earlier letter from the EPA raised concerns about possible contaminants in the soil proposed to be excavated from the Otay project site and transported to raise the height of dike VII between ponds 22 and 23. Current use of this levee by ground-nesting sensitive species

35.27

35.24 In the best professional judgement of the San Diego Bay NWR Manager based on considerable field experience and informal observations not required to be included for evaluation within the EIS, Pond 15 was judged to be a foraging site of low importance for California least tern. The soil additions to the levee between Ponds 22 and 23 will result in improved nesting site conditions for black skimmers and other ground nesting seabirds. The San Diego Bay NWR Manager will ensure that the plans and specifications and biological notes on construction drawings associated with raising the height of this levee include a design that will widen the surface of the levee to increase the net nesting area available to ground nesting waterbirds. In addition, the gradient of the levee slopes will be designed to ensure that non-volant chicks hatched from nests laid on the levee surface will be less likely to fall off into the adjacent ponds or become trapped at the base of the levee. See Responses 35.14, 35.16, and 35.19.

35.25 Various measures have been incorporated into the scope of the project to avoid or minimize any adverse effects to foraging and/or nesting avian species during project implementation (refer to Section 4.3 of the Final EIS). In addition, once restoration actions are completed, the Coastal Development Permit will require long-term monitoring of the restored areas to ensure that the project is meeting its performance standards.

	35.26	According to mapping provided of nest locations, one western snowy plover nest was observed in Pond 20a in 2012, 2013, and 2014. No nests were identified in 2015. We have no data related to nesting success. Based on the proposed restoration design, under both Alternative B and Alternative C, we do not concur that the restoration would eliminate the opportunity for plover nesting within the Otay River floodplain (Pond 20a). The restoration design includes an upland edge along the southern boundary of the restored wetland, in a location similar to that previously occupied by plover nests in 2012–2014. This area of the restoration site would provide similar or increased opportunities for plovers to nest and access appropriate foraging habitat. Therefore, no loss of potential nesting or foraging areas to support western snowy plovers is anticipated.
	35.27	The material to be excavated from the Otay River Floodplain Site has been sampled and deemed appropriately clean for the restoration activity, including for use as fill material for elevating the levee between Pond 22 and 23. The area identified as containing contaminated soil is located to the east of the project site and will be covered with clean fill and revegetated with native scrub species. Refer to Response 23.6.



snowy plover, least tern, and black skimmer raises the possibility of impacts of contaminated soil on these species, their eggs, and chicks should they continue to nest on the levee post-construction. The proposed slope of 3:1 on dike VII could impact productivity and chick survival since the steep slope may increase the possibility of chicks tumbling into the pond and increase the difficulty of and distance travelled by chicks attempting to scale back up the slope.

Appendix C presents route options for trucking, conveyor belt, or pipeline transportation of soils from the proposed Otay project site to the pond 15 project site. However, there is no mention of possible impacts, particularly to plover roosting and nesting areas, the potential for raptor perching, or the impediments to access for birds, saltpond management and biological monitoring. Conveyor or pipeline alignments across ponds 20, 22, 30, and pond 27 on either side of pond 26 would displace roosting or foraging snowy plovers. The addition of any such structures would create raptor perches within nesting, roosting, and foraging areas, resulting in decreased productivity of any nesting species, including the sensitive species. Depending on structure placement, they have the potential to be physical barriers to chicks, which would reduce survival and productivity in shorebird species where chicks may need to shift to multiple ponds to find adequate prey, and in other nesting species where parents may need to shift chicks to escape predators. Such structures may also fragment and reduce nesting habitat by decreasing site openness and visibility.

The DEIS does not address the significant eared grebe, phalarope, shorebird, and swallow foraging in pond 15, nor the previously mentioned foraging by least terns and snowy plovers, nor the potential adverse impact of eliminating nine percent of the current salt pond acreage and 31 percent of the primary pond acreage that these species rely on. Nor does it address the fact that migratory populations have come to rely on these existing resources over the past 100 years and there are no similar prey concentrations or saltpond habitats in the region for them to relocate to. Conversion of pond 15 to saltmarsh would eliminate one of the ponds of highest eared grebe and phalarope numbers/density in a system that hosts the highest concentration of eared grebes and phalaropes in coastal Southern California. Yes, they could shift to other ponds within the system, but those ponds are already used by other individuals and there has been no study to assess the prey base or carrying capacity of the system as a whole or of individual ponds. Also, the loss of acreage of pond 15 in the function of the saltworks system means that salinity gradients will shift in the other ponds, thus affecting brine shrimp, brine fly, and other potential prey species to an undetermined degree. The next closest locations of any size or similar concentration of prey are in central Baja or the San Francisco Bay area so population-level impacts to this crucial migratory foraging stop and wintering destination could be substantial. This also applies to the other shorebird species relying on the prey base within the saltworks, including red knots.

Biologists studying the conversion of saltponds to salt marsh in the San Francisco Bay area have repeatedly called for additional study and warned of potential adverse impacts to saltpond-dependent species. Warnock and Takekawa (1995. Habitat preferences of wintering shorebirds in a temporally changing environment: western sandpipers in the San Francisco Bay Estuary. Auk 112(4):920-930) noted that "regional conservation efforts directed at restoring salt ponds to tidal salt marshes… may result in reducing preferred habitats… energetic studies are needed to determine the extent to which small sandpipers rely on habitats within the salt-pond systems." Page et al (Page, GW, LE Stenzel, JE Kjelmyr. 1999. Overview of shorebird

35.28 The slurry pipeline option has been eliminated from consideration. We concur that measures must be incorporated into the scope of the project to address potential impacts to nesting birds should the conveyor belt option be implemented. The Final EIS has been revised to address this issue; therefore, impacts to nesting birds as a result of the implementation of the conveyor belt option will be avoided.

35.29 Section 3.3.2.2 has been revised in the Final EIS to address changes in the numbers and species of birds using restored tidal salt marsh within the Western Salt Ponds Restoration Project site. Additional analysis of the physical and biological features of the restored western salt ponds indicates that the macroinvertebrate population, which provides foraging for shorebirds and migratory species, remains comparable to the south San Diego Bay (Nordby Biological Consulting and Tijuana River National Estuarine Research Reserve 2016). The total acreage of the ponds within the salt works is approximately 1,089 acres of which approximately 486 acres are the Salinity Category 10, the lowest salinity and most heavily used ponds for foraging by migrant and resident aquatic avian species such as eared grebe. The restoration of Pond 15 would result in the removal of approximately 85 acres of open salt pond water from the existing solar salt operation, replacing it with a range of tidally influenced wetland habitats suitable for foraging by a

		variety of waterbirds. The project would result in the conversion of 7.8% of the solar salt ponds and specifically result in the conversion of 17.4% of the Category 10 ponds. While the project does result in the conversion of open water to salt marsh habitat with open water channels, the studies of the restoration of the western salt ponds (Pond 10, 10a, and 11) document that foraging by open water avian guilds still occur (Nordby Biological Consulting and Tijuana River National Estuarine Research Reserve 2014). Additionally, the avian observational data, unless it can comprehensively sample a larger area than just the salt ponds, will not necessarily provide conclusions about ecological outcomes for birds on a population level, for example *displacement* is not *loss* if similar habitats that support life history functionalities for various species uses are present nearby. See Responses 26.33 and 33.2.
	35.30	Provisions are made for the preservation of a hypersaline pond system within the South Bay Unit of the San Diego Bay NWR CCP. We have reviewed the pertinent literature, much of which is generated in the San Francisco Bay area regarding salt pond restoration and management in the Bay Area. We use this data among other sources of information and best professional judgement to inform our management of the salt ponds of San Diego Bay.



abundance and distribution in wetlands of the Pacific Coast of the contiguous United States. Condor 101:461-471) warned that "conversion of large portions of the… salt evaporation system to salt marsh… could have a detrimental effect on shorebirds such as snowy plover, Wilson's and red-necked phalaropes, and black-necked stilt… if provisions are not made to preserve salt pond habitat for them." And Warnock et al (Warnock, N, GW Page, TD Ruhlen, N Nur, JY Takekawa, JT Hanson. 2002. Management and conservation of San Francisco Bay salt ponds: effects of pond salinity, area, tide, and season on Pacific Flyway birds. Waterbirds 25 (Spec. Publ. 2:79-92) cautioned, "While it is known that the salt ponds… support a large number and diversity of birds, it is not known how these birds will react if salt pond habitat is reduced. This should be the focus of major research efforts. Currently, in North America, the majority of shorebird species are thought to be in decline. Until we get a better handle on these important conservation issues, restoring salt ponds to tidal marsh… as is currently being proposed, should proceed with caution."

The conversion of pond 15 to saltmarsh would result in a direct loss of approximately 86 acres of saltpond foraging habitat for eared grebes and phalaropes which as noted above is nine percent of that currently available to them. The resulting shifting salinity gradients in other ponds would affect additional acreage.

The argument in the DEIS that shorebirds can simply forage on new intertidal flats or move elsewhere does not address the impact of net loss of saltpond shoreline foraging habitat for precocial shorebird chicks. The linear perimeter of pond 15 is currently 1.65 miles of saltpond shoreline available to chicks of snowy plover, killdeer, stilt, and avocet for foraging. Conversion to saltmarsh under the preferred alternative would reduce shoreline available for foraging to 0.67 miles of intertidal shoreline. Thus a loss of nearly one mile of shoreline or 59 percent of that currently available in pond 15.

I checked maps/nest numbers for 2016 and the raising of the height of dike VII for flood control would alter the area where 20 percent of black skimmer nests were and 12 percent of least tern nests. The loss of northern pond 20A to construction of a new flood control berm in addition to the dike VII and pond 15 conversions would eliminate or alter where 8 percent of snowy plover nests were.

The conversion of pond 15 to saltmarsh and conversion of the levees around pond 15 to higher dikes and main perimeter access road would result in the loss of where 81 percent of Caspian tern nests were (and the area most consistently used by Caspians for nesting and roosting every year at least since 1999), 25 percent of royal and 22 percent of elegant tern nests. Modifications of adjacent levees would impact up to 60 percent of where elegant terns nested in 2016. The loss of these areas would require birds that had previously nested there to shift to nest on other levees, crowding out and increasing impacts on smaller species that nest on those other levees, including snowy plovers, least terns, and gull-billed terns. It would also affect undetermined percentage of black-necked stilt and American avocet nests. Concentrating these colonies into smaller areas would also likely increase predation. The levees around pond 15 also are the sites of consistent large gull roosts so the loss of these areas would cause gulls to relocate to other levees and thus increase the potential for impacts to species nesting there.

The DEIS states as objective 3 (p. 1-16) that the project is to "enhance seabird and shorebird nesting and foraging opportunities: increase the area of suitable nesting… by providing

35.30 Cont.

35.31

35.32

35.33

35.34

35.31 Although Pond 15 would be restored to tidally influenced wetland habitats, the salinity levels in Pond 15 would be present in different ponds within the solar salt pond system; therefore, although the amount of foraging habitat for phalaropes may decrease, ponds with salinity levels capable of producing brine invertebrates would continue to be present. The reduction in foraging habitat within the salt ponds on the San Diego Bay NWR would not represent a significant adverse effect to the species of phalaropes known to forage at this site.

35.32 Between 2006 and 2015, a western snowy plover nest was observed on the levee between Ponds 15 and 25 in 2013 and 2014. Nesting throughout the salt works increased between 2006 and 2015, with the majority of the plover nests observed in the secondary ponds (Ponds 20–27). These observations indicate that Pond 15 does not provide significant nesting habitat for western snowy plovers. It also implies that adequate foraging opportunities are available within the secondary ponds for shorebirds that forage on brine invertebrates. Following the restoration of Pond 15, 16.5 acres of intertidal mudflat habitat, considerably more foraging acreage than is available around the edge of the existing salt pond would be created to support foraging shorebirds.

35.33 We do not share the assumption that existing use for nesting by Caspian terns or other ground nesting

	seabirds as a result of the alteration of Pond 15 from open water to intertidal habitat will be lost. We are aware that Caspian terns among other species of colonial nesting larids exhibit certain degrees of nesting site tenacity (philopatry) between years and between generations. However, ground nesting larids in general also display plasticity in nesting site selection depending on the prey availability and nesting site conditions in a given season. Since the salt works levee system will remain largely intact post restoration and since the ponds themselves will still be composed of open water or very shallow water unvegetated habitats in approximately 78% of the area they presently occupy, we expect seabird nesting to continue at the salt works without significant negative effects resulting from the restoration of Pond 15. Pond 15 will upon restoration, provide fisheries habitat that will help support piscivorous bird foraging in the area. As identified in the San Diego Bay NWR CCP, an adaptive management approach to managing refuge habitats is used. Features intended to enhance seabird nesting, such as the creation or enhancement of seabird nest sites are identified in the CCP and may in future, be created by refuge management in response to perceived needs for the optimal mix of habitat features to support the wildlife communities of the San Diego Bay NWR. **35.34** Refer to Response 35.24.

expanded and enhanced habitat areas", but no aspects of either alternative B or C accomplish this. There are no aspects of the proposed project that would increase nesting habitat for any of the species currently breeding in the vicinity of the pond 15 project area with the possible exception of Belding's savannah sparrow. Contrary to the stated objective, the project will reduce existing nesting and foraging habitats. As noted previously, for nesting habitat snowy plovers require unobstructed access for chicks to run between nesting and foraging habitats, and the conversion of pond 15 to salt marsh eliminates that possibility. They require extensive non-vegetated flats for foraging, and the proposed small intertidal channel shores backed by salt marsh are not suitable. Least terns, Forster's terns, gull-billed terns, and skimmers possibly may forage in the proposed tidal channels, but the small channels are not suitable for the other tern species. The DEIR assumes that nesting will continue on the levees of and adjacent to pond 15, but conversion of open saltpond to saltmarsh will reduce or eliminate their suitability for tern and skimmer nesting. These species select levee locations to nest on due to the unobstructed view across open water which enables them to watch for approaching threats. Conversion of non-vegetated shoreline and saltpond to saltmarsh vegetation will not only obstruct that view and site openness, but will attract predators that hunt in saltmarsh vegetation such as harriers and raccoons. Some may attempt to argue that the history of nesting on these levees increases the probability of their continued use, but in the 55 years that these nesting colonies have been established in South San Diego Bay, none of the tern species other than Forster's tern and a small number of individual skimmers have nested adjacent to expanses of vegetation. The same is true for roosting locations as the western ponds restoration has demonstrated – the pond 10/11 levee had been a primary roosting location for brown pelicans, cormorants, gulls, and terns, but with conversion of the adjacent ponds to saltmarsh, it is no longer used.

35.34 Cont.

An additional aspect of the project not detailed in the DEIS but which will contribute to abandonment of the levees around pond 15 for nesting is their conversion from interior saltpond levees to bayfront dike. Due to exposure to tidal action, the levee sides will require at least some degree of reinforcement if not armoring. This will further reduce chick access to shoreline, and depending on the material used, may create threats to chick survival if steep or with crevices that chicks can fall into. If reinforcement is of riprap, rubble, or similar material, productivity of the nesting birds will be reduced due to attraction of the material to rodents, cats, opossums, and other predators. Since these levees will also be converted to the new perimeter of the saltpond system, their surfaces will need to be reinforced to accommodate vehicle access for maintenance.

35.35

The DEIR states (p. 4.3-64) that impacts are to be avoided by avoiding nesting season, but the schedule shows activity during the early and late nesting season. Page 2-31 estimates the start of mobilization on 1 Aug 2017, and dewater and earthwork start Oct 2017, but black skimmer and snowy plover breeding activity frequently extends into October. Demobilization is scheduled by the end of Feb 2018, but double-crested cormorant and snowy plover breeding starts in February. No active construction is scheduled during the "core nesting season" 1 Mar to 31 Jul, remobilization scheduled 1 Aug 2018, and earthwork 1 Sep 2018, but most species still have breeding activity in August and multiple species still have breeding activity in September. Impact assessment on p. 4.3-62 for pond 15 only mentions temporary impacts, with no consideration of the loss of nesting habitat due to the change in levee to road and proximity to vegetation, nor in threat to chick survival by reinforced slopes. Page 4.3-65 MM-BIO-9 proposes that if sensitive species are within the construction area, there should be use of air horn

35.36

35.35 According to the bird survey data for Pond 15, Forster's terns, black skimmers, elegant terns, and double-crested cormorants have been observed nesting at Pond 15. The changes proposed for the levees around Pond 15 are not expected to result in any significant differences in the condition of the levee tops, and no changes are proposed the would affect the western side of the western outer levee of Pond 15, where a number of these species have been observed nesting. Nesting data from 2006 to 2017 also indicate that the avian species that have been observed nesting around Pond 15, also nested in a variety of locations throughout the salt works during various years, therefore, adequate nesting opportunities are and will continue to be available for nesting seabirds and shorebirds.

No armoring of the levees is currently deemed necessary; if at a later time, it is determined that it is necessary to armor the levee slopes, any armoring would be installed and then covered with soil resulting in no change from the current condition and no exposure of crevices that could attract predators. Any new roads that are implemented as part of the project are designed to be no different than the existing road that extends around Pond 15, and levee slopes will be designed to maintain adequate chick access to the adjacent wetland habitats.

or cracker shells "to move birds off the site". Such use would also impact birds in adjacent areas outside of project site and constitute harassment or "take".

Page 4.3-66 states, "The loss of… wildlife… habitat… would be more than offset by the restoration of… tidally influenced and transitional habitat… The benefits of restoration… would include improved biological productivity", yet again, there are no references or data presented to support this claim, and monthly bird survey data and studies elsewhere indicate that the opposite would be true. Page 4.3-67 states, "Currently, pond 15 offers moderate habitat availability for threatened and endangered species. The habitat value of the site is expected to increase significantly with implementation of the flooding and coastal marsh revegetation of the proposed action, which would provide extensive foraging and nesting habitat for threatened and endangered species." This is blatantly untrue - current nesting by Belding's savannah sparrow, snowy plover, least tern, and foraging by Ridgway's rail demonstrate the current high habitat value. The proposed action would eliminate snowy plover and least tern nesting habitat, eliminate foraging habitat for snowy plover broods/chicks, and reduce the concentrated prey sources for Belding's sparrow. The proposed action would only potentially increase nesting habitat for Belding's and Ridgway's rail, provide foraging habitat for least tern although of lesser acreage than currently present, and possibly provide foraging habitat for adult snowy plovers but at lesser acreage than currently present and at the cost of habitat for chick foraging.

35.36 Cont.

35.37

Sincerely,

Robert T. Patton

Robert T. Patton

35.36 Although avoidance of the nesting season is already addressed through the project design, we have added Mitigation Measure MM-BIO-12 to address avoidance of impacts to nesting birds. Refer to Response 2.38 for additional details.

35.37 While the salt works as a whole provides nesting and foraging habitat for listed and sensitive species, Pond 15 and the Otay River floodplain provide no or marginal habitat for the endangered light-footed Ridgway's rail, and only limited habitat quality for the other listed species present on the San Diego Bay NWR. The intertidal Palomar Street drainage that is immediately east of Pond 15 and west of Pond 28, supports nesting and provides year round habitat for the State endangered Belding's Savannah sparrow and light-footed Ridgway's rails have been documented within the channel. While some disruption is inevitable during construction, nesting season impacts will be avoided by shutting down construction during the nesting season window. Post construction, with the restoration of Pond 15 to salt marsh habitat, we expect habitat use; therefore, the area's carrying capacity for the local sparrow and rail populations will expand as the vegetated upper salt marsh habitats within the Pond 15 area mature post restoration. Thus, there will be a net increase in the acreage of suitable nesting and foraging habitat for these species. Individual western snowy plover nests were observed near the southwest

	corner of Pond 15 in 2013 and 2014, on the dike between Pond 15 and 14 in 2004, and within Pond 20a in 2012, 2013, 2014. The levees around Pond 15 will continue to be available for plover nesting after project completion, and the foraging opportunities will be expanded as salt pond habitat will be present within Pond 14 and 25 and restored salt marsh habitat will be present in Pond 15. The subtidal habitat to be created along the Bayside levee of Pond 15 will support fish, providing new foraging opportunities for least terns, not less. Once construction activity has been completed, we do not anticipated any adverse effects to listed species and expect to see increased use of the affected areas by listed species as the habitat becomes established. Additionally, although salinities within the remaining salt ponds will shift in response to the removal of Pond 15 from the system, there will continue to be areas of the salt works that support brine invertebrates, including the ponds where almost all of the snowy plover and California least tern nesting has occurred over the past ten years.

References

Anchor. 2013. Sediment Characterization Sampling and Analysis Report South San Diego Salt Ponds 12, 13, 14, and 15. January 2013.

Anchor. 2017a. Sampling and Analysis Report Otay River Estuary Restoration Soil Characterization Program. Revised August 2017 (Converted vertical datum from NAVD88 to MLLW).

Anchor. 2017b. Sediment Characterization Sampling and Analysis Report South San Diego Salt Ponds 12, 13, 14, and 15. Revised August 2017.

ASTR (Agency for Toxic Substances and Disease Registry). 2014. *Toxicological Profile for Toxaphene*. ATSDR, U.S. Public Health Service, Atlanta, Georgia. 291 pp.

Bay, S.M., D.J. Greenstein, A.N. Parks and C.Q.T. Zeeman. 2016. *An assessment of bioaccumulation in San Diego Bay*. Southern California Coastal Water Research Project (SCCWRP) Technical Report 953. SCCWRP, Costa Mesa California.

Beckvar, N. and G.R. Lotufo. 2011. "DDT and Other Organohalogen Pesticides in Aquatic Organisms." In *Second Edition, Environmental Contaminants in Biota, Interpreting Tissue Concentrations.* W. N. Beyer and J.P. Meador, eds. CRC Press, Boca Raton, Florida. pp. 47–101.

	CDFW. 2017. Background Information on the Salton Sea (https://www.wildlife. ca.gov/Regions/6/Salton-Sea-Program/Background, accessed on September 13, 2017) California Department of Toxic Substances Control Human and Ecological Risk Division (DTSC/HERD). 2000. *HERD Ecological Risk Assessment (ERA) Note Number 4*. California Department of Toxic Substances Control, Sacramento California. https://www.dtsc.ca.gov/AssessingRisk/upload/econote4.pdf. California Department of Toxic Substances Control Human and Ecological Risk Division (DTSC/HERD). 2009. U. S. Navy and U. S. Environmental Protection Agency, Region 9 Biological Technical Assistance Group (Navy/BTAG) Toxicity Reference Values (TRVs) for Ecological Risk Assessment. February 24, 2009 update. https://www.dtsc.ca.gov/AssessingRisk/eco.cfm. Dunning, J.B. Jr. 1984. *Body Weights of 686 Species of North American Birds*. Western Bird Banding Association Monograph No. 1. 1–38. EPA (U.S. Environmental Protection Agency). 2007. *Ecological Soil Screening Levels for DDT and Metabolites*. OSWER Directive 9285.7-57. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response. Washington, D.C.

Everest International Consultants. 2016. *Otay River Estuary Restoration Project – Pond 15 Ocean Inlet/Outlet*.

Inman, D. L. & S. A. Jenkins, 1999, "Climate change and the episodicity of sediment flux of small California rivers," *Jour. Geology*, v. 107, p. 251–270. http://repositories.cdlib.org/ sio/cmg/2/

Jenkins, S. A. and J. Wasyl, 2014, "Tidal Hydraulics Analysis of the Otay River Estuary Restoration Plan" submitted to Poseidon Resources Corp., 23 September, 2014, 95pp

Jenkins, S. A., Poon, Y.C., Zeeman, C., and Roberts, 2015, "Sensitivity Analysis of Potential DDT Deposition in the Otay River Estuary Restoration Plan Post-100 Year and 50-Year Floods", submitted to Poseidon Water LLC, submitted by Michael Baker International and Everest International, 28 October 2015, 70 pp.

Largier, J., 1995, "A study of the circulation of water in San Diego Bay for the purpose of assessing, monitoring and managing the transport and potential accumulation of pollutants and sediment in San Diego Bay", submitted to California Water Resources Control Board, 19 pp. + app.

Long, E.R., D.D. MacDonald, S.L. Smith and F.D. Calder. 1995. Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuarine sediments. Environ. Management. 19(1):81-97.

Nagy. 1984.

Nagy. 2001.

Nordby Biological Consulting and Tijuana River National Estuarine Research Reserve. 2014. South San Diego Bay Coastal Wetland Restoration and Enhancement Project Year 2 Postconstruction Monitoring Report. Prepared for the Southwest Wetlands Interpretive Association.

Nordby Biological Consulting and Tijuana River National Estuarine Research Reserve. 2016. South San Diego Bay Coastal Wetland Restoration and Enhancement Project Year 4 (2015) Postconstruction Monitoring Report. Prepared for the Southwest Wetlands Interpretive Association.

Stransky, C., K. Tait, C. Sheredy, R. Schottle, R. Kolb and B. Bernstein. 2016. *Aquatic Food Web Bioaccumulation Study of San Diego Bay, Final Report*. Amec Foster Wheeler Environment and Infrastructure Inc. San Diego California. Appendix B (Chemistry Summary Tables). http://www.waterboards.ca.gov/sandiego/water_issues/programs/sdbay_strategy/index.shtml.

USFWS (U.S. Fish and Wildlife Service). 1985. *Recovery Plan for the Light-Footed Clapper Rail*. Portland, Oregon.

USFWS. 2003. *Evaluation of the Clean Water Act Section 304(a) Human Health Criterion for Methylmercury: Protectiveness for Threatened and Endangered Wildlife in California*. U.S. Fish and Wildlife Service, Sacramento, California.

USFWS. 2006. *San Diego Bay National Wildlife Refuge (NWR) Sweetwater Marsh and South San Diego Bay Units Final Comprehensive Conservation Plan (CCP) and Environmental Impact Statement (EIS)*. Sacramento, California: USFWS. Adopted September 29, 2006. http://www.fws.gov/refuge/San_Diego_Bay/what_we_do/planning.html.

USFWS. 2007. Recovery Plan for the Pacific Coast Population of the Western Snowy Plover (*Charadrius alexandrinus nivosus*). In 2 volumes. Sacramento, California. xiv + 751 pages.

USGS (U.S. Geological Survey). 2017.

Wang, P. F., Cheng, R. T., Richter, K., Gross, E. S., Sutton, D., and Gartner, J. W. (1998). "Modeling Tidal Hydrodynamics of San Diego Bay, California." J. Amer. Water Res. Assoc., 34 (5), 1123–1140.

	Zeeman, C., S.K. Taylor, J. Gibson, A. Little, and C. Gorbics. 2008a. *Characterizing Exposure and Potential Impacts of Contaminants on Seabirds Nesting at South San Diego Bay Unit of the San Diego National Wildlife Refuge (Salt Works, San Diego Bay) – Final Report*. U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office, Carlsbad, California.Zeeman, C. S.K. Taylor, J. Gibson, A. Little and C. Gorbics. 2008b. *F&G Street Marsh Contaminants Investigation*. Final Report. U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office. Carlsbad, California. 106 pp.

INTENTIONALLY LEFT BLANK

APPENDIX B

Public Scoping Report – 2011 and 2013

APPENDIX A

Public Scoping Report
Otay River Estuary Restoration Project

Public Scoping Meetings held on December 6, 2011 at 1:30 P.M., and 6:00 P.M

Swiss Park & Club,
2001 Main Street Chula Vista, California 91911

Prepared for:

U.S. Fish and Wildlife Service
P.O. Box 2358
Chula Vista, California 91912

Prepared by:

DUDEK
605 Third Street
Encinitas, California 92024

JANUARY 2012

Printed on 30% post-consumer recycled material.

APPENDIX A
2011 Public Scoping Report

OTAY RIVER ESTUARY RESTORATION PROJECT

Scoping Comments from Scoping Meetings of December 6, 2011

Flip Chart Comments

- Will any of the excavated fill go to Pond 20?
- Bird watching opportunities included with restoration project
- Public access
- Concern about how the Carlsbad project is connected with the Otay restoration project (transfer of materials)
- Allow some freshwater storm flow from the river through the project to benefit marsh vegetation
- Limit the deepest water depth to something like the lowest tide level (-2 or so) as it might have been previously – include the historic T map in the EIR as background information
- Build trash trap at outflow from Nestor Creek
- Provide benign public view point
- Consider a retention system in project design
- Include some small areas in the midst of the project that are above the water elevation during storm flows for high water refuge and for nesting
- Require maintenance and monitoring for as long as the desal plant is in operation
- Include a trash trap at Nestor Creek
- Attempt a trash trap where Otay River comes under the freeway
- Attempt to strategically add sediments through inflow water to offset wetlands loss resulting from sea level rise
- What/where will the Otay freshwater influence connect to the proposed estuary?
- Make an additional connection with Otay to allow for freshwater flow into marsh – to create balance and support healthy cordgrass pop.
- Need for non-vegetated tidal mudflats for shorebirds
- Need to maintain some upland grassland for gull-billed tern foraging
- Work with Port and City of San Diego to comprehensively plan habitat restoration for all undeveloped parcels, including Pond 20A and City Park land

- Sediment testing for toxicity and disposal
- How will the project be influenced by sea level rise? Where will buffers be?
- Include measures so project values will survive sea level rise
- Public access included?
- Wildlife viewing platform possibilities?
- If get another 1916 event – what will be the effect?
- If there is any dredging of the Otay River channel, what will be the effect on existing mudflats that are currently exposed (and used) during low tides?
- Has sea level rise been considered?
- Soil disposal – if any?
- What are we doing to prevent siltation of our new area form sediment coming down the Otay River?
- Integrated with other efforts to enhance the south bay area
- Resource restoration with public access for wildlife enjoyment, recreation, and open space

Comment Card

Consider an alternative that has freshwater from Otay River feed into restoration site to provide estuarine transition (i.e., freshwater to saltwater) and freshwater to promote growth of cordgrass.

Work with Port and City (aka adjacent landowners) to comprehensively plan restoration for the entire Pond 20A and parklands to south of the restoration

Attendees at the Otay River Estuary Restoration Project Scoping Meetings: December 6, 2011

Gene Mullenix, South Bay Salt Works, 1470 Bay Blvd. Chula Vista, California 91911

Warren Dodd, South Bay Salt Works, 1470 Bay Blvd. Chula Vista, California 91911

Tracy Strahl, South Bay Salt Works, 1470 Bay Blvd. Chula Vista, California 91911

Mark Stephens, 500 W. Harbor Drive, Unit 514, San Diego, California 92101

Vivian Moreno, Office of San Diego Councilmember David Alvarez (District 8), 202 C Street, MS 10, San Diego, California 92101

Julie Lambert, 5420 Repecho Drive, #208, San Diego, California 92124

Phil Pryde, 7784 Cedar Lake Avenue, San Diego, California 92119

Robert Patton, 4444 La Cuenta, San Diego, California 92124

Anne Jarque, City of San Diego, Streets Division, 2781 Caminito Chollas #44, San Diego, California 92154

Sam and Maria Mendoza, 2170 Leon Avenue, San Diego, California 92154

Marrelle White, Port of San Diego, 3165 Pacific Highway, San Diego, California 92101

Joe Ellis, 1350 5th Street, Imperial Beach, California 91932-3208

Jim Nakagawa, City of Imperial Beach

Carolyn Lieberman, USFWS, 6010 Hidden Valley Road, #101, Carlsbad, California 92011 (Coastal Program,

Carlsbad Fish and Wildlife Office)

Not at meeting but please add – Sandy Vissman, USFWS, 6010 Hidden Valley Road, #101, Carlsbad, California 92011 (Ecological Services, Carlsbad Fish and Wildlife Office)

Jim Janney, Mayor, City of Imperial Beach

Edith Gutterrez, City of San Diego, Storm Water Division, 9370 Chesapeake Drive, Suite 100

(MS 1900), San Diego, California 92123

Eileen Maher, Port of San Diego

Jim Peugh, San Diego Audubon

Dan McKirnan, 1404 Law Street, San Diego, California 92109 (Environmental Health Coalition)

Julie Hagen, 1 Viejas Grade Road, Alpine, California 91901

Peter MacLaggan, 501 W. Broadway #2020, San Diego, California 92101

INTENTIONALLY LEFT BLANK

APPENDIX B

Public Scoping Report
Otay River Estuary Restoration Project

Public Scoping Meeting held on January 23, 2013

Prepared for:

U.S. Fish and Wildlife Service
P.O. Box 2358
Chula Vista, California 91912

Prepared by:

DUDEK
605 Third Street
Encinitas, California 92024

JANUARY 2013/ REVISED MAY 2015

Printed on 30% post-consumer recycled material.

APPENDIX B
2013 Public Scoping Report

OTAY RIVER ESTUARY RESTORATION PROJECT

Scoping Comments from Scoping Meetings of January 23, 2013

Attendance: 14 people signed the attendance sheet

Comment Cards: One comment card was submitted.

Is it possible Poseidon could buy the magnesium pond and restore them, so maybe salt production could continue for a while longer. (Although I am for the ultimate restoration of the entire area.) Theresa Acerio

Comments from the Flip Charts:

Biological Resources

- Consider hydrologic interconnections namely Pond 20 restoration
- Intact nesting capacity concern for predator population
- Concern about impact of climate change on species assemblages and human pathogens (e.g., West Nile Virus, avian flu)
- (Although not recorded, Wayne Dickey indicated that he had provided information on potential sites for soil disposal [two park sites in the area] – did someone write those suggestions down? If not, we should try to get that information for the meeting notes.)

General Project Information:

- Potential impacts to south bay salt works?
- Design should consider and include a model for massive flooding events and flood modeling
- Does design for 2050 reduce current functions and values?
- Design access for future rework to address sea level rise
- Please design an outflow for Otay River to connect to Pond 13 as soon/close as possible so the river has somewhere to go in case of a flood. Since we cannot widen the river bed, or breach a levee of Ponds 22 and 23.
- Otay River floodplain values - uses are maximized

Physical Environment:

- What is driving the project design, fish mitigation or habitat desires?
- What is the impact of pond restoration to nesting seabirds?
- Describe the impact on salt production and the effect on ecosystem of the project, including effect on brine invertebrates and associated bird species, describe shift in biodiversity (current conditions versus restored conditions)
- Provide for brine invertebrate production with restoration - can it be done?
- How small can we go and still have salt production?
- Berm between refuge and rest of Pond 20 – how can this project relate to possible future restoration in Pond 20, will timing allow for a coordinated restoration effort?
- Don't maintain a levee between the project and Pond 20
- How does the implementation of this project affect restoration planning for Pond 20 – will the future restoration of Pond 20 be constrained due to the current project?
- Can the Otay project be designed to allow future restoration of the rest of Pond 20 (removable berm or other features)?
- Describe how excavated material would be used – beneficial use in ponds or could it be used to restore eelgrass habitat in Emory Cove
- In consideration of sea level rise, allow for future access of construction equipment for maintenance activities and to keep pace with sea level rise

Attendees at the Otay River Estuary Restoration Project Scoping Meetings: January 23, 2013

Gene Mullenix, South Bay Salt Works, 1470 Bay Blvd. Chula Vista, California 91911

Don Grace, South Bay Salt Works, 1470 Bay Blvd. Chula Vista, California 91911

Tracy Strahl, South Bay Salt Works, 1470 Bay Blvd. Chula Vista, California 91911

Wayne Dickey, 3813 Coleman Avenue, San Diego, California 92154 (Planning Group member)

Joe Ellis, 1350 5th Street, Imperial Beach, California 91932-3208

John Holder, WildCoast, 925 Seacoast Drive, Imperial Beach, California

Jim Janney, Mayor, City of Imperial Beach

Mike McCoy, SWIA, Imperial Beach, California 91932

Bill and Shannon Davis, 1185 East Lane, Imperial Beach, California 91932

Jim Peugh, San Diego Audubon

Khari Johnson (no address provided)

Michael De la Rosa, Office of San Diego Supervisor Greg Cox, 1600 Pacific Highway, San Diego, California 92101

Theresa Acerro, 3730 Festival Court, Chula Vista, California 91911

INTENTIONALLY LEFT BLANK

APPENDIX C

Final Restoration Plan

NOTE: The Final Restoration Plan (FRP) for the Otay River Estuary Restoration Project (ORERP), provided as Appendix C in the Draft EIS, was prepared for the California Coastal Commission (CCC) in accordance with the required Coastal Development Permit for the ORERP. Revisions and updates to the version of the FRP included in the Draft EIS are necessary prior to its resubmittal to the CCC. When the revised FRP has been submitted and accepted by the CCC, it will be made available for public review by the CCC. For more information, please contact Kate.Huckelbridge@coastal.ca.gov.

DRAFT

Final Restoration Plan
for the Otay River Estuary Restoration Project

Prepared for:

California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, California 94105
Contact: Kate Huckelbridge

Prepared by:

Poseidon Water
5780 Fleet Street, Suite 140
Carlsbad, California 92008
Contact: Stan Williams, Vice President

MAY 2014

APPENDIX D

Planting Plan for Uplands

NORDBY BIOLOGICAL CONSULTING

Planting Plan for Uplands
Associated with the Poseidon Wetland Mitigation Project
San Diego Bay National Wildlife Refuge
~~April 7, 2015~~
~~Revised October 27, 2017~~
January 16, 2018

1.0 INTRODUCTION

The proposed Poseidon Otay River Estuary Restoration Plan (ORERP) would restore approximately 37 acres on the Otay River floodplain to intertidal wetland under the Intertidal Alternative. Approximately 320,000 to 370,000 yd^3 of material would be excavated from the floodplain with 36,000 yd^3 placed within the floodplain east of Nestor Creek and the remaining transported to Pond 15 to restore wetland habitat there. The portion of the floodplain east of Nestor Creek, comprising approximately 40 acres, was eliminated from the restoration plan due to the presence of contaminated soils. The 36,000 yd^3 of soil would be placed over ~~21.5-acre~~ an area east of Nestor Creek that contains elevated levels of contaminants, primarily DDT. This exposure reduction cover (ERC) would be between 1 foot to 1.5 feet in thickness and approximately 23.4 acres in area. ~~as an approximately 1-foot deep cover over the contaminated soils east of Nestor Creek.~~ A construction staging area would also be established on approximately seven acres just to the northwest of the ERC. The~~is~~e areas are ~~is~~ currently vegetated primarily by invasive weeds (e.g., ~~disturbed habitat, supporting~~ crown daisy) and non-native grasses, and are ~~and is~~ mowed each year for fire prevention. The purpose of this planting plan is to revegetate the existing floodplain east of Nestor Creek, including the ERC, ~~1-foot deep soil cover,~~ with a native hydroseed mix that will provide functional habitat and soil stability while not disturbing the soil profile.

During discussions with the U. S. Fish and Wildlife Service (USFWS), owners of the Otay River floodplain site, it was determined that a low-growing shrub community would provide the desired soil stability, provide habitat for wildlife and compliment the adjacent riparian restoration undertaken by the USFWS and River Partners. Accordingly, this plan presents a plant palette composed of Diegan coastal sage scrub species (DCSS). DCSS is characterized by low, woody subshrubs that grow to approximately 1 meter in height (Holland 1986). Common dominant species include coastal sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), laurel sumac (*Malosma laurina*) and white sage (*Salvia apiana*).

2.0 PLANT PALETTE AND APPLICATION

The approximately 40 acres east of Nestor Creek will be revegetated using a custom seed mix, with seed collected from the project vicinity and tested for germination and purity. All seed will

be collected from existing DCSS communities in the project vicinity, in this case south San Diego Bay or nearby Tijuana River Valley. Collected seed will be tested by a seed laboratory certified by the Association of Official Seed Analysts or a seed technologist certified by the Society of Commercial Seed Technologists as per the standards of the California Food and Agriculture Code for purity and germination.

The hydroseed will be applied as slurry to the entire surface area of the disturbed portion of the approximately 40-acre site. The hydroseed slurry will consist of the required seed species and quantities and an inert wood pulp matrix. Hydroseed will be applied as an even coating over all surfaces. Care will be taken to avoid impacting or hydroseeding the existing alkali marsh and coastal salt marsh within the 40-acre area.

Table 1. Plant Palette for Poseidon Upland Planting Plan

Species	% Purity/% Germination	Lbs/acre
Artemisia californica/coastal sagebrush	15/50	2
Encelia Californica/California encelia	40/60	3
Eschsholzia californica/California poppy	98/75	2
Eriogonum fascilculatum/California buckwheat	10/65	12
Isocoma menziesii/coastal goldenbush	20/40	4
Acmispon glaber/deerweed	90/60	8
Lupinus succulentus/arroyo lupine	98/85	4
Salvia apiana/white sage	70/50	2
Total		**39 lbs/acre**

The proposed plant palette is presented in Table 1. This plant palette includes species common to southern California DCSS, both coastal and inland. These species are drought tolerant and have low water requirements. As stated above, seeds of these species would be collected in the south San Diego Bay area and tested for germination and purity.

3.0 IRRIGATION

Irrigation will be provided via a temporary overhead irrigation system that does not disturb the soil profile. Water is available at the Otay River Floodplain and was formerly used by River Partners and the USFWS to establish riparian habitats. This water was delivered from a ~~a~~ well by pipeline from Terra Bella Nursery, located just east of I-5 on the Otay River. River Partners provided certain as-needed services for the well and pump. For example, they replaced the pressure regulator at the well at no charge to the nursery. Poseidon may be required to provide similar services. It is anticipated that irrigation will be required for at least the first year of the project. Irrigation will be phased out gradually depending on the local weather conditions during the establishment period.

4.0 CONTROL OF INVASIVE WEED SPECIES

Grow and Kill Cycles~~ROW AND KILL CYCLES~~

Following installation of the irrigation system, the site will be watered to encourage weed seed to germinate. Once weeds have germinated but prior to flowering and seed set, the site will be treated with glyphosate or other approved ~~,~~ a water~~-~~safe herbicides approved by USFWS~~-approved herbicide,~~ to kill the weed species. Two grow and kill cycles will be completed before application of the hydroseed matrix. Consistent with USFWS Refuge policy, pesticide use will be implemented using an integrated pest management approach likely involving both physical and chemical control.

Herbicide Use Procedures

Consistent with the Department of the Interior's Integrated Pest Management (IPM) Policy, invasive weed species will be addressed by employing a sustainable management approach that minimizes health, environmental, and economic risks. The IPM policy (Part 569, FW1 of the Service Manual) establishes procedures and responsibilities for pest management activities, adopts IPM as the Service's method for making pest management decisions; and provides guidance on how to implement IPM for all pest management activities.

At this site, control will be involve a combination of physical (e.g., hand-pulling, hoeing, mowing), and chemical (e.g., pesticides-) actions. Chemical control will likely include products with the active ingredients glyphosate (e.g., Aquaneat, Razor Pro), although other products such as imazapyr (e.g., Stalker, Habitat), or triclopyr (e.g., Garlon 3A, Garlon) may be considered for use. ~~.~~ The herbicide best suited for the existing habitat type and species to be controlled will be used.

Before an herbicide is applied to the site, the Refuge Manager will ensure that the product and application to be used at the site has been approved through the Service's Pesticide Use Proposal System (PUPS), which has been established to ensure that all chemical pesticides approved for use have been reviewed for their potential impacts to groundwater, surface water, and terrestrial and aquatic non-target vegetation and wildlife, including threatened and endangered species. The also provides details on target pests, current site conditions, presence of sensitive habitats or species, application dates, rates, and methods, and BMPs to be employed to avoid impacts to Refuge resources. Pesticides approved for use will be those that pose the lowest toxicity-related threat to non-target terrestrial and aquatic ecosystems while addressing the specific pest control objectives.

To ensure that adverse effects to water quality related to the application of pesticides will not occur, qualified individuals working under the direction of Refuge staff will adhere to all label directions (e.g., application methods and rates; proper cleaning, storage, and disposal of application equipment and herbicide products), Service regulations, and guidance provided through the PUPS approval process. The lowest application rate needed to achieve the desired control will be selected to minimize the amount of product used on a particular treatment site. Buffers will also be provided between treatment areas and water courses as required by the product label.

Best Management Practices (BMPs) intended to protect water quality will be followed whenever pesticide application occurs. These BMPs include, but are not limited to:

- Spray tanks will not be left unattended during filling.
- All pesticide spills will be addressed immediately.
- Water quality parameters (e.g., pH, hardness) that are important to ensure the greatest efficacy, will be considered when specified on the pesticide label.
- A one-foot no-spray buffer from the water's edge will be used, where applicable, and when it does not detrimentally influence effective control of pest species.
- Low impact herbicide application techniques (e.g., spot treatment, cut stump, oil basal, Thinvert system applications) rather than broadcast foliar applications (e.g., boom sprayer, other larger tank wand applications), will be used where practical.
- When spray applications are necessary, spraying will not be conducted on days with >30% forecast for rain within six hours, except for pesticides that are rapidly rain fast (e.g., glyphosate in 1 hour) to minimize or eliminate potential runoff.
- Spray equipment will be calibrated regularly to ensure that the proper rate of pesticide is applied to the target area or species.
- All product-specific application requirements included in the PUPS approval or provided with the Service's Chemical Profile for a specific product will be followed.

5.0 MONITORING

Monitoring will be conducted over a 5-year maintenance and monitoring period. A qualified restoration ecologist will conduct regular assessments of the project's success based upon success criteria presented in section 6.0. Maintenance will be conducted by the hydroseed installation contractor or by a maintenance contractor. Monitoring will be conducted quarterly for the first two years and semi-annually thereafter. Semi-annual monitoring will be conducted in winter-early spring when DCSS is actively growing and summer-fall when plants are mostly dormant to capture the range of expected conditions. All monitoring will consist of qualitative and quantitative methods as presented below.

Qualitative Monitoring

Qualitative monitoring will focus on soil conditions (e.g., moisture and fertility), seed germination rates, plant health and growth, presence of native and nonnative plant species, and any significant disease or pest problems that require maintenance. During each qualitative site visit, the restoration ecologist will conduct a site overview of the restoration areas to evaluate the following:

- Overall site conditions
- General condition of plants, including plant health/vigor and mortality
- Seed germination rates
- Native plant recruitment

- Potential issues, including irrigation problems (too much or too little), invasive nonnative species of concern (e.g., crown daisy and non-native grasses), vandalism, and other problems that need to be addressed by the installation or maintenance contractor.

During each late summer-early fall site visit, the restoration ecologist will assess the need for potential remedial planting during the ensuing winter. Remedial recommendations will be provided as necessary. Recommendations may include re-seeding the site.

Quantitative Monitoring

Quantitative monitoring will consist of point-intercept transects to determine canopy development and belt transects to quantify species richness

Permanent 50-meter long point-intercept transects will be placed at a density of 1 per acre and will be used to determine native and nonnative cover across the restoration area during the 5-year maintenance and monitoring period. Transects will be placed at random locations across the restoration area. At 0.5-meter intervals along each transect, every plant species that intercepts the transect will be recorded. This sampling method is based on the field sampling protocol designed by the California Invasive Plant Council (Sawyer and Keeler-Wolf 1995).

Due to the high probability of vandalism, marking the transects start and end with stakes is not recommended. Instead, the location of each transects will be marked using a Global Positioning System (GPS) unit and displayed on a site map. Point intercept data will be collected once each year during late summer-early fall and sampling times will be consistent from year to year to minimize variation in the data.

A list of additional species occurring within a 5-meter belt along each 50-meter permanent transect will also be recorded to measure species richness and diversity. Additionally, selected transects will be used as a permanent photo station to visually record the progress of the restoration over the 5-year maintenance and monitoring period.

6.0 SUCCESS CRITERIA

Success criteria are provided to verify that the project achieves desirable native DCCS habitat characteristics within a reasonable time period. Success criteria are based on the composition of native DCSS habitat, experience on similar projects, and reasonable expectations regarding the condition of created/restored habitats after 5 years. Attainment of the final success standards is expected to result in the creation and establishment of DCSS habitat on-site. Yearly success criteria are also provided as milestones to help determine if the restoration is on an adequate trajectory and to aid in adaptive management decisions, including the need for re-seeding or other remedial measures. A combination of qualitative and quantitative monitoring results will determine if success criteria are being met and if management measures need to be adjusted or implemented to meet final success criteria.

Table 2 presents success criteria that must be met for the project to be considered successful. Based on monitoring results, the project restoration ecologist will determine when success standards have been achieved during the milestone periods. This will be communicated to the

resource agencies in the annual reports that document the qualitative and quantitative survey results.

In addition to the success criteria outlined in Table 1, the site must not receive supplemental irrigation for at least 2 years to verify that the site is established and self-sustaining.

7.0 ADAPTIVE MANAGEMENT

Due to the complexity of natural ecosystems, a flexible management strategy will be implemented to ensure an effective long-term management approach to biological resources. Adaptive management measures will be implemented to help drive management decisions in the event that unexpected events cause damage to the restoration site. Consistent, on-going monitoring is key to developing a successful adaptive management plan; therefore, the qualitative and quantitative assessments conducted during the 5-year monitoring and maintenance period will provide the basis to evaluate the status of vegetation development within the restoration area to achieve a self-sustaining system. Following an unforeseeable event

Table 2
Performance Standards and Success Criteria

Milestone	Native Cover (absolute)[1]	Nonnative Cover (absolute)
Year 1	20% native cover	<10% overall, <5% target invasive species[1] on-site
Year 2	35% native cover	<10% overall, <5% target invasive species on-site
Year 3	45% native cover	<5% overall, <1% target invasive species on-site
Year 4	55% native cover	<5% overall, <1% target invasive species on-site
Year 5	70% native cover	<5% overall, 0% target invasive species on-site

[1] Target invasive species for San Diego County have been identified by the San Diego Weed Management Area, a group of agencies, organizations, and individuals working together to control selected invasive plant species in San Diego County. For a complete listing of these species, go to: https://www.sandiegocounty.gov/content/sdc/awm/ipm_sdwma/InWeedWatch..

that causes damage to the restoration site, the monitoring data will be used to develop management actions to repair the damaged areas and ensure future management decisions are based on accurate assessments. Some potential issues that may cause adaptive management measures to be implemented are the lack of germination, and exceedance of non-native species cover.

8.0 REPORTING

The restoration ecologist will supervise the installation contractor during installation, and will prepare brief weekly memorandum documenting the installation progress. At the end of installation, the restoration ecologist will prepare a memo verifying the completion of the restoration installation and the beginning of the 5-year maintenance and monitoring program. The memo will be submitted to Poseidon and the Refuge Manager for subsequent submittal to the appropriate permitting ~~resource~~ agencies.

The restoration ecologist will prepare annual monitoring reports that will include qualitative and quantitative methods and monitoring results, photographic documentation, assessment of plant growth relative to success standards, and review of maintenance activities and any remedial measures that have occurred (e.g., supplemental planting). A draft of the annual report will be submitted to Poseidon and the Refuge Manager for review. Once the report has been reviewed and approved ~~by Poseidon~~, it will be submitted to the appropriate permitting ~~resource~~ agencies.

9.0 UNANTICIPATED IMPACTS TO UPLAND HABITATS

All unanticipated impacts to upland habitats incurred during the course of project construction will be revegetated using the same plant palette presented above. Such revegetation efforts will be subject to the same conditions as the 23.4-acre ERC and seven--acre staging area, including irrigation, control of invasive species, monitoring, success criteria, adaptive management and reporting. If such areas are isolated from the proposed temporary irrigation system, they will be watered by hand using a water truck or similar mechanism.

APPENDIX E

ORERP Construction Methodology

OTAY RIVER ESTUARY RESTORATION PROJECT

CONSTRUCTION METHODOLOGY

Prepared For:

Poseidon Water LLC
5780 Fleet Street, Suite 140
Carlsbad, CA 92008

Contact: Stan Williams

Prepared By:

Everest International Consultants, Inc.
444 West Ocean Boulevard. Suite 1104
Long Beach, CA 90802

Contact: David Cannon

August 2016

Everest# P2164

TABLE OF CONTENTS

1. INTRODUCTION 1

2. MOBILIZATION AND DEMOBILIZATION 2

3. CONSTRUCTION ACCESS AND STAGING AREAS 3

3.1 Construction Access 3

3.2 Staging Areas 4

4. EARTHWORK 5

4.1 Excavation 6

4.1.1 Land-Based Excavation 6

4.1.2 Combination of Land-Based and Water-Based Excavation 6

4.2 Material Transport and Placement 7

4.3 Haul Methods and Routes to Pond 15 8

4.3.1 Truck 8

4.3.2 Conveyor Belt 11

4.3.3 Pipeline 11

4.3.4 Material Placement in Pond 15 14

4.4 Final Grading and Other Earthwork 15

4.5 Pond 15 Ocean Inlet/Outlet 15

5. CONSTRUCTION TIMING, PHASING, AND EQUIPMENT 16

6. SITE PROTECTION AND EROSION CONTROL 18

6.1 Environmental Protection 18

6.2 Protection of Existing Facilities and Infrastructure 18

7. REFERENCE 19

LIST OF FIGURES

Figure 1. Project Site and Vicinity 2
Figure 2. Staging Area Layout 5
Figure 3. Truck Haul Routes 10
Figure 4. Truck Route to Pond 15 10
Figure 5. Conveyor Belt Haul Routes 12
Figure 6. Pipeline Haul Routes 13

LIST OF TABLES

Table 1. Preliminary Construction Schedule 17
Table 2. Construction Equipment Summary 18

1. INTRODUCTION

This document describes a range of construction methods and equipment that could be used for the construction of the Otay River Estuary Restoration Project (Project). Figure 1 shows the Project site and its vicinity. The Project site consists of two major areas denoted by orange lines in Figure 1: (i) Otay River Floodplain (ORF) to the south, and (ii) Salt Pond 15 (Pond 15) in the San Diego National Wildlife Refuge Complex to the north.

Similar to other coastal wetland restoration projects, the major construction activity of this Project is earthwork. Project construction involves lowering the existing ground elevations in the ORF to form subtidal, mudflat, salt marsh, and upland habitats; and filling Pond 15 with excavated material to restore wetland habitats. Specifically, the Project requires the excavation (cut) of approximately 320,000 to 370,000 cubic yards (CY) of soil within the ORF. Most of the excavated material would be transported to Pond 15. A small portion of the excavated material would be used to construct a new berm along the southern edge of the ORF. The construction methods, equipment, and schedule for this Project are described below. These methods, equipment, and schedules have been developed based on Project requirements and constraints, in combination with experience from past projects of a similar nature. The construction methodology ultimately used would be determined by the contractor selected for Project construction with due consideration to the requirements specified in permits, agreements, and approval documents. If the selected contractor chooses a construction methodology that is substantially different than those considered herein then additional environmental review may be needed to verify that the Project would not result in substantial environmental impacts beyond those already considered.



Image: Google Earth Pro

Figure 1. Project Site and Vicinity

2. MOBILIZATION AND DEMOBILIZATION

Heavy construction equipment may be brought to the Project site either by land or water. Equipment transported by land would likely be trucked to the Project site via Main Street.

Large and heavy equipment would be transported during off-peak traffic so as to minimize traffic congestion. The site entrance/exit points are discussed in Section 3. If transported by water then the construction equipment would likely be brought into the site via San Diego Bay and the Otay River. Some large equipment may be brought into the Project site in several pieces and then be assembled on site. Regardless of whether construction equipment is mobilized to the site from land, sea, or both the potential environmental impacts should be assessed as part of environmental review under NEPA and CEQA.

At the end of construction, the equipment would be demobilized. Demobilization of equipment would use the same route as mobilization. Staging areas, access routes, and other disturbed areas would be uncompacted, revegetated, and restored to preconstruction conditions or as specified in the construction documents. Any temporary equipment, structures, or utilities (*e.g.,* water and power) installed at the Project site would be removed at the completion of construction.

3. CONSTRUCTION ACCESS AND STAGING AREAS

3.1 Construction Access

Roads that can be used for construction access routes in the vicinity of the Project site are shown in Figure 1. Saturn Boulevard is the north-south running road located along the eastern edge of the Project site. The other major roads in the Project vicinity are Palm Avenue (State Route 75) to the south, Main Street to the north of the ORF, and Interstate 5 to the east. There are interchanges to Interstate 5 at Main Street and Palm Avenue. Using one of these interchanges, construction equipment would access the ORF via the north-eastern corner of the Project site where West Frontage Road, Main Street, and the Bayshore Bikeway intersect. Construction equipment would access Pond 15 via a USFWS easement located off Bay Boulevard just north of the entrance to the Salt Works operational facility. To complete the construction work on the dike between Ponds 22 and 23, construction equipment would access the site via the main entrance to the Salt Pond Complex located off Bay Boulevard and then wind around the southern boundary of the Salt Pond Complex.

Within the Project site, temporary dirt roads would be established to provide access for construction equipment between the excavation, staging, beneficial use, disposal, and fill areas. For material transport, access routes would be established and maintained for public safety and environmental pollution control. To access the western portion of the ORF from the construction area, the contractor would have to install temporary crossings across Nestor Creek and Otay River. Access to the construction site would be controlled through the use of gates, fencing, and/or site security services.

Construction equipment transporting material to Pond 15 would utilize some of the existing salt pond dikes. Since the existing dikes were not built to accommodate this use, temporary improvements (*e.g.,* widening and resurfacing) may be necessary depending on the method used to haul material between the excavation site (ORF), beneficial use/disposal site (Pond 15), and fill site (dike between Ponds 22 and 23). Three possible methods for material hauling and disposal are described in Section 4 below.

3.2 Staging Areas

Staging areas would be located upland away from construction activities. The area east of Nestor Creek in the ORF would be used for staging (see Figure 2). Drying and sorting of excavated material may also be carried out at this location. The staging area to the south of the stockpiles would be utilized first. Additional area for staging would the land to the west of the stockpiles as depicted in Figure 2. The staging area is near the entrance/exit to/from the excavation site (ORF). Any permits and/or approvals required to conduct the drying activities would need to be obtained prior to commencing with this activity.

To protect the sensitive habitat in the vicinity, the contractor should install temporary fences so as to limit the construction activities in the designated staging area and minimize disturbance of the neighboring area. Figure 2 shows the proposed layout of the temporary construction fencing within the staging area.

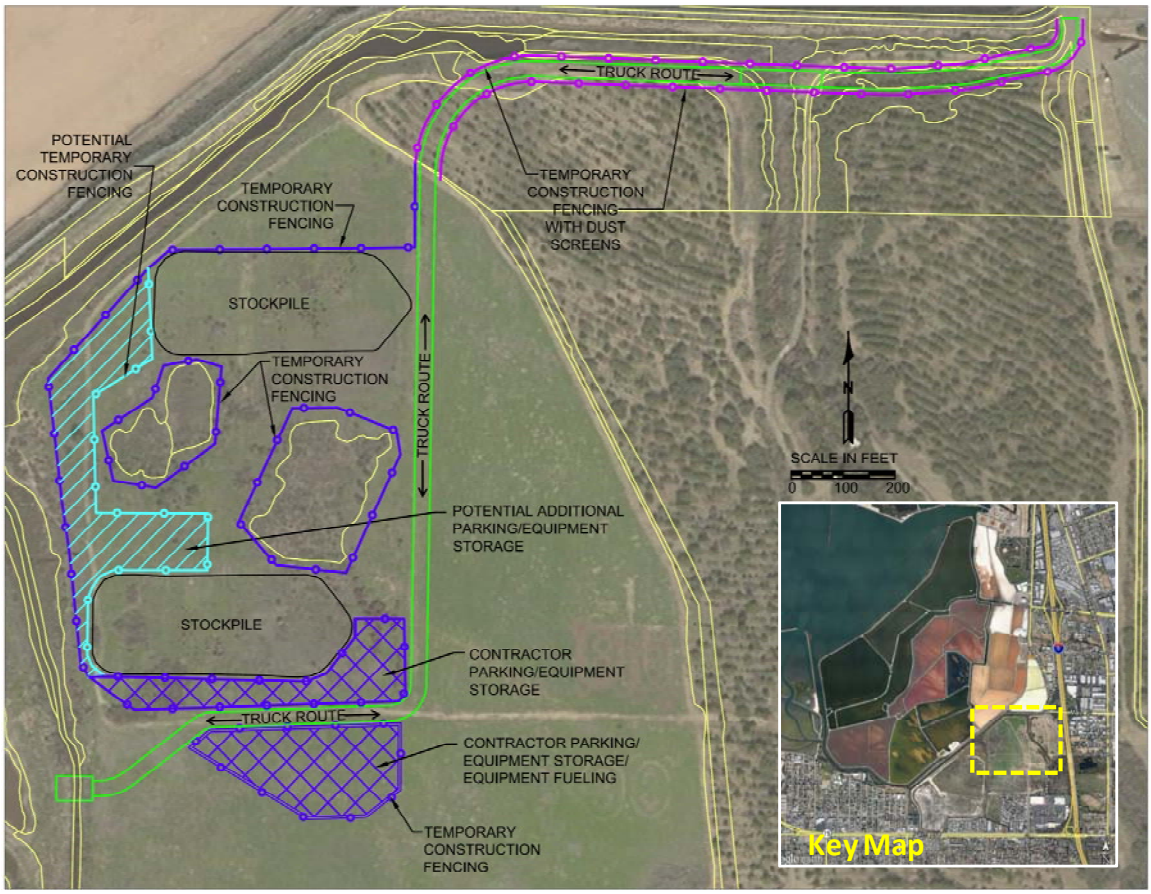


Figure 2. Staging Area Layout

4. EARTHWORK

Earthwork is the major construction activity of the Project. The Project requires the excavation of approximately 320,000 cubic yards (yd^3) of soil (material) within the ORF for the Intertidal Alternative and 370,000 yd^3 for the Subtidal Alternative. Between 50,000 to 60,000 yd^3 of soil would also be excavated from Pond 15. The majority of the soil would be beneficially used as fill and cover within Pond 15 to raise the ground to elevations suitable to support coastal salt marsh habitat and nesting areas. The excavated material would also be disposed of on-site as fill for dikes, levees, and upland habitat creation. The remainder of the material would be stockpiled within the ORF for use on future projects within the Refuge.

The success of wetland restoration depends greatly on the accuracy of the final grading in achieving the desired elevations for different wetland habitats. To meet this requirement, the contractor may decide to use land-based equipment to complete the earthwork under dry conditions or a combination of land-based and water-based equipment to complete the earthwork under wet conditions. Excavated material would be transported to the fill sites by

truck, conveyor belt, pipelines, or a combination of these methods. Bulldozers and loaders might also be used to move material short distances within the ORF.

4.1 Excavation

4.1.1 Land-Based Excavation

If the contractor decides to use land-based equipment to complete the earthwork under dry conditions then it is likely that the work would be done using an approach similar to the one described here. Excavation would most likely be done with land-based equipment for areas above groundwater. Soil within two feet below the groundwater elevation may be wet, but excavation with land-based equipment would likely still be feasible without dewatering. In locations where groundwater is present, dewatering would likely be necessary to conduct work under dry conditions.

Based on the results of soil sampling conducted by Anchor QEA (Anchor QEA 2010), the average groundwater elevation in the ORF is approximately 5 ft above the North American Vertical Datum of 1988 (NAVD88). Therefore, it is likely that water would be ponded in excavated areas below +3 ft, NAVD88. The estimated volume of excavated material below +3 ft, NAVD88 in ORF is 20,000 yd^3 for the Intertidal Alternative and 50,000 yd^3 for the Subtidal Alternative. In Pond 15, the entire area is very low in elevation; therefore, the small volume of material excavated in this pond would be wet.

Land-based excavation would be conducted with a combination of bulldozers, front loaders, backhoes, graders, scrapers, excavators, and trucks. Excavated material would either be loaded directly onto trucks and conveyor belts or it would be stockpiled temporarily near the excavation site. The stockpiled material would then be loaded onto trucks for hauling to the placement sites (Pond 15 and Pond 22/23 dike).

If excavation is conducted using land-based equipment below +3 ft, NAVD88, dewatering may be necessary. Dewatering may be achieved by blocking off the excavation site and then pumping water out of the excavation site. Alternatively, wet material may be excavated by a long-reach excavator and then dewatered on site before being hauled to the placement sites.

4.1.2 Combination of Land-Based and Water-Based Excavation

If the contractor decides to use a combination of land-based and water-based equipment to complete the earthwork under wet conditions then it is likely that the work would be done using an approach similar to the one described here. The contractor would use land-based equipment to excavate material from ORF in matter as described in Section 4.1.1. Material excavated from the ORF would be dumped into a pit and mixed with water taken from the

Otay River to form a slurry. The slurry would then be pumped to Pond 15 via a pipeline. The pit would be hydraulically isolated from the Otay River until project completion at which time it would be opened and connected to the Otay River to restore tidal exchange to the restored area. To minimize impacts to water quality in San Diego Bay, a two-way pipeline system would be installed between the ORF and Pond 15 to convey slurried material to Pond 15 while bringing water back to the ORF for subsequent use. Water would occasionally be pumped from the Otay River to supplement water lost to groundwater and evaporation during operations.

4.2 Material Transport and Placement

Material placement involves the transportation of excavated material to the final placement sites. The Project calls for most of the excavated material from ORF (approximately 260,000 yd^3 for the Intertidal Alternative and 310,000 yd^3 for the Subtidal Alternative) to be transported to Pond 15, with only a small volume (approximately 20,000 yd^3) to be used on-site in the ORF for levee construction and upland restoration. About 30,000 yd^3 to 40,000 yd^3 would be stockpiled in the ORF to the east of Nestor Creek for future USFWS Refuge projects. The stockpiled material would be watered during construction to mitigate for dust generation. Upon completion of project construction, suitable and appropriate upland vegetation would be planted to control wind and water-related erosion until the stockpile material is reused for future USFWS Refuge projects.

Approximately 50,000 yd^3 to 60,000 yd^3 would be excavated from Pond 15. Based on soil sampling and testing, the majority of this material is expected to be free of contaminants; however, it is anticipated that a small portion of soil (<5,000 yd^3) in the vicinity of the dike that would be breached would contain elevated levels of heavy metals. This contaminated material would be buried inside Pond 15 under clean fill from the ORF such that the contaminants would not be available to ecological receptors (*e.g.,* capped under fill material). Excavated material would be disposed of using some combination of scrapers, trucks, bulldozers, loaders, graders, conveyor belts, or pipelines.

If dump trucks are used to transport material from the ORF to Pond 15 then a system of haul roads and access points would need to be established and maintained. A few possible hauling configurations are discussed in Section 4.2.1. Dry material would be loaded onto trucks using front loaders or backhoes or it would be excavated and hauled directly using scrapers. Wet material would be dried and then transported via trucks equipped with a lining to retain water that remains in the soil. Bulldozers may be used to move excavated material to stockpile areas, which may be necessary for drying or staging before being transported by truck. Bulldozers may also be used to move material to on-site upland area or for berm construction.

Conveyor belts may be used to move excavated material within the ORF, part of the distance between the ORF and Pond 15, or all the way from the ORF to Pond 15. Within the ORF, conveyor belts could be used to transport material from the excavation area to the stockpile area. A conveyor belt system could be used to move excavated material across the Otay River and Bayshore Bikeway. Once across (under) the Bayshore Bikeway, and within the Salt Pond Complex, the conveyor belt would transport material to Pond 15.

4.3 Haul Methods and Routes to Pond 15

Three methods for moving excavated material from the ORF to Pond 15 were identified for consideration in evaluating potential environmental impacts. The three methods are described below.

- Truck
- Conveyor Belt
- Pipeline

These three methods represent a range that would likely be considered by a contractor given the site conditions, quantity of material, construction schedule, and likely mitigation measures to minimize environmental impacts. The three methods are described in more detail below.

4.3.1 Truck

Under this method, the contractor would use dump trucks to transport material from the ORF to Pond 15. The most likely truck haul route is shown in Figure 3. The truck route in the vicinity of Pond 15 is shown in Figure 4. Temporary crossings would be necessary for the trucks to cross Nestor Creek, Otay River and Palomar Creek (near Pond 15). These temporary structures are described at the end of this section.

Truck traffic on this route would interfere with the Bayshore Bikeway and City of San Diego bike path where the trucks exit the ORF onto West Frontage Road. Traffic flow at this intersection would be maintained by a flagman in order to ensure public safety. From West Frontage Road, the trucks would turn onto Anita Street and then to Bay Boulevard. The trucks would enter the Salt Ponds Complex via the USFWS easement located just north of the Salt Works operational facility off Bay Boulevard. The dikes within the salt ponds that would be used by construction traffic would be improved and widened to 30 feet to allow for two-way traffic, an exception is the dike around Pond 15 where one-way traffic in a loop can be established. The dike improvements would likely require the placement of small amounts of fill into the ponds. Any such fill would be removed upon the completion of construction activities thus returning the ponded area to pre-project conditions. The round trip distance of the truck route shown in Figure 3 is about 5 miles. A round trip, including loading and

dumping, would likely take about 36 minutes. Assuming a bulking factor of 1.3 due to volume expansion after material is removed from the ground, a contractor using 12-yd^3 trucks would have to make about 28,000 trips and 34,000 round trips, respectively, for the Intertidal Alternative and Subtidal Alternative.



Image: Google Earth Pro

Figure 3. Truck Haul Routes

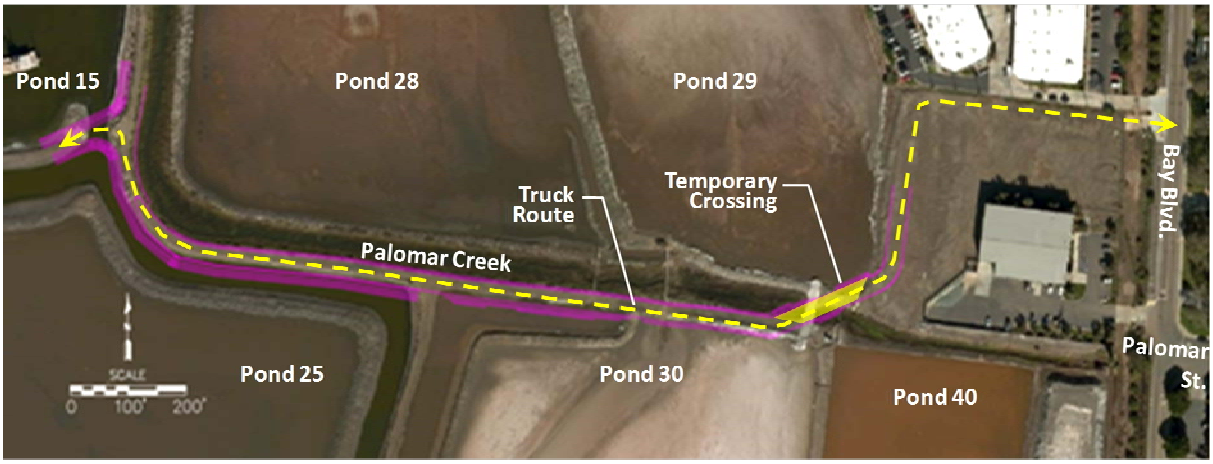


Figure 4. Truck Route to Pond 15

Temporary Crossings for the Truck Route

Nestor Creek Temporary Crossing: In order to access the western portion of the Otay River Floodplain Site from the staging and stockpiling areas east of Nestor Creek, the contractor would have to install a temporary crossing across Nestor Creek. The temporary structure would likely be a bridge structure or a culvert that could maintain a hydraulic connection to Nestor Creek. This crossing would be removed at the completion of the project and the area would be restored to the existing condition.

Otay River Temporary Crossing: To access the western portion of the Otay River Floodplain Site from the staging and stockpiling areas east of Nestor Creek, the contractor would install temporary crossings across the Otay River. This crossing would be removed at the completion of construction and restored to their existing condition.

Palomar Creek Temporary Crossing: Trucks and other construction vehicles accessing the Pond 15 Site from Bay Boulevard would enter the site via the property easement east of Pond 29 (Figure 3). At the southern east corner of Pond 29, the vehicles would cross the Palomar Creek and then travel along the levee on the southern bank of the Palomar Creek towards Pond 15. The temporary crossing would be constructed of fill material. The flow of Palomar Creek would be maintained by installing culverts at the bottom of the temporary crossing. This crossing would be removed at the completion of the project and the area would be restored to the existing condition. The flow of brine between salt ponds would be maintained by installing open channels or pipes across Palomar Creek.

4.3.2 Conveyor Belt

Under this method, the contractor would use a system of conveyor belts to transport material from ORF to Pond 15. Two possible routes are shown in Figure 5 and the length would be approximately 1.5 miles. The conveyor belt would be installed over the Otay River and under the existing eastern Bayshore Bikeway crossing. After crossing the Otay River and Bayshore Bikeway, the conveyor belt would continue northward using the existing dikes for support. One end of the conveyor belt would be near the ORP excavation site and the other end would end either directly into Pond 15 or into awaiting trucks in Pond 15, which would move the material a short distance within the pond.

4.3.3 Pipeline

Under this method, the contractor would use a pipeline to hydraulically transport material from ORF to Pond 15. Two possible pipeline routes are shown in Figure 6. The pipeline would be installed over the Otay River and under the existing eastern Bayshore Bikeway crossing. After crossing the Otay River and Bayshore Bikeway, the pipeline would continue northward. One option of the pipeline route considers using the existing dikes for support, while the other option assumes a more direct path, with some sections floating on the salt ponds. One end of the pipeline would be located in a pit within the ORP excavation site and the other end would end directly into Pond 15. The pipeline would be approximately 1.1 to 1.5 miles in length depending on whether the pipeline remains on the dikes or if it takes a more direct route across (floating) the salt ponds.



Image: Google Earth Pro

Figure 5. Conveyor Belt Haul Routes



Image: Google Earth Pro

Figure 6. Pipeline Haul Routes

4.3.4 Material Placement in Pond 15

If the ORF excavated material is transported to Pond 15 via dump truck or conveyor belt then it would be dried before being hauled from the ORF. In order to place this dry material effectively, Pond 15 would be dewatered prior to material placement. Dewatering of Pond 15 would be one of the first tasks the contractor would complete during construction. This would be done by first modifying the dikes within and around Ponds 12, 13, and 14 (see Figure 1 for pond locations) to bypass the brine water around Pond 15 to the rest of the active salt-producing salt ponds. Next, the dikes around Pond 15 would be modified to hydraulically isolate Pond 15 from the rest of the salt pond system. At that point, the isolated brine water remaining in Pond 15 would be pumped into the active salt-producing salt ponds. Pond 15 is about 87 acres in area with an average water depth of about 5 feet so the volume of water in Pond 15 is estimated to be about 140 million gallons. Pumping this volume of water into the active salt-producing salt ponds would take about a month using several heavy duty water pumps. After the initial pumping to drain Pond 15, dewatering would continue during construction in order to keep the placement area relatively dry.

When Pond 15 is dewatered and ready for receiving fill material, material brought to Pond 15 by trucks or conveyor belts would be placed in the pond. Distribution of material would be carried out with land-based equipment, such as bulldozers, scrapers, and/or long-reach backhoes. To avoid sinking in the wet and soft sediment in the pond, the bulldozers would initially push and spread the ORF fill material outward into the pond from the dikes. The newly formed fill area extending from the dike would provide the working area for the trucks and bulldozers to reach farther into the pond.

If the ORF excavated material is transported to Pond 15 via pipeline then it would arrive at Pond 15 as a slurry mixture of water and soil. Pond 15 would be dewatered prior to material placement as described above. When Pond 15 is dewatered and ready for receiving fill material, material brought to Pond 15 by pipeline would be pumped into the pond. The material would be distributed throughout the pond by periodic relocation of the dredge pipeline discharge location. It is anticipated that it would take a relatively long period of time for the material to achieve a level of consolidation that would allow the safe use of land-based equipment. Consequently, once all the material from the ORF has been pumped to Pond 15 the material would be left in place until final consolidation has been achieved, which is currently estimated at one to five years. After final consolidation has been achieved construction equipment would be mobilized to the site to complete final grading within Pond 15.

4.4 Final Grading and Other Earthwork

Final grading would be conducted in the ORF to achieve final elevations in the excavated area. When the excavation reaches the approximate finished ground elevations, land-based equipment would be used to grade the site to the designed contours and slope variations. Final grading would also be conducted in Pond 15 to achieve final elevations in the fill area. When the fill reaches the approximate finished ground elevations, land-based or amphibious construction equipment would be used to grade the site to the designed contours and slope variations.

The restoration construction would include removal of the southern levee of the Otay River within the Project site, restoration of upland habitat, construction of a new levee along the southern border of the restored wetland, and modification of the Pond 22/23 dike. There would be several levee modifications (levee fill or breach) in Ponds 13 and 14 necessary to rechannelize the flow of brine after Pond 15 is decommissioned. These construction activities would be conducted with land-based equipment. At this time, it is assumed that suitable fill material for the levee construction, upland restoration, and dike modification would be available on-site via project excavation. If suitable material is not available on site then such material would be imported to the project site. Suitable material would be compacted to a density recommended by the project geotechnical engineer.

4.5 Pond 15 Ocean Inlet/Outlet

Breaching of the levee at Pond 15 will be done after all earthwork within Pond 15 is completed, except for a fill area in Pond 15 near the proposed inlet/outlet that can be reserved to receive the cut material from the levee breach. Excavation would likely be conducted from west progressing to east using land-based equipment such as a long-reach backhoe situated on the top of the levee on the east side of the proposed inlet/outlet. This construction may be completed with about 45 equipment hours using a 2 to 3-cy capacity bucket with an average yield of 200 cy per hour.

The excavation of the levee breach may create temporary water turbidity similar to the levee breach construction for the San Diego Bay Western Salt Pond Restoration Project completed in 2011. During the Western Salt Pond Restoration construction, an analysis of the breaching was conducted before it was implemented to determine if such breaching would likely result in substantial erosion of material and associated transport into San Diego Bay to assess potential impacts to turbidity. The results indicated that the impact would be minor and there were no reported problems when the levees were breached for that project. To minimize sediment plumes entering San Diego Bay, the levee breach should be excavated only when turbidity levels are within 20% of ambient conditions. If necessary, the contractor

could install a silt curtain across the breach to minimize the short-term (< 24 hours) distribution of fine-grained material and associated turbidity.

5. CONSTRUCTION TIMING, PHASING, AND EQUIPMENT

The timing and phasing of the various construction activities are important considerations in project planning. Dewatering of Pond 15 would be a critical path task that would be started right after the brine water bypassing of Pond 15. Other mobilization and staging area construction would follow. The access/truck routes would be strengthened and widened as necessary and conveyor belts would be installed, if applicable. The site would be cleared and grubbed to begin excavation. Excavation and disposal of excavated materials would occur simultaneously; otherwise excavated material would be stockpiled while waiting for transport to the fill area. Planting would begin upon completion of earthwork within the ORF and Pond 15. The final step would be to open the restored areas to tidal exchange and demobilize the remaining construction equipment and material from the site.

The existing levee along the southern bank of the Otay River helps to keep tidal and fluvial water from entering the excavation site. In order to maintain a water barrier between the Project site and Otay River during excavation, the existing levee would remain in place until excavation is complete. To maintain flood protection, a new levee along the southern edge of the restored wetland would be constructed prior to removing the existing levee along the southern bank of the Otay River. In addition, there would be several operations maintained throughout most of the construction period, including Pond 15 dewatering, access/haul road resurfacing, bike and pedestrian safety, pollution control, and dust abatement.

The contractor would follow local jurisdiction time restrictions for construction equipment operation. It is anticipated that construction would take place Monday through Friday from 7 a.m. to 6 p.m. Work may or may not occur on holidays, depending on the contractor and local jurisdiction restrictions. In addition, construction activities would be scheduled around the bird nesting season, which generally runs from February 15 to September 30. The construction windows for specific site locations would be determined by the U.S. Fish and Wildlife Refuge Manager during final Project design. In addition, the construction window schedule may change during construction depending on actual nesting activities at the time of construction. For the purpose of assessing environmental impacts, a preliminary construction schedule was developed for the Project based on the assumptions and information above. The schedule, presented in Table 1, is based on hauling the excavated material to Pond 15 via truck and/or conveyor belt. If the contractor opts to slurry the material and use a pipeline to transport the material from the ORF to Pond 15 then an additional one to five years would be needed to complete the construction operation. This is indicated by the last two lines in Table 1 that show the final grading operation in Pond 15 that would occur in any one year between 2020 and 2024 starting in the month of September and running through the month of December.

Table 1. Preliminary Construction Schedule

ACTIVITY	START DATE	FINISH DATE	DURATION
Mobilization	8/1/2017	9/30/2017	2 months
Earthwork	10/1/2017	1/31/2018	4 months
Shut Down*	2/1/2018	2/28/2018	1 month
Core Nesting Season	3/1/2018	7/31/2018	5 months
Remobilization*	8/1/2018	8/31/2018	1 month
Earthwork	9/1/2018	12/31/2018	4 months
Demobilization	1/1/2019	2/28/2019	2 months
Pond 15 Grading (Early Estimate)+	9/1/2020	12/31/2020	4 months
Pond 15 Grading (Late Estimate)+	9/1/2024	12/31/2024	4 months

** Denotes periods when field activities may occur in specifically delineated areas. Delineation of operations zones is dependent on variation of wildlife community and individual species or species groups' activities in a given season. Areas of avoidance will be determined on a case by case basis by the U.S. Fish and Wildlife Refuge Manager.*

+Pond 15 grading shown for the slurry option to indicate grading operations in Pond 15 that would be conducted after consolidation of placed slurried material.

The type of equipment used to construct the Project and the number of various pieces of equipment would ultimately be determined by the contractor during construction. A preliminary list of construction equipment was developed to provide the information needed to evaluate potential environmental impacts. The type and number of major construction equipment used to construct the Project are presented in the table below. The type of fuel for each type of construction equipment is also provided to allow evaluation of impacts to air quality and greenhouse gas emissions. If the pipeline option is used to haul material from the ORF to Pond 15 then additional equipment would be needed to conduct final grading operations in Pond 15 after enough consolidation has occurred to allow construction equipment to operate in the area. It is anticipated that up to four bulldozers, four loaders, and four scrapers would be needed during the four-month final grading operation that would occur between 2020 and 2024.

Table 2. Construction Equipment Summary

EQUIPMENT	FUEL TYPE	EQUIPMENT QUANTITY		
		TRUCK HAUL	CONVEYOR BELT HAUL	PIPELINE HAUL
Backhoe	Diesel	4	4	4
Loader	Diesel	4	4	4
Scraper	Diesel	4	4	4
Bulldozer	Diesel	4	4	4
Dump Truck	Diesel	28	4	4
Conveyor Belt	Electric	None	1.5 to 2.0 miles	None
Pipeline	Electric	None	None	1.1 to 1.5 miles

6. SITE PROTECTION AND EROSION CONTROL

6.1 Environmental Protection

The contractor would be required to comply with National Pollutant Discharge Elimination System (NPDES) stormwater permit conditions as well as other local, state, and federal permit/approval requirements. A stormwater pollution prevention plan (SWPPP) would be prepared and implemented by the contractor to achieve NPDES permit compliance. The contractor would identify and implement best management practices (BMPs) to protect water quality, air quality, and sensitive biological/wildlife resources as well as to reduce construction related noise.

As discussed in the previous section, construction activities would be scheduled around the bird nesting season. The construction windows for specific site locations as well as the noise and pollution restrictions of the construction equipment would be assessed and determined in the EIS and implemented by the U.S. Fish and Wildlife Refuge Manager during final Project design.

6.2 Protection of Existing Facilities and Infrastructure

The Bayshore Bikeway runs along the northern bank of the Otay River outside the Project site. Transport of excavated material to the salt ponds through the use of a temporary bridge would likely interfere with bikeway users. The extent and types of interruption to the Bayshore Bikeway would be discussed with local authorities during the final design phase

such that best management practices and safety measures are developed prior to construction and then implemented during construction.

Utilities have been identified along the extension of Saturn Boulevard east of the ORF, including overhead electric lines and poles, high pressure gas line, sewers, and storm drains. A few manholes were also found east of Saturn Boulevard. These utilities would not need to be relocated, but the contractor would need to maintain and protect them during construction.

The operation of the Salt Works may be impacted by the conveyor belt operation and truck traffic. Coordination with the Salt Works operators should occur during the final design and construction phases. The removal of water from Pond 15 would also require the cooperation of the Salt Works operators. The Salt Pond dikes would be used for access by construction vehicles and/or conveyors transporting and disposing material to the Salt Ponds. These dikes would need to be improved and maintained during construction. When construction is complete, the dikes would be restored to preconstruction conditions.

7. REFERENCE

Anchor QEA, 2010. *Otay River Restoration Screening Assessment Report*. Prepared for Poseidon Resources.

APPENDIX F1

Sediment Characterization
Sampling and Analysis Report



SEDIMENT CHARACTERIZATION SAMPLING AND ANALYSIS REPORT SOUTH SAN DIEGO SALT PONDS 12, 13, 14, AND 15

Prepared for

Poseidon Water, LLC

5780 Fleet Street, Suite 140

Carlsbad, California 92008

Prepared by

Anchor QEA, LLC

27201 Puerta Real, Suite 350

Mission Viejo, California 92691

Revised August 2017

SEDIMENT CHARACTERIZATION SAMPLING AND ANALYSIS REPORT SOUTH SAN DIEGO SALT PONDS 12, 13, 14, AND 15

Prepared for

Poseidon Water, LLC
5780 Fleet Street, Suite 140
Carlsbad, California 92008

Prepared by

Anchor QEA, LLC
27201 Puerta Real, Suite 350
Mission Viejo, California 92691

Revised August 2017

(Converted vertical datum from NAV88 to MLLW)

TABLE OF CONTENTS

1 INTRODUCTION 1
1.1 Targeted Restoration Plan 4
1.2 Purpose 4
1.3 Sampling Approach 5
2 METHODS 8
2.1 Sediment Collection and Handling 8
2.2 Physical and Chemical Analyses 10
2.2.1 Quality Assurance/Quality Control 10
3 RESULTS 12
3.1 Sample Collection and Handling 12
3.2 Results of Physical and Chemical Analyses of Sediment 23
3.2.1 Grain Size and Total Organic Carbon 23
3.2.2 Metals 28
3.2.3 Organics 35
3.2.4 Quality Assurance/Quality Control 35
4 REFERENCES 37

List of Tables

Table 1 Sediment Sampling Strategy by Pond 5
Table 2 Station Coordinates, Mudline Elevation, Estimated Penetration, and Retrieved Core Lengths for Each Sediment Core Sample 13
Table 3 Station Coordinates, Mudline Elevation, and Recovery Depth for Each Sediment Grab Sample 14
Table 4 Summary of Samples Collected from Each Sediment Core and Grab Sample 15
Table 5 Results of Physical and Chemical Analyses of Sediment from Salt Ponds 12, 13, 14, and 15 24

List of Figures

Figure 1 Vicinity Map
Figure 2 Study Area
Figure 3 Actual Sediment Sampling Locations
Figure 4 Photograph of Vibracore Sampling from Pontoon Barge
Figure 5 Sediment Samples Exceeding Zeeman 2004 Screening Levels - Arsenic
Figure 6 Sediment Samples Exceeding Zeeman 2004 Screening Levels - Cadmium
Figure 7 Sediment Samples Exceeding Zeeman 2004 Screening Levels - Copper
Figure 8 Sediment Samples Exceeding Zeeman 2004 Screening Levels - Lead
Figure 9 Sediment Samples Exceeding Zeeman 2004 Screening Levels - Mercury
Figure 10 Sediment Samples Exceeding Zeeman 2004 Screening Levels - Nickel

List of Appendices

Appendix A Field Forms and Sampling Photographs
Appendix B Laboratory Reports
Appendix C Data Validation Report

LIST OF ACRONYMS AND ABBREVIATIONS

CalEPA	California Environmental Protection Agency
CCP	Comprehensive Conservation Plan
CHHSL	California Human Health Screening Level
COC	contaminant of concern
EIS	Environmental Impact Statement
ERL	effects range low
ERM	effects range median
kg	kilogram
MDL	method detection limit
mg	milligram
MLLW	mean lower low water
MS	matrix spike
MSD	matrix spike duplicate
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
QA	quality assurance
QC	quality control
RL	reporting limit
RPD	relative percent difference
RSL	Regional Screening Levels
SAP	Sampling and Analysis Plan
SAR	Sampling and Analysis Report
TOC	total organic carbon
USFW	U.S. Fish and Wildlife Service
USEPA	U.S. Environmental Protection Agency

1 INTRODUCTION

In 2006, the U.S. Fish and Wildlife Service (USFWS) completed and published the Comprehensive Conservation Plan (CCP) and Environmental Impact Statement (EIS) for management and restoration of the South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge. The refuge consists of 2,324 acres, including portions of San Diego Bay, more than 1,000 acres of solar salt ponds, and upland and wetland habitats associated with the Otay River Floodplain. Completion of the CCP provided the basis for the USFWS and other partner agencies to implement the South San Diego Bay Salt Pond restoration project. The site is located on the South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge at the south end of San Diego Bay (Figure 1).

The goals of the San Diego Bay National Wildlife Refuge include the following:

- Increase availability of coastal salt marsh habitat to support federally listed endangered and threatened species and various species of migratory birds.
- Enhance and restore other native habitats (such as riparian and upland habitats) in support of native wildlife and plant species diversity.

To attain these goals, several conceptual alternatives for site restoration were presented and evaluated in the CCP and EIS, and a preferred alternative was selected that includes a mix of intertidal and upland habitats.

Poseidon Water, LLC plans to implement part of the preferred alternative in coordination with the USFWS in order to obtain mitigation credits for the Carlsbad seawater desalination project. Restoration is proposed within Salt Ponds 12, 13, 14, and 15. An initial step in the restoration process required sediment sampling and analysis to be conducted within these ponds to characterize the nature and extent of potential contamination in pond sediments. This Sampling and Analysis Report (SAR) summarizes sampling activities and evaluates sediment chemistry results for Salt Ponds 12, 13, 14, and 15 (Figure 2).



AERIAL SOURCE: Bing maps.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83, U.S. Feet.

0 2
Scale in Miles

L:\AutoCAD Project Files_Projects\0648-Poseidon\Otay River Estuary\SAP\0648-RP-001.dwg FIG 1 VIC
Apr 01, 2013 11:26am mpratschner

ANCHOR QEA

Figure 1
Vicinity Map
South San Diego Bay Salt Ponds 12, 13, 14, and 15



L:\AutoCAD Project Files_Projects\0648-Poseidon\Otay River Estuary\SAP\0648-RP-002.dwg FIG 2

Apr 05, 2013 8:34am mpratschner

AERIAL SOURCE: Bing maps.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83, U.S. Feet.

0 1,200
Scale in Feet

ANCHOR QEA

Figure 2
Study Area
South San Diego Bay Salt Ponds 12, 13, 14, and 15

1.1 Targeted Restoration Plan

The proposed restoration plan for the salt ponds was conceived to enhance opportunities for seabird nesting, restore native habitat in the Otay River Floodplain, and restore tidal circulation within the majority of the salt ponds. Levees holding Salt Ponds 12, 13, 14, and 15 will be breached to restore tidal influence to approximately 300 acres of salt ponds. Portions of levees not affected by the breach will be maintained to provide roosting and nesting habitat for various avian species.

As currently envisioned, restoration of Salt Ponds 12, 13, 14, and 15 will include dredging, excavating, recontouring, and/or filling of areas to create avifauna nesting, coastal salt marsh, intertidal mudflat, and shallow subtidal habitats. Sediment removal may be performed within all four ponds and may extend to a depth of -1.6 feet mean lower low water (MLLW), plus 1 foot of allowable overdepth (Everest 2012). As such, this study was designed to characterize this layer.

After recontouring and/or filling are completed, Salt Ponds 12, 13, 14, and 15 will be opened to San Diego Bay by breaching the levee along the Otay River channel or the levee along San Diego Bay.

1.2 Purpose

The objective of this project was to fully characterize the nature and extent of potential contamination in pond sediments to ensure that: 1) restored habitat is high quality and poses no unacceptable contaminant risk to species for which the habitat is intended; and 2) opening the salt ponds to the San Diego Bay will not have an adverse effect on the bay and its inhabitants. The overall sampling approach considered the following:

- Impacts to sediments from on-site and off-site sources
- Risks to aquatic receptors for sediments left intact
- Risks to terrestrial receptors for sediments excavated and used to create upland habitats
- Physical (geotechnical) suitability of pond surface and subsurface sediments for meeting restoration objectives

1.3 Sampling Approach

A broad-based, stratified-random sampling approach was used to characterize the area, similar to the previous sediment characterization of Salt Ponds 10, 10a, and 11 (Everest and Anchor QEA 2009). As described in the Sampling and Analysis Plan (SAP; Anchor QEA 2013), water from the South Bay Power Plant was historically discharged into the northeast corner of Pond 15, indicating a potential source of contamination. Based on this potential point source, an additional station (Station 15-10) was intentionally placed in the northeast corner of Pond 15, as requested by the USFWS.

A total of 31 stations were identified to characterize Salt Ponds 12, 13, 14, and 15. Station density was based on the previous sediment characterization of Salt Ponds 10, 10a, and 11, with approximately one station per 10 acres (Everest and Anchor QEA 2009). As previously described, an additional station was placed within Pond 15, resulting in a slightly higher station density in this pond. Table 1 presents an overview of the sampling density of each pond. Stations were placed following a stratified-random sampling approach, with the exception of Station 15-10. Figure 3 shows the actual sampling locations within each pond.

Table 1
Sediment Sampling Strategy by Pond

Pond Number	Pond Acreage	Number of Sampling Locations	Sample Interval[1]
12	97	10	Sediment surface to -2.6 feet MLLW
13	68	7	Sediment surface to -2.6 feet MLLW
14	42	4	Sediment surface to -2.6 feet MLLW
15	90	10	Sediment surface to -2.6 feet MLLW
Total	**297**	**31**	**-**

Notes:
1 Excavation depth of -1.6 feet MLLW, plus 1 foot of allowable overdepth.

Sediments in Salt Ponds 12, 13, 14, and 15 may be excavated to a depth of -1.6 feet MLLW, plus 1 foot of allowable overdepth (i.e., -2.6 feet MLLW). Sediment cores targeted this layer plus an additional 1 foot beyond this depth (i.e., -3.6 feet MLLW) to allow for the evaluation of the newly exposed surface layer. For each core, sediment from the surface to -2.6 feet

MLLW was submitted for analysis to evaluate sediment that may be disturbed during restoration activities. Each 1-foot interval from the entire sediment core, including the new surface layer, was archived for potential future analysis.



AERIAL SOURCE: Bing maps. Contours from U.S. Fish and Wildlife Service.
HORIZONTAL DATUM: California State Plane, Zone 6, NAD83, U.S. Feet.
VERTICAL DATUM: MLLW.

LEGEND:

- ●#-# Actual Core Sampling Location
- ▲#-# Actual Grab Sampling Location
- Salt Pond Boundary
- 5 Existing Contour

K:\Projects\0648-Poseidon\Otay River Estuary\SAP\0648-RP-004 ACTUAL SAMPLES.dwg FIG 3
Aug 18, 2017 11:48am mpratschner

ANCHOR QEA

Figure 3
Actual Sediment Sampling Locations
South San Diego Bay Salt Ponds 12, 13, 14, and 15

2 METHODS

All methods and procedures for the characterization of sediment from Salt Ponds 12, 13, 14, and 15 were implemented in accordance with the SAP (Anchor QEA 2013).

2.1 Sediment Collection and Handling

Sediment cores were collected at 31 stations within Salt Ponds 12, 13, 14, and 15 using a small electrically powered vibracore fitted with a 3-inch polycarbonate tube. Sampling was performed from a small pontoon barge equipped with a tripod, moonpool, and hand winch for sample collection (Figure 4). The vibracore was deployed and recovered through the moonpool. Sediment cores were collected to a target depth of -3.6 feet MLLW (excavation depth, plus overdepth, plus new surface layer). If station depths were confirmed in the field to be at or below the proposed excavation depth of -1.6 feet MLLW (not including overdepth), surface sediment was collected using a petite Ponar grab sampler and archived for potential analysis. The station was then moved to an alternative randomly selected location above the proposed excavation depth, and a sediment core was collected.

Sediment core samples were processed at a mobile processing station positioned on top of the levees. The physical characteristics of each core were documented on the sediment core collection form and then photographed (Appendix A). For each core, a continuous vertical composite was created by collecting a proportionate volume of sediment from the sediment surface to -2.6 feet MLLW. Each 1-foot interval of the entire length of the sediment core, including the new surface layer, was archived for potential analysis. Samples were temporarily stored in coolers with ice and picked up for analysis by Calscience Environmental Laboratories, Inc., located in Garden Grove, California. Appropriate chain-of-custody procedures were followed. All sample collection, handling, and processing procedures were implemented as described in the SAP (Anchor QEA 2013).



Figure 4
Photograph of Vibracore Sampling from Pontoon Barge
South San Diego Bay Salt Ponds 12, 13, 14 and 15

2.2 Physical and Chemical Analyses

Vertical composite samples from each station were submitted for analysis of total solids, total organic carbon (TOC), grain size, bulk density, trace metals, organochlorine pesticides, polychlorinated biphenyls (PCBs), and polycyclic aromatic hydrocarbons (PAHs). Analytical methods and target method detection limits (MDLs) and reporting limits (RLs) for this evaluation are presented in Table 5 of the SAP (Anchor QEA 2013).

Results of chemical analyses were compared to effects range low (ERL) and effects range median (ERM) sediment quality guidelines and Zeeman risk-based screening levels. Effects range values are helpful in assessing the potential significance of elevated sediment-associated contaminants of concern (COCs) in conjunction with biological testing (Long et al. 1995).[1] Zeeman risk-based screening levels were used to evaluate potential risks to aquatic-dependent wildlife from bioaccumulative COCs. Zeeman risk-based screening levels have been developed for multiple ecological receptors, including benthic invertebrates, benthic vegetation, fish, bottom feeding birds (scoter), consumers of small fish (grebe, tern, and skimmer), consumers of medium size fish (pelican and sea lion), and herbivores (wigeon and turtle; Zeeman 2004). Results were also compared to soil screening criteria, including California Human Health Screening Levels (CHHSLs; CalEPA 2005, 2009) and Regional Screening Levels (RSLs; USEPA 2010) because of the potential for sediments to be beneficially used in the upland environment.

2.2.1 Quality Assurance/Quality Control

All quality assurance/quality control (QA/QC) procedures were implemented in accordance with the SAP (Anchor QEA 2013).

Laboratory QA/QC samples included duplicates, matrix spike (MS) and matrix spike duplicate (MSD) samples, method blanks, and laboratory control samples. Surrogates were

[1] Briefly, these values were developed from a large dataset where results of both benthic organism effects (e.g., toxicity tests and benthic assessments) and chemical concentrations were available for individual samples. To derive these guidelines, chemical values for paired data demonstrating benthic impairment were sorted by ascending chemical concentration. The 10th percentile of this rank order distribution was identified as the ERL and the 50th percentile as the ERM.

included for all organic methods. QC objectives and the frequency of analysis for QA/QC samples are provided in the SAP (Anchor QEA 2013). All laboratory data were reviewed and verified to determine whether QC objectives were met. A U.S. Environmental Protection Agency (USEPA) Stage 2A (2009) data completeness check was performed by Anchor QEA, in accordance with USEPA National Functional Guidelines (2004, 2008).

Field QA/QC samples included duplicates, split samples, and rinsate blanks. Field duplicates and split samples were collected from Stations 12-09 and 15-01. Field duplicates were collected to evaluate the natural variability within the sampling area, while split samples were collected from homogenized sediment to evaluate overall sampling precision. Rinsate blanks were collected from the sample processing equipment (stainless-steel spoon and bowl) and a polycarbonate core tube to assess potential contamination.

3 RESULTS

3.1 Sample Collection and Handling

Sediment cores and surface grabs were collected from January 29 to February 2, 2013. The weather was warm with predominantly clear skies and a light wind. Sediment cores were collected from 31 stations using a vibracore (Figure 3). One core was required from each station to obtain sufficient volume for the required analysis. At two stations (12-09 and 15-01), a duplicate core was collected for QA/QC samples. Sediment cores were collected to -3.6 feet MLLW, or to refusal depth. If refusal was encountered prior to the target sampling depth, the station was moved slightly, and collection was attempted again. After multiple attempts, the longest core was retained for analysis. Refusal was encountered at the majority of stations due to stiff clay or dense sand, which was present in all ponds.

Within Pond 12, all cores were collected to the target depth, with the exception of Station 12-05. This station captured the full excavation depth and overdepth, and a portion (0.5 foot) of the new surface layer. Within Pond 13, refusal was encountered at all stations. After multiple sampling attempts, sediment cores were accepted at less than the target depth at four stations (13-02, 13-03, 13-04, and 13-5). Within Pond 14, all cores were collected to the target depth, with the exception of Station 14-01. Within Pond 15, refusal was encountered at all stations. Stations within the southern portion of Pond 15 (15-01 to 15-05) were collected to the target depth, while stations in the northern portion of Pond 15 (15-06 to 15-10) were accepted at less than the target depth after multiple sampling attempts. Station 15-08 captured the full excavation depth and overdepth as well as the majority (0.7 foot) of the new surface layer. Station coordinates, mudline elevation, estimated penetration, and retrieved core lengths for each sediment core are summarized in Table 2.

Mudline elevations of Stations 12-08, 14-03, and 14-04 were below the proposed excavation depth. Surface sediment grab samples were collected and archived, and the stations were moved to alternative randomly selected locations (Stations 12-08A, 14-03A, and 14-04A) above the proposed excavation depth. Station coordinates, mudline elevation, and recovery depths for each sediment grab are summarized in Table 3.

Field logs and sampling photographs are provided in Appendix A. A summary of composite, archive, and QA/QC samples collected from each sediment core and grab sample are presented in Table 4.

Table 2
Station Coordinates, Mudline Elevation, Estimated Penetration, and Retrieved Core Lengths for Each Sediment Core Sample

Station ID	Attempt	Latitude (NAD83) (Degrees, Dec. Minutes)	Longitude (NAD83) (Degrees, Dec. Minutes)	Mudline Elevation (feet MLLW)	Estimated Penetration (feet)	Retrieved Core Length (feet)	Elevation Achieved (feet MLLW)
SSDBSP-12-01	1 of 1	N32° 35.663'	W117° 06.833'	2.8	7.5	7.0	-4.2
SSDBSP-12-02	1 of 1	N32° 35.742'	W117° 06.767'	2.5	7.5	7.0	-4.5
SSDBSP-12-03	1 of 1	N32° 35.809'	W117° 06.638'	2.4	6.2	6.0	-3.6
SSDBSP-12-04	1 of 1	N32° 35.885'	W117° 06.504'	2.4	6.8	6.8	-4.4
SSDBSP-12-05	2 of 2	N32° 35.840'	W117° 06.849'	0.3	5.3	3.5	-3.2
SSDBSP-12-06	1 of 1	N32° 35.908'	W117° 06.682'	1.8	6.0	6.0	-4.2
SSDBSP-12-07	1 of 1	N32° 35.969'	W117° 06.595'	1.6	6.0	6.0	-4.4
SSDBSP-12-08A	2 of 2	N32° 35.944'	W117° 06.798'	1.9	6.7	6.5	-4.6
SSDBSP-12-09	1 of 2	N32° 35.977'	W117° 06.713'	1.6	5.7	5.5	-3.9
SSDBSP-12-09[1]	2 of 2	N32° 35.977'	W117° 06.713'	1.6	5.9	5.8	-4.2
SSDBSP-12-10	1 of 1	N32° 36.082'	W117° 06.631'	0.6	5.4	5.2	-4.6
SSDBSP-13-01	1 of 1	N32° 35.662'	W117° 06.740'	3.2	7.0	7.0	-3.8
SSDBSP-13-02	1 of 1	N32° 35.744'	W117° 06.529'	4.1	6.6	6.3	-2.2
SSDBSP-13-03	4 of 4	N32° 35.821'	W117° 06.436'	3.6	5.6	5.2	-1.6
SSDBSP-13-04	2 of 2	N32° 35.880'	W117° 06.346'	3.8	4.3	4.0	-0.2
SSDBSP-13-05	2 of 2	N32° 35.984'	W117° 06.326'	3.7	4.9	4.6	-0.9
SSDBSP-13-06	1 of 1	N32° 36.140'	W117° 06.340'	0.3	4.8	4.8	-4.5
SSDBSP-13-07	1 of 1	N32° 36.239'	W117° 06.117'	-0.1	4.8	4.5	-4.6
SSDBSP-14-01	2 of 2	N32° 36.010'	W117° 06.461'	2.0	4.6	4.5	-2.5
SSDBSP-14-02	1 of 1	N32° 36.111'	W117° 06.556'	2.3	7.0	6.8	-4.5
SSDBSP-14-03A	1 of 1	N32° 36.164'	W117° 06.404'	2.6	6.5	6.4	-3.8
SSDBSP-14-04A	1 of 1	N32° 36.262'	W117° 06.272'	0.3	5.5	5.5	-5.2
SSDBSP-15-01	1 of 2	N32° 36.372'	W117° 06.231'	-1.4	3.2	3.0	-4.4
SSDBSP-15-01[1]	2 of 2	N32° 36.372'	W117° 06.231'	-1.4	3.5	3.0	-4.4
SSDBSP-15-02	1 of 1	N32° 36.305'	W117° 06.185'	2.7	7.5	7.0	-4.3
SSDBSP-15-03	1 of 1	N32° 36.430'	W117° 06.161'	2.0	6.8	6.0	-4.0

Station ID	Attempt	Latitude (NAD83) (Degrees, Dec. Minutes)	Longitude (NAD83) (Degrees, Dec. Minutes)	Mudline Elevation (feet MLLW)	Estimated Penetration (feet)	Retrieved Core Length (feet)	Elevation Achieved (feet MLLW)
SSDBSP-15-04	1 of 1	N32° 36.335'	W117° 06.048'	2.9	7.7	7.7	-4.8
SSDBSP-15-05	1 of 1	N32° 36.384'	W117° 05.981'	2.8	6.7	6.5	-3.7
SSDBSP-15-06	1 of 3	N32° 36.560'	W117° 06.071'	1.8	1.8	1.5	0.3
SSDBSP-15-07	2 of 2	N32° 36.499'	W117° 05.979'	2.3	4.3	4.0	-1.7
SSDBSP-15-08	2 of 2	N32° 36.638'	W117° 06.059'	0.5	4.0	3.8	-3.3
SSDBSP-15-09	1 of 2	N32° 36.600'	W117° 05.964'	2.5	5.0	5.0	-2.5
SSDBSP-15-10	5 of 5	N32° 36.737'	W117° 05.939'	1.0	2.2	2.0	-1.0

Note:
NAD83 = North American Datum 1983
1 Duplicate core collected from station for QA/QC.

Table 3

Station Coordinates, Mudline Elevation, and Recovery Depth for Each Sediment Grab Sample

Station ID	Attempt	Latitude (NAD83) (Degrees, Dec. Minutes)	Longitude (NAD83) (Degrees, Dec. Minutes)	Mudline Elevation (feet MLLW)	Recovery Depth (cm)
SSDBSP-12-08	2 of 2	N32° 35.960'	W117° 06.879'	-6.7	10.0
SSDBSP-14-03	2 of 2	N32° 36.240'	W117° 06.415'	-1.9	10.0
SSDBSP-14-04	1 of 1	N32° 36.288'	W117° 06.340'	-4.4	10.0

Note:
NAD83 = North American Datum 1983
cm = centimeters

Table 4

Summary of Samples Collected from Each Sediment Core and Grab Sample

Station ID	Sample Description	Sediment Sample ID	Sample Interval (feet)	Chemical and Physical Analyses	Archive	QA/QC Samples
SSDBSP-12-01	Vertical composite to -2.6 feet MLLW	SSDBSP-12-01_0.0-5.4	0.0 to 5.4	X		
	1-foot interval	SSDBSP-12-01_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-12-01_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-12-01_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-12-01_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-12-01_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-12-01_5.0-6.0	5.0 to 6.0		X	
		SSDBSP-12-01_6.0-7.0	6.0 to 7.0		X	
SSDBSP-12-02	Vertical composite to -2.6 feet MLLW	SSDBSP-12-02_0.0-6.1	0.0 to 6.1	X		
	1-foot interval	SSDBSP-12-02_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-12-02_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-12-02_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-12-02_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-12-02_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-12-02_5.0-6.0	5.0 to 6.0		X	
		SSDBSP-12-02_6.0-7.0	6.0 to 7.0		X	
SSDBSP-12-03	Vertical composite to -2.6 feet MLLW	SSDBSP-12-03_0.0-5.0	0.0 to 5.0	X		
	1-foot interval	SSDBSP-12-03_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-12-03_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-12-03_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-12-03_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-12-03_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-12-03_5.0-6.0	5.0 to 6.0		X	

Station ID	Sample Description	Sediment Sample ID	Sample Interval (feet)	Chemical and Physical Analyses	Archive	QA/QC Samples
SSDBSP-12-04	Vertical composite to -2.6 feet MLLW	SSDBSP-12-04_0.0-5.0	0.0 to 5.0	X		MS/MSD
	1-foot interval	SSDBSP-12-04_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-12-04_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-12-04_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-12-04_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-12-04_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-12-04_5.0-6.0	5.0 to 6.0		X	
		SSDBSP-12-04_6.0-6.8	6.0 to 6.8		X	
SSDBSP-12-05	Vertical composite to -2.6 feet MLLW	SSDBSP-12-05_0.0-2.9	0.0 to 2.9	X		
	1-foot interval	SSDBSP-12-05_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-12-05_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-12-05_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-12-05_3.0-3.5	3.0 to 3.5		X	
SSDBSP-12-06	Vertical composite to -2.6 feet MLLW	SSDBSP-12-06_0.0-4.4	0.0 to 4.4	X		
	1-foot interval	SSDBSP-12-06_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-12-06_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-12-06_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-12-06_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-12-06_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-12-06_5.0-6.0	5.0 to 6.0		X	
SSDBSP-12-07	Vertical composite to -2.6 feet MLLW	SSDBSP-12-07_0.0-4.2	0.0 to 4.2	X		
	1-foot interval	SSDBSP-12-07_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-12-07_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-12-07_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-12-07_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-12-07_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-12-07_5.0-6.0	5.0 to 6.0		X	
SSDBSP-12-08	Sediment grab	SSDBSP-12-08_SG	0 to 10 cm		X	

Station ID	Sample Description	Sediment Sample ID	Sample Interval (feet)	Chemical and Physical Analyses	Archive	QA/QC Samples
SSDBSP-12-08A	Vertical composite to -2.6 feet MLLW	SSDBSP-12-08A_0.0-4.5	0.0 to 4.5	X		
	1-foot interval	SSDBSP-12-08A_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-12-08A_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-12-08A_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-12-08A_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-12-08A_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-12-08A_5.0-6.0	5.0 to 6.0		X	
		SSDBSP-12-08A_6.0-6.5	6.0 to 6.5		X	
SSDBSP-12-09	Vertical composite to -2.6 feet MLLW	SSDBSP-12-09_0.0-4.2	0.0 to 4.2	X		
	1-foot interval	SSDBSP-12-09_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-12-09_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-12-09_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-12-09_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-12-09_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-12-09_5.0-5.5	5.0 to 5.5		X	
SSDBSP-12-09	Vertical composite to -2.6 feet MLLW	SSDBSP-12-109_0.0-4.2	0.0 to 4.2	X		FD/FS
	1-foot interval	SSDBSP-12-109_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-12-109_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-12-109_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-12-109_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-12-109_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-12-109_5.0-5.8	5.0 to 5.8		X	
SSDBSP-12-10	Vertical composite to -2.6 feet MLLW	SSDBSP-12-0_0.0-3.2	0.0 to 3.2	X		
	1-foot interval	SSDBSP-12-10_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-12-10_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-12-10_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-12-10_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-12-10_4.0-5.0	4.0 to 5.0		X	

Station ID	Sample Description	Sediment Sample ID	Sample Interval (feet)	Chemical and Physical Analyses	Archive	QA/QC Samples
SSDBSP-13-01	Vertical composite to -2.6 feet MLLW	SSDBSP-13-01_0.0-5.8	0.0 to 5.8	X		
	1-foot interval	SSDBSP-13-01_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-13-01_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-13-01_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-13-01_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-13-01_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-13-01_5.0-6.0	5.0 to 6.0		X	
		SSDBSP-13-01_6.0-7.0	6.0 to 7.0		X	
SSDBSP-13-02	Vertical composite to -2.6 feet MLLW	SSDBSP-13-02_0.0-6.3	0.0 to 6.3	X		MS/MSD
	1-foot interval	SSDBSP-13-02_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-13-02_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-13-02_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-13-02_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-13-02_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-13-02_5.0-6.0	5.0 to 6.0		X	
		SSDBSP-13-02_6.0-6.3	6.0 to 6.3		X	
SSDBSP-13-03	Vertical composite to -2.6 feet MLLW	SSDBSP-13-03_0.0-5.2	0.0 to 5.2	X		
	1-foot interval	SSDBSP-13-03_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-13-03_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-13-03_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-13-03_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-13-03_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-13-03_5.0-5.2	5.0 to 5.2		X	
SSDBSP-13-04	Vertical composite to -2.6 feet MLLW	SSDBSP-13-04_0.0-4.0	0.0 to 4.0	X		
	1-foot interval	SSDBSP-13-04_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-13-04_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-13-04_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-13-04_3.0-4.0	3.0 to 4.0		X	

Station ID	Sample Description	Sediment Sample ID	Sample Interval (feet)	Chemical and Physical Analyses	Archive	QA/QC Samples
SSDBSP-13-05	Vertical composite to -2.6 feet MLLW	SSDBSP-13-05_0.0-4.6	0.0 to 4.6	X		
	1-foot interval	SSDBSP-13-05_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-13-05_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-13-05_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-13-05_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-13-05_4.0-4.6	4.0 to 4.6		X	
SSDBSP-13-06	Vertical composite to -2.6 feet MLLW	SSDBSP-13-06_0.0-2.9	0.0 to 2.9	X		
	1-foot interval	SSDBSP-13-06_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-13-06_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-13-06_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-13-06_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-13-06_4.0-4.8	4.0 to 4.8		X	
SSDBSP-13-07	Vertical composite to -2.6 feet MLLW	SSDBSP-13-07_0.0-2.5	0.0 to 2.5	X		
	1-foot interval	SSDBSP-13-07_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-13-07_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-13-07_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-13-07_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-13-07_4.0-4.5	4.0 to 4.5		X	
SSDBSP-14-01	Vertical composite to -2.6 feet MLLW	SSDBSP-14-01_0.0-4.5	0.0 to 4.5	X		
	1-foot interval	SSDBSP-14-01_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-14-01_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-14-01_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-14-01_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-14-01_4.0-4.5	4.0 to 4.5		X	

Station ID	Sample Description	Sediment Sample ID	Sample Interval (feet)	Chemical and Physical Analyses	Archive	QA/QC Samples
SSDBSP-14-02	Vertical composite to -2.6 feet MLLW	SSDBSP-14-02_0.0-4.9	0.0 to 4.9	X		
	1-foot interval	SSDBSP-14-02_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-14-02_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-14-02_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-14-02_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-14-02_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-14-02_5.0-6.0	5.0 to 6.0		X	
		SSDBSP-14-02_6.0-6.8	6.0 to 6.8		X	
SSDBSP-14-03	Sediment grab	SSDBSP-14-03_SG	0 to 10 cm		X	
SSDBSP-14-03A	Vertical composite to -2.6 feet MLLW	SSDBSP-14-03A_0.0-5.2	0.0 to 5.2	X		
	1-foot interval	SSDBSP-14-03A_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-14-03A_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-14-03A_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-14-03A_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-14-03A_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-14-03A_5.0-6.0	5.0 to 6.0		X	
		SSDBSP-14-03A_6.0-6.4	6.0 to 6.4		X	
SSDBSP-14-04	Sediment grab	SSDBSP-14-04_SG	0 to 10 cm		X	
SSDBSP-14-04A	Vertical composite to -2.6 feet MLLW	SSDBSP-14-04A_0.0-2.9	0.0 to 2.9	X		
	1-foot interval	SSDBSP-14-04A_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-14-04A_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-14-04A_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-14-04A_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-14-04A_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-14-04A_5.0-5.5	5.0 to 5.5		X	
SSDBSP-15-01	Vertical composite to -2.6 feet MLLW	SSDBSP-15-01_0.0-1.2	0.0 to 1.2	X		FD/FS
	1-foot interval	SSDBSP-15-01_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-15-01_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-15-01_2.0-3.0	2.0 to 3.0		X	

Station ID	Sample Description	Sediment Sample ID	Sample Interval (feet)	Chemical and Physical Analyses	Archive	QA/QC Samples
SSDBSP-15-02	Vertical composite to -2.6 feet MLLW	SSDBSP-15-02_0.0-5.3	0.0 to 5.3	X		
	1-foot interval	SSDBSP-15-02_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-15-02_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-15-02_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-15-02_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-15-02_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-15-02_5.0-6.0	5.0 to 6.0		X	
		SSDBSP-15-02_6.0-7.0	6.0 to 7.0		X	
SSDBSP-15-03	Vertical composite to -2.6 feet MLLW	SSDBSP-15-03_0.0-4.6	0.0 to 4.6	X		
	1-foot interval	SSDBSP-15-03_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-15-03_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-15-03_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-15-03_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-15-03_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-15-03_5.0-6.0	5.0 to 6.0		X	
SSDBSP-15-04	Vertical composite to -2.6 feet MLLW	SSDBSP-15-04_0.0-5.5	0.0 to 5.5	X		
	1-foot interval	SSDBSP-15-04_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-15-04_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-15-04_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-15-04_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-15-04_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-15-04_5.0-6.0	5.0 to 6.0		X	
		SSDBSP-15-04_6.0-7.0	6.0 to 7.0		X	
		SSDBSP-15-04_7.0-7.7	7.0 to 7.7		X	

Station ID	Sample Description	Sediment Sample ID	Sample Interval (feet)	Chemical and Physical Analyses	Archive	QA/QC Samples
SSDBSP-15-05	Vertical composite to -2.6 feet MLLW	SSDBSP-15-05_0.0-5.4	0.0 to 5.4	X		
	1-foot interval	SSDBSP-15-05_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-15-05_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-15-05_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-15-05_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-15-05_4.0-5.0	4.0 to 5.0		X	
		SSDBSP-15-05_5.0-6.0	5.0 to 6.0		X	
		SSDBSP-15-05_6.0-6.5	6.0 to 6.5		X	
SSDBSP-15-06	Vertical composite to -2.6 feet MLLW	SSDBSP-15-06_0.0-1.5	0.0 to 1.5	X		
	1-foot interval	SSDBSP-15-06_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-15-06_1.0-1.5	1.0 to 1.5		X	
SSDBSP-15-07	Vertical composite to -2.6 feet MLLW	SSDBSP-15-07_0.0-4.0	0.0 to 4.0	X		MS/MSD
	1-foot interval	SSDBSP-15-07_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-15-07_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-15-07_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-15-07_3.0-3.5	3.0 to 3.5		X	
		SSDBSP-15-07_3.5-4.0	3.5 to 4.0		X	
SSDBSP-15-08	Vertical composite to -2.6 feet MLLW	SSDBSP-15-08_0.0-3.1	0.0 to 3.1	X		
	1-foot interval	SSDBSP-15-08_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-15-08_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-15-08_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-15-08_3.0-3.8	3.0 to 3.8		X	
SSDBSP-15-09	Vertical composite to -2.6 feet MLLW	SSDBSP-15-09_0.0-5.0	0.0 to 5.0	X		
	1-foot interval	SSDBSP-15-09_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-15-09_1.0-2.0	1.0 to 2.0		X	
		SSDBSP-15-09_2.0-3.0	2.0 to 3.0		X	
		SSDBSP-15-09_3.0-4.0	3.0 to 4.0		X	
		SSDBSP-15-09_4.0-5.0	4.0 to 5.0		X	

Station ID	Sample Description	Sediment Sample ID	Sample Interval (feet)	Chemical and Physical Analyses	Archive	QA/QC Samples
SSDBSP-15-10	Vertical composite to -2.6 feet MLLW	SSDBSP-15-10_0.0-2.0	0.0 to 2.0	X		
	1-foot interval	SSDBSP-15-10_0.0-1.0	0.0 to 1.0		X	
		SSDBSP-15-10_1.0-2.0	1.0 to 2.0		X	

Notes:
FD = Field duplicate
FS = Field split

3.2 Results of Physical and Chemical Analyses of Sediment

Results of physical and chemical analyses of sediment from Salt Ponds 12, 13, 14, and 15 are presented in Table 5. All results are expressed in dry weight unless otherwise indicated. Results were compared to ERL and ERM sediment quality guidelines (Long et al. 1995), the minimum Zeeman risk-based screening level (2004), and CHHSL (CalEPA 2005, 2009) and RSL (USEPA 2010) soil screening criteria. Samples exceeding the minimum Zeeman screening level were further compared to the other risk-based screening levels in subsequent figures. Target MDLs and RLs were provided in the SAP (Anchor QEA 2013). Actual MDLs and RLs, and raw data for the analyses, are provided in Appendix B.

3.2.1 Grain Size and Total Organic Carbon

Salt pond sediments were predominantly fine-grained materials, consisting of 78.9 to 100 percent fines (silt and clay). TOC concentrations ranged from 0.53 to 6.5 percent. The highest TOC concentration was measured at Station 15-01.

Table 5
Results of Physical and Chemical Analyses of Sediment from Salt Ponds 12, 13, 14, and 15

Parameter	ERL	ERM	Residential CHHSL	Commercial/ Industrial CHHSL	Residential RSL	Industrial RSL	Zeeman 2004 (minimum)	Salt Pond 12											Salt Pond 13				
								SSDBSP-12-01_0.0-5.4	SSDBSP-12-02_0.0-6.1	SSDBSP-12-03_0.0-5.0	SSDBSP-12-04_0.0-5.0	SSDBSP-12-05_0.0-2.9	SSDBSP-12-06_0.0-4.4	SSDBSP-12-07_0.0-4.2	SSDBSP-12-08A_0.0-4.5	SSDBSP-12-09_0.0-4.2	SSDBSP-12-109_0.0-4.2 (Field Duplicate)	SSDBSP-12-209_0.0-4.2 (Field Split)	SSDBSP-12-10_0.0-3.2	SSDBSP-13-01_0.0-5.8	SSDBSP-13-02_0.0-6.3	SSDBSP-13-03_0.0-5.2	SSDBSP-13-04_0.0-4.0	SSDBSP-13-05_0.0-4.6
								2/2/2013	2/2/2013	2/2/2013	2/2/2013	2/2/2013	2/2/2013	2/1/2013	2/2/2013	2/1/2013	2/1/2013	2/1/2013	2/2/2013	2/1/2013	2/1/2013	2/1/2013	2/1/2013	2/1/2013
Conventional Parameters (%)																								
Total organic carbon								1.2	1.5	1.1	1	0.81	1.2	1.5	0.72	1.2	1.5	1.2	1.7	0.72	0.97	1.4	1.4	0.98
Total solids								65	55.6	63.3	66	65.8	62.5	65.4	65.2	55.4	61.4	56.7	49.8	64.3	64.7	54.9	57.3	66.6
Clay (less than 0.00391mm)								38.38	46.88	46.48	41.26	49.22	47.21	36.81	44.16	26.5	36.12	29.12	39.69	21.77	32.2	30.07	32.28	29.49
Coarse Sand (0.5 to 1mm)								< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fine Sand (0.125 to 0.25mm)								< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	3.6	< 0.01	0.79	0.01	8.8	< 0.01	4.42	< 0.01	0.51
Gravel (greater than 2mm)								0.4	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Medium Sand (0.25 to 0.5mm)								< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01	2.56	< 0.01	2.11	< 0.01	< 0.01
Silt (0.00391 to 0.0625mm)								60.95	53.12	53.48	55.93	50.77	52.79	56.52	55.83	61.61	60.92	62.55	54.72	57.12	64.67	59.02	64.53	65.51
Total Silt and Clay (0 to 0.0625mm)								99.33	100	99.96	97.19	100	100	93.34	100	88.11	97.04	91.67	94.41	78.89	96.87	89.1	96.81	95
Very Coarse Sand (1 to 2mm)								< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Very Fine Sand (0.0625 to 0.125mm)								0.27	< 0.01	0.04	2.81	< 0.01	< 0.01	6.66	< 0.01	8.28	2.96	7.54	5.58	9.74	3.13	4.37	3.19	4.49
Metals (mg/kg)																								
Arsenic	8.2	70	0.07	0.24	0.39	1.6	7.2	5.36	6.01	5.24	4.12	4.18	5.07	4.92	5.18	6.07	5.94	6.15	4.98	5.1	5.22	8.85	9.7	5.47
Cadmium	1.2	9.6	1.7	7.5	70	800	0.43	0.173	0.208	0.151 J	0.136 J	0.143 J	0.183	0.189	0.152 J	0.223	0.182	0.26	0.202	0.154 J	0.219	0.25	0.237	0.19
Chromium	81	370					52	19.3	19.4	16.9	12.9	13.2	17.9	17	15	20.7	19.4	20.9	17.5	17.3	21.5	30.7	25.9	18.3
Copper	34	270	3000	38000	3100	41000	19	13.2	20.1	14.3	11.8	12.4	15	13.7	12.5	18.5	15.8	18.2	17	11.8	16	20.6	19.4	12.8
Lead	46.7	218	80	320	400	800	1.03	4.8	7.75	6.09	4.37	6.21	5.64	4.54	4.72	6.65	5.71	6.99	8.37	4.28	5.23	7.56	7.51	4.75
Mercury	0.15	0.71	18	180	5.6	34	0.05	0.0223 J	0.0615	0.0342	0.0319	0.0558	0.05	0.0261 J	0.0324	0.0361 J	0.0543	0.0245 J	0.0536	< 0.0092	< 0.0091	< 0.0107	< 0.0103	< 0.0088
Nickel	20.9	51.6	1600	16000			16	7.41	9.31	7.64	5.52	6.33	7.52	7.12	6.55	8.86	8.14	9.25	8.95	6.27	8.69	11.8	10.6	6.77
Selenium			380	4800	390	5100	2.5	0.171	0.245	0.327	0.234	0.185	0.169	0.255	< 0.112	0.179 J	0.211	0.42	0.406	< 0.114	0.26	0.3	0.177	< 0.11
Silver	1	3.7	380	4800	390	5100	0.73	< 0.0482	< 0.0563	< 0.0494	< 0.0474	< 0.0476	< 0.0501	< 0.0479	< 0.048	0.0705 J	< 0.051	0.0824 J	< 0.0628	< 0.0487	0.0528 J	0.0755 J	0.0687 J	0.0608 J
Zinc	150	410	23000	100000	23000	310000	124	47.1	76.7	46	36.5	40.1	45.3	45.1	41.2	60	48.7	56.5	47.7	41.8	49	67.1	60.3	42.3
Pesticides (µg/kg)																								
2,4'-DDD			2300	9000	2000	7200		< 0.52	< 0.61	< 0.54	< 0.51	< 0.51	< 0.54	< 0.52	< 0.52	< 0.61	< 0.55	< 0.6	< 0.68	< 0.53	< 0.52	< 0.62	< 0.59	< 0.51
2,4'-DDE			1600	6300				< 0.47	< 0.55	< 0.48	< 0.46	< 0.46	< 0.49	< 0.47	< 0.47	< 0.55	< 0.5	< 0.54	< 0.61	< 0.47	< 0.47	< 0.56	< 0.53	< 0.46
2,4'-DDT			1600	6300	1700	7000		< 0.46	< 0.54	< 0.47	< 0.46	< 0.46	< 0.48	< 0.46	< 0.46	< 0.54	< 0.49	< 0.53	< 0.6	< 0.47	< 0.46	< 0.55	< 0.52	< 0.45
4,4'-DDD	2	20	2300	9000	2000	7200		< 0.49	< 0.57	< 0.5	< 0.48	< 0.48	< 0.51	< 0.48	< 0.48	< 0.57	< 0.51	< 0.56	< 0.63	< 0.49	< 0.49	< 0.58	< 0.55	< 0.47
4,4'-DDE	2.2	27	1600	6300	1400	5100		< 0.46	< 0.54	< 0.47	< 0.45	< 0.45	< 0.48	< 0.46	< 0.46	< 0.54	< 0.49	< 0.53	< 0.6	< 0.47	< 0.46	< 0.54	< 0.52	< 0.45
4,4'-DDT	1	7	1600	6300	1700	7000		< 0.51	< 0.6	< 0.53	< 0.51	< 0.51	< 0.54	< 0.51	< 0.51	< 0.6	< 0.54	< 0.59	< 0.67	< 0.52	< 0.52	< 0.61	< 0.58	< 0.5
Total DDTs (ND = 0) [1,4]	1.58	46.1						< 0.52	< 0.61	< 0.54	< 0.51	< 0.51	< 0.54	< 0.52	< 0.52	< 0.61	< 0.55	< 0.6	< 0.68	< 0.53	< 0.52	< 0.62	< 0.59	< 0.51
Aldrin			33	130	29	100		< 0.48	< 0.57	< 0.5	< 0.48	< 0.48	< 0.5	< 0.48	< 0.48	< 0.57	< 0.51	< 0.56	< 0.63	< 0.49	< 0.49	< 0.57	< 0.55	< 0.47
Alpha Chlordane								< 0.49	< 0.58	< 0.51	< 0.49	< 0.49	< 0.51	< 0.49	< 0.49	< 0.58	< 0.52	< 0.57	< 0.64	< 0.5	< 0.5	< 0.58	< 0.56	< 0.48
alpha-BHC								< 0.5	< 0.58	< 0.51	< 0.49	< 0.49	< 0.52	< 0.5	< 0.5	< 0.58	< 0.53	< 0.57	< 0.65	< 0.5	< 0.5	< 0.59	< 0.57	< 0.49
beta-BHC								< 0.41	< 0.48	< 0.42	< 0.4	< 0.4	< 0.42	< 0.4	< 0.41	< 0.48	< 0.43	< 0.47	< 0.53	< 0.41	< 0.41	< 0.48	< 0.46	< 0.4
Chlordane								< 5	< 5.9	< 5.2	< 4.9	< 5	< 5.2	< 5	< 5	< 5.9	< 5.3	< 5.8	< 6.6	< 5.1	< 5	< 6	< 5.7	< 4.9
Cis-nonachlor								< 0.45	< 0.53	< 0.46	< 0.44	< 0.45	< 0.47	< 0.45	< 0.45	< 0.53	< 0.48	< 0.52	< 0.59	< 0.46	< 0.45	< 0.53	< 0.51	< 0.44
delta-BHC								< 0.39	< 0.46	< 0.4	< 0.39	< 0.39	< 0.41	< 0.39	< 0.39	< 0.46	< 0.42	< 0.45	< 0.51	< 0.4	< 0.4	< 0.47	< 0.45	< 0.38
Dieldrin	0.02	8	35	130	30	110		< 0.51	< 0.59	< 0.52	< 0.5	< 0.5	< 0.53	< 0.5	< 0.51	< 0.6	< 0.54	< 0.58	0.72 J	< 0.51	0.79 J	< 0.6	< 0.58	< 0.5
Endosulfan sulfate					370000	3700000		< 0.52	< 0.61	< 0.53	< 0.51	< 0.51	< 0.54	< 0.52	< 0.52	< 0.61	< 0.55	< 0.6	< 0.68	< 0.53	< 0.52	< 0.62	< 0.59	< 0.51
Endosulfan-alpha (I)								< 0.4	< 0.47	< 0.41	< 0.4	< 0.4	< 0.42	< 0.4	< 0.4	< 0.47	< 0.43	< 0.46	< 0.53	< 0.41	< 0.41	< 0.48	< 0.46	< 0.39
Endosulfan-beta (II)								< 0.43	< 0.5	< 0.44	< 0.42	< 0.42	< 0.45	< 0.43	< 0.43	< 0.5	< 0.46	< 0.49	< 0.56	< 0.43	< 0.43	< 0.51	< 0.49	< 0.42
Endrin			21000	230000	18000	180000		< 0.55	< 0.64	< 0.57	< 0.54	< 0.54	< 0.57	< 0.55	< 0.55	< 0.65	< 0.58	< 0.63	< 0.72	< 0.56	< 0.55	< 0.65	< 0.63	< 0.54
Endrin aldehyde								< 0.38	< 0.44	< 0.39	< 0.37	< 0.37	< 0.39	< 0.37	< 0.37	< 0.44	< 0.4	< 0.43	< 0.49	< 0.38	< 0.38	< 0.44	< 0.43	< 0.37
Endrin ketone								< 0.53	< 0.62	< 0.55	< 0.53	< 0.53	< 0.56	< 0.53	< 0.53	< 0.63	< 0.57	< 0.61	< 0.7	< 0.54	< 0.54	< 0.63	< 0.61	< 0.52
Gamma Chlordane								< 0.49	< 0.57	< 0.5	< 0.48	< 0.48	< 0.51	< 0.49	< 0.49	< 0.57	< 0.52	< 0.56	< 0.64	< 0.49	< 0.49	< 0.58	< 0.55	< 0.48
gamma-BHC (Lindane)			500	2000				< 0.53	< 0.62	< 0.55	< 0.52	< 0.53	< 0.55	< 0.53	< 0.53	< 0.62	< 0.56	< 0.61	< 0.7	< 0.54	< 0.54	< 0.63	< 0.6	< 0.52
Heptachlor			130	520	110	380		< 0.49	< 0.58	< 0.51	< 0.49	< 0.49	< 0.51	< 0.49	< 0.49	< 0.58	< 0.52	< 0.57	< 0.65	< 0.5	< 0.5	< 0.59	< 0.56	< 0.48
Heptachlor epoxide					53	190		< 0.55	< 0.64	< 0.56	< 0.54	< 0.54	< 0.57	< 0.54	< 0.55	< 0.64	< 0.58	< 0.63	< 0.71	< 0.55	< 0.55	< 0.65	< 0.62	< 0.53
Methoxychlor			340000	3800000	310000	3100000		< 0.5	< 0.58	< 0.51	< 0.49	< 0.49	< 0.52	< 0.5	< 0.5	< 0.59	< 0.53	< 0.57	< 0.65	< 0.5	< 0.5	< 0.59	< 0.57	< 0.49
Oxychlordane								< 0.43	< 0.51	< 0.44	< 0.43	< 0.43	< 0.45	< 0.43	< 0.43	< 0.51	< 0.46	< 0.5	< 0.56	< 0.44	< 0.43	< 0.51	< 0.49	< 0.42
Total Chlordanes (ND = 0) [1,3]	0.5	6	430	1700	1600	6500		< 0.49	< 0.58	< 0.51	< 0.49	< 0.49	< 0.51	< 0.49	< 0.49	< 0.58	< 0.52	< 0.57	< 0.64	< 0.5	< 0.5	< 0.58	< 0.56	< 0.48
Toxaphene			460	1800	440	1600		< 9.7	< 11	< 10	< 9.6	< 9.6	< 10	< 9.7	< 9.7	< 11	< 10	< 11	< 13	< 9.9	< 9.8	< 12	< 11	< 9.5
Trans-nonachlor								< 0.44	< 0.52	< 0.45	< 0.44	< 0.44	< 0.46	< 0.44	< 0.44	< 0.52	< 0.47	< 0.51	< 0.58	< 0.45	< 0.45	< 0.52	< 0.5	< 0.43
PAH (µg/kg)																								
1-Methylnaphthalene					22000	99000		< 3.1	< 3.6	< 3.2	< 3	< 3	< 3.2	< 3.1	< 3.1	< 3.6	< 3.3	< 3.5	< 4	< 3.1	< 3.1	< 3.6	< 3.5	< 3
2-Methylnaphthalene	70	670			310000	4100000		< 2.8	< 3.2	< 2.9	< 2.7	< 2.7	< 2.9	< 2.8	< 2.8	< 3.3	< 2.9	< 3.2	< 3.6	< 2.8	< 2.8	< 3.3	< 3.1	< 2.7
Acenaphthene	16	500			3400000	33000000		< 2.8	< 3.2	< 2.8	< 2.7	< 2.7	< 2.9	< 2.8	< 2.8	< 3.2	< 2.9	< 3.2	< 3.6	< 2.8	< 2.8	< 3.3	< 3.1	< 2.7
Acenaphthylene	44	640						< 2.3	< 2.7	< 2.4	< 2.3	< 2.3	< 2.4	< 2.3	< 2.3	< 2.7	< 2.5	< 2.7	< 3	< 2.4	< 2.3	< 2.8	< 2.6	< 2.3
Anthracene	85.3	1100			17000000	1.70E+08		< 1.2	< 1.4	< 1.3	< 1.2	< 1.2	< 1.3	< 1.2	< 1.2	< 1.5	< 1.3	< 1.4	< 1.6	< 1.3	< 1.2	< 1.5	< 1.4	< 1.2
Benzo (a) Anthracene	261	1600			150	2100		< 2.4	< 2.8	< 2.5	< 2.4	< 2.4	< 2.5	< 2.4	< 2.4	10 J	< 2.5	< 2.7	< 3.1	< 2.4	< 2.4	< 2.8	< 2.7	< 2.3
Benzo (a) Pyrene	430	1600	38	130	15	210		< 1.6	< 1.8	< 1.6	< 1.5	1.7 J	< 1.6	< 1.6	< 1.6	19	< 1.7	< 1.8	< 2	< 1.6	< 1.6	< 1.9	< 1.8	< 1.5
Benzo (b) Fluoranthene					150	2100		< 1.6	< 1.8	< 1.6	< 1.5	< 1.5	< 1.6	< 1.6	< 1.6	11 J	< 1.7	< 1.8	< 2	< 1.6	< 1.6	< 1.9	< 1.8	< 1.5
Benzo (e) Pyrene								< 2.3	< 2.7	< 2.4	< 2.3	< 2.3	< 2.4	< 2.3	< 2.3	16 J	< 2.4	< 2.7	< 3	< 2.3	< 2.3	< 2.7	< 2.6	< 2.3
Benzo (g,h,i) Perylene								< 1.5	< 1.7	< 1.5	< 1.4	< 1.4	< 1.5	< 1.4	< 1.4	20	< 1.5	< 1.7	< 1.9	< 1.5	< 1.5	< 1.7	< 1.6	< 1.4
Benzo (k) Fluoranthene					1500	21000		< 2.1	< 2.5	< 2.2	< 2.1	< 2.1	< 2.2	< 2.1	< 2.1	9.1 J	< 2.3	< 2.5	< 2.8	< 2.2	< 2.2	< 2.5	< 2.4	< 2.1
Chrysene	384	2800			15000	210000		< 1.8	< 2.1	< 1.8	< 1.8	< 1.8	< 1.9	< 1.8	< 1.8	10 J	< 1.9	< 2.1	< 2.3	< 1.8	< 1.8	< 2.1	< 2	< 1.8
Dibenz (a,h) Anthracene	63.4	260			15	210		< 1.6	< 1.9	< 1.6	< 1.6	< 1.6	< 1.7	< 1.6	< 1.6	3.3 J	< 1.7	< 1.8	< 2.1	< 1.6	< 1.6	< 1.9	< 1.8	< 1.6
Fluoranthene	600	5100			2300000	22000000		< 1.5	< 1.8	< 1.6	< 1.5	1.9 J	< 1.6	< 1.5	< 1.5	9 J	< 1.6	2.1 J	< 2	< 1.5	< 1.5	< 1.8	< 1.7	< 1.5
Fluorene	19	540			2300000	22000000		< 2.3	< 2.6	< 2.3	< 2.2	< 2.2	< 2.3	< 2.2	< 2.2	< 2.6	< 2.4	< 2.6	< 2.9	< 2.3	< 2.3	< 2.7	< 2.6	< 2.2
Indeno (1,2,3-c,d) Pyrene					150	2100		< 1.6	< 1.9	< 1.7	< 1.6	< 1.6	< 1.7	< 1.6	< 1.6	13 J	< 1.7	< 1.9	< 2.1	< 1.7	< 1.6	< 1.9	< 1.9	< 1.6
Naphthalene	160	2100			3600	18000		< 4.6	< 5.4	< 4.7	< 4.6	< 4.6	< 4.8	< 4.6	< 4.6	< 5.4	< 4.9	16 J	< 6	12 J	< 4.6	< 5.5	< 5.2	< 4.5
Phenanthrene	240	1500						< 1.6	< 1.8	< 1.6	< 1.5	< 1.5	< 1.6	< 1.5	< 1.5	4.6 J	< 1.6	< 1.8	< 2	< 1.6	< 1.6	< 1.8	< 1.8	< 1.5
Pyrene	665	2600			1700000	17000000		< 1.5	3.1 J	< 1.6	3.1 J	3.2 J	< 1.6	< 1.5	< 1.5	15 J	< 1.6	3.6 J	3.9 J	< 1.5	< 1.5	< 1.8	< 1.7	< 1.5
Perylene								< 2.7	< 3.1	< 2.7	< 2.6	< 2.6	< 2.8	< 2.7	< 2.7	7.1 J	< 2.8	< 3.1	< 3.5	< 2.7	< 2.7	< 3.2	< 3	< 2.6
Biphenyl								< 2.1	< 2.5	< 2.2	< 2.1	< 2.1	< 2.2	< 2.1	< 2.1	< 2.5	< 2.3	< 2.4	< 2.8	< 2.2	< 2.1	< 2.5	< 2.4	< 2.1
1-Methylphenanthrene								< 2.5	< 2.9	< 2.6	< 2.5	< 2.5	< 2.6	< 2.5	< 2.5	< 2.9	< 2.6	< 2.9	< 3.3	< 2.5	< 2.5	< 3	< 2.8	< 2.4
2,6-Dimethylnaphthalene								< 2.6	< 3	< 2.6	< 2.5	< 2.5	< 2.7	< 2.5	< 2.5	6.6 J	< 2.7	< 2.9	7.6 J	< 2.6	< 2.6	< 3	< 2.9	< 2.5
1,6,7-Trimethylnaphthalene								< 2.2	< 2.5	< 2.2	< 2.1	< 2.1	< 2.3	< 2.2	< 2.2	< 2.5	< 2.3	< 2.5	< 2.8	< 2.2	< 2.2	< 2.6	< 2.5	< 2.1
Total HMW PAHs (ND = 0) [1,5]	1700	9600						< 2.7	3.1	< 2.7	3.1	6.8	< 2.8	< 2.7	< 2.7	142.5	< 2.8	5.7	3.9	< 2.7	< 2.7	< 3.2	< 3	< 2.6
Total LMW PAHs (ND = 0) [1,6]	552	3160						< 4.6	< 5.4	< 4.7	< 4.6	< 4.6	< 4.8	< 4.6	< 4.6	11.2	< 4.9	16	7.6	12	< 4.6	< 5.5	< 5.2	< 4.5
Total PAHs (ND = 0) [1,7]	4022	44792						< 4.6	3.1	< 4.7	3.1	6.8	< 4.8	< 4.6	< 4.6	153.7	< 4.9	21.7	11.5	12	< 4.6	< 5.5	< 5.2	< 4.5
Total PAHs (ND = 1/2 MDL) [2,7]							1000	< 4.6	32.55	< 4.7	27.95	30.15	< 4.8	< 4.6	< 4.6	168.8	< 4.9	47.3	42.7	36.1	< 4.6	< 5.5	< 5.2	< 4.5
PCB Congeners (µg/kg)																								

Table 5
Results of Physical and Chemical Analyses of Sediment from Salt Ponds 12, 13, 14, and 15

Parameter	ERL	ERM	Residential CHHSL	Commercial/ Industrial CHHSL	Residential RSL	Industrial RSL	Zeeman 2004 (minimum)	Salt Pond 12											Salt Pond 13				
								SSDBSP-12-01_0.0-5.4	SSDBSP-12-02_0.0-6.1	SSDBSP-12-03_0.0-5.0	SSDBSP-12-04_0.0-5.0	SSDBSP-12-05_0.0-2.9	SSDBSP-12-06_0.0-4.4	SSDBSP-12-07_0.0-4.2	SSDBSP-12-08A_0.0-4.5	SSDBSP-12-09_0.0-4.2	SSDBSP-12-109_0.0-4.2 (Field Duplicate)	SSDBSP-12-209_0.0-4.2 (Field Split)	SSDBSP-12-10_0.0-3.2	SSDBSP-13-01_0.0-5.8	SSDBSP-13-02_0.0-6.3	SSDBSP-13-03_0.0-5.2	SSDBSP-13-04_0.0-4.0	SSDBSP-13-05_0.0-4.6
								2/2/2013	2/2/2013	2/2/2013	2/2/2013	2/2/2013	2/2/2013	2/1/2013	2/2/2013	2/1/2013	2/1/2013	2/1/2013	2/2/2013	2/1/2013	2/1/2013	2/1/2013	2/1/2013	2/1/2013
PCB018								< 0.24	< 0.28	< 0.25	< 0.24	< 0.24	< 0.25	< 0.24	< 0.24	< 0.28	< 0.26	< 0.28	< 0.32	< 0.24	< 0.24	< 0.29	< 0.27	< 0.24
PCB028								< 0.15	< 0.18	< 0.16	< 0.15	< 0.15	< 0.16	< 0.15	< 0.15	< 0.18	< 0.16	< 0.18	< 0.2	< 0.15	< 0.15	< 0.18	< 0.17	< 0.15
PCB037								< 0.2	< 0.24	< 0.21	< 0.2	< 0.2	< 0.21	< 0.2	< 0.2	< 0.24	< 0.21	< 0.23	< 0.26	< 0.2	< 0.2	< 0.24	< 0.23	< 0.2
PCB044								< 0.2	< 0.24	< 0.21	< 0.2	< 0.2	< 0.21	< 0.2	< 0.2	< 0.24	< 0.21	< 0.23	< 0.26	< 0.2	< 0.2	< 0.24	< 0.23	< 0.2
PCB049								< 0.18	< 0.21	< 0.19	< 0.18	< 0.18	< 0.19	< 0.18	< 0.18	< 0.21	< 0.19	< 0.21	< 0.24	< 0.18	< 0.18	< 0.21	< 0.21	< 0.18
PCB052								< 0.15	< 0.17	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.17	< 0.16	< 0.17	< 0.19	< 0.15	< 0.15	< 0.18	< 0.17	< 0.15
PCB066								< 0.14	< 0.16	< 0.14	< 0.14	< 0.14	< 0.15	< 0.14	< 0.14	< 0.16	< 0.15	< 0.16	< 0.18	< 0.14	< 0.14	< 0.17	< 0.16	< 0.14
PCB070								< 0.13	< 0.15	< 0.13	< 0.12	< 0.12	< 0.13	< 0.13	< 0.13	< 0.15	< 0.13	< 0.14	< 0.16	< 0.13	< 0.13	< 0.15	< 0.14	< 0.12
PCB074								< 0.15	< 0.17	< 0.15	< 0.14	< 0.14	< 0.15	< 0.14	< 0.14	< 0.17	< 0.15	< 0.17	< 0.19	< 0.15	< 0.15	< 0.17	< 0.16	< 0.14
PCB077								< 0.15	< 0.18	< 0.15	< 0.15	< 0.15	< 0.16	< 0.15	< 0.15	< 0.18	< 0.16	< 0.17	< 0.2	< 0.15	< 0.15	< 0.18	< 0.17	< 0.15
PCB081								< 0.19	< 0.22	< 0.19	< 0.19	< 0.19	< 0.2	< 0.19	< 0.19	< 0.22	< 0.2	< 0.22	< 0.25	< 0.19	< 0.19	< 0.22	< 0.21	< 0.18
PCB087								< 0.16	< 0.18	< 0.16	< 0.15	< 0.15	< 0.16	< 0.15	< 0.15	< 0.18	< 0.16	< 0.18	< 0.2	< 0.16	< 0.16	< 0.18	< 0.18	< 0.15
PCB099								< 0.13	< 0.15	< 0.13	< 0.13	< 0.13	< 0.14	< 0.13	< 0.13	< 0.15	< 0.14	< 0.15	< 0.17	< 0.13	< 0.13	< 0.16	< 0.15	< 0.13
PCB101								< 0.12	< 0.15	< 0.13	< 0.12	< 0.12	< 0.13	< 0.12	< 0.12	< 0.15	< 0.13	< 0.14	< 0.16	< 0.13	< 0.13	< 0.15	< 0.14	< 0.12
PCB105					34	110		< 0.16	< 0.19	< 0.17	< 0.16	< 0.16	< 0.17	< 0.16	< 0.16	< 0.19	< 0.17	< 0.18	< 0.21	< 0.16	< 0.16	< 0.19	< 0.18	< 0.16
PCB110								< 0.16	< 0.19	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.19	< 0.17	< 0.18	< 0.21	< 0.16	< 0.16	< 0.19	< 0.18	< 0.15
PCB114					0.68	2.3		< 0.15	< 0.18	< 0.16	< 0.15	< 0.15	< 0.16	< 0.15	< 0.15	< 0.18	< 0.16	< 0.18	< 0.2	< 0.16	< 0.15	< 0.18	< 0.17	< 0.15
PCB118					34	110		< 0.2	< 0.24	< 0.21	< 0.2	< 0.2	< 0.21	< 0.2	< 0.2	< 0.24	< 0.22	< 0.23	< 0.27	< 0.21	< 0.21	< 0.24	< 0.23	< 0.2
PCB119								< 0.13	< 0.16	< 0.14	< 0.13	< 0.13	< 0.14	< 0.13	< 0.13	< 0.16	< 0.14	< 0.15	< 0.17	< 0.13	< 0.13	< 0.16	< 0.15	< 0.13
PCB123					34	110		< 0.13	< 0.16	< 0.14	< 0.13	< 0.13	< 0.14	< 0.13	< 0.13	< 0.16	< 0.14	< 0.15	< 0.18	< 0.14	< 0.13	< 0.16	< 0.15	< 0.13
PCB126					0.034	0.11		< 0.21	< 0.25	< 0.22	< 0.21	< 0.21	< 0.22	< 0.21	< 0.21	< 0.25	< 0.22	< 0.24	< 0.28	< 0.21	< 0.21	< 0.25	< 0.24	< 0.21
PCB128								< 0.16	< 0.18	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.16	< 0.19	< 0.17	< 0.18	< 0.21	< 0.16	< 0.16	< 0.19	< 0.18	< 0.15
PCB138/158								< 0.31	< 0.37	< 0.32	< 0.31	< 0.31	< 0.32	< 0.31	< 0.31	< 0.37	< 0.33	< 0.36	< 0.41	< 0.32	< 0.31	< 0.37	< 0.35	< 0.3
PCB149								< 0.14	< 0.16	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.14	< 0.16	< 0.15	< 0.16	< 0.18	< 0.14	< 0.14	< 0.16	< 0.16	< 0.13
PCB151								< 0.16	< 0.19	< 0.16	< 0.16	< 0.16	< 0.17	< 0.16	< 0.16	< 0.19	< 0.17	< 0.18	< 0.21	< 0.16	< 0.16	< 0.19	< 0.18	< 0.16
PCB153								< 0.16	< 0.19	< 0.16	< 0.16	< 0.16	< 0.17	< 0.16	< 0.16	< 0.19	< 0.17	< 0.18	< 0.21	< 0.16	< 0.16	< 0.19	< 0.18	< 0.16
PCB156					6.8	23		< 0.15	< 0.18	< 0.15	< 0.15	< 0.15	< 0.16	< 0.15	< 0.15	< 0.18	< 0.16	< 0.17	< 0.2	< 0.15	< 0.15	< 0.18	< 0.17	< 0.15
PCB157					6.8	23		< 0.15	< 0.17	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.15	< 0.17	< 0.16	< 0.17	< 0.19	< 0.15	< 0.15	< 0.17	< 0.17	< 0.14
PCB167					340	1100		< 0.15	< 0.18	< 0.16	< 0.15	< 0.15	< 0.16	< 0.15	< 0.15	< 0.18	< 0.16	< 0.18	< 0.2	< 0.16	< 0.15	< 0.18	< 0.17	< 0.15
PCB168								< 0.13	< 0.15	< 0.14	< 0.13	< 0.13	< 0.14	< 0.13	< 0.13	< 0.16	< 0.14	< 0.15	< 0.17	< 0.13	< 0.13	< 0.16	< 0.15	< 0.13
PCB169								< 0.13	< 0.15	< 0.13	< 0.12	< 0.12	< 0.13	< 0.12	< 0.13	< 0.15	< 0.13	< 0.14	< 0.16	< 0.13	< 0.13	< 0.15	< 0.14	< 0.12
PCB170								< 0.14	< 0.17	< 0.15	< 0.14	< 0.14	< 0.15	< 0.14	< 0.14	< 0.17	< 0.15	< 0.16	< 0.19	< 0.14	< 0.14	< 0.17	< 0.16	< 0.14
PCB177								< 0.19	< 0.22	< 0.19	< 0.19	< 0.19	< 0.2	< 0.19	< 0.19	< 0.22	< 0.2	< 0.22	< 0.25	< 0.19	< 0.19	< 0.22	< 0.22	< 0.19
PCB180								< 0.094	< 0.11	< 0.097	< 0.093	< 0.093	< 0.098	< 0.094	< 0.094	< 0.11	< 0.1	< 0.11	< 0.12	< 0.095	< 0.095	< 0.11	< 0.11	< 0.092
PCB183								< 0.17	< 0.2	< 0.18	< 0.17	< 0.17	< 0.18	< 0.17	< 0.17	< 0.2	< 0.18	< 0.2	< 0.22	< 0.17	< 0.17	< 0.2	< 0.19	< 0.17
PCB187								< 0.16	< 0.19	< 0.17	< 0.16	< 0.16	< 0.17	< 0.16	< 0.16	< 0.19	< 0.17	< 0.18	< 0.21	< 0.16	< 0.16	< 0.19	< 0.18	< 0.16
PCB189					34	110		< 0.13	< 0.15	< 0.14	< 0.13	< 0.13	< 0.14	< 0.13	< 0.13	< 0.15	< 0.14	< 0.15	< 0.17	< 0.13	< 0.13	< 0.16	< 0.15	< 0.13
PCB194								< 0.15	< 0.17	< 0.15	< 0.14	< 0.15	< 0.15	< 0.15	< 0.15	< 0.17	< 0.16	< 0.17	< 0.19	< 0.15	< 0.15	< 0.17	< 0.17	< 0.14
PCB201								< 0.088	< 0.1	< 0.09	< 0.086	< 0.087	< 0.091	< 0.087	< 0.087	< 0.1	< 0.093	< 0.1	< 0.11	< 0.089	< 0.088	< 0.1	< 0.099	< 0.086
PCB206								< 0.13	< 0.15	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	< 0.13	< 0.15	< 0.13	< 0.15	< 0.17	< 0.13	< 0.13	< 0.15	< 0.14	< 0.12
Total PCB Congeners (ND = 0) [1,8]	22.7	180	89	300	220	740		< 0.31	< 0.37	< 0.32	< 0.31	< 0.31	< 0.32	< 0.31	< 0.31	< 0.37	< 0.33	< 0.36	< 0.41	< 0.32	< 0.31	< 0.37	< 0.35	< 0.3
Total PCB Congeners (ND = 1/2 MDL) [2,8]							6	< 0.31	< 0.37	< 0.32	< 0.31	< 0.31	< 0.32	< 0.31	< 0.31	< 0.37	< 0.33	< 0.36	< 0.41	< 0.32	< 0.31	< 0.37	< 0.35	< 0.3

Table 5
Results of Physical and Chemical Analyses of Sediment from Salt Ponds 12, 13, 14, and 15

	Pond 13		Salt Pond 14				Salt Pond 15											
Parameter	SSDBSP-13-06_0.0-2.9 1/31/2013	SSDBSP-13-07_0.0-2.5 1/31/2013	SSDBSP-14-01_0.0-4.5 1/31/2013	SSDBSP-14-02_0.0-4.9 1/31/2013	SSDBSP-14-03A_0.0-5.2 1/31/2013	SSDBSP-14-04A_0.0-2.9 1/31/2013	SSDBSP-15-01_0.0-1.2 1/30/2013	SSDBSP-15-101_0.0-1.2 (Field Duplicate) 1/30/2013	SSDBSP-15-201_0.0-1.2 (Field Split) 1/30/2013	SSDBSP-15-02_0.0-5.3 1/30/2013	SSDBSP-15-03_0.0-4.6 1/30/2013	SSDBSP-15-04_0.0-5.5 1/31/2013	SSDBSP-15-05_0.0-5.4 1/31/2013	SSDBSP-15-06_0.0-1.5 1/30/2013	SSDBSP-15-07_0.0-4.0 1/29/2013	SSDBSP-15-08_0.0-3.1 1/29/2013	SSDBSP-15-09_0.0-5.0 1/29/2013	SSDBSP-15-10_0.0-2.0 1/29/2013
Conventional Parameters (%)																		
Total organic carbon	1.9	1.8	0.54	0.53	0.55	3.3	6.5	5.2	6	0.76	0.73	0.58	1.2	1.2	2	3.5	1.8	2.7
Total solids	41.9	46.1	70	72.3	70.8	40.2	31.4	39.2	32.2	68.5	67.2	67.6	53.8	58.1	57.6	64.6	62.5	49.8
Clay (less than 0.00391mm)	27.24	26.36	26.85	23.43	25.91	19.68	21.02	10.2	18.38	22.84	29.29	23.17	32.65	39.47	36.91	33.04	35.77	28.38
Coarse Sand (0.5 to 1mm)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	3.95	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fine Sand (0.125 to 0.25mm)	6.9	4.1	0.06	4.79	2.44	2.79	7.03	13.01	7.79	3.1	< 0.01	1.28	< 0.01	2.8	0.03	0.06	0.02	2.59
Gravel (greater than 2mm)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Medium Sand (0.25 to 0.5mm)	5.12	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	1.71	9.49	0.26	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Silt (0.00391 to 0.0625mm)	54.28	63.44	66.74	59.18	63.96	68.5	62.29	49.54	63.82	62.77	66.92	63.65	64.99	55.92	61.56	62	61.42	65.19
Total Silt and Clay (0 to 0.0625mm)	81.53	89.8	93.59	82.62	89.87	88.18	83.31	59.74	82.19	85.61	96.21	86.83	97.64	95.39	98.47	95.05	97.19	93.57
Very Coarse Sand (1 to 2mm)	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Very Fine Sand (0.0625 to 0.125mm)	6.46	6.09	6.35	12.6	7.69	9.03	7.95	13.81	9.75	11.29	3.79	11.89	2.36	1.81	1.5	4.89	2.78	3.84
Metals (mg/kg)																		
Arsenic	5.21	5.42	3.99	4.2	3.32	4.2	3.14	2.83	3.19	4.39	4.71	3.89	6.05	7.09	5.99	3.77	5.5	4.55
Cadmium	0.313	0.313	0.156	0.13 J	0.128 J	0.394	0.474	0.233 J	0.312	0.198	0.175	0.148	0.378	0.311	0.251	0.192	0.205	0.365
Chromium	22.7	23.2	13.1	11.6	11.8	17.1	17.9	13.1	14.9	16.2	15.1	12.9	25.2	24.2	29.9	18.4	17.7	24
Copper	19.7	20.3	9.94	9.89	8.08	25.2	133	23.5	119	12.8	11.9	9.96	25.6	22.7	23	19.1	18.7	179
Lead	13.2	13.4	3.7	3.66	3.69	12.2	22.7	128	17.4	4.26	4.35	3.43	8.78	9.36	8.53	5.24	5.88	22.1
Mercury	0.0239 J	0.0215 J	< 0.0084	< 0.0081	< 0.0083	0.0458 J	0.0503 J	< 0.015	0.048 J	< 0.0086	0.0103 J	< 0.0087	0.0363 J	0.0416	0.0473	0.0306 J	0.0279 J	0.117
Nickel	11.4	10.7	5.11	4.83	4.29	9.9	34.4	10.2	28.9	6.54	6.07	5.33	11	12.4	13.3	8.71	8.83	26.5
Selenium	0.266	< 0.158	0.141 J	0.155	< 0.103	0.304	0.387	0.207 J	0.342	0.115 J	0.169	0.118 J	0.333	0.253	0.347	0.238	0.324	0.239
Silver	< 0.0747	0.0825 J	< 0.0447	< 0.0433	< 0.0442	0.177 J	0.14 J	< 0.0798	< 0.0972	< 0.0457	< 0.0466	< 0.0463	0.172 J	0.0937 J	0.076 J	0.056 J	0.064 J	0.121 J
Zinc	66.5	62.1	32.7	32.7	29.2	59.3	65.1	53.9	59	40.6	38	32.4	77.2	60.2	66.1	40.5	41.3	68.3
Pesticides (µg/kg)																		
2,4'-DDD	< 0.81	< 0.73	< 0.48	< 0.47	< 0.48	< 0.84	< 1.1	< 0.86	< 1.1	< 0.49	< 0.5	< 0.5	< 0.63	< 0.58	< 0.59	< 0.52	< 0.54	< 0.68
2,4'-DDE	< 0.73	< 0.66	< 0.44	< 0.42	< 0.43	< 0.76	< 0.97	< 0.78	< 0.95	< 0.45	< 0.45	< 0.45	< 0.57	< 0.53	< 0.53	< 0.47	< 0.49	< 0.61
2,4'-DDT	< 0.72	< 0.65	< 0.43	< 0.42	< 0.42	< 0.75	5.2	5.1	5.7	< 0.44	< 0.45	< 0.44	< 0.56	< 0.52	< 0.52	< 0.47	< 0.48	< 0.6
4,4'-DDD	< 0.75	< 0.69	< 0.45	< 0.44	< 0.45	< 0.79	< 1	< 0.81	< 0.98	< 0.46	< 0.47	< 0.47	< 0.59	< 0.54	< 0.55	< 0.49	< 0.51	< 0.63
4,4'-DDE	< 0.71	0.95 J	< 0.43	< 0.41	< 0.42	1 J	5.1	3.9	5.8	< 0.44	< 0.45	< 0.44	< 0.56	< 0.51	< 0.52	< 0.46	< 0.48	0.77 J
4,4'-DDT	< 0.8	< 0.73	< 0.48	< 0.46	< 0.47	< 0.83	< 1.1	< 0.85	< 1	< 0.49	< 0.5	< 0.5	< 0.62	< 0.58	< 0.58	< 0.52	< 0.54	< 0.67
Total DDTs (ND = 0) [1,4]	< 0.81	0.95	< 0.48	< 0.47	< 0.48	1	10.3	9	11.5	< 0.49	< 0.5	< 0.5	< 0.63	< 0.58	< 0.59	< 0.52	< 0.54	0.77
Aldrin	< 0.75	< 0.68	< 0.45	< 0.44	< 0.44	< 0.78	< 1	< 0.8	< 0.98	< 0.46	< 0.47	< 0.47	< 0.58	< 0.54	< 0.55	< 0.49	< 0.5	< 0.63
Alpha Chlordane	< 0.77	< 0.7	< 0.46	< 0.44	< 0.45	< 0.8	< 1	< 0.82	< 1	< 0.47	< 0.48	< 0.47	< 0.6	< 0.55	< 0.56	< 0.5	< 0.51	< 0.64
alpha-BHC	< 0.77	< 0.7	< 0.46	< 0.45	< 0.46	< 0.81	< 1	< 0.83	< 1	< 0.47	< 0.48	< 0.48	< 0.6	< 0.56	< 0.56	< 0.5	< 0.52	< 0.65
beta-BHC	< 0.63	< 0.57	< 0.38	< 0.37	< 0.37	< 0.66	< 0.84	< 0.67	< 0.82	< 0.39	< 0.39	< 0.39	< 0.49	< 0.45	< 0.46	< 0.41	< 0.42	< 0.53
Chlordane	< 7.8	< 7.1	< 4.7	< 4.5	< 4.6	< 8.1	< 10	< 8.3	< 10	< 4.8	< 4.9	< 4.8	< 6.1	< 5.6	< 5.7	< 5.1	< 5.2	< 6.6
Cis-nonachlor	< 0.7	< 0.64	< 0.42	< 0.41	< 0.41	< 0.73	< 0.94	< 0.75	< 0.91	< 0.43	< 0.44	< 0.43	< 0.55	< 0.51	< 0.51	< 0.45	< 0.47	< 0.59
delta-BHC	< 0.61	< 0.56	< 0.37	< 0.35	< 0.36	< 0.64	< 0.81	< 0.65	< 0.79	< 0.37	< 0.38	< 0.38	< 0.48	< 0.44	< 0.44	< 0.4	< 0.41	< 0.51
Dieldrin	< 0.79	1.9 J	< 0.47	< 0.46	< 0.47	2.6	< 1	< 0.84	< 1	< 0.48	< 0.49	< 0.49	< 0.61	< 0.57	< 0.57	< 0.51	< 0.53	< 0.66
Endosulfan sulfate	< 0.81	< 0.73	< 0.48	< 0.47	< 0.48	< 0.84	< 1.1	3.3	< 1	< 0.49	< 0.5	< 0.5	< 0.63	< 0.58	< 0.59	< 0.52	< 0.54	< 0.68
Endosulfan-alpha (I)	< 0.63	< 0.57	< 0.37	< 0.36	< 0.37	< 0.65	< 0.83	< 0.67	< 0.81	< 0.38	< 0.39	< 0.39	< 0.49	< 0.45	< 0.45	< 0.41	< 0.42	< 0.53
Endosulfan-beta (II)	< 0.67	< 0.61	< 0.4	< 0.39	< 0.39	< 0.7	< 0.89	< 0.71	< 0.87	< 0.41	< 0.42	< 0.41	< 0.52	< 0.48	< 0.49	< 0.43	< 0.45	< 0.56
Endrin	< 0.86	< 0.78	< 0.51	< 0.5	< 0.51	< 0.89	< 1.1	< 0.91	< 1.1	< 0.52	< 0.53	< 0.53	< 0.67	< 0.62	< 0.62	< 0.55	< 0.57	< 0.72
Endrin aldehyde	< 0.58	< 0.53	< 0.35	< 0.34	< 0.34	< 0.61	< 0.78	< 0.62	< 0.76	< 0.36	< 0.36	< 0.36	< 0.45	< 0.42	< 0.42	< 0.38	< 0.39	< 0.49
Endrin ketone	< 0.83	< 0.75	< 0.5	< 0.48	< 0.49	< 0.86	< 1.1	< 0.89	< 1.1	< 0.51	< 0.52	< 0.51	< 0.65	< 0.6	< 0.6	< 0.54	< 0.56	< 0.7
Gamma Chlordane	< 0.76	< 0.69	< 0.45	< 0.44	< 0.45	< 0.79	< 1	< 0.81	< 0.99	< 0.46	< 0.47	< 0.47	< 0.59	< 0.55	< 0.55	< 0.49	< 0.51	< 0.64
gamma-BHC (Lindane)	< 0.83	< 0.75	< 0.49	< 0.48	< 0.49	< 0.86	< 1.1	< 0.88	< 1.1	< 0.51	< 0.52	< 0.51	< 0.64	< 0.6	< 0.6	< 0.54	< 0.55	< 0.7
Heptachlor	< 0.77	< 0.7	< 0.46	< 0.44	< 0.45	< 0.8	< 1	< 0.82	< 1	< 0.47	< 0.48	< 0.48	< 0.6	< 0.55	< 0.56	< 0.5	< 0.51	< 0.65
Heptachlor epoxide	< 0.85	< 0.77	< 0.51	< 0.49	< 0.5	< 0.88	< 1.1	< 0.91	< 1.1	< 0.52	< 0.53	< 0.53	< 0.66	< 0.61	< 0.62	< 0.55	< 0.57	< 0.71
Methoxychlor	< 0.77	< 0.7	< 0.46	< 0.45	< 0.46	< 0.81	< 1	< 0.83	< 1	< 0.47	< 0.48	< 0.48	< 0.6	< 0.56	< 0.56	< 0.5	< 0.52	< 0.65
Oxychlordane	< 0.67	< 0.61	< 0.4	< 0.39	< 0.4	< 0.7	< 0.9	< 0.72	< 0.87	< 0.41	< 0.42	< 0.42	< 0.52	< 0.48	< 0.49	< 0.44	< 0.45	< 0.56
Total Chlordanes (ND = 0) [1,3]	< 0.77	< 0.7	< 0.46	< 0.44	< 0.45	< 0.8	< 1	< 0.82	< 1	< 0.47	< 0.48	< 0.47	< 0.6	< 0.55	< 0.56	< 0.5	< 0.51	< 0.64
Toxaphene	< 15	< 14	< 9.1	< 8.8	< 8.9	< 16	< 20	< 16	< 20	< 9.3	< 9.4	< 9.4	< 12	< 11	< 11	< 9.8	< 10	< 13
Trans-nonachlor	< 0.69	< 0.62	< 0.41	< 0.4	< 0.41	< 0.72	< 0.92	< 0.73	< 0.89	< 0.42	< 0.43	< 0.43	< 0.54	< 0.5	< 0.5	< 0.45	< 0.46	< 0.58
PAH (µg/kg)																		
1-Methylnaphthalene	< 4.8	< 4.3	< 2.9	< 2.8	< 2.8	< 5	< 6.4	< 5.1	< 6.2	< 2.9	< 3	< 3	< 3.7	< 3.4	< 3.5	< 3.1	< 3.2	21
2-Methylnaphthalene	< 4.3	< 3.9	< 2.6	< 2.5	< 2.5	< 4.5	7.3 J	< 4.6	< 5.6	< 2.6	< 2.7	< 2.7	< 3.4	< 3.1	< 3.1	< 2.8	< 2.9	34
Acenaphthene	< 4.3	< 3.9	< 2.6	< 2.5	2.7 J	6.3 J	< 5.7	< 4.6	< 5.6	< 2.6	< 2.7	< 2.7	< 3.3	< 3.1	< 3.1	< 2.8	< 2.9	< 3.6
Acenaphthylene	< 3.6	< 3.3	< 2.2	< 2.1	2.4 J	5.9 J	< 4.8	< 3.9	< 4.7	< 2.2	< 2.3	< 2.2	< 2.8	< 2.6	< 2.6	< 2.3	< 2.4	< 3
Anthracene	< 1.9	< 1.7	< 1.2	< 1.1	< 1.1	< 2	< 2.6	< 2.1	< 2.5	< 1.2	< 1.2	< 1.2	< 1.5	< 1.4	< 1.4	< 1.2	< 1.3	< 1.6
Benzo (a) Anthracene	< 3.7	11 J	< 2.2	< 2.2	< 2.2	< 3.9	< 5	< 4	< 4.8	< 2.3	< 2.3	< 2.3	< 2.9	11 J	< 2.7	< 2.4	4 J	3.7 J
Benzo (a) Pyrene	< 2.4	11 J	< 1.5	2.1 J	< 1.4	3.6 J	6.2 J	3 J	4.8 J	1.7 J	2.3 J	< 1.5	4.4 J	11 J	3.5 J	< 1.6	5.1 J	6.1 J
Benzo (b) Fluoranthene	< 2.4	8.5 J	< 1.5	2.6 J	< 1.4	< 2.5	< 3.2	< 2.6	< 3.2	< 1.5	2.1 J	< 1.5	3.6 J	6.6 J	2.9 J	< 1.6	3.9 J	4.5 J
Benzo (e) Pyrene	< 3.6	< 3.3	< 2.1	< 2.1	< 2.1	< 3.7	5.7 J	< 3.8	5.5 J	< 2.2	< 2.2	< 2.2	3.9 J	6.9 J	3.7 J	< 2.3	3.8 J	5.7 J
Benzo (g,h,i) Perylene	< 2.3	8.2 J	< 1.3	2.6 J	< 1.3	4 J	< 3	< 2.4	< 2.9	2.1 J	2.7 J	< 1.4	4.9 J	7.1 J	4.9 J	< 1.5	4.6 J	5.4 J
Benzo (k) Fluoranthene	< 3.3	8.3 J	< 2	< 1.9	< 2	< 3.5	< 4.4	< 3.6	< 4.3	< 2	< 2.1	< 2.1	3.2 J	9.4 J	< 2.4	< 2.2	4.4 J	5.6 J
Chrysene	< 2.8	9.7 J	< 1.7	1.6 J	< 1.6	< 2.9	6.8 J	3.2 J	4.5 J	< 1.7	< 1.7	< 1.7	2.7 J	9.5 J	2.7 J	< 1.8	3.7 J	6.9 J
Dibenz (a,h) Anthracene	< 2.5	< 2.2	< 1.5	< 1.4	< 1.5	< 2.6	< 3.3	< 2.6	< 3.2	< 1.5	< 1.5	< 1.5	< 1.9	< 1.8	< 1.8	< 1.6	< 1.7	< 2.1
Fluoranthene	< 2.3	11 J	< 1.4	2.5 J	< 1.4	4.3 J	7.8 J	4.1 J	7.3 J	2.4 J	2.5 J	1.6 J	5.3 J	13 J	4.1 J	1.7 J	4.4 J	8.6 J
Fluorene	< 3.5	< 3.2	< 2.1	< 2	3 J	8.1 J	5.6 J	< 3.7	4.8 J	< 2.1	< 2.2	< 2.2	3 J	< 2.5	< 2.5	< 2.3	< 2.3	5.7 J
Indeno (1,2,3-c,d) Pyrene	< 2.5	6.8 J	< 1.5	1.6 J	< 1.5	< 2.6	< 3.4	< 2.7	< 3.3	< 1.6	1.6 J	< 1.6	3.3 J	5.2 J	2.8 J	< 1.6	3.3 J	5.1 J
Naphthalene	< 7.2	< 6.5	< 4.3	< 4.2	4.7 J	< 7.5	< 9.6	< 7.7	20 J	< 4.4	< 4.5	< 4.4	< 5.6	9.2 J	< 5.2	< 4.7	7.3 J	22
Phenanthrene	< 2.4	5.2 J	< 1.4	< 1.4	< 1.4	< 2.5	8.8 J	6.1 J	10 J	1.5 J	< 1.5	< 1.5	2.2 J	4.8 J	2.5 J	< 1.6	3.3 J	7.5 J
Pyrene	2.6 J	14 J	1.5 J	4.6 J	6.5 J	16 J	12 J	6.9 J	12 J	3.5 J	4.1 J	2.6 J	16 J	21	6.8 J	2.8 J	7.7 J	14 J
Perylene	< 4.2	< 3.8	< 2.5	3.1 J	< 2.5	< 4.3	< 5.5	< 4.4	< 5.4	4.1 J	< 2.6	< 2.6	< 3.2	3.5 J	< 3	< 2.7	< 2.8	4.1 J
Biphenyl	< 3.3	< 3	< 2	< 1.9	< 2	< 3.4	9.8 J	6.4 J	6.6 J	< 2	< 2.1	< 2.1	< 2.6	< 2.4	< 2.4	< 2.1	< 2.2	13 J
1-Methylphenanthrene	< 3.9	< 3.5	< 2.3	< 2.2	< 2.3	< 4	< 5.2	< 4.1	< 5	< 2.4	< 2.4	< 2.4	< 3	< 2.8	< 2.8	< 2.5	< 2.6	< 3.3
2,6-Dimethylnaphthalene	8.1 J	49	3.7 J	4.6 J	5.4 J	130	540	420	440	11 J	2.5 J	2.9 J	< 3.1	11 J	7.1 J	19	< 2.7	120
1,6,7-Trimethylnaphthalene	< 3.4	< 3.1	< 2	< 1.9	< 2	< 3.5	11 J	< 3.6	5.6 J	< 2.1	< 2.1	< 2.1	< 2.6	< 2.4	< 2.4	< 2.2	< 2.3	9.6 J
Total HMW PAHs (ND = 0) [1,5]	2.6	88.5	1.5	20.7	6.5	27.9	38.5	17.2	34.1	13.8	15.3	4.2	47.3	104.2	31.4	4.5	44.9	69.7
Total LMW PAHs (ND = 0) [1,6]	8.1	54.2	3.7	4.6	18.2	150.3	582.5	432.5	487	12.5	2.5	2.9	5.2	25	9.6	19	10.6	232.8
Total PAHs (ND = 0) [1,7]	10.7	142.7	5.2	25.3	24.7	178.2	621	449.7	521.1	26.3	17.8	7.1	52.5	129.2	41	23.5	55.5	302.5
Total PAHs (ND = 1/2 MDL) [2,7]	48	165.55	27.6	41.4	41.2	207.4	652.05	482.45	549.45	44.95	37.35	29.55	72.3	141.95	60.45	46.95	70.15	309.3
PCB Congeners (µg/kg)																		

Table 5
Results of Physical and Chemical Analyses of Sediment from Salt Ponds 12, 13, 14, and 15

	Pond 13		Salt Pond 14				Salt Pond 15											
Parameter	SSDBSP-13-06_0.0-2.9 1/31/2013	SSDBSP-13-07_0.0-2.5 1/31/2013	SSDBSP-14-01_0.0-4.5 1/31/2013	SSDBSP-14-02_0.0-4.9 1/31/2013	SSDBSP-14-03A_0.0-5.2 1/31/2013	SSDBSP-14-04A_0.0-2.9 1/31/2013	SSDBSP-15-01_0.0-1.2 1/30/2013	SSDBSP-15-101_0.0-1.2 (Field Duplicate) 1/30/2013	SSDBSP-15-201_0.0-1.2 (Field Split) 1/30/2013	SSDBSP-15-02_0.0-5.3 1/30/2013	SSDBSP-15-03_0.0-4.6 1/30/2013	SSDBSP-15-04_0.0-5.5 1/31/2013	SSDBSP-15-05_0.0-5.4 1/31/2013	SSDBSP-15-06_0.0-1.5 1/30/2013	SSDBSP-15-07_0.0-4.0 1/29/2013	SSDBSP-15-08_0.0-3.1 1/29/2013	SSDBSP-15-09_0.0-5.0 1/29/2013	SSDBSP-15-10_0.0-2.0 1/29/2013
PCB018	< 0.38	< 0.34	< 0.22	< 0.22	< 0.22	< 0.39	< 0.5	< 0.4	< 0.49	< 0.23	< 0.23	< 0.23	< 0.29	< 0.27	< 0.27	< 0.24	< 0.25	< 0.32
PCB028	< 0.24	< 0.22	< 0.14	< 0.14	< 0.14	< 0.25	< 0.32	< 0.25	< 0.31	< 0.15	< 0.15	< 0.15	< 0.18	< 0.17	< 0.17	< 0.15	< 0.16	< 0.2
PCB037	< 0.31	< 0.28	< 0.19	< 0.18	< 0.18	< 0.33	< 0.42	< 0.33	< 0.41	< 0.19	< 0.19	< 0.19	< 0.24	< 0.23	< 0.23	< 0.2	< 0.21	< 0.26
PCB044	< 0.31	< 0.29	< 0.19	< 0.18	< 0.19	< 0.33	< 0.42	< 0.34	< 0.41	< 0.19	< 0.2	< 0.19	< 0.24	< 0.23	< 0.23	< 0.2	< 0.21	< 0.26
PCB049	< 0.28	< 0.26	< 0.17	< 0.16	< 0.17	< 0.29	< 0.38	< 0.3	< 0.37	< 0.17	< 0.18	< 0.17	< 0.22	< 0.2	< 0.2	< 0.18	< 0.19	< 0.24
PCB052	< 0.23	< 0.21	< 0.14	< 0.13	< 0.14	< 0.24	< 0.31	< 0.25	< 0.3	< 0.14	< 0.14	< 0.14	< 0.18	< 0.17	< 0.17	< 0.15	< 0.15	< 0.19
PCB066	< 0.22	< 0.2	< 0.13	< 0.13	< 0.13	< 0.23	< 0.29	< 0.23	< 0.28	< 0.13	< 0.14	< 0.14	< 0.17	< 0.16	< 0.16	< 0.14	< 0.15	< 0.18
PCB070	< 0.2	< 0.18	< 0.12	< 0.11	< 0.12	< 0.2	< 0.26	< 0.21	< 0.25	< 0.12	< 0.12	< 0.12	< 0.15	< 0.14	< 0.14	< 0.13	< 0.13	< 0.16
PCB074	< 0.23	< 0.2	< 0.13	< 0.13	< 0.13	< 0.24	< 0.3	< 0.24	< 0.29	< 0.14	< 0.14	< 0.14	< 0.18	< 0.16	< 0.16	< 0.15	< 0.15	< 0.19
PCB077	< 0.23	< 0.21	< 0.14	< 0.13	< 0.14	< 0.24	< 0.31	< 0.25	< 0.3	< 0.14	< 0.15	< 0.14	< 0.18	< 0.17	< 0.17	< 0.15	< 0.16	< 0.2
PCB081	< 0.29	< 0.27	< 0.17	< 0.17	< 0.17	< 0.3	< 0.39	< 0.31	< 0.38	< 0.18	< 0.18	< 0.18	< 0.23	< 0.21	< 0.21	< 0.19	< 0.2	< 0.25
PCB087	< 0.24	< 0.22	< 0.14	< 0.14	< 0.14	< 0.25	< 0.32	< 0.26	< 0.31	< 0.15	< 0.15	< 0.15	< 0.19	< 0.17	< 0.18	< 0.16	< 0.16	< 0.2
PCB099	< 0.2	< 0.18	< 0.12	< 0.12	< 0.12	< 0.21	< 0.27	< 0.22	< 0.26	< 0.12	< 0.13	< 0.13	< 0.16	< 0.15	< 0.15	< 0.13	< 0.14	< 0.17
PCB101	< 0.19	< 0.18	< 0.12	< 0.11	< 0.11	< 0.2	< 0.26	< 0.21	< 0.25	< 0.12	< 0.12	< 0.12	< 0.15	< 0.14	< 0.14	< 0.13	< 0.13	< 0.16
PCB105	< 0.25	< 0.23	< 0.15	< 0.15	< 0.15	< 0.26	< 0.33	< 0.27	< 0.33	< 0.15	< 0.16	< 0.16	< 0.19	< 0.18	< 0.18	< 0.16	< 0.17	< 0.21
PCB110	< 0.25	< 0.22	< 0.15	< 0.14	< 0.15	< 0.26	< 0.33	< 0.26	< 0.32	< 0.15	< 0.15	< 0.15	< 0.19	< 0.18	< 0.18	< 0.16	< 0.16	< 0.21
PCB114	< 0.24	< 0.22	< 0.14	< 0.14	< 0.14	< 0.25	< 0.32	< 0.25	< 0.31	< 0.15	< 0.15	< 0.15	< 0.19	< 0.17	< 0.17	< 0.15	< 0.16	< 0.2
PCB118	< 0.32	< 0.29	< 0.19	< 0.18	< 0.19	< 0.33	< 0.42	< 0.34	< 0.41	< 0.19	< 0.2	< 0.2	< 0.25	< 0.23	< 0.23	< 0.21	< 0.21	< 0.27
PCB119	< 0.21	< 0.19	< 0.12	< 0.12	< 0.12	< 0.22	< 0.28	< 0.22	< 0.27	< 0.13	< 0.13	< 0.13	< 0.16	< 0.15	< 0.15	< 0.13	< 0.14	< 0.17
PCB123	< 0.21	< 0.19	< 0.12	< 0.12	< 0.12	< 0.22	< 0.28	< 0.22	< 0.27	< 0.13	< 0.13	< 0.13	< 0.16	< 0.15	< 0.15	< 0.14	< 0.14	< 0.18
PCB126	< 0.33	< 0.3	< 0.2	< 0.19	< 0.2	< 0.34	< 0.44	< 0.35	< 0.43	< 0.2	< 0.21	< 0.2	< 0.26	< 0.24	< 0.24	< 0.21	< 0.22	< 0.28
PCB128	< 0.24	< 0.22	< 0.15	< 0.14	< 0.14	< 0.26	< 0.33	< 0.26	< 0.32	< 0.15	< 0.15	< 0.15	< 0.19	< 0.18	< 0.18	< 0.16	< 0.16	< 0.21
PCB138/158	< 0.48	< 0.44	< 0.29	< 0.28	< 0.29	< 0.5	< 0.65	< 0.52	< 0.63	< 0.3	< 0.3	< 0.3	< 0.38	< 0.35	< 0.35	< 0.31	< 0.32	< 0.41
PCB149	< 0.21	< 0.19	< 0.13	< 0.12	< 0.13	< 0.22	< 0.28	< 0.23	< 0.28	< 0.13	< 0.13	< 0.13	< 0.17	< 0.15	< 0.16	< 0.14	< 0.14	< 0.18
PCB151	< 0.25	< 0.22	< 0.15	< 0.14	< 0.15	< 0.26	< 0.33	< 0.26	< 0.32	< 0.15	< 0.15	< 0.15	< 0.19	< 0.18	< 0.18	< 0.16	< 0.17	< 0.21
PCB153	< 0.25	< 0.23	< 0.15	< 0.14	< 0.15	< 0.26	< 0.33	< 0.27	< 0.32	< 0.15	< 0.15	< 0.15	< 0.19	< 0.18	< 0.18	< 0.16	< 0.17	< 0.21
PCB156	< 0.23	< 0.21	< 0.14	< 0.14	< 0.14	< 0.24	< 0.31	< 0.25	< 0.3	< 0.14	< 0.15	< 0.14	< 0.18	< 0.17	< 0.17	< 0.15	< 0.16	< 0.2
PCB157	< 0.23	< 0.21	< 0.14	< 0.13	< 0.14	< 0.24	< 0.31	< 0.24	< 0.3	< 0.14	< 0.14	< 0.14	< 0.18	< 0.16	< 0.17	< 0.15	< 0.15	< 0.19
PCB167	< 0.24	< 0.22	< 0.14	< 0.14	< 0.14	< 0.25	< 0.32	< 0.25	< 0.31	< 0.15	< 0.15	< 0.15	< 0.19	< 0.17	< 0.17	< 0.15	< 0.16	< 0.2
PCB168	< 0.21	< 0.19	< 0.12	< 0.12	< 0.12	< 0.21	< 0.27	< 0.22	< 0.27	< 0.13	< 0.13	< 0.13	< 0.16	< 0.15	< 0.15	< 0.13	< 0.14	< 0.17
PCB169	< 0.19	< 0.18	< 0.12	< 0.11	< 0.12	< 0.2	< 0.26	< 0.21	< 0.25	< 0.12	< 0.12	< 0.12	< 0.15	< 0.14	< 0.14	< 0.13	< 0.13	< 0.16
PCB170	< 0.22	< 0.2	< 0.13	< 0.13	< 0.13	< 0.23	< 0.29	< 0.24	< 0.29	< 0.14	< 0.14	< 0.14	< 0.17	< 0.16	< 0.16	< 0.14	< 0.15	< 0.19
PCB177	< 0.29	< 0.27	< 0.18	< 0.17	< 0.17	< 0.31	< 0.39	< 0.31	< 0.38	< 0.18	< 0.18	< 0.18	< 0.23	< 0.21	< 0.21	< 0.19	< 0.2	< 0.25
PCB180	< 0.15	< 0.13	< 0.087	< 0.085	< 0.086	< 0.15	< 0.19	< 0.16	< 0.19	< 0.089	< 0.091	< 0.09	< 0.11	< 0.11	< 0.11	< 0.095	< 0.098	< 0.12
PCB183	< 0.27	< 0.24	< 0.16	< 0.15	< 0.16	< 0.28	< 0.36	< 0.28	< 0.35	< 0.16	< 0.17	< 0.16	< 0.21	< 0.19	< 0.19	< 0.17	< 0.18	< 0.22
PCB187	< 0.25	< 0.23	< 0.15	< 0.14	< 0.15	< 0.26	< 0.33	< 0.27	< 0.33	< 0.15	< 0.16	< 0.15	< 0.19	< 0.18	< 0.18	< 0.16	< 0.17	< 0.21
PCB189	< 0.2	< 0.19	< 0.12	< 0.12	< 0.12	< 0.21	< 0.27	< 0.22	< 0.27	< 0.12	< 0.13	< 0.13	< 0.16	< 0.15	< 0.15	< 0.13	< 0.14	< 0.17
PCB194	< 0.23	< 0.21	< 0.14	< 0.13	< 0.13	< 0.24	< 0.3	< 0.24	< 0.3	< 0.14	< 0.14	< 0.14	< 0.18	< 0.16	< 0.17	< 0.15	< 0.15	< 0.19
PCB201	< 0.14	< 0.12	< 0.081	< 0.079	< 0.08	< 0.14	< 0.18	< 0.15	< 0.18	< 0.083	< 0.085	< 0.084	< 0.11	< 0.098	< 0.099	< 0.088	< 0.091	< 0.11
PCB206	< 0.2	< 0.18	< 0.12	< 0.11	< 0.12	< 0.21	< 0.26	< 0.21	< 0.26	< 0.12	< 0.12	< 0.12	< 0.15	< 0.14	< 0.14	< 0.13	< 0.13	< 0.17
Total PCB Congeners (ND = 0) [1,8]	< 0.48	< 0.44	< 0.29	< 0.28	< 0.29	< 0.5	< 0.65	< 0.52	< 0.63	< 0.3	< 0.3	< 0.3	< 0.38	< 0.35	< 0.35	< 0.31	< 0.32	< 0.41
Total PCB Congeners (ND = 1/2 MDL) [2,8]	< 0.48	< 0.44	< 0.29	< 0.28	< 0.29	< 0.5	< 0.65	< 0.52	< 0.63	< 0.3	< 0.3	< 0.3	< 0.38	< 0.35	< 0.35	< 0.31	< 0.32	< 0.41

Notes:

Detected result exceeds ERL but is less than ERM.

Detected result exceeds the minimum Zeeman 2004 level.

Detected result exceeds ERL and the minimum Zeeman 2004 level.

Detected result exceeds Residential CHHSL but is less than Commercial/Industrial CHHSL.

Detected result exceeds Commercial/Industrial CHHSL and Residential CHHSL.

Underline = Detected result exceeds Residential RSL but is less than Industrial RSL.

Underline = Detected result exceeds Industrial RSL and Residential RSL.

Bold = Detected result

J = Estimated value

µg/kg = micrograms per kilogram

CHHSL = California Human Health Screening Level (CalEPA 2005 and 2009)

ERL = effects range low (Long et al. 1995)

ERM = effects range median (Long et al. 1995)

MDL = method detection limit

mg/kg = milligrams per kilogram

mm = millimeters

ND = non-detect

RSL = Regional Screening Level (USEPA 2010). The lesser (more protective) of the cancerous and noncancerous screening levels were used.

PAHs = polycyclic aromatic hydrocarbons

PCBs = polycyclic biphenyls

Non-detects were reported as < MDL.

1 For comparison to ERL, ERM, CHHSLs, and RSLs, zeros were used for non-detect samples for summing. If all samples were non-detect, the total is reported as < the highest MDL of all samples.

2 For comparison to Zeeman 2004 screening levels, 1/2 MDLs were used for non-detect samples for summing. If all samples were non-detect, the total is reported as < the highest MDL of all samples.

3 Total Chlordanes calculated as the sum of alpha Chlordane, gamma Chlordane, cis-Nonachlor, Oxychlordane, and trans-Nonachlor.

4 Total DDTs calculated as the sum of 2,4'-DDD, 2,4'-DDE, 2,4'-DDT, 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT.

5 Total HMW PAHs calculated as the sum of Benzo (a) anthracene, Benzo (a) pyrene, Benzo (b) fluoranthene, Benzo (e) pyrene, Benzo (g,h,i) perylene, Benzo (k) fluoranthene, Chrysene, Dibenz (a,h) anthracene, Fluoranthene, Indeno (1,2,3-c,d) pyrene, Perylene, and Pyrene.

6 Total LMW PAHs calculated as the sum of 1-Methylnaphthalene, 1-Methylphenanthrene, 1,6,7-Trimethylnaphthalene, 2,6-Dimethylnaphthalene, 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Anthracene, Biphenyl, Fluorene, Naphthalene, and Phenanthrene.

7 Total PAHs calculated as the sum of HMW and LMW PAHs.

8 Total PCB Congeners calculated as the sum of all PCB congeners.

3.2.2 Metals

All metals were detected in salt pond sediments. Chromium, selenium, silver, and zinc concentrations were less than screening levels in all samples. Arsenic, cadmium, copper, lead, mercury, and nickel were measured at concentrations greater than screening levels in at least one sample (Table 5). A summary of results is provided below.

- Arsenic concentrations were greater than both Residential and Commercial/Industrial CHHSLs and RSLs at all stations. Stations 13-03 and 13-04 also exceeded the ERL value and Zeeman risk-based screening level for benthic invertebrates (Figure 5). However, all concentrations of arsenic were less than the southern California regional background level of 12 milligrams per kilogram (mg/kg; Chernoff et al. 2008).
- Cadmium concentrations were relatively low, with the exception of Station 15-01. This station exceeded the Zeeman screening levels for fish and tern (Figure 6).
- Copper concentrations were greater than Zeeman screening levels at 12 stations (Figure 7), which included one station in each of Ponds 12 and 14 and approximately 60 percent of stations in Ponds 13 and 15. All stations exceeded the Zeeman screening level for benthic invertebrates, five stations exceeded the screening level for benthic vegetation, and two stations (15-01 and 15-10) exceeded the screening level for wigeon, scooter, and tern. Stations 15-01 and 15-10 also exceeded the ERL value.
- Lead concentrations were greater than Zeeman screening levels at all stations (Figure 8). All stations exceeded the screening level for wigeon, scooter, tern, grebe, and skimmer. Nineteen stations exceeded the screening level for pelican. Stations 15-01 and 15-10 exceeded the screening level for turtle.
- Mercury concentrations were greater than Zeeman screening levels at six stations (Figure 9), which included four stations within Pond 12 and two stations within Pond 15. All stations exceeded the screening level for tern. Station 15-10 exceeded the screening level for skimmer.
- Nickel concentrations were relatively low, with the exception of Stations 15-01 and 15-10. Both stations exceeded the ERL value and Zeeman screening level for benthic invertebrates (Figure 10). Station 15-01 also exceeded Zeeman screening levels for sea lion and tern.

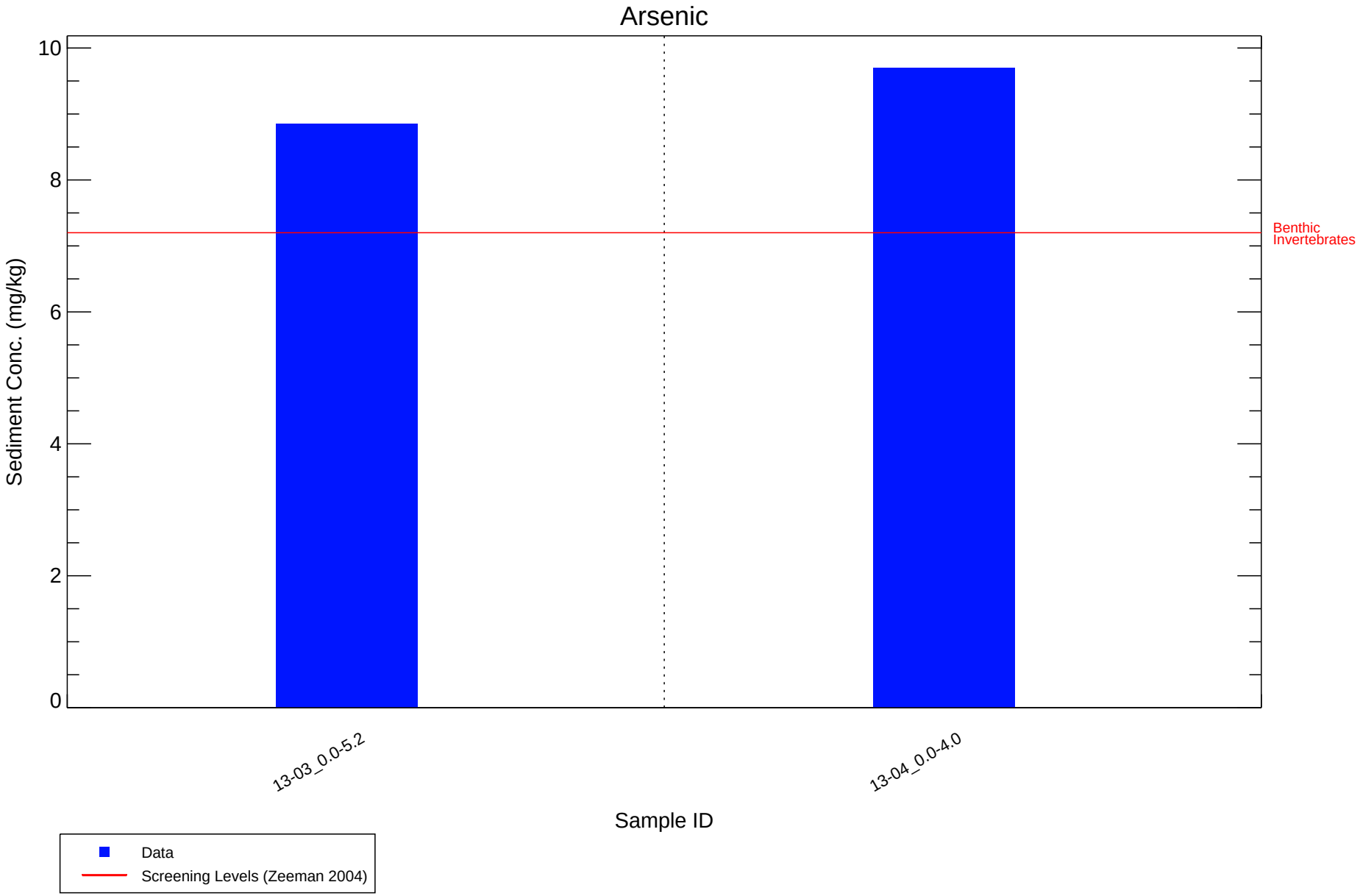


Figure 5

Sediment Samples Exceeding Zeeman 2004 Screening Levels - Arsenic
South San Diego Bay Salt Ponds 12, 13, 14, and 15

ANCHOR QEA

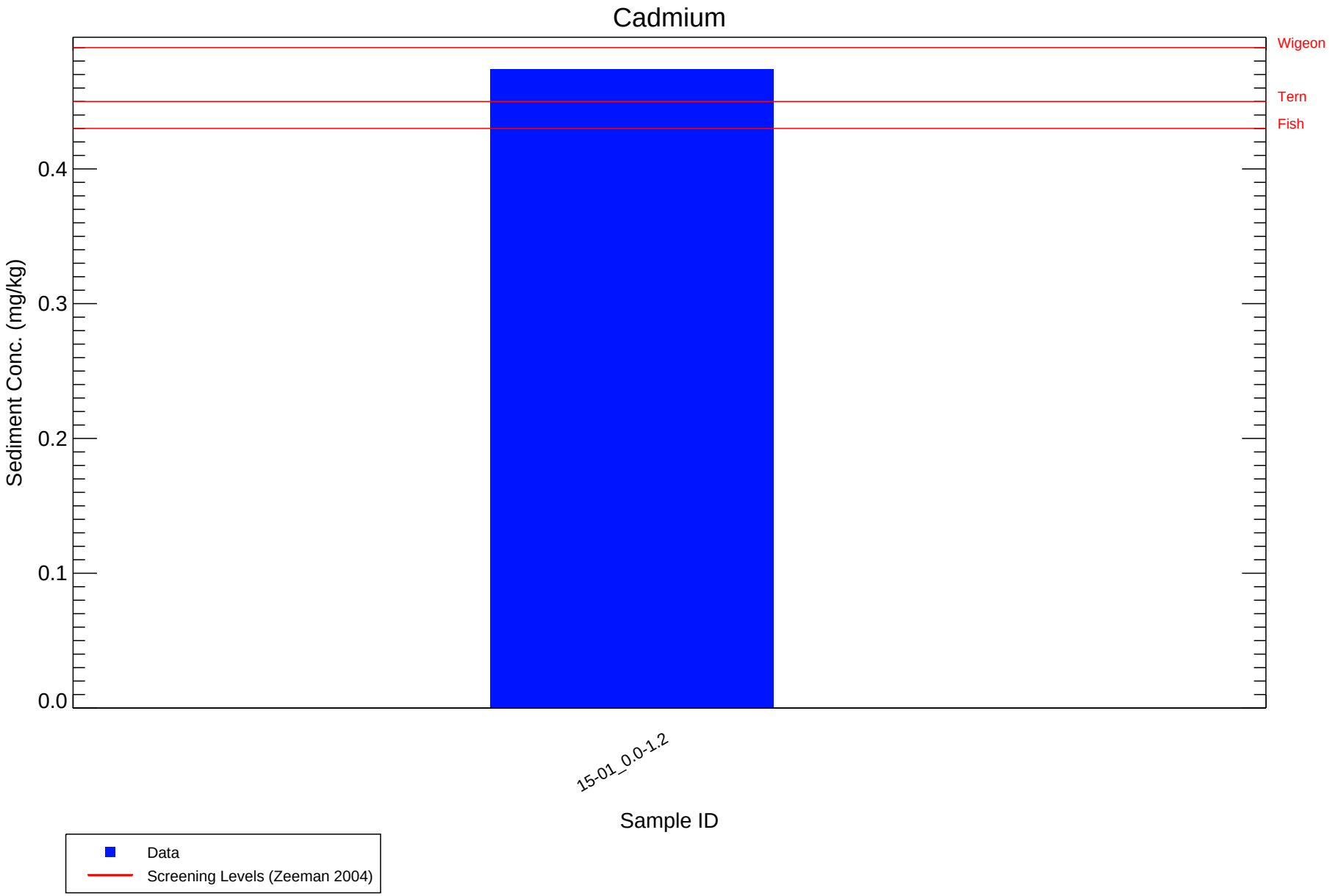


Figure 6

Sediment Samples Exceeding Zeeman 2004 Screening Levels - Cadmium
South San Diego Bay Salt Ponds 12, 13, 14, and 15

ANCHOR QEA

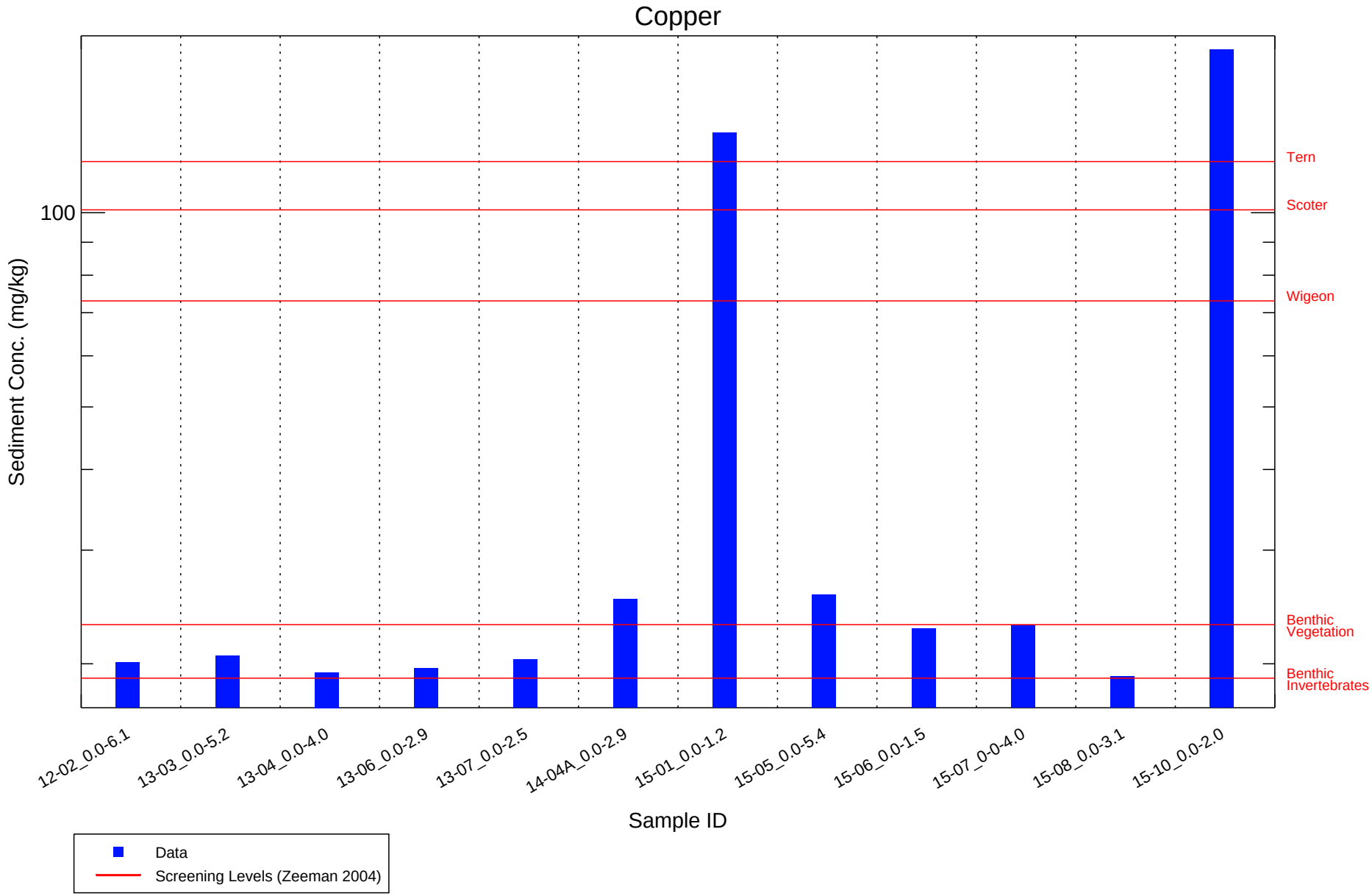


Figure 7

Sediment Samples Exceeding Zeeman 2004 Screening Levels - Copper
South San Diego Bay Salt Ponds 12, 13, 14, and 15

ANCHOR QEA

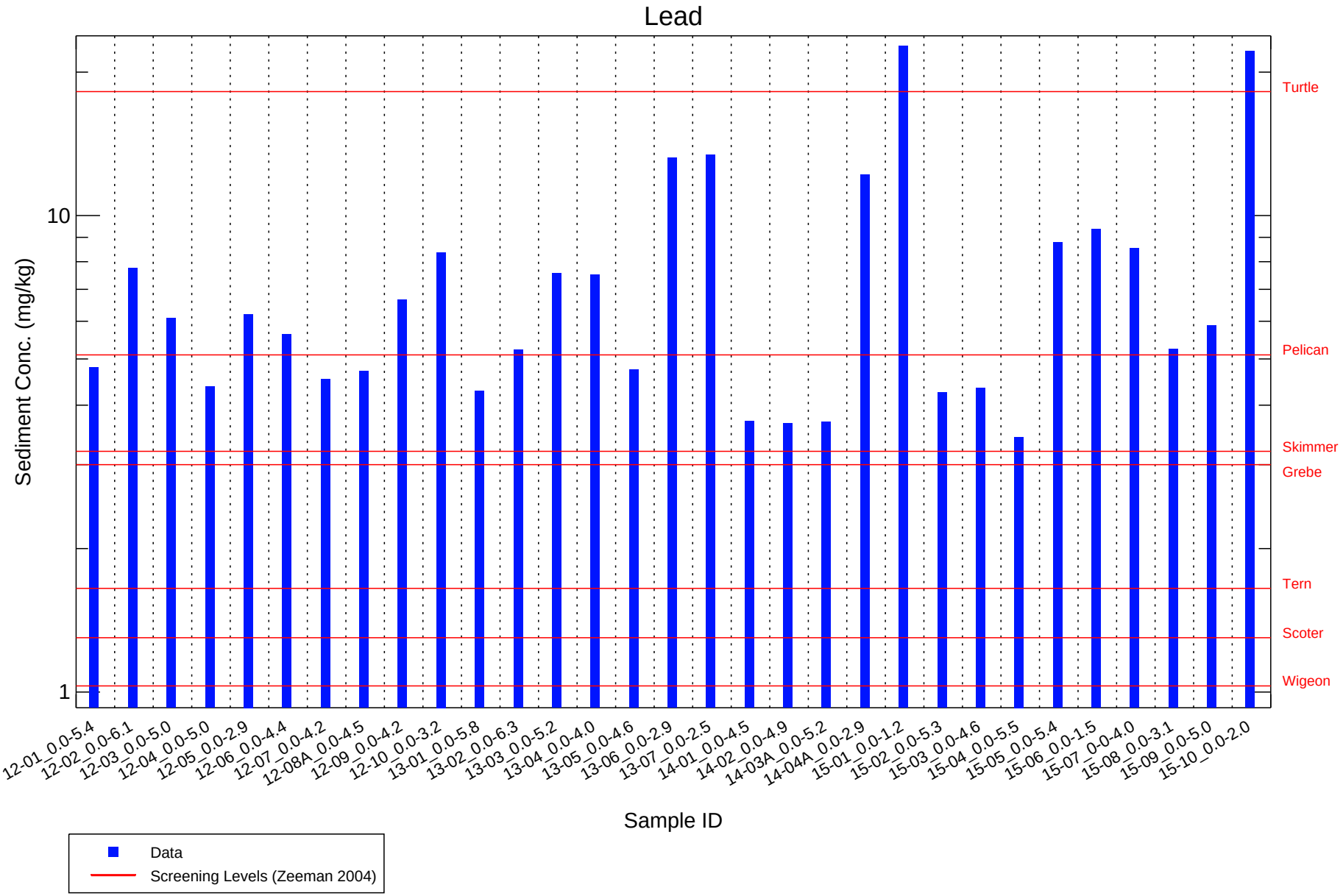


Figure 8

Sediment Samples Exceeding Zeeman 2004 Screening Levels - Lead
South San Diego Bay Salt Ponds 12, 13, 14, and 15

ANCHOR QEA

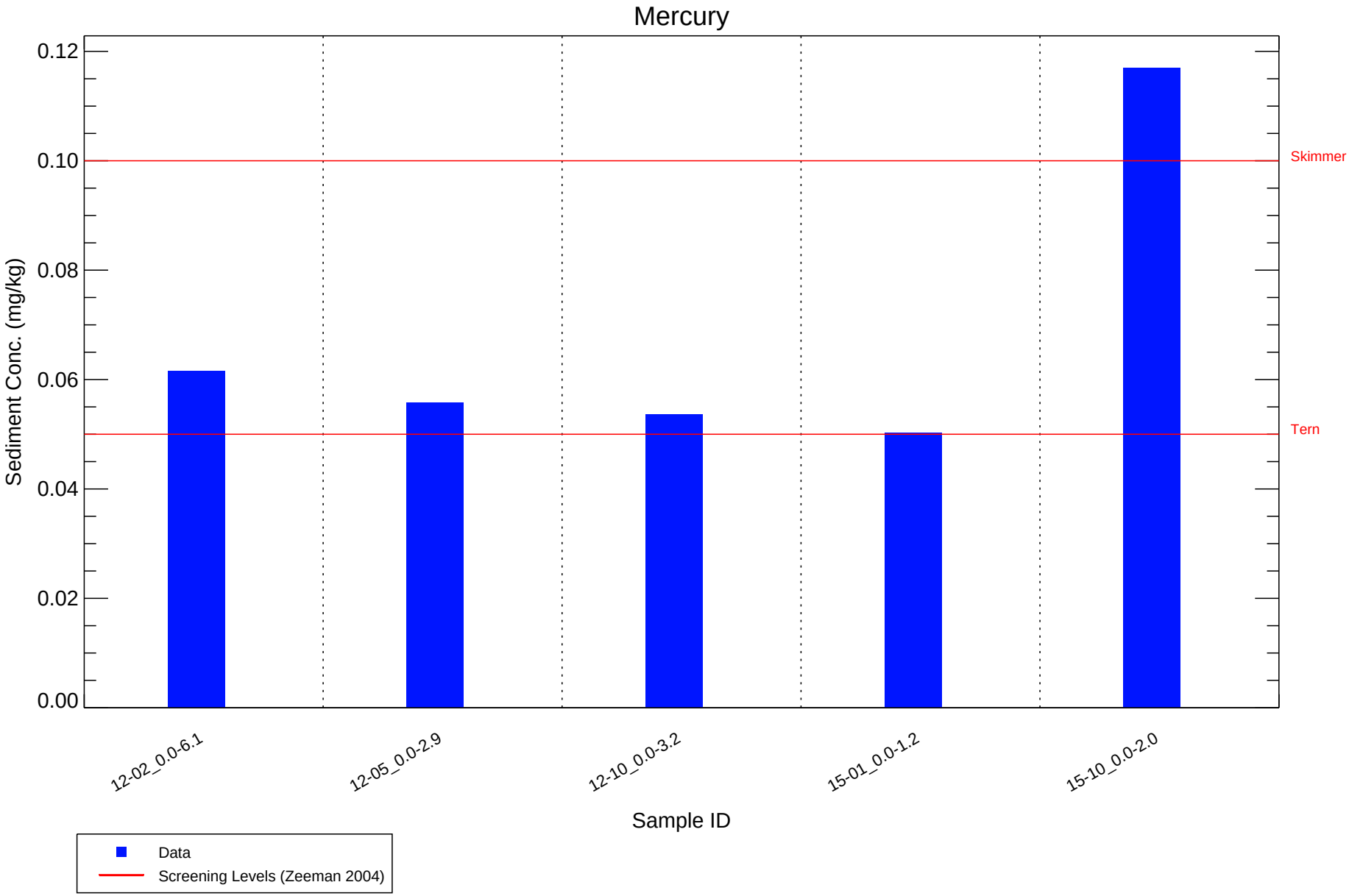


Figure 9

Sediment Samples Exceeding Zeeman 2004 Screening Levels - Mercury
South San Diego Bay Salt Ponds 12, 13, 14, and 15

ANCHOR QEA

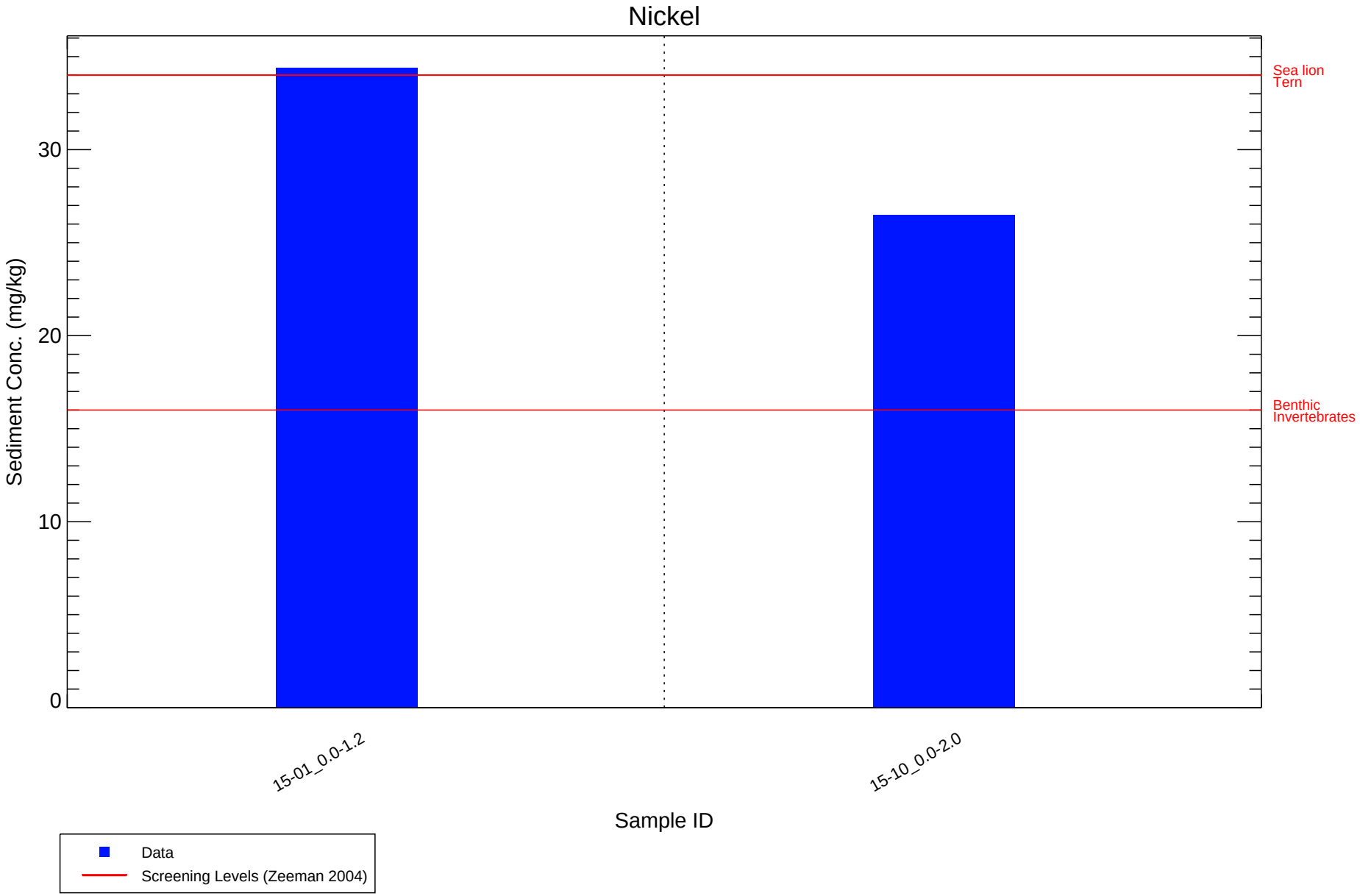


Figure 10

Sediment Samples Exceeding Zeeman 2004 Screening Levels - Nickel
South San Diego Bay Salt Ponds 12, 13, 14, and 15

ANCHOR QEA

3.2.3 Organics

PAHs and pesticides were detected in salt pond sediments. PAHs were measured at low concentrations in approximately half of the samples from Ponds 12 and 13 and all of the samples from Ponds 14 and 15. Station 15-01 exceeded the ERL value for total low molecular weight PAHs, while Station 12-09 exceeded the Residential RSL for benzo(a)pyrene.

DDTs and dieldrin were the only pesticides detected in salt pond sediments. DDTs were measured at four stations (13-07, 14-04A, 15-01, and 15-10). Station 15-01 exceeded the ERL values for 4,4'-DDE and total DDTs. Dieldrin was measured at four stations (12-10, 13-02, 13-07, and 14-04A). All concentrations were greater than the ERL value.

PCB congeners were not detected in salt pond sediment.

3.2.4 Quality Assurance/Quality Control

A review of analytical results for sediment was conducted to evaluate the laboratory's performance in meeting QA/QC guidelines outlined in the SAP (Anchor QEA 2013). The data validation report prepared by Anchor QEA is presented in Appendix C. All samples were analyzed within the appropriate holding times. Generally, QA/QC sample results were within the project-specified and/or laboratory control limits, with the following exceptions:

- Mercury was detected in the method blank at a concentration between the MDL and RL; however, this compound was not detected in the associated samples. Data are not expected to be affected.
- The surrogate 2-fluorobiphenyl recovered at a concentration greater than control limits in samples SSDBSP-15-08_0.0-3.1, SSDBSP-12-07_0.0-4.2, and SSDBSP-12-03_0.0-5.0. All PCB results were non-detect in these samples; therefore, data are not expected to be affected.
- The surrogate 2,4,5,6-tetrachloro-m-xylene recovered at a concentration greater than control limits for SSDBSP-15-01_0.0-1.2, SSDBSP-15-201_0.0-1.2, and SSDBSP-15-101_0.0-1.2. Pesticide results in these samples may be biased high.
- Acenaphthene, acenaphthylene, fluorene, and phenanthrene recovered at concentrations less than control limits in the MS/MSD in SSDBSP-12-04_0.0-5.0. Associated sample results may be biased low.

Field QA/QC samples included duplicates, splits, and rinsate blanks. Field duplicate results were similar to the original samples, with two exceptions. At Station 15-01, lead was approximately six times greater than the original sample, and copper was approximately five times less than the original sample. These results indicate some natural variability at the site. Split sample relative percent difference (RPD) values were within 50 percent, with only minor exceptions. RPD values for selenium, fluoranthene, pyrene, and 1,6,7-trimethylnaphthalene were greater than 50 percent in at least one split sample. All concentrations were within five times the RL, and the difference between the split sample and original sample was less than two times the RL; therefore, data are not expected to be affected. Variability is expected to be higher at concentrations near the RL. Within field rinsate blanks, all concentrations were less than the RL.

4 REFERENCES

Anchor QEA, L.P., 2013. *Sediment Characterization Sampling and Analysis Plan*, *South San Diego Bay Salt Ponds 12, 13, 14, and 15*. January 2013.

Chernoff et al. (Chernoff, G., W. Bosan, and D. Oudiz), 2008. Determination of a Southern California Regional Background Arsenic Concentration in Soil. http://www.dtsc.ca.gov/upload/Background-Arsenic.pdf.

CalEPA (California Environmental Protection Agency), 2005. *Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties*. January 2005.

CalEPA, 2009. *Revised California Human Health Screening Levels for Lead*. September 2009.

Everest (Everest International Consultants, Inc.), 2012. Personal communication with David Cannon. December 4, 2012.

Everest and Anchor QEA (Everest and Anchor QEA, L.P.), 2009. *Sampling and Analysis Results Report South San Diego Bay Salt Ponds 10, 10a, and 11*. Prepared for U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office. May 2009, updated August 2010.

Long et al. (Long, E.R., D.D. MacDonald, S.L. Smith, and F.D. Calder), 1995. Incidence of Adverse Biological Effects within Ranges of Chemical Concentrations in Marine and Estuarine Sediments. *Environmental Management* 19:81-97.

USEPA (U.S. Environmental Protection Agency), 2004. USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review. USEPA, Office of Superfund Remediation and Technology Innovation (OSRTI). USEPA 540-R-04-004. October 2004.

USEPA, 2008. USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review. USEPA, OSRTI. USEPA 540-R-08-01. June 2008.

USEPA, 2009. Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use. USEPA, Office of Solid Waste and Emergency Response. OSWER No. 9200.1-85. January 2009.

USEPA, 2010. Regional Screening Levels. Available from: http://www.epa.gov/region9/superfund/prg/. Updated 2010.

Zeeman, C.Q.T., 2004. Ecological Risk-Based Screening Levels for Contaminants in Sediments of San Diego Bay, Technical Memorandum CFWO-C-TM-04-01. USFWS, Carlsbad Fish and Wildlife Office, Carlsbad, California.

LIST OF APPENDICES

APPENDIX A FIELD FORMS AND SAMPLING PHOTOGRAPHS

APPENDIX B LABORATORY REPORTS

APPENDIX C DATA VALIDATION REPORT

APPENDIX F2

Soil Characterization Program
Sampling and Analysis Report

FINAL



SAMPLING AND ANALYSIS REPORT
OTAY RIVER ESTUARY RESTORATION
SOIL CHARACTERIZATION PROGRAM

Prepared for

Poseidon Water, LLC

501 West Broadway, Suite 2020

San Diego, California 92101

Prepared by

Anchor QEA, LLC

27201 Puerta Real, Suite 350

Mission Viejo, California 92691

Revised August 2017

FINAL SAMPLING AND ANALYSIS REPORT

OTAY RIVER ESTUARY RESTORATION SOIL CHARACTERIZATION PROGRAM

Prepared for

Poseidon Water, LLC

501 West Broadway, Suite 2020

San Diego, California 92101

Prepared by

Anchor QEA, LLC

27201 Puerta Real, Suite 350

Mission Viejo, California 92691

Revised August 2017

(Converted vertical datum from NAVD88 to MLLW)

TABLE OF CONTENTS

1 INTRODUCTION 1
1.1 Study Objective 1
1.2 Site Description 1
1.3 Project Team and Responsibilities 3
2 SAMPLING METHODS 5
2.1 Sediment Collection and Sample Processing 5
2.2 Summary of Sediment Collection Activities 9
2.2.1 Sample Collection Procedures 9
2.2.2 Biological, Archeological, and Native American Monitoring 9
2.2.3 Sample Processing 10
2.2.4 Sample Compositing 12
2.2.4.1 Otay River Floodplain 13
2.2.4.2 Subarea 3 14
2.2.4.3 Nestor Creek 15
2.2.4.4 Otay River 15
2.3 Deviations from the SAP 16
3 RESULTS OF PHYSICAL AND CHEMICAL ANALYSES 17
3.1 Soil and Sediment Composite Samples 17
3.1.1 Physical Results 17
3.1.2 Chemical Results 17
3.1.2.1 Metals 17
3.1.2.2 Pesticides 17
3.1.2.3 PCBs 21
3.1.2.4 TPHs and SVOCs 21
3.2 Soil and Sediment Archive Samples 21
3.2.1 Grain Size Results 27
3.2.2 Chemical Results 27
3.2.2.1 Pesticides 27
3.2.2.2 PCBs 33
3.3 Quality Assurance/Quality Control Summary 33

4 REFERENCES 35

List of Tables

Table 1 Sampling Location Coordinates, Elevations, and Depths Achieved 5
Table 2 Sediment Sample Processing and Testing Strategy 11
Table 3 Otay River Floodplain Area Sampling and Compositing Scheme 13
Table 4 Subarea 3 Compositing Scheme 15
Table 5 Nestor Creek Compositing Scheme 15
Table 6 Otay River Compositing Scheme 16
Table 7 Results of Physical and Chemical Analyses of Soil and Sediment Composite Samples 18
Table 8 Summary of Physical and Chemical Analyses Performed on Archived Samples 23
Table 9 Grain Size Results for Archived Samples 28
Table 10 Pesticide and PCB Results for Archived Samples 31

List of Figures

Figure 1 Vicinity Map 2
Figure 2 Site Plan 4
Figure 3 Otay River Floodplain Sampling Locations and Composite Areas 7
Figure 4 Otay River Sampling Locations 8

List of Appendices

Appendix A Field Forms and Core Photographs
Appendix B Laboratory Data Reports
Appendix C Data Validation Reports

LIST OF ACRONYMS AND ABBREVIATIONS

%R	percent recovery
µg	microgram
bgs	below ground surface
Calscience	Calscience Environmental Laboratories, Inc.
kg	kilogram
MLLW	mean lower low water
MOU	Memorandum of Understanding
MS	matrix spike
MSD	matrix spike duplicate
ORERP	Otay River Estuary Restoration Project
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
QA	quality assurance
QC	quality control
Red Tail	Red Tail Monitoring and Research, Inc.
RPD	relative percent difference
SAP	Sampling and Analysis Plan
SAR	Sampling and Analysis Report
SVOC	semi-volatile organic compound
TOC	total organic carbon
TPH	total petroleum hydrocarbon
USFWS	U.S. Fish and Wildlife Service

1 INTRODUCTION

This Sampling and Analysis Report (SAR) provides an overview of data collection and sampling analysis activities that occurred during the May 2012 field effort in support of the Otay River Estuary restoration soil characterization program. Activities were completed in accordance with the equipment, procedures, and methods documented in the Sampling and Analysis Plan (SAP; Anchor QEA 2012).

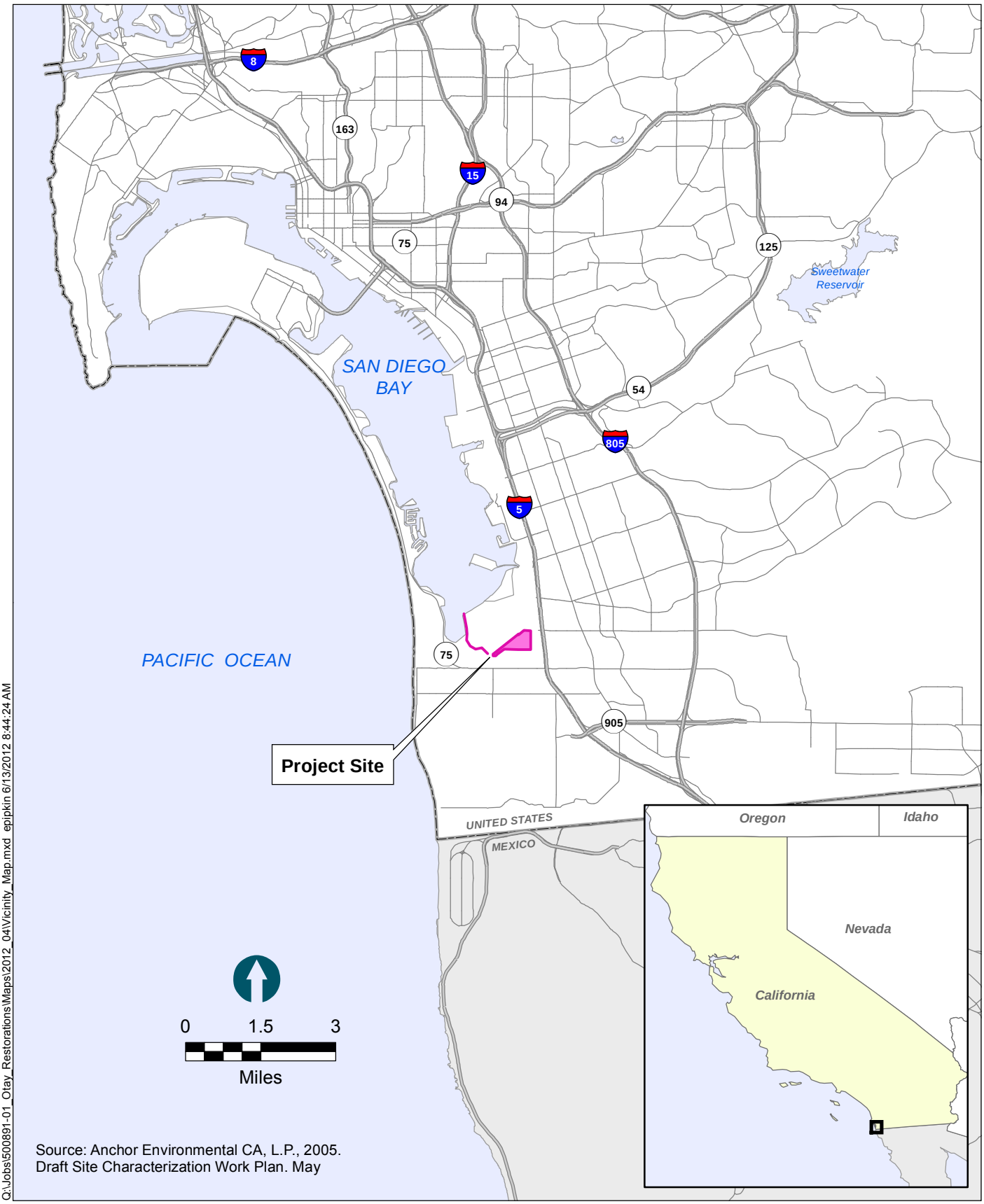
1.1 Study Objective

Poseidon Water, LLC is developing plans in coordination with the U.S. Fish and Wildlife Service (USFWS) to restore approximately 67 acres of disturbed wetlands and upland habitat within the Otay River Floodplain to functional estuarine and salt marsh habitats. The larger Otay River Estuary Restoration Project (ORERP) will involve the excavation of approximately 750,000 to 1 million cubic yards of material from this area to create an intertidal estuarine and salt marsh habitat system. The purpose of the May 2012 soil characterization program was to evaluate the magnitude, extent, and variability of physical and chemical soil and sediment properties throughout the area proposed for restoration.

1.2 Site Description

The Otay River Floodplain is located at the western terminus of the Otay River. The project site is included within the management boundaries of the South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge. The property is located along Saturn Boulevard (19th Street) and is bounded by Interstate 5 to the east, Main Street and the Otay River to the north, and residential structures and the Imperial Sands Mobile Park (1810 Palm Avenue) to the south. San Diego Bay is northwest of the site (Figure 1).

The project site originally consisted of wetlands that were diked and drained decades ago. Fill material was imported to the site, and the area was converted to upland. The site is currently vacant and relatively flat.



ANCHOR QEA

Figure 1
Vicinity Map
Otay River Estuary Restoration Soil Characterization Program

The project site is depicted on Figure 2 and includes the following areas[1]:

- The northern portion of former evaporative Salt Pond 20A (Subarea 1)
- Former agricultural land (Subareas 2 and 5)
- A former agricultural equipment storage and supply area (Subarea 3)
- Former wastewater treatment ponds (Subareas 6A and 6B)
- Nestor Creek, which runs north-to-south approximately midway through the project site
- The final reaches of the Otay River, which run between raised levees immediately north of the project site then westward and northward into San Diego Bay

1.3 Project Team and Responsibilities

The soil characterization program was performed and managed by Anchor QEA, L.P., who worked with a team of subcontractors. Vironex provided drilling services for upland borings taken from the Otay River Floodplain Area and Subarea 3. Biologists from Dudek provided biological resource monitoring throughout the sampling program. During upland excavations (Otay River Floodplain and Subarea 3) and Nestor Creek sampling; ASM Affiliates provided archeological monitoring services; and Red Tail Monitoring and Research, Inc. (Red Tail), provided Native American monitoring services. All analytical testing was performed by Calscience Environmental Laboratories, Inc. (Calscience).

1 Subareas for the Otay River Floodplain Area are referenced in parentheses and provided on Figure 2 for reference; these subareas were originally developed based on historic uses of the site and a 2005 restoration conceptual plan.



ANCHOR QEA

Feet
0 500 1,000

Figure 2
Site Plan
Otay River Estuary Restoration Soil Characterization Program

2 SAMPLING METHODS

2.1 Sediment Collection and Sample Processing

Sampling locations were pre-selected based on the current conceptual plan for ORERP (Figure 3). The sampling program was subdivided into four areas: the Otay River Floodplain Area (the majority of the ORERP site), Subarea 3 (the former agricultural equipment storage and supply area [subjected to a higher density of sampling]), Nestor Creek, and the Otay River. Sampling areas are presented on Figures 3 and 4.

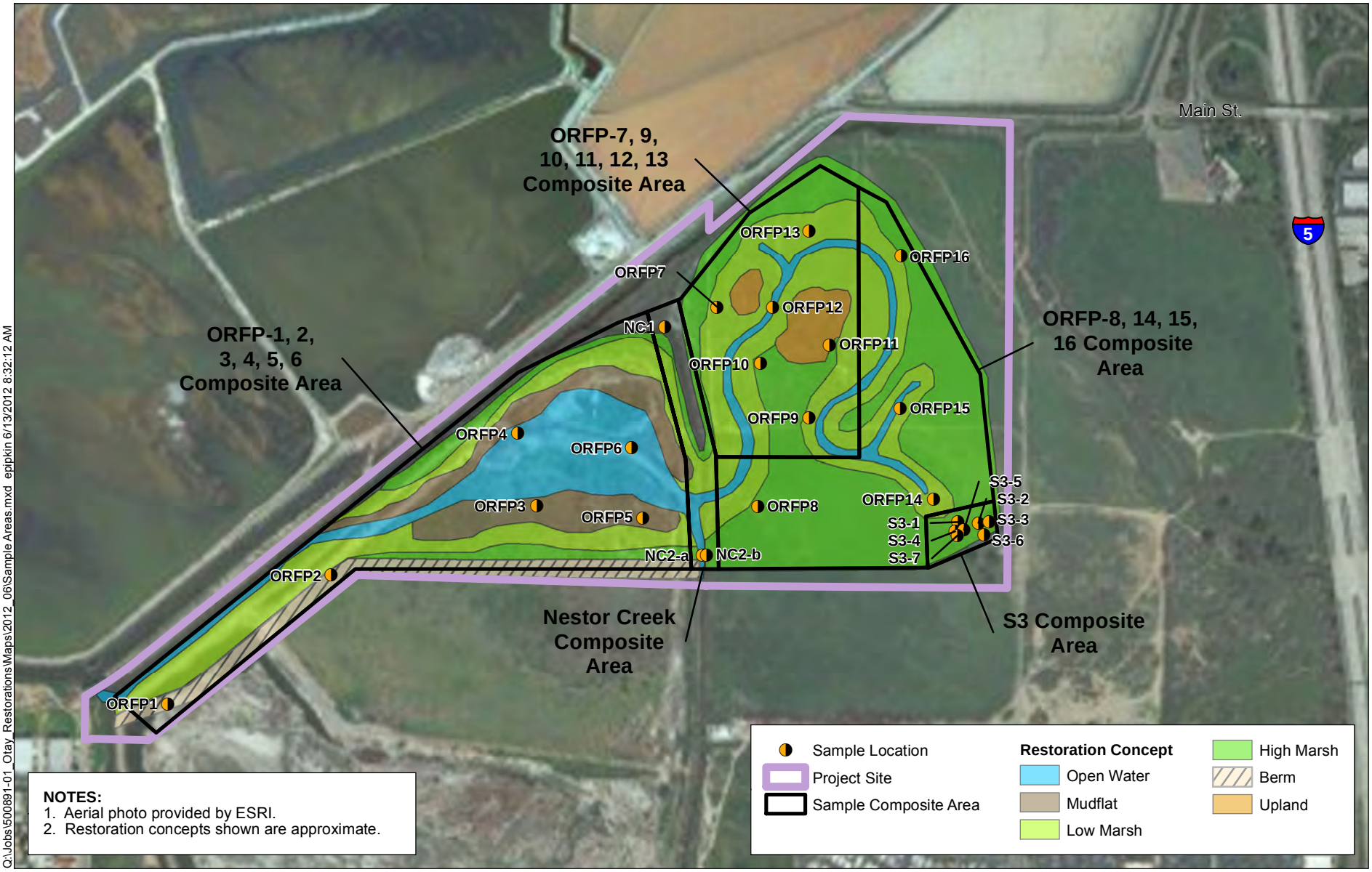
All sampling points were located and advanced in compliance with the SAP (Anchor QEA 2012), with a few exceptions and deviations needed to avoid biological and Native American resources (see Section 2.3). To proceed with the soil characterization effort in May 2012, site access and regulatory approvals were obtained from the USFWS, the Port of San Diego, and the County of San Diego. Table 1 provides a summary of the four sampling areas and associated number of cores, the approximate surface elevations, sample depths, and elevations achieved. Vertical datum is presented in mean lower low water (MLLW).

Table 1
Sampling Location Coordinates, Elevations, and Depths Achieved

Sample ID	Longitude	Latitude	Ground Surface Elevation (feet MLLW)	Depth Achieved (feet bgs)	Elevation Achieved (feet MLLW)
Otay River Floodplain Area					
ORFP-1	-117.10448	32.58796	+8.4	16	-7.6
ORFP-2	-117.10220	32.58949	+12.4	20	-7.6
ORFP-3	-117.09933	32.59031	+12.4	20	-7.6
ORFP-4	-117.09960	32.59117	+10.4	18	-7.6
ORFP-5	-117.09785	32.59017	+12.4	20	-7.6
ORFP-6	-117.09801	32.59100	+12.4	20	-7.6
ORFP-7	-117.09682	32.59266	+9.4	17	-7.6
ORFP-8	-117.09625	32.59032	+11.4	19	-7.6
ORFP-9	-117.09553	32.59135	+11.4	19	-7.6
ORFP-10	-117.09621	32.59200	+11.4	19	-7.6
ORFP-11	-117.09525	32.59221	+12.4	20	-7.6

Sample ID	Longitude	Latitude	Ground Surface Elevation (feet MLLW)	Depth Achieved (feet bgs)	Elevation Achieved (feet MLLW)
ORFP-12	-117.09604	32.59266	+8.4	16	-7.6
ORFP-13	-117.09682	32.59266	+11.4	19	-7.6
ORFP-14	-117.09379	32.59039	+14.4	22	-7.6
ORFP-15	-117.09426	32.59146	+14.4	22	-7.6
ORFP-16	-117.09425	32.59327	+12.4	20	-7.6
Subarea 3					
S3-1	-117.09345	32.59012	+16.4	22	-5.6
S3-2	-117.09317	32.59011	+16.4	22	-5.6
S3-3	-117.09302	32.59012	+16.4	22	-5.6
S3-4	-117.09349	32.59001	+16.4	22	-5.6
S3-5	-117.09337	32.59003	+16.4	22	-5.6
S3-6	-117.09309	32.58997	+16.4	22	-5.6
S3-7	-117.09346	32.58996	+16.4	22	-5.6
Nestor Creek					
NC-1	-117.09755	32.59242	+5.4	13	-7.6
NC-2A	-117.09702	32.58973	+4.4	7	-2.6
NC-2B	-117.09696	32.58973	+10.4	18	-7.6
Otay River					
OR-1	-117.11551	32.59948	-1.6	6	-7.6
OR-2	-117.11520	32.59766	-0.6	4.2	-4.8
OR-3	-117.11462	32.59586	+0.4	5.8	-5.4
OR-4	-117.11444	32.59394	+0.4	5.2	-4.8
OR-5	-117.11452	32.59189	+0.4	5.2	-4.8
OR-6	-117.11353	32.5908	+0.4	5.5	-5.1
OR-7	-117.11173	32.58970	+0.4	4	-3.6
OR-8	-117.10950	32.58956	+0.4	4.4	-4.0
OR-9	-117.10758	32.58842	+1.4	2	-0.6

Note:
bgs = below ground surface



Q:\Jobs\500891-01_Otay_Restorations\Maps\2012_06\SampleAreas.mxd epipkin 6/13/2012 8:32:12 AM

ANCHOR QEA

Feet
0 300 600

Figure 3
Otay River Floodplain Sample Locations and Composite Areas
Otay River Estuary Restoration Soil Characterization Program



Q:\Jobs\500891-01_Otay_Restorations\Maps\2012_06\River_Samples_final.mxd epipkin 2012-06-14 2:41:29 PM

0 400 800

Feet

ANCHOR QEA

Figure 4
Otay River Sample Locations
Otay River Estuary Restoration Soil Characterization Program

2.2 Summary of Sediment Collection Activities

2.2.1 Sample Collection Procedures

Soil and sediment sampling was conducted between May 1 and 11, 2012. The weather was warm and sunny through the duration of the field program.

Upland soil borings in the Otay River Floodplain and Subarea 3 were collected using a truck-mounted, direct-push Geoprobe rig (operated by Vironex). The rig advanced 2.3-inch-diameter core tubes using a Macro Core Sampler and Direct Push Technology to obtain soil cores to the full desired depth. To ensure each vertical profile was sampled, the Geoprobe rig was advanced and samples were extracted every 2 feet to 3 feet.

Sampling locations within Nestor Creek were accessed by foot only, and sediment samples were collected by hand auger. While attempting to collect the bottom soil/sediment intervals from NC-2, refusal was encountered at a depth of 7 feet or an approximate elevation of -2.6 feet MLLW. The NC-2 sampling location was completed by advancing the direct-push Geoprobe rig adjacent to the creek to the desired elevation.

Sampling locations within the Otay River were accessed by foot and two small, inflatable Zodiac boats. Sediment cores were collected with hand-pushed fixed-piston cores. Refusal conditions were encountered at OR-7, OR-8, and OR-9 prior to reaching target sample depths.

Each soil core was characterized and documented on a boring log. Core samples were evaluated for evidence of stratigraphic subsurface differences, which was logged and physically described as separate vertical subsurface layers. Each soil sample was photographed, homogenized, and placed in appropriately labeled jars and bags for analysis. Field core logs, core photographs, and other associated documentation for the sampling effort are provided as Appendix A.

2.2.2 Biological, Archeological, and Native American Monitoring

Biologists from Dudek conducted pre-construction nesting bird surveys and biological monitoring during the sampling effort. Additional pre-construction surveys for nesting birds

were conducted by a qualified biologist in the early morning, immediately prior to geotechnical activities at each location scheduled for work during that day. Following completion of the daily, early morning nest surveys, geotechnical activities were monitored by a qualified biologist to ensure that any potential impacts to biological resources were avoided and minimized to the maximum extent feasible. Equipment was re-routed and testing activities were altered to avoid impacting vegetation, sensitive plants, and breeding birds.

Prior to initiating sampling activities at the site, archeologists from ASM Affiliates performed a review of site records on file at the South Coastal Information Center (at San Diego State University) to identify any known archeological sites in the project area. Once construction began, a qualified archaeologist was present on site to observe exploration activities within the Otay River Floodplain, Subarea 3, and Nestor Creek. Previous consultations with the USFWS determined that archeological monitoring would not be required for Otay River sampling. No cultural materials were identified in the spoils from any boring.

The Viejas Band of Kumeyaay Indians, a federally recognized Indian Tribe, has a Memorandum of Understanding (MOU) with the County and City of San Diego that a Native American monitor be present during all ground disturbing activities on lands within the County and City of San Diego's jurisdiction. A Native American monitor from Red Tail was on site during all ground disturbance activities.

2.2.3 Sample Processing

When penetration at a station was complete, the core length was recovered from the borehole and transported to the staging area. The core was then placed in a horizontal position and subdivided into 2-foot sample intervals and labeled. Photographs were taken of each core length and are included in Appendix A. Soil from each 2-foot interval was then homogenized in a mixing bowl with a sample collected for archive.

The remaining material was retained for additional compositing with the other subsamples from other areas within the specified composite depth interval. A sufficient volume of composited material was placed in one or more appropriately sized sample jars, as needed for

physical and chemical analyses planned for that composite sample. The sediment sample processing and testing strategy is presented in Table 2.

Table 2
Sediment Sample Processing and Testing Strategy

Sample Area	Composite Sample ID (each corresponds to defined depth interval)	Boring IDs used to Create Composites	Sample from Each 2-Foot Interval Archived	Composite Sample Analyzed for Grain Size, TOC, Pesticides, Metals, and TPHs	Composite Sample Analyzed for PCBs and SVOCs
Otay River Floodplain	A B C D	ORFP-1 ORFP-2 ORFP-3 ORFP-4 ORFP-5 ORFP-6	Yes	Yes	Yes
	A B C D	ORFP-7 ORFP-9 ORFP-10 ORFP-11 ORFP-12 ORFP-13	Yes	Yes	Yes
	A B C D	ORFP-08 ORFP-14 ORFP-15 ORFP-16	Yes	Yes	No
Subarea 3	A B C D	S3-1 S3-2 S3-3 S3-4 S3-5 S3-6 S3-7	Yes	Yes	Yes
Nestor Creek	A B	NC-1 NC-2	Yes	Yes	No

Sample Area	Composite Sample ID (each corresponds to defined depth interval)	Boring IDs used to Create Composites	Sample from Each 2-Foot Interval Archived	Composite Sample Analyzed for Grain Size, TOC, Pesticides, Metals, and TPHs	Composite Sample Analyzed for PCBs and SVOCs
Otay River	A	OR-1	Yes	Yes	No
	B	OR-2			
	C	OR-3			
	A	OR-4	Yes	Yes	No
	B	OR-5			
	C	OR-6			
	A	OR-7	Yes	Yes	No
	B	OR-8			
	C	OR-9			

Notes:
PCBs = polychlorinated biphenyls
SVOCs = semi-volatile organic carbons
TOC = total organic carbon
TPHs = total petroleum hydrocarbons

Each core section was logged through the full penetration depth. All logs are provided in Appendix A. A soil description of each core sample was recorded on the core log for the following parameters as appropriate and present:

- Sample recovery (depth in feet of penetration and sample compaction)
- Physical soil description (soil type, density/consistency of soil, and color)
- Odor (e.g., hydrogen sulfide and petroleum)
- Presence of vegetation or organic content
- Debris
- Any other distinguishing characteristics or features

2.2.4 Sample Compositing

The sample compositing scheme differed slightly for the various exploration subareas. Soil for each representative composite was homogenized until it appeared uniform in color and texture. Each composite sample consisted of an appropriate representative proportion of material from each individual sample. Sediment samples were placed into labeled, pre-cleaned sample jars and stored on ice until delivered to laboratory personnel. Soil samples

were delivered to the laboratory within 24 hours of sampling. Signed and dated chain-of-custody forms are provided with the laboratory reports in Appendix B.

2.2.4.1 Otay River Floodplain

Composite samples were prepared for four vertical layers from samples collected in three subareas of the site:

1. Sampling locations ORFP-1,2,3,4,5,6
2. Sampling locations ORFP-7,9,10,11,12,13
3. Sampling locations ORFP-8,14,15,16

Physical and chemical testing for the first two listed composite samples included grain size, total organic carbon (TOC), metals, pesticides, total petroleum hydrocarbons (TPHs), polychlorinated biphenyls (PCBs), and semi-volatile organic carbons (SVOCs). The third listed composite was analyzed for grain size, TOC, heavy metals, pesticides, and TPHs. Table 3 summarizes the composite samples created from different elevation intervals within the three subareas of the site.

Table 3
Otay River Floodplain Area Sampling and Compositing Scheme

Component Sampling Locations	Composite Sample ID	Elevation Interval Represented
ORFP-1,2,3,4,5,6	A	Surface to 1 foot bgs
	B	1 foot bgs to +0.4 foot MLLW
	C	+0.4 foot to -5.6 feet MLLW
	D	-5.6 feet to -7.6 feet MLLW
ORFP-7,9,10,11,12,13	A	Surface to 1 foot bgs
	B	1 foot bgs to +0.4 foot MLLW
	C	+0.4 foot to -5.6 feet MLLW
	D	-5.6 feet to -7.6 feet MLLW

Component Sampling Locations	Composite Sample ID	Elevation Interval Represented
ORFP-8,14,15,16	A	Surface to 1 foot bgs
	B	1 foot bgs to +0.4 foot MLLW
	C	+0.4 foot to -5.6 feet MLLW
	D	-5.6 feet to -7.6 feet MLLW
Total number of composite samples		**12**

Note:
bgs = below ground surface

Although the SAP (Anchor QEA 2012) called for a separate compositing of ORFP-3 and ORFP-11 for the purposes of testing for PCBs and SVOCs, a field decision was made to analyze for these constituents within the larger composite group based on some heterogeneity of soils encountered on site. This modification from the SAP provided better representation of PCB and SVOC concentrations within these portions of the site.

2.2.4.2 Subarea 3

Samples were collected throughout Subarea 3 and composited by elevation interval as presented in Table 4. Physical and chemical testing for each of the four composite samples included grain size, TOC, heavy metals, pesticides, TPHs, PCBs, and SVOCs. Table 4 summarizes the composite samples created from different elevation intervals within Subarea 3.

Table 4
Subarea 3 Compositing Scheme

Component Sampling Locations	Composite Sample ID	Elevation Interval Represented
S3-1 S3-2 S3-3 S3-4 S3-5 S3-6 S3-7	A	Surface to 1 foot bgs
	B	1 foot below ground surface to +6.4 feet MLLW
	C	+6.4 feet to -3.6 feet MLLW
	D	-3.6 feet to -5.6 feet MLLW
Total number of composite samples		**4**

Note:
bgs = below ground surface

2.2.4.3 Nestor Creek

Samples were collected from the Nestor Creek locations and composited by elevation interval as presented in Table 5. Physical and chemical testing for each of the three composite samples included grain size, TOC, heavy metals, pesticides, and TPHs. Table 5 summarizes the composite samples created from different elevation intervals within Nestor Creek.

Table 5
Nestor Creek Compositing Scheme

Component Sampling Locations	Composite Sample ID	Elevation Interval Represented
NC-1 NC-2	A	Surface to 1 foot bgs
	B	1 foot below mudline to -5.6 feet MLLW
	C	-5.6 feet to -7.6 feet MLLW
Total number of composite samples		**3**

Note:
bgs = below ground surface

2.2.4.4 Otay River

Samples were composited in three groups based relative location within the river (as presented in Table 6). Physical and chemical testing for each of the six composite samples

included grain size, TOC, heavy metals, pesticides, and TPHs. Table 6 summarizes the composite samples created from the Otay River cores.

Table 6
Otay River Compositing Scheme

Component Sampling Locations	Composite Sample ID	Elevation Interval Represented
OR-1 OR-2 OR-3	A	Mudline to -3.6 feet MLLW
	B	-3.6 feet to -5.6 feet MLLW
OR-4 OR-5 OR-6	A	Mudline to -3.6 feet MLLW
	B	-3.6 feet to -5.6 feet MLLW
OR-7 OR-8 OR-9	A	Mudline to -3.6 feet MLLW
	B	-3.6 feet to -5.6 feet MLLW
Total number of composite samples		**6**

2.3 Deviations from the SAP

Sampling locations and site access routes were determined in the field based on consultation with on-site biological monitors to avoid sensitive habitat or vegetation. Similarly, adjustments to operations during sampling activities were made as needed due to the potential presence of archeological or Native American artifacts in coordination with on-site resource monitors.

Other than minor deviations to avoid sensitive habitat or significant brush, samples were collected in accordance with the SAP (Anchor QEA 2012). However, S3-3 failed to obtain good soil recovery, potentially because of its location in proximity to a large tree trunk and root system. This boring was relocated to a new position approximately 10 feet away and redone, with successful recovery.

3 RESULTS OF PHYSICAL AND CHEMICAL ANALYSES

3.1 Soil and Sediment Composite Samples

Soil and sediment composite samples were analyzed for grain size, total solids, TOC, pesticides, metals, TPHs, PCBs, and SVOCs in accordance with test methods provided in the SAP (Anchor QEA 2012). Results of physical and chemical analyses on composite samples are presented in Table 7. Laboratory reports are provided in Appendix B.

3.1.1 Physical Results

Grain size, total solids, and TOC analyses were performed on all composite samples. Physical testing results and distribution plots of grain size are provided in Appendix B. Soil and sediment were predominately found to consist of silts and clays, with pockets of fine to medium sand.

3.1.2 Chemical Results

Chemical analysis was performed on the composite samples as indicated in Table 2. Results are presented in Table 7, and the laboratory reports from Calscience are provided in Appendix B. All results are expressed in dry weight unless otherwise indicated. Target detection limits were provided in the SAP (Anchor QEA 2012). Actual detection limits and raw data for analyses are provided in Appendix B.

3.1.2.1 Metals

Metals were detected in all surface and subsurface composite samples. Metal concentrations in surface and subsurface soils are similar across all areas sampled, with the exception of composite samples from ORFP-7,9,10,11,12,13. Samples from this area contained elevated concentrations of metals, including copper, lead, and zinc.

3.1.2.2 Pesticides

Pesticides—DDT compounds, toxaphene, and dieldrin—were detected in the surface and/or subsurface samples of composites from the majority of samples.

Table 7
Results of Physical and Chemical Analyses of Soil and Sediment Composite Samples

Area	Otay River						Otay River Flood Plain													Nestor Creek				Subarea 3				
Subarea Name	OR-1,2,3		OR-4,5,6		OR-7,8,9		ORFP-1,2,3,4,5,6				ORFP-7,9,10,11,12,13				ORFP-8,14,15,16					NC-1 and NC-2				S3				
Composite Sample ID	OR-1,2,3-A	OR-1,2,3-B	OR-4,5,6-A	OR-4,5,6-B	OR-7,8,9-A	OR-7,8,9-B	A-12	B-12	C-12	D-12	A-12	B-12	C-12	D-12	A-12	B-12	C-12	D-12	D-12-DUP	A-12	B-12	B-12-DUP	C-12	A-12	B-12	B-12-DUP	C-12	D-12
Depth Interval/Elevation Range	Mudline to -3.6 feet MLLW	-3.6 to -5.6 feet MLLW	Mudline to -3.6 feet MLLW	-3.6 to -5.6 feet MLLW	Mudline -3.6 feet MLLW	-3.6 to -5.6 feet MLLW	Ground surface to 1 foot bgs	1 foot bgs to +0.4 feet MLLW	+0.4 to -5.6 feet MLLW	-5.6 to -7.6 feet MLLW	Ground surface to 1 foot bgs	1 foot bgs to +0.4 feet MLLW	+0.4 to -5.6 feet MLLW	-5.6 to -7.6 feet MLLW	Ground surface to 1 foot bgs	1 foot bgs to +0.4 feet MLLW	+0.4 to -5.6 feet MLLW	-5.6 to -7.6 feet MLLW	-5.6 to -7.6 feet MLLW	Ground surface to 1 foot bgs	1 foot bgs to -5.6 feet MLLW	1 foot bgs to -5.6 feet MLLW	-5.6 to -7.6 feet MLLW	Ground surface to 1 foot bgs	1 foot bgs to +6.4 feet MLLW	1 foot bgs to +6.4 feet MLLW	+6.4 to -3.6 feet MLLW	-3.6 to -5.6 feet MLLW
Sample Date	5/11/2012	5/11/2012	5/10/2012	5/10/2012	5/9/2012	5/9/2012	5/8/2012	5/8/2012	5/8/2012	5/8/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012
Conventional Parameters (percent)																												
Total organic carbon	0.81	0.49	0.71	1.1	1.5	3.6	0.37	0.65	0.66	0.84	0.53	0.46	0.31	0.23	0.60	0.56	0.18	0.20	0.26	0.97	0.47	0.46	0.23	0.58	0.39	0.5	0.15	0.04 J
Total solids	64.0	71.1	66.4	65.8	57.6	50.4	94.4	82.1	79.8	83.0	93.1	84.3	81.7	79.6	97.3	77.1	81.8	83.4	83.2	59	73.8	74.7	79.5	96.4	86.5	85.5	85.2	84.1
Clay (less than 0.00391mm)	14.84	11.88	13.77	23.34	23.51	13.98	7.61	14.73	19.76	21.27	5.24	12.92	15.29	16.49	1.45	8.63	16.88	13.36	NA	12.73	17.28	NA	12.19	6.36	19.15	NA	8.83	2.53
Silt (0.00391 to 0.0625mm)	37.72	37.37	35.79	59.76	52.36	51.49	24.95	51.58	60.17	60.38	27.39	38.47	40.94	49.99	7.28	20.14	51.19	49.24	NA	40.78	53.54	NA	43.26	17.23	55.25	NA	28.46	6.44
Total Silt and Clay (0 to 0.0625mm)	54.56	49.25	49.56	83.10	75.86	65.47	32.57	66.32	79.92	81.66	32.62	51.39	56.23	66.48	8.73	28.77	68.07	62.60	NA	53.51	70.82	NA	55.45	23.59	74.39	NA	37.29	8.96
Very Fine Sand (0.0625 to 0.125mm)	9.04	15.17	14.26	13.37	10.25	16.3	10.48	17.43	13.79	12.2	14.03	16.67	15.84	18.70	5.13	8.73	14.84	25.42	NA	14.84	16.63	NA	20.78	9.16	15.95	NA	13.11	4.04
Fine Sand (0.125 to 0.25mm)	7.21	11.30	15.55	3.23	6.60	9.89	12.77	6.78	4.38	4.95	15.78	10.95	10.16	11.00	10.28	14.22	7.84	10.27	NA	8.93	6.14	NA	12.79	14.54	7.41	NA	12.53	9.41
Medium Sand (0.25 to 0.5mm)	19.91	16.65	13.26	0.01	5.89	6.96	21.86	5.60	1.81	1.20	20.13	10.26	8.34	2.30	35.24	27.15	5.08	1.44	NA	9.10	3.68	NA	7.56	30.38	0.77	NA	16.22	25.03
Coarse Sand (0.5 to 1mm)	8.40	6.83	7.04	< 0.01	< 0.01	1.38	21.46	2.91	< 0.01	< 0.01	12.29	9.31	9.05	1.53	35.24	18.46	2.41	< 0.00	NA	11.79	1.66	NA	3.32	21.71	< 0.01	NA	15.65	32.13
Very Coarse Sand (1 to 2mm)	< 0.01	0.02	0.04	< 0.01	< 0.01	< 0.01	0.58	< 0.01	< 0.01	< 0.01	2.05	0.07	< 0.01	< 0.01	3.15	1.47	< 0.00	< 0.00	NA	0.10	< 0.01	NA	< 0.01	0.23	< 0.01	NA	2.32	9.32
Gravel (greater than 2mm)	0.87	0.78	0.30	0.29	1.40	< 0.01	0.29	0.96	0.10	< 0.01	3.09	1.35	0.39	< 0.01	2.13	1.21	1.77	0.28	NA	1.73	1.08	NA	0.10	0.38	1.48	NA	2.88	11.11
Metals (mg/kg)																												
Arsenic	5.04	3.51	4.79	5.69	6.71 B	7.96 B	1.88	2.87	2.83	2.51	4.16	4.19	3.94	4.77	1.80	2.62	2.28	2.69	2.27	4.510 B	3.25 B	3.50 B	2.45 B	2.34 B	2.71 B	2.33 B	2.19 B	1.57 B
Cadmium	0.207	0.091 J	0.16	0.105 J	0.385	0.144 J	0.024 J	0.021 J	0.029 J	0.026 J	0.488	0.405	0.451	0.521	0.665	0.107 J	0.063 J	0.035 J	0.036 J	0.178	0.066 J	0.068 J	0.038 J	0.337	0.098 J	0.061 J	0.035 J	< 0.015
Chromium	18.3	10.6	14.8	17.0	24.7	23.2	5.27	10.5	9.65	7.72	15.7	15.0	17.9	16.7	9.78	7.49	7.89	8.6	8.05	12.0	9.93	9.09	6.76	4.27	6.20	6.11	5.03	2.68
Copper	19.2	9.73	13.1	15.8	28.2	16.9	6.31	10.0	11.4	7.95	61.3	55.5	67.3	55.5	16.7	10.0	9.14	8.51	8.19	20.4	13.7	12.2	8.98	10.7	8.67	8.32	5.24	1.91
Lead	10.6	5.51	6.58	5.58	35.0	6.28	7.93	4.17	4.54	3.11	78.8	43.2	50.3	53.1	8.24	3.95	5.04	3.61	3.28	19.8	4.89	4.77	3.34	9.81	3.67	3.51	2.48	1.86
Mercury	0.038	0.018 J	0.024 J	0.019 J	0.064	< 0.012	< 0.006	< 0.007	< 0.007	< 0.007	< 0.006	0.009 J	< 0.007	< 0.007	0.038	< 0.008	< 0.007	< 0.007	< 0.007	0.024 J	< 0.008	< 0.008	< 0.007	0.009 J	< 0.007	< 0.007	< 0.007	< 0.007
Nickel	7.71	4.51	6.17	7.39	10.6	10.5	8.130 B	4.360 B	4.480 B	3.320 B	5.35	6.35	6.80	7.04	3.45	3.45	3.55	4.78	3.70	6.04	4.95	4.62	3.28	2.58	3.63	3.21	2.41	1.68
Selenium	< 0.086	< 0.077	< 0.082	< 0.083	< 0.088	< 0.100	< 0.054	< 0.062	< 0.063	< 0.061	< 0.054	< 0.060	< 0.062	< 0.064	< 0.052	< 0.066	< 0.062	< 0.061	< 0.061	< 0.086	< 0.069	< 0.068	< 0.064	< 0.052	< 0.059	< 0.059	< 0.059	< 0.06
Silver	0.115 J	0.045 J	0.087 J	0.065 J	0.187	0.062 J	0.015 J	0.016 J	0.043 J	0.047 J	0.289	0.247	0.308	0.253	0.579	0.084 J	0.037 J	0.025 J	0.024 J	0.147 J	0.036 J	0.037 J	0.024 J	0.090 J	0.048 J	0.037 J	0.019 J	< 0.012
Zinc	67.4	35.2	52.9	51.3	96.7	59.7	22.8	33.2	37.1	28.3	177	153	167	156	53.3	90.1	27.3	28.1	26.9	71.9	41.9	41.0	29.1	56.3	28.5	32.7	19.2	12.9
TPH (mg/kg)																												
TPH (as diesel)	< 7.5	< 6.8	< 7.2	< 7.3	20 HD	< 9.5	< 5.1	< 5.9	< 6.0	< 5.8	29 HD	< 5.7	< 5.9	< 6.0	8.6 HD	< 6.2	< 5.9	< 5.8	< 5.8	< 8.2	< 6.5	< 6.4	< 6.1	20 HD	< 5.6	< 5.6	< 5.6	< 5.7
Pesticides (µg/kg)																												
2,4'-DDD	< 0.53	< 0.48	< 0.51	< 0.51	< 0.59	< 0.67	< 0.36	< 0.41	< 0.42	< 0.41	0.84 J	< 0.40	< 0.41	< 0.43	16	1.3	< 0.41	< 0.41	< 0.41	3.2	< 0.46	< 0.45	< 0.43	1.7	< 0.39	< 0.40	< 0.40	< 0.40
2,4'-DDE	< 0.48	< 0.43	< 0.46	< 0.46	< 0.53	< 0.61	< 0.32	< 0.37	< 0.38	< 0.37	1.3	< 0.36	< 0.37	< 0.38	8.1	0.48 J	< 0.37	< 0.37	< 0.37	2.3	< 0.41	< 0.41	< 0.38	2.5	< 0.35	< 0.36	< 0.36	< 0.36
2,4'-DDT	< 0.47	< 0.42	< 0.45	< 0.46	< 0.52	< 0.60	< 0.32	< 0.37	< 0.38	< 0.36	< 0.32	0.36 J	< 0.37	< 0.38	54	0.53 J	< 0.37	< 0.36	< 0.36	13	< 0.41	< 0.40	< 0.38	21	0.58 J	0.67 J	< 0.35	< 0.36
4,4'-DDD	< 0.49	0.61 J	< 0.48	< 0.48	3.4	< 0.63	< 0.33	< 0.38	< 0.40	< 0.38	2.3	2.1	< 0.39	< 0.40	35	5.3	0.44 J	< 0.38	< 0.38	23	< 0.43	< 0.42	< 0.40	24	0.71 J	1.0 J	< 0.37	< 0.38
4,4'-DDE	1.1 J	3.1	1.4 J	0.72 J	6.7	< 0.59	0.50 J	< 0.36	< 0.37	< 0.36	19	1.7	< 0.37	< 0.38	880	47	2.0	< 0.36	< 0.36	270	2.5	2.0	0.54 J	330	12	11	< 0.35	< 0.36
4,4'-DDT	< 0.52	< 0.47	< 0.50	< 0.51	2.1	< 0.66	< 0.35	< 0.41	< 0.42	< 0.40	8.3	11	< 0.41	< 0.42	350	3.9	< 0.41	< 0.40	< 0.40	120	< 0.45	< 0.45	< 0.42	110	3.1	2.6	< 0.39	< 0.40
Total DDTs	1.1 J	3.7 J	1.4 J	0.72 J	12.2	< 0.67	0.50 J	< 0.41	< 0.42	< 0.41	32 J	15 J	< 0.41	< 0.43	1340	59 J	2.4 J	< 0.41	< 0.41	430	2.5	2.0	0.54 J	490	16 J	15 J	< 0.40	< 0.40
Aldrin	< 0.49	< 0.44	< 0.47	< 0.48	< 0.55	< 0.62	< 0.33	< 0.38	< 0.39	< 0.38	< 0.34	< 0.37	< 0.39	< 0.40	< 0.65	< 0.41	< 0.38	< 0.38	< 0.38	< 0.53	< 0.43	< 0.42	< 0.40	< 0.33	< 0.36	< 0.37	< 0.37	< 0.37
Alpha Chlordane	< 0.50	< 0.45	< 0.48	< 0.49	< 0.56	< 0.64	< 0.34	< 0.39	< 0.40	< 0.39	< 0.34	< 0.38	< 0.39	< 0.40	< 0.66	< 0.42	< 0.39	< 0.38	< 0.39	5.4	< 0.43	< 0.43	< 0.40	8.1	< 0.37	< 0.38	< 0.38	< 0.38
alpha-BHC	< 0.51	< 0.46	< 0.49	< 0.49	< 0.56	< 0.64	< 0.34	< 0.39	< 0.41	< 0.39	< 0.35	< 0.38	< 0.40	< 0.41	< 0.67	< 0.42	< 0.40	< 0.39	< 0.39	< 0.55	< 0.44	< 0.43	< 0.41	< 0.34	< 0.37	< 0.38	< 0.38	< 0.39
beta-BHC	< 0.41	< 0.37	< 0.40	< 0.40	< 0.46	< 0.52	< 0.28	< 0.32	< 0.33	< 0.32	< 0.28	< 0.31	< 0.32	< 0.33	< 0.54	< 0.34	< 0.32	< 0.32	< 0.32	< 0.45	< 0.36	< 0.35	< 0.33	< 0.27	< 0.31	< 0.31	< 0.31	< 0.31
Chlordane (Technical)	< 5.10	< 4.60	< 4.90	< 5.00	< 5.70	< 6.50	< 3.50	< 4.00	< 4.10	< 3.90	< 3.50	< 3.90	< 4.00	< 4.10	< 6.70	< 4.20	< 4.00	< 3.90	< 3.90	30	< 4.40	< 4.40	< 4.10	86	< 3.80	< 3.80	< 3.80	< 3.90
Cis-nonachlor	< 0.46	< 0.41	< 0.44	< 0.45	< 0.51	< 0.58	< 0.31	< 0.36	< 0.37	< 0.35	< 0.32	< 0.35	< 0.36	< 0.37	< 0.60	< 0.38	< 0.36	< 0.35	< 0.35	< 0.50	< 0.40	< 0.39	< 0.37	4.4	< 0.34	< 0.34	< 0.34	< 0.35
delta-BHC	< 0.40	< 0.36	< 0.39	< 0.39	< 0.44	< 0.51	< 0.27	< 0.31	< 0.32	< 0.31	< 0.27	< 0.30	< 0.31	< 0.32	< 0.53	< 0.33	< 0.31	< 0.31	< 0.31	< 0.43	< 0.35	< 0.34	< 0.32	< 0.27	< 0.30	< 0.30	< 0.30	< 0.30
Dieldrin	< 0.52	< 0.46	< 0.50	< 0.50	< 0.57	< 0.65	< 0.35	< 0.40	< 0.41	< 0.40	< 0.35	< 0.39	< 0.40	< 0.41	< 0.68	< 0.43	< 0.40	< 0.40	< 0.40	3.9	< 0.45	< 0.44	< 0.41	19	0.47 J	0.58 J	< 0.39	< 0.39
Endosulfan sulfate	< 0.53	< 0.48	< 0.51	< 0.51	< 0.59	< 0.67	< 0.36	< 0.41	< 0.42	< 0.41	< 0.36	< 0.40	< 0.41	< 0.42	< 0.69	< 0.44	< 0.41	< 0.41	< 0.41	< 0.57	< 0.46	< 0.45	< 0.43	< 0.35	< 0.39	< 0.40	< 0.40	< 0.40
Endosulfan-alpha (I)	< 0.41	< 0.37	< 0.39	< 0.40	< 0.45	< 0.52	< 0.28	< 0.32	< 0.33	< 0.32	< 0.28	< 0.31	< 0.32	< 0.33	< 0.54	< 0.34	< 0.32	< 0.31	< 0.31	< 0.44	< 0.36	< 0.35	< 0.33	< 0.27	< 0.30	< 0.31	< 0.31	< 0.31
Endosulfan-beta (II)	< 0.44	< 0.39	< 0.42	< 0.42	< 0.49	< 0.55	< 0.30	< 0.34	< 0.35	< 0.34	< 0.30	< 0.33	< 0.34	< 0.35	< 0.57	< 0.36	< 0.34	< 0.34	< 0.34	< 0.47	< 0.38	< 0.37	< 0.35	< 0.29	< 0.32	< 0.33	< 0.33	< 0.33
Endrin	< 0.56	< 0.50	< 0.54	< 0.54	< 0.62	< 0.71	< 0.38	< 0.44	< 0.45	< 0.43	< 0.38	< 0.43	< 0.44	< 0.45	< 0.74	< 0.46	< 0.44	< 0.43	< 0.43	< 0.61	< 0.49	< 0.48	< 0.45	< 0.37	< 0.41	< 0.42	< 0.42	< 0.43
Endrin aldehyde	< 0.38	< 0.34	< 0.37	< 0.37	< 0.42	< 0.48	< 0.26	< 0.30	< 0.31	< 0.29	< 0.26	< 0.29	< 0.30	< 0.31	< 0.50	< 0.32	< 0.30	< 0.29	< 0.29	< 0.41	< 0.33	< 0.33	< 0.31	< 0.25	< 0.28	< 0.29	< 0.29	< 0.29
Endrin ketone	< 0.54	< 0.49	< 0.52	< 0.53	< 0.60	< 0.69	< 0.37	< 0.42	< 0.44	< 0.42	< 0.37	< 0.41	< 0.42	< 0.44	< 0.71	< 0.45	< 0.42	< 0.42	< 0.42	< 0.59	< 0.47	< 0.46	< 0.44	< 0.36	< 0.40	< 0.41	< 0.41	< 0.41
Gamma Chlordane	< 0.50	< 0.45	< 0.48	< 0.48	< 0.55	< 0.63	< 0.34	< 0.39	< 0.40	< 0.38	< 0.34	< 0.38	< 0.39	< 0.40	< 0.65	< 0.41	< 0.39	< 0.38	< 0.38	3.7	< 0.43	< 0.43	< 0.40	9.3	< 0.37	< 0.37	< 0.37	< 0.38
gamma-BHC (Lindane)	< 0.54	< 0.49	< 0.52	< 0.53	< 0.60	< 0.69	< 0.37	< 0.42	< 0.43	< 0.42	< 0.37	< 0.41	< 0.42	< 0.43	< 0.71	< 0.45	< 0.42	< 0.42	< 0.42	< 0.59	< 0.47	< 0.46	< 0.44	< 0.36	< 0.40	< 0.40	< 0.41	< 0.41
Heptachlor	< 0.50	< 0.45	< 0.48	< 0.49	< 0.56	< 0.64	< 0.34	< 0.39	< 0.40	< 0.39	< 0.35	< 0.38	< 0.39	< 0.40	< 0.66	< 0.42	< 0.39	< 0.39	< 0.39	< 0.54	< 0.44	< 0.43	< 0.40	< 0.33	< 0.37	< 0.38	< 0.38	< 0.38
Heptachlor epoxide	< 0.56	< 0.50	< 0.54	< 0.54	< 0.62	< 0.71	< 0.38	< 0.43	< 0.45	< 0.43	< 0.38	< 0.42	< 0.44	< 0.45	< 0.73	< 0.46	< 0.43	< 0.43	< 0.43	< 0.60	< 0.48	< 0.48	< 0.45	< 0.37	< 0.41	< 0.42	< 0.42	< 0.42
Methoxychlor	< 0.51	< 0.46	< 0.49	< 0.49	< 0.56	< 0.64	< 0.34	< 0.40	< 0.41	< 0.39	< 0.35	< 0.39	< 0.40	< 0.41	< 0.67	< 0.42	< 0.40	< 0.39	< 0.39	< 0.55	< 0.44	< 0.43	< 0.41	< 0.34	< 0.38	< 0.38	< 0.38	< 0.39
Oxychlordane	< 0.44	< 0.40	< 0.42	< 0.43	< 0.49	< 0.56	< 0.30	< 0.34	< 0.35	< 0.34	< 0.30	< 0.33	< 0.34	< 0.35	< 0.58	< 0.36	< 0.34	< 0.34	< 0.34	< 0.48	< 0.38	< 0.38	< 0.35	< 0.29	< 0.33	< 0.33	< 0.33	< 0.33
Total Chlordanes	< 0.50	< 0.45	< 0.48	< 0.49	< 0.56	< 0.64	< 0.34	< 0.39	< 0.40	< 0.39	< 0.34	< 0.38	< 0.39	< 0.40	< 0.66	< 0.42	< 0.39	< 0.38	< 0.39	10.4	< 0.43	< 0.43	< 0.40	26	< 0.37	< 0.38	< 0.38	< 0.38
Toxaphene	< 9.9	< 8.9	< 9.5	< 9.6	< 11	< 13	< 6.7	< 7.7	< 7.9	< 7.6	15 J	< 7.5	< 7.8	< 8.0	1200	34	< 7.7	< 7.6	< 7.6	310	< 8.6	< 8.5	< 8.0	670	17 J	19 J	< 7.4	< 7.5
Trans-nonachlor	< 0.45	< 0.40	< 0.43	< 0.44	< 0.50	< 0.57	< 0.30	< 0.35	< 0.36	< 0.35	< 0.31	< 0.34	< 0.35	< 0.36	< 0.59	< 0.37	< 0.35	< 0.35	< 0.35	1.30 J	< 0.39	< 0.39	< 0.36	3.8	< 0.33	< 0.34	< 0.34	< 0.34
PCB Congeners (µg/kg)																												
PCB018	NA	NA	NA	NA	NA	NA	< 0.17	< 0.19	< 0.2	< 0.19	< 0.17	< 0.19	< 0.19	< 0.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.16	< 0.18	< 0.18	< 0.18	< 0.19
PCB028	NA	NA	NA	NA	NA	NA	< 0.11	< 0.12	< 0.12	< 0.12	< 0.11	< 0.12	< 0.12	< 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.10	< 0.11	< 0.12	< 0.12	< 0.12
PCB037	NA	NA	NA	NA	NA	NA	< 0.14	< 0.16	< 0.16	< 0.16	< 0.14	< 0.16	< 0.16	< 0.16	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.14	< 0.15	< 0.15	< 0.15	< 0.16
PCB044	NA	NA	NA	NA	NA	NA	< 0.14	< 0.16	< 0.16	< 0.16	0.20 J	< 0.16	< 0.16	< 0.17	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.14	< 0.15	< 0.15	< 0.15	< 0.16
PCB049	NA	NA	NA	NA	NA	NA	< 0.12	< 0.14	< 0.15	< 0.14	< 0.13	< 0.14	< 0.14	< 0.15	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.12	< 0.14	< 0.14	< 0.14	< 0.14
PCB052	NA	NA	NA	NA	NA	NA	< 0.10	< 0.12	< 0.12	< 0.12	0.52 J	< 0.11	< 0.12	< 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.10	< 0.11	< 0.11	< 0.11	< 0.12
PCB066	NA	NA	NA	NA	NA	NA	< 0.097	< 0.11	< 0.11	< 0.11	0.13 J	< 0.11	< 0.11	< 0.11	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.095	< 0.11	< 0.11	< 0.11	< 0.11
PCB070	NA	NA	NA	NA	NA	NA	< 0.087	< 0.10	< 0.10	< 0.099	0.29 J	< 0.097	< 0.10	< 0.10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.085	< 0.095	< 0.096	< 0.096	< 0.098
PCB074	NA	NA	NA	NA	NA	NA	< 0.10	< 0.12	< 0.12	< 0.11	< 0.10	< 0.11	< 0.12	< 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.098	< 0.11	< 0.11	< 0.11	< 0.11
PCB077	NA	NA	NA	NA	NA	NA	< 0.10	< 0.12	< 0.12	< 0.12	0.2 J	< 0.12	< 0.12	< 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.10	< 0.11	< 0.11	< 0.11	< 0.12
PCB081	NA	NA	NA	NA	NA	NA	< 0.13	< 0.15	< 0.15	< 0.15	< 0.13	< 0.14	< 0.15	< 0.15	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.13	< 0.14	< 0.14	< 0.14	< 0.15
PCB087	NA	NA	NA	NA	NA	NA	< 0.11	< 0.12	< 0.13	< 0.12	1.0	< 0.12	< 0.12	< 0.13	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.10	< 0.12	< 0.12	< 0.12	< 0.12
PCB099	NA	NA	NA	NA	NA	NA	< 0.090	< 0.10	< 0.11	< 0.10	0.80	< 0.10	< 0.10	< 0.11	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.088	< 0.098	< 0.10	< 0.10	< 0.10
PCB101	NA	NA	NA	NA	NA	NA	< 0.086	< 0.099	< 0.10	< 0.098	2.7	< 0.096	< 0.099	< 0.10	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.17 J	< 0.094	< 0.095	< 0.095	< 0.097
PCB105	NA	NA	NA	NA	NA	NA	< 0.11	< 0.13	< 0.13	< 0.13	1.2	< 0.12	< 0.13	< 0.13	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.11	< 0.12	< 0.12	< 0.12	< 0.12
PCB110	NA	NA	NA	NA	NA	NA	< 0.11	< 0.13	< 0.13	< 0.12	2.3	< 0.12	< 0.13	< 0.13	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.18 J	< 0.12	< 0.12	< 0.12	< 0.12
PCB114	NA	NA	NA	NA	NA	NA	< 0.11	< 0.12	< 0.12	< 0.12	< 0.11	< 0.12	< 0.12	< 0.13	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.10	< 0.12	< 0.12	< 0.12	< 0.12
PCB118	NA	NA	NA	NA	NA	NA	< 0.14	< 0.16	< 0.17	< 0.16	2.3	< 0.16	< 0.16	< 0.17	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.14	< 0.15	< 0.16	< 0.16	< 0.16
PCB119	NA	NA	NA	NA	NA	NA	< 0.092	< 0.11	< 0.11	< 0.10	< 0.093	< 0.10	< 0.11	< 0.11	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.090	< 0.10	< 0.10	< 0.10	< 0.10
PCB123	NA	NA	NA	NA	NA	NA	< 0.092	< 0.11	< 0.11	< 0.11	< 0.094	< 0.10	< 0.11	< 0.11	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.090	< 0.10	< 0.10	< 0.10	< 0.10

Table 7
Results of Physical and Chemical Analyses of Soil and Sediment Composite Samples

Subarea Name	OR-1,2,3		OR-4,5,6		OR-7,8,9		ORFP-1,2,3,4,5,6				ORFP-7,9,10,11,12,13				ORFP-8,14,15,16					NC-1 and NC-2				S3				
Composite Sample ID	OR-1,2,3-A	OR-1,2,3-B	OR-4,5,6-A	OR-4,5,6-B	OR-7,8,9-A	OR-7,8,9-B	A-12	B-12	C-12	D-12	A-12	B-12	C-12	D-12	A-12	B-12	C-12	D-12	D-12-DUP	A-12	B-12	B-12-DUP	C-12	A-12	B-12	B-12-DUP	C-12	D-12
Depth Interval/Elevation Range	Mudline to -3.6 feet MLLW	-3.6 to -5.6 feet MLLW	Mudline to -3.6 feet MLLW	-3.6 to -5.6 feet MLLW	Mudline -3.6 feet MLLW	-3.6 to -5.6 feet MLLW	Ground surface to 1 foot bgs	1 foot bgs to +0.4 feet MLLW	+0.4 to -5.6 feet MLLW	-5.6 to -7.6 feet MLLW	Ground surface to 1 foot bgs	1 foot bgs to +0.4 feet MLLW	+0.4 to -5.6 feet MLLW	-5.6 to -7.6 feet MLLW	Ground surface to 1 foot bgs	1 foot bgs to +0.4 feet MLLW	+0.4 to -5.6 feet MLLW	-5.6 to -7.6 feet MLLW	-5.6 to -7.6 feet MLLW	Ground surface to 1 foot bgs	1 foot bgs to -5.6 feet MLLW	1 foot bgs to -5.6 feet MLLW	-5.6 to -7.6 feet MLLW	Ground surface to 1 foot bgs	1 foot bgs to +6.4 feet MLLW	1 foot bgs to +6.4 feet MLLW	+6.4 to -3.6 feet MLLW	-3.6 to -5.6 feet MLLW
Sample Date	5/11/2012	5/11/2012	5/10/2012	5/10/2012	5/9/2012	5/9/2012	5/8/2012	5/8/2012	5/8/2012	5/8/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012
PCB126	NA	NA	NA	NA	NA	NA	< 0.15	< 0.17	< 0.17	< 0.17	0.70	< 0.16	< 0.17	< 0.17	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.14	< 0.16	< 0.16	< 0.16	< 0.16
PCB128	NA	NA	NA	NA	NA	NA	< 0.11	< 0.12	< 0.13	< 0.12	0.80	< 0.12	< 0.13	< 0.13	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.11	< 0.12	< 0.12	< 0.12	< 0.12
PCB138/158	NA	NA	NA	NA	NA	NA	< 0.22	< 0.25	< 0.25	< 0.24	5.3	< 0.24	< 0.25	< 0.25	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.50 J	< 0.23	< 0.24	< 0.24	< 0.24
PCB149	NA	NA	NA	NA	NA	NA	< 0.095	< 0.11	< 0.11	< 0.11	3.5	< 0.11	< 0.11	< 0.11	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.32 J	< 0.10	< 0.10	< 0.10	< 0.11
PCB151	NA	NA	NA	NA	NA	NA	< 0.11	< 0.13	< 0.13	< 0.12	1.2	< 0.12	< 0.13	< 0.13	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.11	< 0.12	< 0.12	< 0.12	< 0.12
PCB153	NA	NA	NA	NA	NA	NA	< 0.11	< 0.13	< 0.13	< 0.13	4.7	< 0.12	< 0.13	< 0.13	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.43 J	< 0.12	< 0.12	< 0.12	< 0.12
PCB156	NA	NA	NA	NA	NA	NA	< 0.10	< 0.12	< 0.12	< 0.12	0.71	< 0.12	< 0.12	< 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.10	< 0.11	< 0.11	< 0.11	< 0.12
PCB157	NA	NA	NA	NA	NA	NA	< 0.10	< 0.12	< 0.12	< 0.12	< 0.10	< 0.11	< 0.12	< 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.099	< 0.11	< 0.11	< 0.11	< 0.11
PCB167	NA	NA	NA	NA	NA	NA	< 0.11	< 0.12	< 0.13	< 0.12	< 0.11	< 0.12	< 0.12	< 0.13	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.10	< 0.12	< 0.12	< 0.12	< 0.12
PCB168	NA	NA	NA	NA	NA	NA	< 0.091	< 0.10	< 0.11	< 0.10	0.64	< 0.10	< 0.11	< 0.11	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.089	< 0.099	< 0.10	< 0.10	< 0.10
PCB169	NA	NA	NA	NA	NA	NA	< 0.087	< 0.099	< 0.10	< 0.098	0.88	< 0.097	< 0.10	< 0.10	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.085	< 0.094	< 0.096	< 0.096	< 0.097
PCB170	NA	NA	NA	NA	NA	NA	< 0.098	< 0.11	< 0.12	< 0.11	3.1	< 0.11	< 0.11	< 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.25 J	< 0.11	< 0.11	< 0.11	< 0.11
PCB177	NA	NA	NA	NA	NA	NA	< 0.13	< 0.15	< 0.15	< 0.15	1.0	< 0.15	< 0.15	< 0.15	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.13	< 0.14	< 0.14	< 0.14	< 0.15
PCB180	NA	NA	NA	NA	NA	NA	< 0.065	< 0.074	< 0.077	< 0.074	6.0	< 0.073	< 0.075	< 0.077	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.390 J	< 0.071	< 0.072	< 0.072	< 0.073
PCB183	NA	NA	NA	NA	NA	NA	< 0.12	< 0.14	< 0.14	< 0.13	1.3	< 0.13	< 0.14	< 0.14	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.12	< 0.13	< 0.13	< 0.13	< 0.13
PCB187	NA	NA	NA	NA	NA	NA	< 0.11	< 0.13	< 0.13	< 0.13	3.5	< 0.12	< 0.13	< 0.13	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.25 J	< 0.12	< 0.12	< 0.12	< 0.12
PCB189	NA	NA	NA	NA	NA	NA	< 0.091	< 0.10	< 0.11	< 0.10	< 0.092	< 0.10	< 0.10	< 0.11	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.089	< 0.099	< 0.10	< 0.10	< 0.10
PCB194	NA	NA	NA	NA	NA	NA	< 0.10	< 0.12	< 0.12	< 0.12	2.7	< 0.11	< 0.12	< 0.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.15 J	< 0.11	< 0.11	< 0.11	< 0.11
PCB201	NA	NA	NA	NA	NA	NA	< 0.060	< 0.069	< 0.071	< 0.069	0.30 J	< 0.068	< 0.07	< 0.072	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.059	< 0.066	< 0.067	< 0.067	< 0.068
PCB206	NA	NA	NA	NA	NA	NA	< 0.088	< 0.10	< 0.10	< 0.10	1.3	< 0.098	< 0.10	< 0.10	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.19 J	< 0.096	< 0.097	< 0.097	< 0.099
Total PCB Congeners	NA	NA	NA	NA	NA	NA	< 0.22	< 0.25	< 0.25	< 0.24	49.3 J	< 0.24	< 0.25	< 0.25	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.83 J	< 0.23	< 0.24	< 0.24	< 0.24
PAH (µg/kg)																												
1-Methylnaphthalene	NA	NA	NA	NA	NA	NA	< 1.9	< 2.2	3.70 J	< 2.2	< 1.9	< 2.1	< 2.2	< 2.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.9	< 2.1	< 2.1	< 2.1	< 2.1
Acenaphthene	NA	NA	NA	NA	NA	NA	13	< 2.3	< 2.3	< 2.2	3.9 J	< 2.2	< 2.3	< 2.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	14	< 2.1	< 2.2	< 2.2	< 2.2
Acenaphthylene	NA	NA	NA	NA	NA	NA	14	< 2.0	< 2.1	< 2.0	3.3 J	< 2.0	< 2.0	< 2.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	13	< 1.9	< 1.9	< 1.9	< 2.0
Anthracene	NA	NA	NA	NA	NA	NA	< 1.9	< 2.2	< 2.3	< 2.2	< 1.9	< 2.1	< 2.2	< 2.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.9	< 2.1	< 2.1	< 2.1	< 2.1
Benzo (a) Anthracene	NA	NA	NA	NA	NA	NA	< 2.3	< 2.6	< 2.7	< 2.6	< 2.3	< 2.6	< 2.6	< 2.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 2.2	< 2.5	< 2.5	< 2.5	< 2.6
Benzo (a) Pyrene	NA	NA	NA	NA	NA	NA	2.2 J	< 2.1	< 2.2	< 2.1	< 1.9	< 2.1	< 2.1	< 2.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.8	< 2.0	< 2.0	< 2.1	< 2.1
Benzo (b) Fluoranthene	NA	NA	NA	NA	NA	NA	2.3 J	< 2.2	< 2.3	< 2.2	< 1.9	< 2.1	< 2.2	< 2.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.9	< 2.1	< 2.1	< 2.1	< 2.1
Benzo (g,h,i) Perylene	NA	NA	NA	NA	NA	NA	< 2.0	< 2.3	< 2.3	< 2.2	< 2.0	< 2.2	< 2.3	< 2.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.9	< 2.1	< 2.2	< 2.2	< 2.2
Benzo (k) Fluoranthene	NA	NA	NA	NA	NA	NA	< 2.6	< 3.0	< 3.1	< 3.0	< 2.7	< 3.0	< 3.1	< 3.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 2.6	< 2.9	< 2.9	< 2.9	< 3.0
Chrysene	NA	NA	NA	NA	NA	NA	3.0 J	< 2.5	< 2.6	< 2.5	< 2.2	< 2.4	< 2.5	< 2.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.8 J	< 2.4	< 2.4	< 2.4	< 2.4
Dibenz (a,h) Anthracene	NA	NA	NA	NA	NA	NA	< 2.1	< 2.4	< 2.4	< 2.3	< 2.1	< 2.3	< 2.4	< 2.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 2.0	< 2.3	< 2.3	< 2.3	< 2.3
Fluoranthene	NA	NA	NA	NA	NA	NA	4.6 J	< 2.3	< 2.4	< 2.3	< 2.0	< 2.3	< 2.3	< 2.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.6 J	< 2.2	< 2.2	< 2.2	< 2.3
Fluorene	NA	NA	NA	NA	NA	NA	7.7 J	< 2.1	< 2.2	< 2.1	2.9 J	< 2.1	< 2.1	< 2.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.9 J	< 2.0	< 2.0	< 2.1	< 2.1
Indeno (1,2,3-c,d) Pyrene	NA	NA	NA	NA	NA	NA	< 1.9	< 2.2	< 2.3	< 2.2	< 1.9	< 2.1	< 2.2	< 2.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.9	< 2.1	< 2.1	< 2.1	< 2.1
Naphthalene	NA	NA	NA	NA	NA	NA	49	< 2.3	3.5 J	< 2.2	7.0 J	< 2.2	< 2.3	< 2.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	86	3.6 J	< 2.2	< 2.2	< 2.2
Phenanthrene	NA	NA	NA	NA	NA	NA	2.9 J	< 2.3	< 2.4	< 2.3	< 2.0	< 2.3	< 2.3	< 2.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 2.0	< 2.2	< 2.2	< 2.2	< 2.3
Pyrene	NA	NA	NA	NA	NA	NA	11	< 3.0	< 3.1	< 3.0	2.7 J	< 3.0	< 3.1	< 3.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.1 J	< 2.9	< 2.9	< 2.9	< 3.0
Total HMW PAHs	NA	NA	NA	NA	NA	NA	23	< 3.0	< 3.1	< 3.0	2.7	< 3.0	< 3.1	< 3.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	8.5	< 2.9	< 2.9	< 2.9	< 3.0
Total LMW PAHs	NA	NA	NA	NA	NA	NA	87	< 2.3	7.2	< 2.3	17.1	< 2.3	< 2.3	< 2.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	116	3.6	< 2.2	< 2.2	< 2.3
Total PAHs	NA	NA	NA	NA	NA	NA	110	< 3.0	7.2	< 3.0	19.8	< 3.0	< 3.1	< 3.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	124	3.6	< 2.9	< 2.9	< 3.0
Phenols (µg/kg)																												
2,4,5-Trichlorophenol	NA	NA	NA	NA	NA	NA	< 1.9	< 2.1	< 2.2	< 2.1	< 1.9	< 2.1	< 2.1	< 2.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.8	< 2.0	< 2.0	< 2.1	< 2.1
2,4,6-Trichlorophenol	NA	NA	NA	NA	NA	NA	< 1.4	< 1.6	< 1.6	< 1.6	< 1.4	< 1.5	< 1.6	< 1.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.3	< 1.5	< 1.5	< 1.5	< 1.5
2,4-Dichlorophenol	NA	NA	NA	NA	NA	NA	< 1.4	< 1.6	< 1.7	< 1.6	< 1.5	< 1.6	< 1.7	< 1.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.4	< 1.6	< 1.6	< 1.6	< 1.6
2,4-Dimethylphenol	NA	NA	NA	NA	NA	NA	< 1.7	< 2.0	< 2.1	< 2.0	< 1.8	< 2.0	< 2.0	< 2.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.7	< 1.9	< 1.9	< 1.9	< 2.0
2,4-Dinitrophenol	NA	NA	NA	NA	NA	NA	< 57	< 66	< 68	< 65	< 58	< 64	< 66	< 68	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 56	< 62	< 63	< 63	< 64
2-Chlorophenol	NA	NA	NA	NA	NA	NA	8.3 J	< 2.0	< 2.1	< 2.0	4.3 J	< 2.0	< 2.0	< 2.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	37	< 1.9	< 1.9	< 1.9	< 2.0
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	< 1.9	< 2.1	< 2.2	< 2.1	< 1.9	< 2.1	< 2.1	< 2.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.8	< 2.0	< 2.0	< 2.1	< 2.1
2-Methylphenol	NA	NA	NA	NA	NA	NA	< 1.7	< 1.9	< 2.0	< 1.9	< 1.7	< 1.9	< 2.0	< 2.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.7	< 1.8	< 1.9	< 1.9	< 1.9
2-Nitrophenol	NA	NA	NA	NA	NA	NA	< 1.6	< 1.8	< 1.9	< 1.8	< 1.6	< 1.8	< 1.8	< 1.9	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.6	2.1 J	< 1.8	< 1.8	< 1.8
3/4-Methylphenol	NA	NA	NA	NA	NA	NA	< 1.7	< 1.9	< 2.0	< 1.9	< 1.7	< 1.9	< 2.0	< 2.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.7	< 1.8	< 1.9	< 1.9	< 1.9
4,6-Dinitro-2-Methylphenol	NA	NA	NA	NA	NA	NA	< 73	< 84	< 87	< 83	< 74	< 82	< 85	< 87	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 72	< 80	< 81	< 81	< 82
4-Chloro-3-Methylphenol	NA	NA	NA	NA	NA	NA	4.8 J	< 1.7	< 1.8	< 1.7	< 1.5	< 1.7	< 1.7	< 1.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.5	< 1.6	< 1.6	< 1.6	< 1.7
4-Nitrophenol	NA	NA	NA	NA	NA	NA	< 68	< 78	< 80	< 77	< 69	< 76	< 78	< 80	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 66	< 74	< 75	< 75	< 76
Pentachlorophenol	NA	NA	NA	NA	NA	NA	< 57	< 66	< 68	< 65	< 58	< 64	< 66	< 68	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 56	< 62	< 63	< 63	< 64
Phenol	NA	NA	NA	NA	NA	NA	< 1.9	< 2.2	< 2.3	< 2.2	< 1.9	< 2.1	< 2.2	< 2.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.9	< 2.1	< 2.1	< 2.1	< 2.1
Phthalates (µg/kg)																												
Diethyl Phthalate	NA	NA	NA	NA	NA	NA	5.8 BJ	6.8 BJ	6.4 BJ	6.2 BJ	8.7 BJ	11 BJ	7.3 BJ	8.2 BJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.6 BJ	9.8 BJ	7.4 BJ	7.3 BJ	7.9 BJ
Dimethyl Phthalate	NA	NA	NA	NA	NA	NA	310 B	420 B	470 B	560 B	240 B	410 B	530 B	570 B	NA	NA	NA	NA	NA	NA	NA	NA	NA	400 B	470 B	420 B	470 B	360 B
Di-n-Butyl Phthalate	NA	NA	NA	NA	NA	NA	4.9 BJ	4.3 BJ	4.2 BJ	3.4 BJ	4.5 BJ	10 BJ	5.9 BJ	6.1 BJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	8.0 BJ	10 BJ	7.1 BJ	8.2 BJ	7.3 BJ
Di-n-Octyl Phthalate	NA	NA	NA	NA	NA	NA	< 3.1	< 3.5	< 3.6	< 3.5	< 3.1	< 3.4	< 3.5	< 3.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 3.0	< 3.4	< 3.4	< 3.4	< 3.4
Bis(2-Ethylhexyl) Phthalate	NA	NA	NA	NA	NA	NA	40 B	15 B	13 B	13 B	36 B	22 B	13 B	16 B	NA	NA	NA	NA	NA	NA	NA	NA	NA	20 B	14 B	11 BJ	11 BJ	18 B
Butyl Benzyl Phthalate	NA	NA	NA	NA	NA	NA	7.6 J	4.3 J	4.7 J	4.1 J	11 J	33	7.7 J	9.2 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.4 J	9.9 J	7.8 J	10 J	8.8 J

Table 7
Results of Physical and Chemical Analyses of Soil and Sediment Composite Samples

Notes:
B = analyte was present in the associated method blank
J = reported value is estimated
HD = chromatographic pattern inconsistent with diesel fuel standard indicating a different type of fuel or weathered diesel
µg/kg = micrograms per kilogram
bgs = below ground surface
HMW = high molecular weight
LMW = low molecular weight
mg/kg = milligrams per kilogram
MLLW = mean lower low water
NA = not analyzed
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
TPHs = total petroleum hydrocarbons
Non-detect samples are reported as less than method d
For calculated total chemicals (Total DDTs, PAHs, PCBs, and Chlordane) only detected compounds were summed.
Total DDTs are the sum of 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, 2,4'-DDD, 2,4'-DDE, and 2,4'-DDT.
Total Chlordanes are the sum of Alpha Chlordane, Gamma Chlordane, Cis-Nonachlor, Oxychlordane, and Trans-Nonachlor.
Total HMW PAHs are the sum of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)flouranthene, chrysene, dibenzo(a,h,)anthracene, fluoranthene, indeno(1,2,3-c,d)pyrene, and pyrene.
Total LMW PAHs are the sum of 1-methylnaphthalene, 2-methylnaphthalene, acenaphthene, acenaphthylene, anthracene, flourene, napthalene, and phenathrene.
Total PAHs are the sum of the HMW and LMW PAHs.

In the Otay River Floodplain, DDTs were detected in composite samples from ORFP-7,9,10,11,12,13 in the surface (top 1 foot) and second depth interval (extending down to +0.4 foot MLLW). For composite samples from ORFP-8,14,15,16, detections were observed in the surface, and in the second and third depth intervals (extending down to -5.6 feet MLLW). Toxaphene was detected in the surface from ORFP-7,9,10,11,12,13 and in the surface and second depth interval (extending down to +0.4 foot MLLW) from ORFP-8,14,15,16. No pesticides were detected within composite samples from ORFP-1,2,3,4,5,6.

In Subarea 3, DDTs, dieldrin, and toxaphene were detected in the surface and second depth interval (extending to +6.4 feet MLLW).

In Nestor Creek, DDT compounds were detected in the surface and second depth interval (extending to -5.6 feet MLLW). Dieldrin and toxaphene were detected in the surface.

In the Otay River, DDT compounds were detected in the lower depth interval (from -3.6 feet to -5.6 feet MLLW) for composite samples from OR-1,2,3. For composite samples from OR-7,8,9, similar detections were observed in the upper depth interval (from mudline to -3.6 feet MLLW).

3.1.2.3 PCBs

PCBs were detected in the surface composite samples from ORFP-7,9,10,11,12,13 and Subarea 3.

3.1.2.4 TPHs and SVOCs

No detections were observed for TPHs and polycyclic aromatic hydrocarbons (PAHs); phenols were generally not detected in most composite samples analyzed. Phthalates were detected; however, many samples were B qualified, indicating these results may be biased high due to chemicals being present in the laboratory's analytical blank samples.

3.2 Soil and Sediment Archive Samples

Based on the physical and chemical results of composite samples, additional testing was performed on archived samples. Testing was completed to further characterize grain size

distributions throughout site soils and to better delineate concentrations of pesticides and PCBs, as follows:

- The grain size distribution of composite samples indicated variability between areas and depths. Therefore, grain size was measured in archived samples from each depth interval of each station to further delineate the vertical and horizontal grain size distribution and to identify areas and/or depths that are predominantly coarse-grained material for specific sediment/soil management alternatives.
- As described in Section 3.1.2.2, elevated concentrations of pesticides were detected within the top three depth intervals of composite samples from ORFP-7,9,10,11,12,13; ORFP-8,14,15,16; Subarea 3; and Nestor Creek. Pesticides were analyzed in archived samples from the top three depth intervals of each station within these areas to determine which stations contributed to the elevated concentrations within composite samples.
- As described in Section 3.1.2.3, elevated concentrations of PCBs were measured in the surface composite sample from ORFP-7,9,10,11,12,13. PCBs were measured in archived samples from the surface of each station within this area to determine which stations contributed to the elevated concentrations within the composite sample. PCBs were not initially measured on composite samples from ORFP-8,14,15,16 or Nestor Creek. These composite areas are located adjacent to ORFP-7,9,10,11,12,13; therefore, PCBs were also analyzed on archived composite samples from these areas to determine the horizontal extent of contamination. A summary of physical and chemical analyses performed on archived samples is presented in Table 8.

Table 8
Summary of Physical and Chemical Analyses Performed on Archived Samples

Station ID	Subsurface Sediment Sample ID	Sample Interval		Archive Testing	
		Depth (feet bgs)	Elevation (feet MLLW)	Chemistry	Physical
Composite Area ORFP-1,2,3,4,5,6					
ORFP-1	ORFP-1-A-12-A	0 to 1	8.4 to 7.4	--	GS
	ORFP-1-B-12-A	1 to 3	7.4 to 5.4	--	GS
	ORFP-1-C-12-A	3 to 5	5.4 to 3.4	--	GS
	ORFP-1-D-12-A	5 to 7	3.4 to 1.4	--	GS
	ORFP-1-E-12-A	7 to 9	1.4 to -0.6	--	GS
	ORFP-1-F-12-A	9 to 11	-0.6 to -2.6	--	GS
	ORFP-1-G-12-A	11 to 14	-2.6 to -5.6	--	GS
	ORFP-1-H-12-A	14 to 16	-5.6 to -7.6	--	GS
ORFP-2	ORFP-2-A-12-A	0 to 1	12.4 to 11.4	--	GS
	ORFP-2-B-12-A	1 to 3	11.4 to 9.4	--	GS
	ORFP-2-C-12-A	3 to 5	9.4 to 7.4	--	GS
	ORFP-2-D-12-A	5 to 7	7.4 to 5.4	--	GS
	ORFP-2-E-12-A	7 to 9	5.4 to 3.4	--	GS
	ORFP-2-F-12-A	9 to 11	3.4 to 1.4	--	GS
	ORFP-2-G-12-A	11 to 13	1.4 to -0.6	--	GS
	ORFP-2-H-12-A	13 to 15	-0.6 to -2.6	--	GS
	ORFP-2-I-12-A	15 to 17	-2.6 to -4.6	--	GS
	ORFP-2-J-12-A	17 to 20	-4.6 to -7.6	--	GS
ORFP-3	ORFP-3-A-12-A	0 to 1	12.4 to 11.4	--	GS
	ORFP-3-B-12-A	1 to 3	11.4 to 9.4	--	GS
	ORFP-3-C-12-A	3 to 5	9.4 to 7.4	--	GS
	ORFP-3-D-12-A	5 to 7	7.4 to 5.4	--	GS
	ORFP-3-E-12-A	7 to 9	5.4 to 3.4	--	GS
	ORFP-3-F-12-A	9 to 11	3.4 to 1.4	--	GS
	ORFP-3-G-12-A	11 to 13	1.4 to -0.6	--	GS
	ORFP-3-H-12-A	13 to 15	-0.6 to -2.6	--	GS
	ORFP-3-I-12-A	15 to 17	-2.6 to -4.6	--	GS
	ORFP-3-J-12-A	17 to 20	-4.6 to -7.6	--	GS
ORFP-4	ORFP-4-A-12-A	0 to 1	10.4 to 9.4	--	GS
	ORFP-4-B-12-A	1 to 3	9.4 to 7.4	--	GS
	ORFP-4-C-12-A	3 to 5	7.4 to 5.4	--	GS
	ORFP-4-D-12-A	5 to 7	5.4 to 3.4	--	GS
	ORFP-4-E-12-A	7 to 9	3.4 to 1.4	--	GS
	ORFP-4-F-12-A	9 to 11	1.4 to -0.6	--	GS
	ORFP-4-G-12-A	11 to 13	-0.6 to -2.6	--	GS
	ORFP-4-H-12-A	13 to 15	-2.6 to -4.6	--	GS
	ORFP-4-I-12-A	15 to 18	-4.6 to -7.6	--	GS
ORFP-5	ORFP-5-A-12-A	0 to 1	12.4 to 11.4	--	GS
	ORFP-5-B-12-A	1 to 3	11.4 to 9.4	--	GS
	ORFP-5-C-12-A	3 to 5	9.4 to 7.4	--	GS
	ORFP-5-D-12-A	5 to 7	7.4 to 5.4	--	GS
	ORFP-5-E-12-A	7 to 9	5.4 to 3.4	--	GS
	ORFP-5-F-12-A	9 to 11	3.4 to 1.4	--	GS
	ORFP-5-G-12-A	11 to 13	1.4 to -0.6	--	GS
	ORFP-5-H-12-A	13 to 15	-0.6 to -2.6	--	GS
	ORFP-5-I-12-A	15 to 17	-2.6 to -4.6	--	GS
	ORFP-5-J-12-A	17 to 20	-4.6 to -7.6	--	GS
ORFP-6	ORFP-6-A-12-A	0 to 1	12.4 to 11.4	--	GS
	ORFP-6-B-12-A	1 to 3	11.4 to 9.4	--	GS
	ORFP-6-C-12-A	3 to 5	9.4 to 7.4	--	GS
	ORFP-6-D-12-A	5 to 7	7.4 to 5.4	--	GS
	ORFP-6-E-12-A	7 to 9	5.4 to 3.4	--	GS
	ORFP-6-F-12-A	9 to 11	3.4 to 1.4	--	GS
	ORFP-6-G-12-A	11 to 13	1.4 to -0.6	--	GS
	ORFP-6-H-12-A	13 to 15	-0.6 to -2.6	--	GS
	ORFP-6-I-12-A	15 to 17	-2.6 to -4.6	--	GS
	ORFP-6-J-12-A	17 to 20	-4.6 to -7.6	--	GS
Composite Area ORFP-7,9,10,11,12,13					
ORFP-7	ORFP-7-A-12-A	0 to 1	9.4 to 8.4	PCBs/Pesticides	GS/TS
	ORFP-7-B-12-A	1 to 3	8.4 to 6.4	Pesticides	GS/TS
	ORFP-7-C-12-A	3 to 5	6.4 to 4.4	Pesticides	GS/TS
	ORFP-7-D-12-A	5 to 7	4.4 to 2.4	--	GS
	ORFP-7-E-12-A	7 to 9	2.4 to 0.4	--	GS
	ORFP-7-F-12-A	9 to 11	0.4 to -1.6	--	GS
	ORFP-7-G-12-A	11 to 13	-1.6 to -3.6	--	GS
	ORFP-7-H-12-A	13 to 15	-3.6 to -5.6	--	GS
	ORFP-7-I-12-A	15 to 17	-5.6 to -7.6	--	GS

Table 8
Summary of Physical and Chemical Analyses Performed on Archived Samples

Station ID	Subsurface Sediment Sample ID	Sample Interval		Archive Testing	
		Depth (feet bgs)	Elevation (feet MLLW)	Chemistry	Physical
ORFP-9	ORFP-9-A-12-A	0 to 1	11.4 to 10.4	PCBs/Pesticides	GS/TS
	ORFP-9-B-12-A	1 to 3	10.4 to 8.4	Pesticides	GS/TS
	ORFP-9-C-12-A	3 to 5	8.4 to 6.4	Pesticides	GS/TS
	ORFP-9-D-12-A	5 to 7	6.4 to 4.4	--	GS
	ORFP-9-E-12-A	7 to 9	4.4 to 2.4	--	GS
	ORFP-9-F-12-A	9 to 11	2.4 to 0.4	--	GS
	ORFP-9-G-12-A	11 to 13	0.4 to -1.6	--	GS
	ORFP-9-H-12-A	13 to 15	-1.6 to -3.6	--	GS
	ORFP-9-I-12-A	15 to 17	-3.6 to -5.6	--	GS
	ORFP-9-J-12-A	17 to 19	-5.6 to -7.6	--	GS
ORFP-10	ORFP-10-A-12-A	0 to 1	11.4 to 10.4	PCBs/Pesticides	GS/TS
	ORFP-10-B-12-A	1 to 3	10.4 to 8.4	Pesticides	GS/TS
	ORFP-10-C-12-A	3 to 5	8.4 to 6.4	Pesticides	GS/TS
	ORFP-10-D-12-A	5 to 7	6.4 to 4.4	--	GS
	ORFP-10-E-12-A	7 to 9	4.4 to 2.4	--	GS
	ORFP-10-F-12-A	9 to 11	2.4 to 0.4	--	GS
	ORFP-10-G-12-A	11 to 13	0.4 to -1.6	--	GS
	ORFP-10-H-12-A	13 to 15	-1.6 to -3.6	--	GS
	ORFP-10-I-12-A	15 to 17	-3.6 to -5.6	--	GS
	ORFP-10-J-12-A	17 to 19	-5.6 to -7.6	--	GS
ORFP-11	ORFP-11-A-12-A	0 to 1	12.4 to 11.4	PCBs/Pesticides	GS/TS
	ORFP-11-B-12-A	1 to 3	11.4 to 9.4	Pesticides	GS/TS
	ORFP-11-C-12-A	3 to 5	9.4 to 7.4	Pesticides	GS/TS
	ORFP-11-D-12-A	5 to 7	7.4 to 5.4	--	GS
	ORFP-11-E-12-A	7 to 9	5.4 to 3.4	--	GS
	ORFP-11-F-12-A	9 to 11	3.4 to 1.4	--	GS
	ORFP-11-G-12-A	11 to 13	1.4 to -0.6	--	GS
	ORFP-11-H-12-A	13 to 15	-0.6 to -2.6	--	GS
	ORFP-11-I-12-A	15 to 17	-2.6 to -4.6	--	GS
	ORFP-11-J-12-A	17 to 20	-4.6 to -7.6	--	GS
ORFP-12	ORFP-12-A-12-A	0 to 1	8.4 to 7.4	PCBs/Pesticides	GS/TS
	ORFP-12-B-12-A	1 to 3	7.4 to 5.4	Pesticides	GS/TS
	ORFP-12-C-12-A	3 to 5	5.4 to 3.4	Pesticides	GS/TS
	ORFP-12-D-12-A	5 to 7	3.4 to 1.4	--	GS
	ORFP-12-E-12-A	7 to 9	1.4 to -0.6	--	GS
	ORFP-12-F-12-A	9 to 11	-0.6 to -2.6	--	GS
	ORFP-12-G-12-A	11 to 13	-2.6 to -4.6	--	GS
	ORFP-12-H-12-A	13 to 17	-4.6 to -8.6	--	GS
ORFP-13	ORFP-13-A-12-A	0 to 1	11.4 to 10.4	PCBs/Pesticides	GS/TS
	ORFP-13-B-12-A	1 to 3	10.4 to 8.4	Pesticides	GS/TS
	ORFP-13-C-12-A	3 to 5	8.4 to 6.4	Pesticides	GS/TS
	ORFP-13-D-12-A	5 to 7	6.4 to 4.4	--	GS
	ORFP-13-E-12-A	7 to 9	4.4 to 2.4	--	GS
	ORFP-13-F-12-A	9 to 11	2.4 to 0.4	--	GS
	ORFP-13-G-12-A	11 to 13	0.4 to -1.6	--	GS
	ORFP-13-H-12-A	13 to 15	-1.6 to -3.6	--	GS
	ORFP-13-I-12-A	15 to 17	-3.6 to -5.6	--	GS
	ORFP-13-J-12-A	17 to 20	-5.6 to -8.6	--	GS
Composite Area ORFP-8,14,15,16					
Composite	ORFP-8,14,15,16-A-12	Composite	Ground surface to 1 below ground surface	PCBS	GS/TS
ORFP-8	ORFP-8-A-12-A	0 to 1	11.4 to 10.4	Pesticides	GS/TS
	ORFP-8-B-12-A	1 to 3	10.4 to 8.4	Pesticides	GS/TS
	ORFP-8-C-12-A	3 to 5	8.4 to 6.4	Pesticides	GS/TS
	ORFP-8-D-12-A	5 to 7	6.4 to 4.4	--	GS
	ORFP-8-E-12-A	7 to 9	4.4 to 2.4	--	GS
	ORFP-8-F-12-A	9 to 11	2.4 to 0.4	--	GS
	ORFP-8-G-12-A	11 to 13	0.4 to -1.6	--	GS
	ORFP-8-H-12-A	13 to 15	-1.6 to -3.6	--	GS
	ORFP-8-I-12-A	15 to 17	-3.6 to -5.6	--	GS
	ORFP-8-J-12-A	17 to 19	-5.6 to -7.6	--	GS
ORFP-14	ORFP-14-A-12-A	0 to 1	14.4 to 13.4	Pesticides	GS/TS
	ORFP-14-B-12-A	1 to 3	13.4 to 11.4	Pesticides	GS/TS
	ORFP-14-C-12-A	3 to 5	11.4 to 9.4	Pesticides	GS/TS
	ORFP-14-D-12-A	5 to 7	9.4 to 7.4	--	GS
	ORFP-14-E-12-A	7 to 9	7.4 to 5.4	--	GS
	ORFP-14-F-12-A	9 to 11	5.4 to 3.4	--	GS
	ORFP-14-G-12-A	11 to 14	3.4 to 0.4	--	GS

Table 8
Summary of Physical and Chemical Analyses Performed on Archived Samples

Station ID	Subsurface Sediment Sample ID	Sample Interval		Archive Testing	
		Depth (feet bgs)	Elevation (feet MLLW)	Chemistry	Physical
	ORFP-14-H-12-A	14 to 16	0.4 to -1.6	--	GS
	ORFP-14-I-12-A	16 to 18	-1.6 to -3.6	--	GS
	ORFP-14-J-12-A	18 to 20	-3.6 to -5.6	--	GS
	ORFP-14-K-12-A	20 to 22	-5.6 to -7.6	--	GS
ORFP-15	ORFP-15-A-12-A	0 to 1	13.4 to 12.4	Pesticides	GS/TS
	ORFP-15-B-12-A	1 to 3	12.4 to 10.4	Pesticides	GS/TS
	ORFP-15-C-12-A	3 to 5	10.4 to 8.4	Pesticides	GS/TS
	ORFP-15-D-12-A	5 to 7	8.4 to 6.4	--	GS
	ORFP-15-E-12-A	7 to 9	6.4 to 4.4	--	GS
	ORFP-15-F-12-A	9 to 11	4.4 to 2.4	--	GS
	ORFP-15-G-12-A	11 to 13	2.4 to 0.4	--	GS
	ORFP-15-H-12-A	13 to 15	0.4 to -1.6	--	GS
	ORFP-15-I-12-A	15 to 17	-1.6 to -3.6	--	GS
	ORFP-15-J-12-A	17 to 19	-3.6 to -5.6	--	GS
	ORFP-15-K-12-A	19 to 21	-5.6 to -7.6	--	GS
ORFP-16	ORFP-16-A-12-A	0 to 1	11.4 to 10.4	Pesticides	GS/TS
	ORFP-16-B-12-A	1 to 3	10.4 to 8.4	Pesticides	GS/TS
	ORFP-16-C-12-A	3 to 5	8.4 to 6.4	Pesticides	GS/TS
	ORFP-16-D-12-A	5 to 7	6.4 to 4.4	--	GS
	ORFP-16-E-12-A	7 to 9	4.4 to 2.4	--	GS
	ORFP-16-F-12-A	9 to 11	2.4 to 0.4	--	GS
	ORFP-16-G-12-A	11 to 13	0.4 to -1.6	--	GS
	ORFP-16-H-12-A	13 to 15	-1.6 to -3.6	--	GS
	ORFP-16-I-12-A	15 to 17	-3.6 to -5.6	--	GS
	ORFP-16-J-12-A	17 to 19	-5.6 to -7.6	--	GS
Nestor Creek					
Composite	NC-A-12	Composite	Surface to 1 ft below mudline	PCBS	GS/TS
NC-1	NC-1-A-12-A	0 to 1	5.4 to 4.4	Pesticides	GS/TS
	NC-1-B-12-A	1 to 3	4.4 to 2.4	Pesticides	GS/TS
	NC-1-C-12-A	3 to 5	2.4 to 0.4	Pesticides	GS/TS
	NC-1-D-12-A	5 to 7	0.4 to -1.6	--	GS
	NC-1-E-12-A	7 to 9	-1.6 to -3.6	--	GS
	NC-1-F-12-A	9 to 11	-3.6 to -5.6	--	GS
	NC-1-G-12-A	11 to 13	-5.6 to -7.6	--	GS
NC-2	NC-2-A-12-A	0 to 1	4.4 to 3.4	Pesticides	GS/TS
	NC-2-B-12-A	1 to 3	3.4 to 1.4	Pesticides	GS/TS
	NC-2-C-12-A	3 to 5	1.4 to -0.6	Pesticides	GS/TS
	NC-2-D-12-A	5 to 7	-0.6 to -2.6	--	GS
	NC-2-E-12-A	7 to 9	-2.6 to -4.6	--	GS
	NC-2-F-12-A	9 to 11	-4.6 to -6.6	--	GS
	NC-2-G-12-A	11 to 13	-6.6 to -8.6	--	GS
Subarea S3					
S3-1	S3-1-A-12-A	0 to 1	16.4 to 15.4	Pesticides	GS/TS
	S3-1-B-12-A	1 to 3	15.4 to 13.4	Pesticides	GS/TS
	S3-1-C-12-A	3 to 5	13.4 to 11.4	Pesticides	GS/TS
	S3-1-D-12-A	5 to 7	11.4 to 9.4	--	GS
	S3-1-E-12-A	7 to 9	9.4 to 7.4	--	GS
	S3-1-F-12-A	9 to 11	7.4 to 5.4	--	GS
	S3-1-G-12-A	11 to 13	5.4 to 3.4	--	GS
	S3-1-H-12-A	13 to 15	3.4 to 1.4	--	GS
	S3-1-I-12-A	15 to 17	1.4 to -0.6	--	GS
	S3-1-J-12-A	17 to 19	-0.6 to -2.6	--	GS
	S3-1-K-12-A	19 to 22	-2.6 to -5.6	--	GS
S3-2	S3-2-A-12-A	0 to 1	16.4 to 15.4	Pesticides	GS/TS
	S3-2-B-12-A	1 to 3	15.4 to 13.4	Pesticides	GS/TS
	S3-2-C-12-A	3 to 5	13.4 to 11.4	Pesticides	GS/TS
	S3-2-D-12-A	5 to 7	11.4 to 9.4	--	GS
	S3-2-E-12-A	7 to 9	9.4 to 7.4	--	GS
	S3-2-F-12-A	9 to 11	7.4 to 5.4	--	GS
	S3-2-G-12-A	11 to 13	5.4 to 3.4	--	GS
	S3-2-H-12-A	13 to 15	3.4 to 1.4	--	GS
	S3-2-I-12-A	15 to 17	1.4 to -0.6	--	GS
	S3-2-J-12-A	17 to 19	-0.6 to -2.6	--	GS
	S3-2-K-12-A	19 to 22	-2.6 to -5.6	--	GS
	S3-3-A-12-A	0 to 1	16.4 to 15.4	Pesticides	GS/TS
	S3-3-B-12-A	1 to 3	15.4 to 13.4	Pesticides	GS/TS
	S3-3-C-12-A	3 to 5	13.4 to 11.4	Pesticides	GS/TS

Table 8
Summary of Physical and Chemical Analyses Performed on Archived Samples

Station ID	Subsurface Sediment Sample ID	Sample Interval		Archive Testing	
		Depth (feet bgs)	Elevation (feet MLLW)	Chemistry	Physical
S3-3	S3-3-D-12-A	5 to 7	11.4 to 9.4	--	GS
	S3-3-E-12-A	7 to 9	9.4 to 7.4	--	GS
	S3-3-F-12-A	9 to 11	7.4 to 5.4	--	GS
	S3-3-G-12-A	11 to 13	5.4 to 3.4	--	GS
	S3-3-H-12-A	13 to 15	3.4 to 1.4	--	GS
	S3-3-I-12-A	15 to 17	1.4 to -0.6	--	GS
	S3-3-J-12-A	17 to 19	-0.6 to -2.6	--	GS
	S3-3-K-12-A	19 to 22	-2.6 to -5.6	--	GS
S3-4	S3-4-A-12-A	0 to 1	16.4 to 15.4	Pesticides	GS/TS
	S3-4-B-12-A	1 to 3	15.4 to 13.4	Pesticides	GS/TS
	S3-4-C-12-A	3 to 5	13.4 to 11.4	Pesticides	GS/TS
	S3-4-D-12-A	5 to 7	11.4 to 9.4	--	GS
	S3-4-E-12-A	7 to 9	9.4 to 7.4	--	GS
	S3-4-F-12-A	9 to 11	7.4 to 5.4	--	GS
	S3-4-G-12-A	11 to 13	5.4 to 3.4	--	GS
	S3-4-H-12-A	13 to 15	3.4 to 1.4	--	GS
	S3-4-I-12-A	15 to 17	1.4 to -0.6	--	GS
	S3-4-J-12-A	17 to 19	-0.6 to -2.6	--	GS
	S3-4-K-12-A	19 to 22	-2.6 to -5.6	--	GS
S3-5	S3-5-A-12-A	0 to 1	16.4 to 15.4	Pesticides	GS/TS
	S3-5-B-12-A	1 to 3	15.4 to 13.4	Pesticides	GS/TS
	S3-5-C-12-A	3 to 5	13.4 to 11.4	Pesticides	GS/TS
	S3-5-D-12-A	5 to 7	11.4 to 9.4	--	GS
	S3-5-E-12-A	7 to 9	9.4 to 7.4	--	GS
	S3-5-F-12-A	9 to 11	7.4 to 5.4	--	GS
	S3-5-G-12-A	11 to 13	5.4 to 3.4	--	GS
	S3-5-H-12-A	13 to 15	3.4 to 1.4	--	GS
	S3-5-I-12-A	15 to 17	1.4 to -0.6	--	GS
	S3-5-J-12-A	17 to 19	-0.6 to -2.6	--	GS
	S3-5-K-12-A	19 to 21	-2.6 to -4.6	--	GS
S3-6	S3-6-A-12-A	0 to 1	16.4 to 15.4	Pesticides	GS/TS
	S3-6-B-12-A	1 to 3	15.4 to 13.4	Pesticides	GS/TS
	S3-6-C-12-A	3 to 5	13.4 to 11.4	Pesticides	GS/TS
	S3-6-D-12-A	5 to 7	11.4 to 9.4	--	GS
	S3-6-E-12-A	7 to 9	9.4 to 7.4	--	GS
	S3-6-F-12-A	9 to 11	7.4 to 5.4	--	GS
	S3-6-G-12-A	11 to 13	5.4 to 3.4	--	GS
	S3-6-H-12-A	13 to 15	3.4 to 1.4	--	GS
	S3-6-I-12-A	15 to 17	1.4 to -0.6	--	GS
	S3-6-J-12-A	17 to 19	-0.6 to -2.6	--	GS
	S3-6-K-12-A	19 to 22	-2.6 to -5.6	--	GS
S3-7	S3-7-A-12-A	0 to 1	16.4 to 15.4	Pesticides	GS/TS
	S3-7-B-12-A	1 to 3	15.4 to 13.4	Pesticides	GS/TS
	S3-7-C-12-A	3 to 5	13.4 to 11.4	Pesticides	GS/TS
	S3-7-D-12-A	5 to 7	11.4 to 9.4	--	GS
	S3-7-E-12-A	7 to 9	9.4 to 7.4	--	GS
	S3-7-F-12-A	9 to 11	7.4 to 5.4	--	GS
	S3-7-G-12-A	11 to 13	5.4 to 3.4	--	GS
	S3-7-H-12-A	13 to 15	3.4 to 1.4	--	GS
	S3-7-I-12-A	15 to 17	1.4 to -0.6	--	GS
	S3-7-J-12-A	17 to 19	-0.6 to -2.6	--	GS
	S3-7-K-12-A	19 to 22	-2.6 to -5.6	--	GS

Notes:
bgs = below ground surface
GS = Grain size
MLLW = mean lower low water
PCBs = polychlorinated biphenyls
TS = total solids

3.2.1 Grain Size Results

Grain size results for archived samples are presented in Table 9. Laboratory reports are presented in Appendix B. Results indicate that soils within Otay River Floodplain, Subarea 3, and Nestor Creek are generally comprised of fine-grained materials (silt and clay) with some pockets of silty sand. No trends were apparent, and only a few stations consisted of primarily coarse-grained materials (ORFP-7, ORFP-10, ORFP-15, and S3-5).

3.2.2 Chemical Results

Chemical results for archived samples are presented in Table 10. Laboratory reports are presented in Appendix B.

3.2.2.1 Pesticides

Within the Otay River Floodplain, concentrations of DDTs, chlordane, and toxaphene were highest at the surface and decreased with depth, with only a few exceptions. At ORFP-13, concentrations of DDTs, chlordane, and toxaphene were highest in the third depth interval. At ORFP-12, concentrations of DDTs were similar across all three depth intervals. Highest concentrations of DDTs and toxaphene within the Otay River Floodplain were measured in the surface of ORFP-8, ORFP-14, ORFP-15, and ORFP-16. Dieldrin was only measured at ORFP-8, ORFP-13, and ORFP-14.

Within Nestor Creek, concentrations of DDTs, chlordane, and toxaphene were highest at the surface and decreased with depth. DDTs were detected at both stations; however, substantially higher concentrations were measured at NC-2. Chlordane and toxaphene were only measured at NC-2.

Within Subarea 3, concentrations of DDTs, chlordane, toxaphene, and dieldrin were highest at the surface and decreased with depth, with the exception of S3-4. At this station, concentrations increased with depth and were highest in the third depth interval. DDTs, chlordane, and toxaphene were elevated in at least one depth interval of all stations, while dieldrin was only detected at four stations (S3-2, S3-3, S3-6, and S3-7). Highest dieldrin concentrations were measured in the surface at S3-2 and S3-3.

Table 9
Grain Size Results for Archived Samples

Sample ID	Sample Date	Clay (less than 0.00391 mm)	Silt (0.00391 to 0.0625 mm)	Total Silt and Clay (0 to 0.0625 mm)	Very Fine Sand (0.0625 to 0.125 mm)	Fine Sand (0.125 to 0.25 mm)	Medium Sand (0.25 to 0.5 mm)	Coarse Sand (0.5 to 1 mm)	Very Coarse Sand (1 to 2 mm)	Gravel (greater than 2 mm)
NC-1-A-12-A	5/4/2012	24.81	61.02	85.83	8.49	5.39	0.28	< 0.01	< 0.01	< 0.01
NC-1-B-12-A	5/4/2012	26.24	59.3	85.54	13.4	1.06	< 0.01	< 0.01	< 0.01	< 0.01
NC-1-C-12-A	5/4/2012	24.36	53.69	78.05	18.8	3.15	< 0.01	< 0.01	< 0.01	< 0.01
NC-1-D-12-A	5/4/2012	12.16	28.4	40.56	13.4	19.1	21.6	4.9	0.45	< 0.01
NC-1-E-12-A	5/4/2012	23.51	65.06	88.57	11.39	0.04	< 0.01	< 0.01	< 0.01	< 0.01
NC-1-F-12-A	5/4/2012	27.1	66.17	93.26	6.72	0.02	< 0.01	< 0.01	< 0.01	< 0.01
NC-1-G-12-A	5/4/2012	27.96	67.83	95.79	4.16	0.05	< 0.01	< 0.01	< 0.01	< 0.01
NC-2-A-12-A	5/4/2012	24.09	54.12	78.21	15.41	6.37	0.01	< 0.01	< 0.01	< 0.01
NC-2-B-12-A	5/4/2012	35.91	64.08	100	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
NC-2-C-12-A	5/4/2012	36	64	100	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
NC-2-D-12-A	5/4/2012	21.38	65.16	86.54	13.09	0.37	< 0.01	< 0.01	< 0.01	< 0.01
NC-2-E-12-A	5/4/2012	29.91	65.08	94.99	4.99	0.03	< 0.01	< 0.01	< 0.01	< 0.01
NC-2-F-12-A	5/4/2012	30.07	62.08	92.14	7.71	0.15	< 0.01	< 0.01	< 0.01	< 0.01
NC-2-G-12-A	5/4/2012	32.89	66.9	99.79	0.21	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-1-A-12-A	5/8/2012	28.83	69.77	98.6	1.4	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-1-B-12-A	5/8/2012	27.82	72.15	99.96	0.04	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-1-C-12-A	5/8/2012	32.34	67.54	99.88	0.12	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-1-D-12-A	5/8/2012	29.72	69.59	99.31	0.69	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-1-E-12-A	5/8/2012	38.09	61.8	99.89	0.11	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-1-F-12-A	5/8/2012	35.51	64.4	99.9	0.1	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-1-G-12-A	5/8/2012	30.86	62.79	93.65	6.35	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-1-H-12-A	5/8/2012	38.83	60.49	99.32	0.68	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-2-A-12-A	5/4/2012	34.73	59.02	93.75	5.6	0.65	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-2-B-12-A	5/4/2012	2.79	4.39	7.18	5.68	37.31	44.91	4.92	< 0.01	< 0.01
ORFP-2-C-12-A	5/4/2012	5.62	14.18	19.8	11.88	32.96	31.26	3.78	0.32	< 0.01
ORFP-2-D-12-A	5/4/2012	17.55	63.4	80.95	13.2	5.84	0.01	< 0.01	< 0.01	< 0.01
ORFP-2-E-12-A	5/4/2012	24.42	67.51	91.93	8.05	0.01	0.01	< 0.01	< 0.01	< 0.01
ORFP-2-F-12-A	5/4/2012	25.88	59.68	85.56	14.2	0.24	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-2-G-12-A	5/4/2012	21.1	57.36	78.46	18.29	3.26	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-2-H-12-A	5/4/2012	35.69	64.12	99.81	0.19	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-2-I-12-A	5/4/2012	35.07	62.64	97.72	2.28	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-2-J-12-A	5/4/2012	3.56	9.26	12.82	7.6	21.71	38.72	18.71	0.43	< 0.01
ORFP-3-A-12-A	5/8/2012	2.65	6.09	8.73	1.62	5.46	40.57	41.57	2.06	< 0.01
ORFP-3-B-12-A	5/8/2012	1.49	2.74	4.23	1.73	9.59	51.51	32.8	0.14	< 0.01
ORFP-3-C-12-A	5/8/2012	3.16	4.99	8.14	2.83	15.29	53.26	20.29	0.19	< 0.01
ORFP-3-D-12-A	5/8/2012	15.87	46.82	62.68	23.01	14.31	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-3-E-12-A	5/8/2012	19.88	62.38	82.26	17.7	0.04	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-3-F-12-A	5/8/2012	24.65	67.7	92.35	7.65	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-3-G-12-A	5/8/2012	16.96	47.4	64.36	27.1	8.52	0.01	< 0.01	< 0.01	< 0.01
ORFP-3-H-12-A	5/8/2012	30.32	66.49	96.81	3.19	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-3-I-12-A	5/8/2012	20.89	60.86	81.74	17.99	0.27	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-3-J-12-A	5/8/2012	17.81	52.85	70.66	16.32	13.01	0.01	< 0.01	< 0.01	< 0.01
ORFP-4-A-12-A	5/8/2012	19.49	46.9	66.4	21.5	12.1	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-4-B-12-A	5/8/2012	10.13	25.31	35.44	14.5	18.8	25.11	5.8	0.35	< 0.01
ORFP-4-C-12-A	5/8/2012	18.43	56.31	74.74	16.2	9.01	0.05	< 0.01	< 0.01	< 0.01
ORFP-4-D-12-A	5/8/2012	29.33	59.59	88.92	7.83	3.25	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-4-E-12-A	5/8/2012	29.36	64.41	93.77	5.98	0.25	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-4-F-12-A	5/8/2012	25.18	62.12	87.29	12.7	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-4-G-12-A	5/8/2012	28.45	71.05	99.5	0.5	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-4-H-12-A	5/8/2012	18.45	66.25	84.71	15.11	0.18	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-4-I-12-A	5/8/2012	28.3	64.68	92.98	7.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-5-A-12-A	5/8/2012	0.83	3.69	4.52	3.22	10	35	40.6	6.65	< 0.01
ORFP-5-B-12-A	5/8/2012	0.84	2.29	3.13	2.21	9.95	44.4	37.3	3.02	< 0.01
ORFP-5-C-12-A	5/8/2012	20.21	60.54	80.75	14.41	4.84	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-5-D-12-A	5/8/2012	29.96	66.71	96.67	3.33	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-5-E-12-A	5/8/2012	28.39	69.29	97.68	2.32	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-5-F-12-A	5/8/2012	23.21	53.11	76.33	20.9	2.77	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-5-G-12-A	5/8/2012	37.19	62.76	99.95	0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-5-H-12-A	5/8/2012	29.02	61.28	90.3	9.4	0.3	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-5-I-12-A	5/8/2012	36.63	57.67	94.3	4.86	0.84	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-5-J-12-A	5/8/2012	24.85	52.76	77.62	20.79	1.6	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-6-A-12-A	5/8/2012	10.19	31.11	41.3	12.9	13.5	18.31	13.9	0.08	< 0.01
ORFP-6-B-12-A	5/8/2012	13.4	46.19	59.59	19.5	8.82	10.7	1.4	< 0.01	< 0.01
ORFP-6-C-12-A	5/8/2012	12.11	41.52	53.63	15.61	10.81	13.41	6.54	< 0.01	< 0.01
ORFP-6-D-12-A	5/8/2012	18.97	62	80.97	17.6	1.43	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-6-E-12-A	5/8/2012	20.88	62.05	82.93	13.11	3.96	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-6-F-12-A	5/8/2012	13.74	46.2	59.94	26.9	11.8	1.2	0.16	< 0.01	< 0.01
ORFP-6-G-12-A	5/8/2012	28.04	61.28	89.32	8.02	2.66	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-6-H-12-A	5/8/2012	31.29	64.74	96.02	3.85	0.13	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-6-I-12-A	5/8/2012	32.56	63.86	96.43	3.57	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-6-J-12-A	5/8/2012	17.34	46.4	63.75	16.7	16.5	3.05	< 0.01	< 0.01	< 0.01
ORFP-7-A-12-A	5/2/2012	4.85	15.4	20.25	10.8	20.19	26.19	14.83	1.63	6.11
ORFP-7-B-12-A	5/2/2012	3.1	7.55	10.65	6.08	15.79	29.67	15.55	1.68	20.58
ORFP-7-C-12-A	5/2/2012	14.43	39.59	54.01	30.19	15.79	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-7-D-12-A	5/2/2012	30.68	66.51	97.19	2.81	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-7-E-12-A	5/2/2012	7	14.39	21.39	4.92	15.59	34.67	21.48	1.95	< 0.01
ORFP-7-F-12-A	5/2/2012	11.54	31.52	43.06	11.91	12.61	18.91	13.51	0.01	< 0.01
ORFP-7-G-12-A	5/2/2012	19.98	52.96	72.94	21.02	6.04	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-7-H-12-A	5/2/2012	10.68	29.99	40.67	13.29	17.09	19.29	9.65	0.01	< 0.01
ORFP-7-I-12-A	5/2/2012	4.79	12.01	16.8	7.63	16.43	30.74	23.25	1.25	3.89
ORFP-8-A-12-A	5/1/2012	2.21	13.7	15.91	7.99	10.47	32.97	28.67	1.76	2.22
ORFP-8-B-12-A	5/1/2012	10.92	22.17	33.1	4.24	14.94	28.17	14.56	0.07	4.93
ORFP-8-C-12-A	5/1/2012	24.62	59.94	84.56	7.05	8.34	0.04	< 0.01	< 0.01	< 0.01
ORFP-8-D-12-A	5/1/2012	24.43	54.32	78.75	14.81	6.44	< 0.01	< 0.01	< 0.01	< 0.01

Table 9
Grain Size Results for Archived Samples

Sample ID	Sample Date	Clay (less than 0.00391 mm)	Silt (0.00391 to 0.0625 mm)	Total Silt and Clay (0 to 0.0625 mm)	Very Fine Sand (0.0625 to 0.125 mm)	Fine Sand (0.125 to 0.25 mm)	Medium Sand (0.25 to 0.5 mm)	Coarse Sand (0.5 to 1 mm)	Very Coarse Sand (1 to 2 mm)	Gravel (greater than 2 mm)
ORFP-8-E-12-A	5/1/2012	37.74	61.96	99.7	0.3	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-8-F-12-A	5/1/2012	20.77	51.89	72.66	17.6	9.74	0.01	< 0.01	< 0.01	< 0.01
ORFP-8-G-12-A	5/1/2012	34.14	65.25	99.39	0.61	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-8-H-12-A	5/1/2012	27.06	64.07	91.12	8.86	0.02	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-8-I-12-A	5/1/2012	23.67	62.26	85.93	12.99	1.08	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-8-J-12-A	5/1/2012	26.85	69.65	96.5	3.5	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-9-A-12-A	5/2/2012	3.47	19.75	23.22	11.34	14.79	20.67	12.19	1.77	16.01
ORFP-9-B-12-A	5/2/2012	9.96	26.4	36.35	12.72	17.63	16.16	3.1	< 0.01	14.03
ORFP-9-C-12-A	5/2/2012	20.61	50.19	70.8	19.9	9	0.3	< 0.01	< 0.01	< 0.01
ORFP-9-D-12-A	5/2/2012	25.74	62.19	87.93	12	0.07	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-9-E-12-A	5/2/2012	34.2	59.72	93.93	5.51	0.56	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-9-F-12-A	5/2/2012	19.06	49.83	68.89	15.11	14.21	1.79	< 0.01	< 0.01	< 0.01
ORFP-9-G-12-A	5/2/2012	35.88	57.5	93.38	4.71	1.91	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-9-H-12-A	5/2/2012	17.53	44.27	61.8	30.28	7.92	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-9-I-12-A	5/2/2012	29.03	53.81	82.84	6.93	10.18	0.04	< 0.01	< 0.01	< 0.01
ORFP-9-J-12-A	5/2/2012	20.37	47.12	67.49	15.21	15.81	1.49	< 0.01	< 0.01	< 0.01
ORFP-10-A-12-A	5/2/2012	9.4	22.8	32.2	10.8	15.9	24.4	14.3	2.4	< 0.01
ORFP-10-B-12-A	5/2/2012	27.17	66.19	93.36	6.01	0.63	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-10-C-12-A	5/2/2012	6.68	16	22.68	12.2	25.31	29.01	9.57	1.23	< 0.01
ORFP-10-D-12-A	5/2/2012	2.6	8.2	10.81	3.25	11.51	47.63	25.52	1.29	< 0.01
ORFP-10-E-12-A	5/2/2012	0.8	1.47	2.27	1.09	10.29	45.45	36.46	4.44	< 0.01
ORFP-10-F-12-A	5/2/2012	1.21	3.68	4.89	2.41	8.11	28.59	49.38	6.64	< 0.01
ORFP-10-G-12-A	5/2/2012	1.64	5.29	6.93	1.47	5.07	21.51	48.61	16.4	< 0.01
ORFP-10-H-12-A	5/2/2012	4.81	11.7	16.51	6.34	16.1	26.3	30.6	4.16	< 0.01
ORFP-10-I-12-A	5/2/2012	29.73	61.34	91.06	7.17	1.76	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-10-J-12-A	5/2/2012	31.17	66.07	97.25	2.75	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-11-A-12-A	5/2/2012	12.04	35.7	47.74	23	19.4	7.73	2.14	< 0.01	< 0.01
ORFP-11-B-12-A	5/2/2012	31.95	53.7	85.65	8.16	0.22	< 0.01	< 0.01	< 0.01	5.97
ORFP-11-C-12-A	5/2/2012	25.23	46.31	71.54	5.65	1.82	0.27	< 0.01	< 0.01	20.72
ORFP-11-D-12-A	5/2/2012	18.31	41.16	59.47	21.18	16.98	2.14	0.23	< 0.01	< 0.01
ORFP-11-E-12-A	5/2/2012	31.18	66.05	97.22	2.18	0.6	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-11-F-12-A	5/2/2012	21.87	48.99	70.86	14	14.5	0.65	< 0.01	< 0.01	< 0.01
ORFP-11-G-12-A	5/2/2012	29.08	70.63	99.71	0.29	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-11-H-12-A	5/2/2012	35.83	64.03	99.86	0.14	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-11-I-12-A	5/2/2012	21.61	60.05	81.66	11.21	7.09	0.04	< 0.01	< 0.01	< 0.01
ORFP-11-J-12-A	5/2/2012	23.86	61.12	84.98	13.51	1.51	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-12-A-12-A	5/2/2012	3.53	8.17	11.7	4.57	11.7	43.49	27.79	0.75	< 0.01
ORFP-12-B-12-A	5/2/2012	37.81	60.89	98.7	1.3	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-12-C-12-A	5/2/2012	19.24	56.08	75.33	21.99	2.68	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-12-D-12-A	5/2/2012	24.76	69.48	94.24	5.76	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-12-E-12-A	5/2/2012	37.81	62.13	99.93	0.07	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-12-F-12-A	5/2/2012	36.33	63.02	99.35	0.65	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-12-G-12-A	5/2/2012	41.87	58.11	99.97	0.03	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-12-H-12-A	5/2/2012	34.63	63.5	98.13	1.87	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-13-A-12-A	5/2/2012	30.4	63	93.4	6.12	0.48	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-13-B-12-A	5/2/2012	23.24	64.42	87.66	12.3	0.03	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-13-C-12-A	5/2/2012	22.67	46.01	68.69	14.67	7.85	< 0.01	< 0.01	< 0.01	8.8
ORFP-13-D-12-A	5/2/2012	21.79	60.1	81.89	18.1	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-13-E-12-A	5/2/2012	8.34	21.71	30.05	11.61	16.11	23.11	14.71	4.41	< 0.01
ORFP-13-F-12-A	5/2/2012	15.71	46.91	62.63	16.1	15.2	5.61	0.45	< 0.01	< 0.01
ORFP-13-G-12-A	5/2/2012	23.96	53.42	77.38	11.5	10.6	0.51	< 0.01	< 0.01	< 0.01
ORFP-13-H-12-A	5/2/2012	28.36	66.42	94.78	5.22	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-13-I-12-A	5/2/2012	37.09	62.73	99.82	0.18	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-13-J-12-A	5/2/2012	36.12	63.79	99.91	0.09	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-14-A-12-A	5/1/2012	1.84	11	12.84	8.32	14.4	41.1	22.9	0.44	< 0.01
ORFP-14-B-12-A	5/1/2012	1.86	6.41	8.27	5.28	13.79	43.18	27.89	1.6	< 0.01
ORFP-14-C-12-A	5/1/2012	21.09	56.25	77.35	13.09	9.55	0.01	< 0.01	< 0.01	< 0.01
ORFP-14-D-12-A	5/1/2012	25.11	63.77	88.88	10.7	0.42	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-14-E-12-A	5/1/2012	29.95	57.82	87.78	9.26	2.96	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-14-F-12-A	5/1/2012	23.25	56.84	80.09	12.59	7.08	0.24	< 0.01	< 0.01	< 0.01
ORFP-14-G-12-A	5/1/2012	29.42	61.69	91.11	5.62	3.27	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-14-H-12-A	5/1/2012	31.25	65.12	96.37	3.41	0.22	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-14-I-12-A	5/1/2012	49.44	50.56	100	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-14-J-12-A	5/1/2012	12.51	33.91	46.42	19.41	24.31	8.53	1.33	< 0.01	< 0.01
ORFP-14-K-12-A	5/1/2012	2.09	6.41	8.5	4.34	13.59	42.97	27.68	2.93	< 0.01
ORFP-15-A-12-A	5/1/2012	2.5	15.4	17.91	8.58	12	36.91	23.61	0.99	< 0.01
ORFP-15-B-12-A	5/1/2012	2.6	6.13	8.73	4.04	12.3	44.58	28.99	1.37	< 0.01
ORFP-15-C-12-A	5/1/2012	35.05	62.6	97.65	2.35	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-15-D-12-A	5/1/2012	9.92	21.21	31.13	9.99	15.91	27.21	14.01	1.75	< 0.01
ORFP-15-E-12-A	5/1/2012	5.65	12.09	17.74	5.65	16.08	34.76	22.87	2.89	< 0.01
ORFP-15-F-12-A	5/1/2012	8.01	18.98	27	6.51	10.25	20.65	11.68	3.4	20.52
ORFP-15-G-12-A	5/1/2012	6.25	16.68	22.93	7.19	13.23	19.4	14.43	2.95	19.87
ORFP-15-H-12-A	5/1/2012	29.31	67.48	96.79	3.21	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-15-I-12-A	5/1/2012	24.19	63.77	87.96	9.6	2.44	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-15-J-12-A	5/1/2012	28.74	67.03	95.77	4.23	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-15-K-12-A	5/1/2012	11.35	32.12	43.47	19.71	27.12	9.36	0.35	< 0.01	< 0.01
ORFP-16-A-12-A	5/1/2012	2.94	21.73	24.67	10.91	11.82	27.84	22.93	1.83	< 0.01
ORFP-16-B-12-A	5/1/2012	27.35	59.82	87.17	10	2.83	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-16-C-12-A	5/1/2012	19.14	49.13	68.27	14.18	16.28	1.27	< 0.01	< 0.01	< 0.01
ORFP-16-D-12-A	5/1/2012	24.65	53.68	78.33	10.3	11.1	0.28	< 0.01	< 0.01	< 0.01
ORFP-16-E-12-A	5/1/2012	25.37	72.09	97.46	2.54	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-16-F-12-A	5/1/2012	22.17	61.98	84.15	13.29	2.56	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-16-G-12-A	5/1/2012	28.73	67.99	96.72	3.28	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-16-H-12-A	5/1/2012	31.18	61.87	93.05	5.67	1.28	< 0.01	< 0.01	< 0.01	< 0.01

Table 9
Grain Size Results for Archived Samples

Sample ID	Sample Date	Clay (less than 0.00391 mm)	Silt (0.00391 to 0.0625 mm)	Total Silt and Clay (0 to 0.0625 mm)	Very Fine Sand (0.0625 to 0.125 mm)	Fine Sand (0.125 to 0.25 mm)	Medium Sand (0.25 to 0.5 mm)	Coarse Sand (0.5 to 1 mm)	Very Coarse Sand (1 to 2 mm)	Gravel (greater than 2 mm)
ORFP-16-I-12-A	5/1/2012	**37.16**	**62.84**	**100**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
ORFP-16-J-12-A	5/1/2012	**52.13**	**47.87**	**100**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-1-A-12-A	5/4/2012	**31.83**	**58.97**	**90.8**	**5.92**	**3.28**	< 0.01	< 0.01	< 0.01	< 0.01
S3-1-B-12-A	5/4/2012	**36.46**	**62.53**	**98.99**	**1.01**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-1-C-12-A	5/4/2012	**14.96**	**39.87**	**54.83**	**26.88**	**18.29**	**0.01**	< 0.01	< 0.01	< 0.01
S3-1-D-12-A	5/4/2012	**22.02**	**70.33**	**92.35**	**7.64**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-1-E-12-A	5/4/2012	**37.31**	**62.46**	**99.77**	**0.23**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-1-F-12-A	5/4/2012	**27.77**	**63.96**	**91.74**	**8.26**	**0.01**	< 0.01	< 0.01	< 0.01	< 0.01
S3-1-G-12-A	5/4/2012	**31.92**	**67.85**	**99.77**	**0.23**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-1-H-12-A	5/4/2012	**32.73**	**66.49**	**99.22**	**0.78**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-1-I-12-A	5/4/2012	**17.39**	**46.76**	**64.15**	**14.99**	**17.48**	**3.38**	< 0.01	< 0.01	< 0.01
S3-1-J-12-A	5/4/2012	**3.03**	**7.67**	**10.71**	**6.08**	**19.91**	**46.12**	**15.71**	**1.47**	< 0.01
S3-1-K-12-A	5/4/2012	**2.42**	**5.68**	**8.1**	**3.41**	**9.25**	**21.01**	**32.01**	**26.21**	< 0.01
S3-2-A-12-A	5/3/2012	**5.61**	**17.1**	**22.71**	**8.62**	**15.7**	**34.5**	**17.9**	**0.57**	< 0.01
S3-2-B-12-A	5/3/2012	**32.82**	**60.58**	**93.4**	**6.42**	**0.18**	< 0.01	< 0.01	< 0.01	< 0.01
S3-2-C-12-A	5/3/2012	**15.29**	**43.6**	**58.88**	**25.4**	**11.9**	**3.05**	**0.77**	< 0.01	< 0.01
S3-2-D-12-A	5/3/2012	**30.86**	**62.68**	**93.54**	**6.46**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-2-E-12-A	5/3/2012	**29.85**	**64.82**	**94.67**	**5.33**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-2-F-12-A	5/3/2012	**18.25**	**49.92**	**68.16**	**20.21**	**11.6**	**0.02**	< 0.01	< 0.01	< 0.01
S3-2-G-12-A	5/3/2012	**27.71**	**65.69**	**93.4**	**6.59**	**0.01**	< 0.01	< 0.01	< 0.01	< 0.01
S3-2-H-12-A	5/3/2012	**22.44**	**58.58**	**81.03**	**15.8**	**3.18**	< 0.01	< 0.01	< 0.01	< 0.01
S3-2-I-12-A	5/3/2012	**18.56**	**58.26**	**76.82**	**18.59**	**4.6**	< 0.01	< 0.01	< 0.01	< 0.01
S3-2-J-12-A	5/3/2012	**9.34**	**28.8**	**38.14**	**22**	**26.1**	**12.7**	**1.07**	< 0.01	< 0.01
S3-2-K-12-A	5/3/2012	**13.21**	**38.3**	**51.51**	**20.4**	**21.2**	**6.52**	**0.37**	< 0.01	< 0.01
S3-3-A-12-A	5/3/2012	**2.51**	**11**	**13.5**	**6.78**	**13.89**	**40.48**	**24.79**	**0.55**	< 0.01
S3-3-B-12-A	5/3/2012	**1.16**	**2.5**	**3.66**	**2.06**	**9.49**	**48.18**	**35.69**	**0.93**	< 0.01
S3-3-C-12-A	5/3/2012	**24.36**	**62.65**	**87.01**	**12.21**	**0.78**	< 0.01	< 0.01	< 0.01	< 0.01
S3-3-D-12-A	5/3/2012	**29.72**	**66.69**	**96.41**	**3.59**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-3-E-12-A	5/3/2012	**33.03**	**62.72**	**95.75**	**4.25**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-3-F-12-A	5/4/2012	**34.29**	**65.62**	**99.91**	**0.09**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-3-G-12-A	5/3/2012	**24.04**	**62.34**	**86.38**	**12.11**	**1.51**	< 0.01	< 0.01	< 0.01	< 0.01
S3-3-H-12-A	5/4/2012	**35.11**	**64.09**	**99.2**	**0.8**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-3-I-12-A	5/3/2012	**17.19**	**56.93**	**74.12**	**22.01**	**3.87**	< 0.01	< 0.01	< 0.01	< 0.01
S3-3-J-12-A	5/3/2012	**4.93**	**13.42**	**18.36**	**10.88**	**37.25**	**9.25**	**2.78**	**0.05**	**21.43**
S3-3-K-12-A	5/3/2012	**1.77**	**3.71**	**5.48**	**0.61**	**1.59**	**9.73**	**33.36**	**30.98**	**18.24**
S3-4-A-12-A	5/3/2012	**22.34**	**55.71**	**78.05**	**18.5**	**3.45**	< 0.01	< 0.01	< 0.01	< 0.01
S3-4-B-12-A	5/3/2012	**24.46**	**63.41**	**87.87**	**11**	**1.13**	< 0.01	< 0.01	< 0.01	< 0.01
S3-4-C-12-A	5/3/2012	**2.02**	**10.7**	**12.72**	**8.28**	**19.1**	**42.4**	**17.3**	**0.2**	< 0.01
S3-4-D-12-A	5/3/2012	**29.63**	**64.8**	**94.43**	**5.57**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-4-E-12-A	5/3/2012	**26.49**	**59.19**	**85.68**	**9.5**	**4.79**	**0.03**	< 0.01	< 0.01	< 0.01
S3-4-F-12-A	5/3/2012	**23.4**	**67.62**	**91.02**	**7.47**	**1.51**	< 0.01	< 0.01	< 0.01	< 0.01
S3-4-G-12-A	5/3/2012	**22.32**	**58.67**	**80.99**	**11.49**	**5.31**	**2.21**	< 0.01	< 0.01	< 0.01
S3-4-H-12-A	5/3/2012	**28.15**	**59.65**	**87.8**	**8.36**	**3.84**	< 0.01	< 0.01	< 0.01	< 0.01
S3-4-I-12-A	5/3/2012	**2.21**	**6.91**	**9.12**	**4.44**	**12.7**	**39**	**32.2**	**2.54**	< 0.01
S3-4-J-12-A	5/3/2012	**2.96**	**6.62**	**9.59**	**3.77**	**7.98**	**24.31**	**27.91**	**12.28**	**14.16**
S3-4-K-12-A	5/3/2012	**2.45**	**6.12**	**8.57**	**4.04**	**7.03**	**19.29**	**27.39**	**33.69**	< 0.01
S3-5-A-12-A	5/4/2012	**7.4**	**14.2**	**21.61**	**7.09**	**17.31**	**36.31**	**17.31**	**0.38**	< 0.01
S3-5-B-12-A	5/4/2012	**3.75**	**8.7**	**12.44**	**5.36**	**17.09**	**44.17**	**20.89**	**0.05**	< 0.01
S3-5-C-12-A	5/4/2012	**9.55**	**22.81**	**32.37**	**23.11**	**31.22**	**10.81**	**2.39**	**0.11**	< 0.01
S3-5-D-12-A	5/4/2012	**30.35**	**65.93**	**96.32**	**3.68**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-5-E-12-A	5/4/2012	**22.91**	**57.98**	**80.89**	**13.29**	**5.82**	< 0.01	< 0.01	< 0.01	< 0.01
S3-5-F-12-A	5/4/2012	**14.86**	**41.5**	**56.37**	**20.9**	**17.2**	**3.73**	**1.8**	< 0.01	< 0.01
S3-5-G-12-A	5/4/2012	**29.06**	**69.86**	**98.92**	**1.08**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-5-H-12-A	5/4/2012	**21.58**	**43.52**	**65.1**	**15.31**	**19.31**	**0.28**	< 0.01	< 0.01	< 0.01
S3-5-I-12-A	5/4/2012	**4.71**	**10.7**	**15.42**	**7.72**	**17.81**	**37.31**	**20.81**	**0.93**	< 0.01
S3-5-J-12-A	5/4/2012	**7.67**	**16.7**	**24.37**	**6.93**	**23.9**	**25.51**	**17.5**	**1.78**	< 0.01
S3-5-K-12-A	5/4/2012	**3.37**	**9.48**	**12.85**	**6.19**	**13.7**	**36**	**29.6**	**1.66**	< 0.01
S3-6-A-12-A	5/3/2012	**1.51**	**8.54**	**10.05**	**7.58**	**16.49**	**42.97**	**22.28**	**0.63**	< 0.01
S3-6-B-12-A	5/3/2012	**2.49**	**15.8**	**18.29**	**13.6**	**19**	**34.3**	**14.7**	**0.12**	< 0.01
S3-6-C-12-A	5/3/2012	**32.72**	**61.51**	**94.23**	**5.19**	**0.58**	< 0.01	< 0.01	< 0.01	< 0.01
S3-6-D-12-A	5/3/2012	**28.01**	**60.04**	**88.04**	**7.84**	**4.11**	< 0.01	< 0.01	< 0.01	< 0.01
S3-6-E-12-A	5/3/2012	**31.37**	**63.41**	**94.78**	**5.22**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-6-F-12-A	5/3/2012	**19.8**	**48.91**	**68.71**	**15.9**	**10.7**	**4.46**	**0.22**	< 0.01	< 0.01
S3-6-G-12-A	5/3/2012	**21.38**	**58.24**	**79.61**	**13.78**	**6.6**	< 0.01	< 0.01	< 0.01	< 0.01
S3-6-H-12-A	5/3/2012	**19.75**	**57.62**	**77.36**	**17.31**	**5.33**	< 0.01	< 0.01	< 0.01	< 0.01
S3-6-I-12-A	5/3/2012	**23.63**	**63.11**	**86.75**	**12.4**	**0.85**	< 0.01	< 0.01	< 0.01	< 0.01
S3-6-J-12-A	5/3/2012	**4.41**	**11.89**	**16.3**	**8.49**	**24.38**	**34.68**	**14.39**	**1.76**	< 0.01
S3-6-K-12-A	5/3/2012	**4.32**	**12**	**16.32**	**7.57**	**18.7**	**37.19**	**19.5**	**0.73**	< 0.01
S3-7-A-12-A	5/3/2012	**3.69**	**20.9**	**24.59**	**11.8**	**17.6**	**31.69**	**13.9**	**0.43**	< 0.01
S3-7-B-12-A	5/3/2012	**9.76**	**40.5**	**50.26**	**18.8**	**17.1**	**9.67**	**4.14**	**0.02**	< 0.01
S3-7-C-12-A	5/3/2012	**19.81**	**50.2**	**70.01**	**17.7**	**11.6**	**0.69**	< 0.01	< 0.01	< 0.01
S3-7-D-12-A	5/3/2012	**28.1**	**61.91**	**90.01**	**8.16**	**1.83**	< 0.01	< 0.01	< 0.01	< 0.01
S3-7-E-12-A	5/3/2012	**30.56**	**65.7**	**96.26**	**3.74**	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
S3-7-F-12-A	5/3/2012	**25.61**	**65.1**	**90.71**	**9.28**	**0.01**	< 0.01	< 0.01	< 0.01	< 0.01
S3-7-G-12-A	5/3/2012	**25.98**	**64.41**	**90.39**	**9.58**	**0.03**	< 0.01	< 0.01	< 0.01	< 0.01
S3-7-H-12-A	5/3/2012	**6.12**	**15.8**	**21.92**	**7.98**	**15.1**	**31.1**	**20.5**	**3.41**	< 0.01
S3-7-I-12-A	5/3/2012	**1.81**	**6.11**	**7.92**	**4.63**	**13.71**	**43.14**	**27.83**	**2.77**	< 0.01
S3-7-J-12-A	5/3/2012	**2.09**	**7.15**	**9.24**	**4.63**	**10.8**	**31.71**	**33.51**	**10.1**	< 0.01
S3-7-K-12-A	5/3/2012	**3.02**	**7.9**	**10.92**	**4.73**	**8.31**	**24.72**	**30.28**	**6.57**	**14.48**

Notes:

Bold = detected result

< = less than listed method detection limit

mm = millimeters

Table 10
Pesticide and PCB Results for Archived Samples

	Composite Area ORFP-7,9,10,11,12,13																		Composite Area ORFP-8,14,15,16													Nestor Creek						
Parameter	ORFP-7-A-12-A	ORFP-7-B-12-A	ORFP-7-C-12-A	ORFP-9-A-12-A	ORFP-9-B-12-A	ORFP-9-C-12-A	ORFP-10-A-12-A	ORFP-10-B-12-A	ORFP-10-C-12-A	ORFP-11-A-12-A	ORFP-11-B-12-A	ORFP-11-C-12-A	ORFP-12-A-12-A	ORFP-12-B-12-A	ORFP-12-C-12-A	ORFP-13-A-12-A	ORFP-13-B-12-A	ORFP-13-C-12-A	ORFP-8,14,-15,16-A-12	ORFP-8-A-12-A	ORFP-8-B-12-A	ORFP-8-C-12-A	ORFP-14-A-12-A	ORFP-14-B-12-A	ORFP-14-C-12-A	ORFP-15-A-12-A	ORFP-15-B-12-A	ORFP-15-C-12-A	ORFP-16-A-12-A	ORFP-16-B-12-A	ORFP-16-C-12-A	NC-A-12	NC-1-A-12-A	NC-1-B-12-A	NC-1-C-12-A	NC-2-A-12-A	NC-2-B-12-A	NC-2-C-12-A
	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/2/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/1/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012	5/4/2012
Conventional Parameters (%)																																					
Total solids	**92.3**	**88.8**	**78.4**	**92.6**	**89.5**	**82.1**	**96**	**92.5**	**88.3**	**95.2**	**88.6**	**91.3**	**96.4**	**88.3**	**83.1**	**85.3**	**80.4**	**91.8**	**97.3**	**96.8**	**96.7**	**80.6**	**96.7**	**94.4**	**86.5**	**96**	**95.1**	**90.6**	**93.6**	**69.8**	**77.2**	**59**	**45.9**	**69.5**	**72.8**	**76.7**	**72.7**	**69.2**
Pesticides (µg/kg)																																					
2,4'-DDD	**2.2**	< 0.38	< 0.43	**2.5**	< 0.38	< 0.41	< 0.35	< 0.37	< 0.38	**1.1**	< 0.38	< 0.37	< 0.35	**0.95 J**	**0.76 J**	< 0.40	< 0.42	< 0.37	NA	**27**	< 0.35	< 0.42	**19**	< 0.36	< 0.39	**49**	**1.2**	**7.1**	**160**	**13**	< 0.44	NA	**2.00 J**	< 0.49	< 0.47	**6.1**	< 0.47	< 0.49
2,4'-DDE	**3.6**	< 0.34	< 0.39	< 0.33	< 0.34	< 0.37	**11**	< 0.33	< 0.35	< 0.32	< 0.34	< 0.33	< 0.32	< 0.35	< 0.37	< 0.36	< 0.38	**4.2**	NA	**25**	**0.99 J**	< 0.38	**21**	< 0.32	< 0.35	**32**	**1.00 J**	**4.3**	**66**	**5.1**	< 0.40	NA	< 0.67	< 0.44	< 0.42	**4.6**	< 0.42	< 0.44
2,4'-DDT	**1.9**	< 0.34	< 0.38	**2.2**	< 0.34	< 0.37	< 0.31	< 0.32	< 0.34	< 0.32	**0.61 J**	< 0.33	< 0.31	< 0.34	< 0.36	< 0.35	< 0.37	**19**	NA	**150**	< 0.31	< 0.37	**140**	**6.3**	< 0.35	**240**	**13**	**28**	**230**	**18**	< 0.39	NA	< 0.65	< 0.43	< 0.41	**16**	**0.44 J**	< 0.43
4,4'-DDD	**7.6**	< 0.36	< 0.40	**6.4**	**0.59 J**	< 0.38	< 0.33	**1.2**	**0.47 J**	**2**	**0.65 J**	**1.8**	**1.9**	**2.1**	**8.8**	**1.6**	< 0.39	< 0.34	NA	< 3.30	< 0.33	< 0.39	< 3.30	< 0.33	< 0.37	**130**	< 0.33	**15**	< 3.40	< 0.45	< 0.41	NA	**1.80 J**	< 0.45	< 0.43	**15**	**1.20 J**	< 0.46
4,4'-DDE	**33**	**0.71 J**	< 0.38	**43**	**5.3**	< 0.36	**24**	**7.3**	**2.1**	**6.7**	**1.6**	**2.4**	**12**	**11**	**5.9**	**1.2**	< 0.37	**30**	NA	**890**	**14**	**7.2**	**680**	**42**	**2.9**	**1300**	**45**	**140**	**1700**	**150**	**2.3**	NA	**5.3**	**0.95 J**	**0.58 J**	**170**	**6.7**	**0.90 J**
4,4'-DDT	**9.1**	< 0.38	< 0.43	**6.3**	**0.70 J**	< 0.41	< 0.35	**0.68 J**	< 0.38	**3.5**	**3.2**	**3.6**	**1.2**	**0.71 J**	< 0.40	**3.3**	< 0.42	**170**	NA	**320**	**1.6**	**1.6**	**310**	**13**	**1.10 J**	**720**	**35**	**84**	**590**	**33**	< 0.43	NA	< 0.73	< 0.48	< 0.46	**67**	**0.95 J**	< 0.48
Total DDTs (ND = 0)	**57.4**	**0.71**	< 0.43	**60.4**	**6.59**	< 0.41	**35**	**9.18**	**2.57**	**13.3**	**6.06**	**7.8**	**15.1**	**14.76**	**15.46**	**6.1**	< 0.42	**223.2**	NA	**1412**	**16.59**	**8.8**	**1170**	**61.3**	**4**	**2471**	**95.2**	**278.4**	**2746**	**219.1**	**2.3**	NA	**9.1**	**0.95**	**0.58**	**278.7**	**9.29**	**0.9**
Aldrin	< 0.34	< 0.35	< 0.40	< 0.34	< 0.35	< 0.38	< 0.33	< 0.34	< 0.36	< 0.33	< 0.36	< 0.34	< 0.33	< 0.36	< 0.38	< 0.37	< 0.39	< 0.34	NA	< 3.30	< 0.33	< 0.39	< 3.30	< 0.33	< 0.36	< 3.30	< 0.33	< 0.35	< 3.40	< 0.45	< 0.41	NA	< 0.69	< 0.45	< 0.43	< 0.41	< 0.43	< 0.45
Alpha Chlordane	< 0.35	< 0.36	< 0.41	< 0.35	< 0.36	< 0.39	< 0.33	< 0.35	< 0.36	< 0.34	< 0.36	< 0.35	< 0.33	< 0.36	< 0.39	< 0.38	< 0.40	< 0.35	NA	< 3.30	< 0.33	< 0.40	< 3.30	< 0.34	< 0.37	< 3.30	< 0.34	< 0.35	< 3.40	< 0.46	< 0.42	NA	< 0.70	< 0.46	< 0.44	< 0.42	< 0.44	< 0.46
alpha-BHC	< 0.35	< 0.36	< 0.41	< 0.35	< 0.36	< 0.39	< 0.34	< 0.35	< 0.37	< 0.34	< 0.37	< 0.35	< 0.34	< 0.37	< 0.39	< 0.38	< 0.40	< 0.35	NA	< 3.30	< 0.34	< 0.40	< 3.40	< 0.34	< 0.37	< 3.40	< 0.34	< 0.36	< 3.50	< 0.46	< 0.42	NA	< 0.71	< 0.47	< 0.45	< 0.42	< 0.45	< 0.47
beta-BHC	< 0.29	< 0.30	< 0.34	< 0.29	< 0.30	< 0.32	< 0.28	< 0.29	< 0.30	< 0.28	< 0.30	< 0.29	< 0.27	< 0.30	< 0.32	< 0.31	< 0.33	< 0.29	NA	< 2.70	< 0.27	< 0.33	< 2.70	< 0.28	< 0.31	< 2.80	**0.31 J**	< 0.29	< 2.80	< 0.38	< 0.34	NA	< 0.58	< 0.38	< 0.36	< 0.34	< 0.36	< 0.38
Chlordane (Technical)	**32**	< 3.70	< 4.20	< 3.50	< 3.70	< 4.00	< 3.40	< 3.50	< 3.70	< 3.40	< 3.70	< 3.60	< 3.40	< 3.70	< 3.90	< 3.80	< 4.10	**120**	NA	**64**	< 3.40	< 4.10	**49**	< 3.50	< 3.80	**130**	< 3.40	**23**	**170**	**17**	< 4.20	NA	< 7.10	< 4.70	< 4.50	**36**	< 4.50	< 4.70
Cis-nonachlor	< 0.32	< 0.33	< 0.37	< 0.32	< 0.33	< 0.36	**20**	< 0.32	< 0.33	< 0.31	< 0.33	< 0.32	< 0.30	< 0.33	< 0.35	< 0.34	< 0.37	< 0.32	NA	< 3.00	< 0.30	< 0.36	< 3.00	< 0.31	< 0.34	< 3.10	< 0.31	< 0.32	< 3.10	< 0.42	< 0.38	NA	< 0.64	< 0.42	< 0.40	< 0.38	< 0.40	< 0.42
delta-BHC	< 0.28	< 0.29	< 0.33	< 0.28	< 0.29	< 0.31	< 0.27	< 0.28	< 0.29	< 0.27	< 0.29	< 0.28	< 0.27	< 0.29	< 0.31	< 0.30	< 0.32	< 0.28	NA	< 2.60	< 0.26	< 0.32	< 2.60	< 0.27	**0.38 J**	< 2.70	< 0.27	< 0.28	< 2.70	< 0.37	< 0.33	NA	< 0.56	< 0.37	< 0.35	< 0.33	< 0.35	< 0.37
Dieldrin	< 0.36	< 0.37	< 0.42	< 0.36	< 0.37	< 0.40	< 0.34	< 0.36	< 0.37	< 0.35	< 0.37	< 0.36	< 0.34	< 0.37	< 0.40	< 0.39	< 0.41	**4.8**	NA	< 3.40	**0.63 J**	< 0.41	< 3.40	**2.4**	**0.39 J**	< 3.40	< 0.35	< 0.36	< 3.50	< 0.47	< 0.43	NA	< 0.72	< 0.47	< 0.45	< 0.43	< 0.45	< 0.48
Endosulfan sulfate	< 0.37	< 0.38	< 0.43	< 0.36	< 0.38	< 0.41	< 0.35	< 0.37	< 0.38	< 0.35	< 0.38	< 0.37	< 0.35	< 0.38	< 0.41	< 0.40	< 0.42	< 0.37	NA	< 3.50	< 0.35	< 0.42	< 3.50	< 0.36	< 0.39	< 3.50	< 0.36	< 0.37	< 3.60	< 0.48	< 0.44	NA	< 0.74	< 0.49	< 0.46	< 0.44	< 0.46	< 0.49
Endosulfan-alpha (I)	< 0.28	< 0.30	< 0.33	< 0.28	< 0.29	< 0.32	< 0.27	< 0.28	< 0.30	< 0.28	< 0.30	< 0.29	< 0.27	< 0.30	< 0.32	< 0.31	< 0.33	< 0.29	NA	< 2.70	< 0.27	< 0.33	< 2.70	< 0.28	< 0.30	< 2.70	< 0.28	< 0.29	< 2.80	< 0.38	< 0.34	NA	< 0.57	< 0.38	< 0.36	< 0.34	< 0.36	< 0.38
Endosulfan-beta (II)	< 0.30	< 0.31	< 0.36	< 0.30	< 0.31	< 0.34	< 0.29	< 0.30	< 0.32	< 0.29	< 0.32	< 0.31	< 0.29	< 0.32	< 0.34	< 0.33	< 0.35	< 0.30	NA	< 2.90	< 0.29	< 0.35	< 2.90	< 0.30	< 0.32	< 2.90	< 0.29	< 0.31	< 3.00	< 0.40	< 0.36	NA	< 0.61	< 0.40	< 0.38	< 0.36	< 0.38	< 0.40
Endrin	< 0.39	< 0.40	< 0.46	< 0.39	< 0.40	< 0.44	< 0.37	< 0.39	< 0.41	< 0.38	< 0.40	< 0.39	< 0.37	< 0.41	< 0.43	< 0.42	< 0.45	< 0.39	NA	< 3.70	< 0.37	< 0.44	< 3.70	< 0.38	< 0.41	< 3.70	< 0.38	< 0.40	< 3.80	< 0.51	< 0.46	NA	< 0.78	< 0.52	< 0.49	< 0.47	< 0.49	< 0.52
Endrin aldehyde	< 0.26	< 0.28	< 0.31	< 0.26	< 0.27	< 0.30	< 0.25	< 0.26	< 0.28	< 0.26	< 0.28	< 0.27	< 0.25	< 0.28	< 0.29	< 0.29	< 0.30	< 0.27	NA	< 2.50	< 0.25	< 0.30	< 2.50	< 0.26	< 0.28	< 2.50	< 0.26	< 0.27	< 2.60	< 0.35	< 0.32	NA	< 0.53	< 0.35	< 0.34	< 0.32	< 0.34	< 0.35
Endrin ketone	< 0.38	< 0.39	< 0.44	< 0.37	< 0.39	< 0.42	< 0.36	< 0.38	< 0.39	< 0.36	< 0.39	< 0.38	< 0.36	< 0.39	< 0.42	< 0.41	< 0.43	< 0.38	NA	< 3.60	< 0.36	< 0.43	< 3.60	< 0.37	< 0.40	< 3.60	< 0.37	< 0.38	< 3.70	< 0.50	< 0.45	NA	< 0.76	< 0.50	< 0.48	< 0.45	< 0.48	< 0.50
Gamma Chlordane	< 0.34	< 0.36	< 0.41	< 0.34	< 0.35	< 0.39	< 0.33	< 0.34	< 0.36	< 0.33	< 0.36	< 0.35	< 0.33	< 0.36	< 0.38	< 0.37	< 0.40	< 0.35	NA	< 3.30	< 0.33	< 0.39	< 3.30	< 0.34	< 0.37	**4.30 J**	< 0.33	< 0.35	< 3.40	< 0.46	< 0.41	NA	< 0.69	< 0.46	< 0.44	< 0.41	< 0.44	< 0.46
gamma-BHC (Lindane)	< 0.38	< 0.39	< 0.44	< 0.37	< 0.39	< 0.42	< 0.36	< 0.37	< 0.39	< 0.36	< 0.39	< 0.38	< 0.36	< 0.39	< 0.42	< 0.41	< 0.43	< 0.38	NA	< 3.60	< 0.36	< 0.43	< 3.60	< 0.37	< 0.40	< 3.60	< 0.36	< 0.38	< 3.70	< 0.50	< 0.45	NA	< 0.75	< 0.50	< 0.48	< 0.45	< 0.48	< 0.50
Heptachlor	< 0.35	< 0.36	< 0.41	< 0.35	< 0.36	< 0.39	< 0.33	< 0.35	< 0.36	< 0.34	< 0.36	< 0.35	< 0.33	< 0.36	< 0.39	< 0.38	< 0.40	< 0.35	NA	< 3.30	< 0.33	< 0.40	< 3.30	< 0.34	< 0.37	< 3.30	< 0.34	< 0.35	< 3.40	< 0.46	< 0.42	NA	< 0.70	< 0.46	< 0.44	< 0.42	< 0.44	< 0.46
Heptachlor epoxide	< 0.39	< 0.40	**0.46 J**	< 0.38	< 0.40	< 0.43	< 0.37	< 0.38	< 0.40	< 0.37	< 0.40	< 0.39	< 0.37	< 0.40	< 0.43	< 0.42	< 0.44	< 0.39	NA	< 3.70	< 0.37	< 0.44	< 3.70	< 0.38	< 0.41	< 3.70	< 0.37	< 0.39	< 3.80	< 0.51	< 0.46	NA	< 0.77	< 0.51	< 0.49	< 0.46	< 0.49	< 0.51
Methoxychlor	< 0.35	< 0.37	< 0.41	< 0.35	< 0.36	< 0.40	< 0.34	< 0.35	< 0.37	< 0.34	< 0.37	< 0.36	< 0.34	< 0.37	< 0.39	< 0.38	< 0.40	< 0.35	NA	< 3.40	< 0.34	< 0.40	< 3.40	< 0.34	< 0.38	< 3.40	< 0.34	< 0.36	< 3.50	< 0.47	< 0.42	NA	< 0.71	< 0.47	< 0.45	< 0.42	< 0.45	< 0.47
Oxychlordane	**2.2**	< 0.32	< 0.36	**43**	< 0.31	< 0.34	**6.1**	< 0.30	< 0.32	**6.8**	< 0.32	< 0.31	< 0.29	< 0.32	< 0.34	< 0.33	< 0.35	< 0.31	NA	< 2.90	< 0.29	< 0.35	< 2.90	< 0.30	< 0.33	< 2.90	< 0.30	< 0.31	< 3.00	< 0.40	< 0.36	NA	< 0.61	< 0.40	< 0.39	< 0.37	< 0.39	< 0.41
Toxaphene	**35**	< 7.10	< 8.10	< 6.80	< 7.10	< 7.70	< 6.60	< 6.90	< 7.20	< 6.70	< 7.20	< 6.90	< 6.60	< 7.20	< 7.60	< 7.40	< 7.90	**17.00 J**	NA	**1500**	**18.00 J**	**13.00 J**	**1500**	**59**	**9.80 J**	**2100**	**150**	**250**	**2500**	**140**	< 8.20	NA	< 14.00	< 9.10	< 8.70	**160**	< 8.70	< 9.20
Trans-nonachlor	< 0.31	< 0.32	< 0.37	< 0.31	< 0.32	< 0.35	< 0.30	< 0.31	< 0.33	< 0.30	< 0.32	< 0.32	< 0.30	< 0.33	< 0.35	< 0.34	< 0.36	< 0.31	NA	< 3.00	< 0.30	< 0.36	< 3.00	< 0.30	< 0.33	< 3.00	< 0.30	< 0.32	< 3.10	< 0.41	< 0.37	NA	< 0.63	< 0.41	< 0.40	< 0.38	< 0.40	< 0.42
Total Chlordanes (ND = 0)	**2.2**	< 0.36	< 0.41	**43**	< 0.36	< 0.39	**26.1**	< 0.35	< 0.36	**6.8**	< 0.36	< 0.35	< 0.33	< 0.36	< 0.39	< 0.38	< 0.40	< 0.35	NA	< 3.30	< 0.33	< 0.40	< 3.30	< 0.34	< 0.37	**4.3**	< 0.34	< 0.35	< 3.40	< 0.46	< 0.42	NA	< 0.70	< 0.46	< 0.44	< 0.42	< 0.44	< 0.46
PCB Congeners (µg/kg)																																					
PCB018	< 0.170	NA	NA	< 0.170	NA	NA	< 0.160	NA	NA	< 0.170	NA	NA	< 0.160	NA	NA	< 0.180	NA	NA	< 0.160	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.270	NA	NA	NA	NA	NA	NA
PCB028	< 0.110	NA	NA	< 0.110	NA	NA	**0.340 J**	NA	NA	< 0.100	NA	NA	< 0.100	NA	NA	< 0.120	NA	NA	< 0.100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.190 J**	NA	NA	NA	NA	NA	NA
PCB037	< 0.140	NA	NA	< 0.140	NA	NA	< 0.140	NA	NA	< 0.140	NA	NA	< 0.140	NA	NA	< 0.150	NA	NA	< 0.130	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.220	NA	NA	NA	NA	NA	NA
PCB044	**0.380 J**	NA	NA	< 0.140	NA	NA	**2.3**	NA	NA	< 0.140	NA	NA	< 0.140	NA	NA	< 0.150	NA	NA	< 0.140	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.710 J**	NA	NA	NA	NA	NA	NA
PCB049	< 0.130	NA	NA	< 0.130	NA	NA	**0.99**	NA	NA	< 0.120	NA	NA	< 0.120	NA	NA	< 0.140	NA	NA	< 0.120	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.350 J**	NA	NA	NA	NA	NA	NA
PCB052	**0.510 J**	NA	NA	< 0.100	NA	NA	**3.7**	NA	NA	**0.200 J**	NA	NA	< 0.100	NA	NA	< 0.110	NA	NA	**0.120 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.93**	NA	NA	NA	NA	NA	NA
PCB066	**0.250 J**	NA	NA	< 0.099	NA	NA	**1.1**	NA	NA	< 0.096	NA	NA	< 0.095	NA	NA	< 0.110	NA	NA	< 0.094	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.660 J**	NA	NA	NA	NA	NA	NA
PCB070	**0.440 J**	NA	NA	< 0.089	NA	NA	**2.4**	NA	NA	< 0.086	NA	NA	< 0.085	NA	NA	< 0.096	NA	NA	< 0.084	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.560 J**	NA	NA	NA	NA	NA	NA
PCB074	**0.100 J**	NA	NA	< 0.100	NA	NA	**0.56**	NA	NA	< 0.099	NA	NA	< 0.098	NA	NA	< 0.110	NA	NA	< 0.097	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.380 J**	NA	NA	NA	NA	NA	NA
PCB077	< 0.110	NA	NA	< 0.110	NA	NA	**0.9**	NA	NA	< 0.100	NA	NA	< 0.100	NA	NA	< 0.110	NA	NA	< 0.100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.170	NA	NA	NA	NA	NA	NA
PCB081	< 0.130	NA	NA	< 0.130	NA	NA	< 0.130	NA	NA	< 0.130	NA	NA	< 0.130	NA	NA	< 0.140	NA	NA	< 0.130	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.210	NA	NA	NA	NA	NA	NA
PCB087	**0.56**	NA	NA	< 0.110	NA	NA	**5.8**	NA	NA	**0.240 J**	NA	NA	< 0.100	NA	NA	< 0.120	NA	NA	**0.200 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.320 J**	NA	NA	NA	NA	NA	NA
PCB099	**0.470 J**	NA	NA	< 0.092	NA	NA	**4.8**	NA	NA	**0.260 J**	NA	NA	< 0.088	NA	NA	< 0.100	NA	NA	**0.170 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.350 J**	NA	NA	NA	NA	NA	NA
PCB101	**1.2**	NA	NA	< 0.088	NA	NA	**15**	NA	NA	**0.62**	NA	NA	< 0.084	NA	NA	< 0.095	NA	NA	**0.440 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.680 J**	NA	NA	NA	NA	NA	NA
PCB105	**0.420 J**	NA	NA	< 0.110	NA	NA	**6.9**	NA	NA	**0.310 J**	NA	NA	< 0.110	NA	NA	< 0.120	NA	NA	**0.270 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.430 J**	NA	NA	NA	NA	NA	NA
PCB110	**1.3**	NA	NA	< 0.110	NA	NA	**14**	NA	NA	**0.73**	NA	NA	< 0.110	NA	NA	< 0.120	NA	NA	**0.54**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.720 J**	NA	NA	NA	NA	NA	NA
PCB114	< 0.110	NA	NA	< 0.110	NA	NA	< 0.100	NA	NA	< 0.100	NA	NA	< 0.100	NA	NA	< 0.120	NA	NA	< 0.100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.170	NA	NA	NA	NA	NA	NA
PCB118	**1**	NA	NA	< 0.140	NA	NA	**15**	NA	NA	**0.450 J**	NA	NA	< 0.140	NA	NA	< 0.160	NA	NA	**0.340 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.660 J**	NA	NA	NA	NA	NA	NA
PCB119	< 0.094	NA	NA	< 0.094	NA	NA	**0.220 J**	NA	NA	< 0.091	NA	NA	< 0.090	NA	NA	< 0.100	NA	NA	< 0.089	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.150	NA	NA	NA	NA	NA	NA
PCB123	< 0.095	NA	NA	< 0.094	NA	NA	< 0.091	NA	NA	< 0.092	NA	NA	< 0.090	NA	NA	< 0.100	NA	NA	< 0.090	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.150	NA	NA	NA	NA	NA	NA
PCB126	**0.280 J**	NA	NA	< 0.150	NA	NA	**0.290 J**	NA	NA	**0.260 J**	NA	NA	< 0.140	NA	NA	< 0.160	NA	NA	**0.300 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.230	NA	NA	NA	NA	NA	NA
PCB128	**0.310 J**	NA	NA	< 0.110	NA	NA	**5.5**	NA	NA	**0.280 J**	NA	NA	< 0.110	NA	NA	< 0.120	NA	NA	**0.240 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.250 J**	NA	NA	NA	NA	NA	NA
PCB138/158	**1.4**	NA	NA	< 0.220	NA	NA	**30**	NA	NA	**1.1**	NA	NA	< 0.210	NA	NA	< 0.240	NA	NA	**1.4**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.200 J**	NA	NA	NA	NA	NA	NA
PCB149	**0.83**	NA	NA	< 0.097	NA	NA	**20**	NA	NA	**0.7**	NA	NA	< 0.093	NA	NA	< 0.100	NA	NA	**0.79**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.660 J**	NA	NA	NA	NA	NA	NA
PCB151	**0.210 J**	NA	NA	< 0.110	NA	NA	**6.5**	NA	NA	**0.190 J**	NA	NA	< 0.110	NA	NA	< 0.120	NA	NA	**0.210 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.220 J**	NA	NA	NA	NA	NA	NA
PCB153	**1.2**	NA	NA	< 0.110	NA	NA	**31**	NA	NA	**1**	NA	NA	**0.130 J**	NA	NA	< 0.120	NA	NA	**1.3**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.94**	NA	NA	NA	NA	NA	NA
PCB156	< 0.110	NA	NA	< 0.110	NA	NA	**3.3**	NA	NA	**0.150 J**	NA	NA	< 0.100	NA	NA	< 0.110	NA	NA	**0.100 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.170	NA	NA	NA	NA	NA	NA
PCB157	< 0.100	NA	NA	< 0.100	NA	NA	**0.76**	NA	NA	< 0.100	NA	NA	< 0.099	NA	NA	< 0.110	NA	NA	< 0.098	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.160	NA	NA	NA	NA	NA	NA
PCB167	< 0.110	NA	NA	< 0.110	NA	NA	< 0.100	NA	NA	< 0.100	NA	NA	< 0.100	NA	NA	< 0.120	NA	NA	< 0.100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.170	NA	NA	NA	NA	NA	NA
PCB168	< 0.093	NA	NA	< 0.093	NA	NA	< 0.090	NA	NA	< 0.090	NA	NA	< 0.089	NA	NA	< 0.100	NA	NA	< 0.088	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.150	NA	NA	NA	NA	NA	NA
PCB169	< 0.088	NA	NA	< 0.088	NA	NA	**3.7**	NA	NA	< 0.086	NA	NA	< 0.085	NA	NA	< 0.096	NA	NA	**0.090 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.140	NA	NA	NA	NA	NA	NA
PCB170	**0.62**	NA	NA	< 0.100	NA	NA	**16**	NA	NA	**0.510 J**	NA	NA	< 0.096	NA	NA	< 0.110	NA	NA	**0.78**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.630 J**	NA	NA	NA	NA	NA	NA
PCB177	< 0.130	NA	NA	< 0.130	NA	NA	**6.7**	NA	NA	< 0.130	NA	NA	< 0.130	NA	NA	< 0.140	NA	NA	**0.230 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.210	NA	NA	NA	NA	NA	NA
PCB180	**0.82**	NA	NA	< 0.066	NA	NA	**31**	NA	NA	**0.66**	NA	NA	**0.095 J**	NA	NA	< 0.072	NA	NA	**0.94**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.820 J**	NA	NA	NA	NA	NA	NA
PCB183	**0.170 J**	NA	NA	< 0.120	NA	NA	**6.5**	NA	NA	**0.140 J**	NA	NA	< 0.120	NA	NA	< 0.130	NA	NA	**0.190 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.190	NA	NA	NA	NA	NA	NA
PCB187	**0.380 J**	NA	NA	< 0.110	NA	NA	**20**	NA	NA	**0.390 J**	NA	NA	< 0.110	NA	NA	< 0.120	NA	NA	**0.57**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.540 J**	NA	NA	NA	NA	NA	NA
PCB189	< 0.093	NA	NA	< 0.092	NA	NA	**0.350 J**	NA	NA	< 0.090	NA	NA	< 0.089	NA	NA	< 0.100	NA	NA	< 0.088	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.150	NA	NA	NA	NA	NA	NA
PCB194	**0.270 J**	NA	NA	< 0.100	NA	NA	**13**	NA	NA	**0.350 J**	NA	NA	< 0.099	NA	NA	< 0.110	NA	NA	**0.390 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.540 J**	NA	NA	NA	NA	NA	NA
PCB201	< 0.062	NA	NA	< 0.062	NA	NA	**1.3**	NA	NA	< 0.060	NA	NA	< 0.059	NA	NA	< 0.067	NA	NA	< 0.059	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.097	NA	NA	NA	NA	NA	NA
PCB206	**0.320 J**	NA	NA	< 0.089	NA	NA	**5.2**	NA	NA	**0.360 J**	NA	NA	< 0.086	NA	NA	< 0.097	NA	NA	< 0.085	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.410 J**	NA	NA	NA	NA	NA	NA
Total PCB Congeners (ND = 0)	**13.44**	NA	NA	< 0.220	NA	NA	**275.11**	NA	NA	**8.9**	NA	NA	**0.225**	NA	NA	< 0.240	NA	NA	**9.61**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**13.15**	NA	NA	NA	NA	NA	NA

Table 10
Pesticide and PCB Results for Archived Samples

	Subarea 3																				
Parameter	S3-1-A-12-A 5/4/2012	S3-1-B-12-A 5/4/2012	S3-1-C-12-A 5/4/2012	S3-2-A-12-A 5/3/2012	S3-2-B-12-A 5/3/2012	S3-2-C-12-A 5/3/2012	S3-3-A-12-A 5/3/2012	S3-3-B-12-A 5/3/2012	S3-3-C-12-A 5/3/2012	S3-4-A-12-A 5/3/2012	S3-4-B-12-A 5/3/2012	S3-4-C-12-A 5/3/2012	S3-5-A-12-A 5/4/2012	S3-5-B-12-A 5/4/2012	S3-5-C-12-A 5/4/2012	S3-6-A-12-A 5/3/2012	S3-6-B-12-A 5/3/2012	S3-6-C-12-A 5/3/2012	S3-7-A-12-A 5/3/2012	S3-7-B-12-A 5/3/2012	S3-7-C-12-A 5/3/2012
Conventional Parameters (%)																					
Total solids	**96.4**	**95.8**	**86.9**	**88.8**	**93.7**	**85.8**	**93.2**	**95.6**	**86.5**	**89.4**	**87.3**	**95.8**	**96.4**	**94.6**	**89.9**	**96.6**	**94.8**	**85.2**	**93.7**	**86.2**	**90.4**
Pesticides (µg/kg)																					
2,4'-DDD	**1.00 J**	< 0.35	< 0.39	**4.6**	**1.1**	< 0.39	< 0.36	< 0.35	< 0.39	< 0.38	< 0.39	**2.9**	< 3.50	< 0.36	< 0.38	**5.9**	< 0.36	< 0.40	**2.8**	< 0.39	< 0.37
2,4'-DDE	**8**	**3.1**	< 0.35	**7.2**	**1.2**	< 0.36	**6**	< 0.32	< 0.35	< 0.34	< 0.35	**6.9**	**12**	**2.3**	< 0.34	< 0.32	< 0.32	< 0.36	**7.5**	< 0.35	< 0.34
2,4'-DDT	**44**	**18**	< 0.35	**57**	**3.3**	< 0.35	**50**	< 0.31	< 0.35	< 0.34	< 0.34	**56**	**120**	**23**	**0.96 J**	**5.7**	< 0.32	< 0.35	**43**	< 0.35	< 0.33
4,4'-DDD	**27**	**6.7**	< 0.36	**9.8**	**4.5**	< 0.37	**16**	< 0.33	< 0.37	< 0.35	**0.44 J**	< 0.33	< 3.30	< 0.33	< 0.35	< 0.33	**4.1**	< 0.37	< 0.34	**0.38 J**	< 0.35
4,4'-DDE	**290**	**150**	**0.98 J**	**260**	**47**	**0.36 J**	**300**	**1.8**	**0.47 J**	**0.49 J**	**2.1**	**300**	**410**	**97**	**4.6**	**120**	**3.8**	**1.3**	**330**	**3.1**	< 0.33
4,4'-DDT	**110**	**41**	< 0.39	**140**	**6.9**	< 0.39	**160**	< 0.35	< 0.39	< 0.37	**0.47 J**	**150**	**220**	**43**	**2.3**	**77**	< 0.35	**1.10 J**	**140**	**0.87 J**	< 0.37
Total DDTs (ND = 0)	**480**	**218.8**	**0.98**	**478.6**	**64**	**0.36**	**532**	**1.8**	**0.47**	**0.49**	**3.01**	**515.8**	**762**	**165.3**	**7.86**	**208.6**	**7.9**	**2.4**	**523.3**	**4.35**	< 0.37
Aldrin	< 0.33	< 0.33	< 0.36	< 0.35	< 0.34	< 0.37	< 0.34	< 0.33	< 0.36	< 0.35	< 0.36	< 0.33	< 3.30	< 0.33	< 0.35	< 0.33	< 0.33	< 0.37	< 0.34	< 0.37	< 0.35
Alpha Chlordane	< 0.33	< 0.33	< 0.37	< 0.36	< 0.34	< 0.37	< 0.34	< 0.34	< 0.37	< 0.36	< 0.37	< 0.33	< 3.30	< 0.34	< 0.36	< 0.33	< 0.34	< 0.38	< 0.34	< 0.37	< 0.35
alpha-BHC	< 0.34	< 0.34	< 0.37	< 0.36	< 0.35	< 0.38	< 0.35	< 0.34	< 0.37	< 0.36	< 0.37	< 0.34	< 3.40	< 0.34	< 0.36	< 0.34	< 0.34	< 0.38	< 0.35	< 0.38	< 0.36
beta-BHC	< 0.27	< 0.28	< 0.30	< 0.30	< 0.28	< 0.31	< 0.28	< 0.28	< 0.31	< 0.30	< 0.30	< 0.28	< 2.70	< 0.28	< 0.29	< 0.27	< 0.28	< 0.31	< 0.28	< 0.31	< 0.29
Chlordane (Technical)	**74**	**40**	< 3.80	**40**	< 3.50	< 3.80	**64**	< 3.40	< 3.80	< 3.70	< 3.70	**120**	**86**	**13**	< 3.60	**720**	**7.80 J**	**12**	**140**	< 3.80	< 3.60
Cis-nonachlor	< 0.30	< 0.31	< 0.34	< 0.33	< 0.31	< 0.34	< 0.32	< 0.31	< 0.34	< 0.33	< 0.34	< 0.31	< 3.00	< 0.31	< 0.33	< 0.30	< 0.31	< 0.34	< 0.31	< 0.34	< 0.32
delta-BHC	< 0.27	< 0.27	< 0.29	< 0.29	< 0.27	< 0.30	< 0.27	< 0.27	< 0.30	< 0.29	< 0.29	< 0.27	< 2.70	< 0.27	< 0.28	< 0.26	< 0.27	< 0.30	< 0.27	< 0.30	< 0.28
Dieldrin	< 0.34	< 0.34	< 0.38	**23**	**2**	< 0.38	**41**	**0.66 J**	< 0.38	< 0.37	< 0.38	< 0.34	< 3.40	< 0.35	< 0.37	< 0.34	**1.7**	< 0.39	< 0.35	**0.72 J**	< 0.36
Endosulfan sulfate	< 0.35	< 0.35	< 0.39	< 0.38	< 0.36	< 0.39	< 0.36	< 0.35	< 0.39	< 0.38	< 0.39	< 0.35	< 3.50	< 0.36	< 0.38	< 0.35	< 0.36	< 0.40	< 0.36	< 0.39	< 0.37
Endosulfan-alpha (I)	< 0.27	< 0.27	< 0.30	< 0.30	< 0.28	< 0.31	< 0.28	< 0.27	< 0.30	< 0.29	< 0.30	< 0.27	< 2.70	< 0.28	< 0.29	< 0.27	< 0.28	< 0.31	< 0.28	< 0.30	< 0.29
Endosulfan-beta (II)	< 0.29	< 0.29	< 0.32	< 0.31	< 0.30	< 0.33	< 0.30	< 0.29	< 0.32	< 0.31	< 0.32	< 0.29	< 2.90	< 0.30	< 0.31	< 0.29	< 0.29	< 0.33	< 0.30	< 0.32	< 0.31
Endrin	< 0.37	< 0.37	< 0.41	< 0.40	< 0.38	< 0.42	< 0.38	< 0.37	< 0.41	< 0.40	< 0.41	< 0.37	< 3.70	< 0.38	< 0.40	< 0.37	< 0.38	< 0.42	< 0.38	< 0.42	< 0.40
Endrin aldehyde	< 0.25	< 0.25	< 0.28	< 0.28	< 0.26	< 0.28	< 0.26	< 0.26	< 0.28	< 0.27	< 0.28	< 0.25	< 2.50	< 0.26	< 0.27	< 0.25	< 0.26	< 0.29	< 0.26	< 0.28	< 0.27
Endrin ketone	< 0.36	< 0.36	< 0.40	< 0.39	< 0.37	< 0.40	< 0.37	< 0.36	< 0.40	< 0.39	< 0.40	< 0.36	< 3.60	< 0.37	< 0.39	< 0.36	< 0.37	< 0.41	< 0.37	< 0.40	< 0.38
Gamma Chlordane	< 0.33	< 0.33	< 0.37	< 0.36	< 0.34	< 0.37	< 0.34	< 0.33	< 0.37	< 0.36	< 0.36	< 0.33	< 3.30	< 0.34	< 0.35	< 0.33	< 0.34	< 0.37	< 0.34	< 0.37	< 0.35
gamma-BHC (Lindane)	< 0.36	< 0.36	< 0.40	< 0.39	< 0.37	< 0.40	< 0.37	< 0.36	< 0.40	< 0.39	< 0.40	< 0.36	< 3.60	< 0.37	< 0.39	< 0.36	< 0.37	< 0.41	< 0.37	< 0.40	< 0.38
Heptachlor	< 0.33	< 0.34	< 0.37	< 0.36	< 0.34	< 0.37	< 0.34	< 0.34	< 0.37	< 0.36	< 0.37	< 0.34	< 3.30	< 0.34	< 0.36	< 0.33	< 0.34	< 0.38	< 0.34	< 0.37	< 0.36
Heptachlor epoxide	< 0.37	< 0.37	< 0.41	< 0.40	< 0.38	< 0.41	< 0.38	< 0.37	< 0.41	< 0.40	< 0.41	< 0.37	< 3.70	< 0.38	< 0.40	< 0.37	< 0.38	< 0.42	< 0.38	< 0.41	< 0.39
Methoxychlor	< 0.34	< 0.34	< 0.37	< 0.37	< 0.35	< 0.38	< 0.35	< 0.34	< 0.38	< 0.36	< 0.37	< 0.34	< 3.40	< 0.34	< 0.36	< 0.34	< 0.34	< 0.38	< 0.35	< 0.38	< 0.36
Oxychlordane	< 0.29	< 0.29	< 0.32	< 0.32	< 0.30	< 0.33	< 0.30	< 0.29	< 0.33	< 0.31	< 0.32	< 0.29	< 2.90	< 0.30	< 0.31	< 0.29	< 0.30	< 0.33	< 0.30	< 0.33	< 0.31
Toxaphene	**1000**	**220**	< 7.30	**480**	< 6.80	< 7.40	**360**	< 6.60	< 7.30	< 7.10	< 7.30	**960**	**1700**	**250**	**19.00 J**	**160**	**7.90 J**	< 7.40	**960**	**14.00 J**	< 7.00
Trans-nonachlor	< 0.30	< 0.30	< 0.33	< 0.32	< 0.31	< 0.34	< 0.31	< 0.30	< 0.33	< 0.32	< 0.33	< 0.30	< 3.00	< 0.30	< 0.32	< 0.30	< 0.30	< 0.34	< 0.31	< 0.33	< 0.32
Total Chlordanes (ND = 0)	< 0.33	< 0.33	< 0.37	< 0.36	< 0.34	< 0.37	< 0.34	< 0.34	< 0.37	< 0.36	< 0.37	< 0.33	< 3.30	< 0.34	< 0.36	< 0.33	< 0.34	< 0.38	< 0.34	< 0.37	< 0.35
PCB Congeners (µg/kg)																					
PCB018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB028	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB037	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB044	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB049	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB052	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB066	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB070	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB074	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB077	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB081	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB087	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB099	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB101	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB105	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB110	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB114	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB118	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB119	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB123	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB126	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB128	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB138/158	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB149	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB151	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB153	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB156	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB157	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB167	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB168	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB169	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB170	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB177	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB180	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB183	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB187	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB189	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB194	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB201	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB206	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCB Congeners (ND = 0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
Bold = detected result
< = less than listed method detection limit
J = indicates an estimated value
µg/kg = micrograms per kilogram
NA = not analyzed
ND = non-detect
Non-detect samples are reported as less than method detection limit.
For calculated total chemicals (Total DDTs, PAHs, PCBs, and Chlordane) only detected compounds were summed.
Total DDTs are the sum of 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, 2,4'-DDD, 2,4'-DDE, and 2,4'-DDT.
Total Chlordanes are the sum of Alpha Chlordane, Gamma Chlordane, Cis-Nonachlor, Oxychlordane, and Trans-Nonachlor.

3.2.2.2 PCBs

PCBs were detected in composite archive samples from ORFP-8,14,15,16 and Nestor Creek. Total PCB concentrations were 9.61 and 13.15 micrograms per kilogram (µg/kg), respectively.

For the composite archive sample from ORFP-7,9,10,11,12,13, PCBs were detected in ORFP-7, ORFP-10, ORFP-11, and ORFP-12. Concentrations were substantially higher at OERFP-10 when compared to the other stations.

3.3 Quality Assurance/Quality Control Summary

A review of analytical results was conducted to evaluate the laboratory performance in meeting quality assurance/quality control (QA/QC) guidelines outlined in the SAP (Anchor QEA 2012). Data validation reports generated by Anchor QEA are presented in Appendix C. All composite samples were analyzed within holding times. Archived samples were frozen prior to holding time expiration and remained in that condition until analysis. Generally, QA/QC sample results were within the project-specified and/or laboratory control limits, with the following exceptions:

- Composite samples
  - Arsenic, nickel, and several SVOCs were detected in method blanks. All concentrations detected in method blanks were at levels below reporting limits.
  - The matrix spike (MS) and/or matrix spike duplicate (MSD) percent recovery (%R) values for lead and zinc were outside the project-specific control limits.
  - The MS and/or MSD %R values and/or relative percent difference (RPD) values for several pesticides were greater than control limits.
  - The MS and/or MSD RPD values for four SVOCs were greater than control limits.
- Archive samples
  - The pesticide surrogate %R values were greater than control limits due to matrix interference in 10 samples.
  - The PCB surrogate %R values were greater than control limits due to matrix interference in two samples.

- The MS and/or MSD %R values and/or RPD values for several pesticides were outside control limits.

4 REFERENCES

Anchor QEA, L.P., 2012. *Sampling and Analysis Plan for Otay River Estuary Restoration Soil Characterization Program*. Prepared for Poseidon Resources, LLC. April 2012.

LIST OF APPENDICES

APPENDIX A FIELD FORMS AND CORE PHOTOGRAPHS

APPENDIX B LABORATORY DATA REPORTS

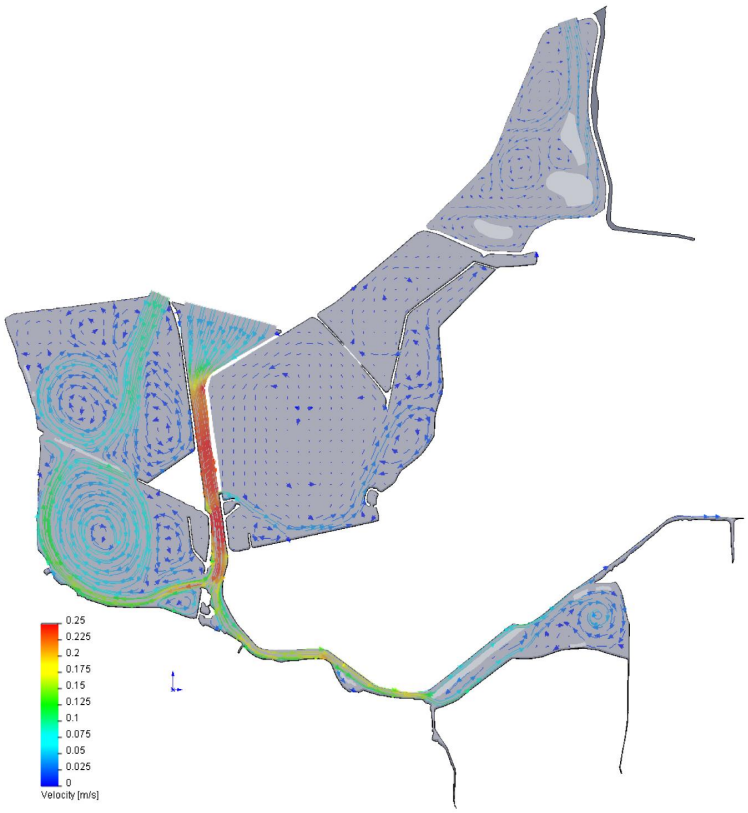
APPENDIX C DATA VALIDATION REPORTS

APPENDIX G

Tidal Hydraulics Analysis

Tidal Hydraulics Analysis of the Otay River Estuary Restoration Plan

by
Scott A. Jenkins, Ph. D. & Joseph Wasyl



Submitted by:
Dr. Scott A Jenkins Consulting
14765 Kalapana St.
Poway, CA 92064

Submitted to:
Poseidon Water LLC
5780 Fleet Street, Suite 140
Carlsbad, CA 92008

Draft: 23 September 2014

Table of Contents

ABSTRACT.....3

1.0) Introduction…….7

2.0) Technical Approach……...16

2.1 Tidal Hydraulics Model Physics……18

3.0) Model Initialization……25

3.1 San Diego Bay Circulation……..26

3.2 San Diego Bay Tidal Regime ……26

3.3 San Diego Bay Water Quality ……....31

3.4 Sea Level Rise Effects on San Diego Bay Water Levels ……...35

3.5 Model Calibration…….42

4.0) Tidal Hydraulics of the Existing Otay River Floodplain ……44

4.1 Tidal Current Simulations ……..44

4.2 Hydroperiod Simulations…….49

5.0) Analysis of the Intertidal Alternative……51

5.1 Bathymetric Input for the Intertidal Alternative ……..51

5.2 Tidal Inundation Simulations of the Intertidal Alternative …….54

5.3 Residence Time of the Intertidal Alternative …….66

6.0) Analysis of the Subtidal Alternative …….....68

6.1 Bathymetric Input for the Subtidal Alternative ……68

6.2 Tidal Inundation Simulations of the Subtidal Alternative ……...71

6.3 Residence Time of the Subtidal Alternative ……...83

7.0) Summary and Conclusion……..85

REFERENCES…….....90

ABSTRACT: This study employs a well-tested and peer-reviewed hydrodynamic model to evaluate the tidal hydraulics the Intertidal Alternative and the Subtidal Alternative for the Otay River Estuary Restoration Project (ORERP). Both alternatives involve restoration of a portion of the Otay River Floodplain Site and Pond 15 Site to native habitat by lowering the existing ground elevations in the Otay River Floodplain Site and using the excavated soils from the Otay River Floodplain Site as fill material in the Pond 15 Site.

The model, analysis methods, and supporting data bases used herein are the same as those utilized in the Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the San Dieguito Wetland Restoration Project, (EIR/EIS, 2000), and for the preparation of the San Dieguito Wetlands Restoration Project, Final Restoration Plan, (SCE, 2005). The analysis is based on updated bathymetry provided by Wetlands Research Associates (WRA) and latest updates to San Diego Bay tides for the 1983-2001 tidal epoch supported by Otay Sonde tidal elevation measurements at the mouth of the Otay River. The computer models used in this study are 2-dimensional finite element types, built from some well-studied and proven computational methods and numerical architecture that have been successful in predicting shallow water tidal propagation. Monitoring data for the newly completed San Dieguito Lagoon Restoration Project was used to calibrate tidal hydraulics model. San Dieguito Lagoon was selected as a calibration proxy for the restoration alternatives because of morphologic similarities: in particular, both the San Dieguito and restoration sites have a long "goose-neck" feeder channel connecting source water to interior tidal basins of comparable acreage and distance from the source water. Habitat surveys conducted during the San Dieguito Lagoon Restoration Project by Josselyn & Whelchel (1999), and then later updated by vegetation surveys in the lower Otay River flood plain by Josselyn (2012), were used to develop functional relationships between habitat breaks and amounts of time for wetting and drying (hydroperiod functions). The hydroperiod functions were calculated by the model for both present and future extremes of sea level in the year 2050 from estimates of both maximum and minimum sea level rise. These relationships were used to transpose tidal hydraulics model output into calculations of acreage of various wetland habitat types created by the two restoration alternatives.

The elevation breaks (zonation) between the different wetland habitat types from the modeled hydroperiod curves are summarized below in Tables ES-1 and ES-2 for the Intertidal Alternative; and in Tables ES-3 and ES-4 for the Subtidal Alternative. The elevations for the habitat breaks in these tables are applied to the KTUA grading designs and yield the acreages of habitat creation listed in Table ES-5 for the Intertidal Alternative at present sea level, and at 2050 sea levels in Table ES-6.The companion set of habitat creation acres for the Subtidal Alternative are listed in Table ES-7 at present sea level, and in Table ES-8 at 2050 sea levels. Comparing Tables ES-5 and ES-7, it is apparent that the Intertidal Alternative creates an additional 1.37 acres of habitat in 2018 than does the Subtidal Alternative. For all possible sea level scenarios, the elevation limit of subtidal habitat in the floodplain basin of both restoration alternatives is limited by existing bars, hummocks and other channel bottom features at the inlet and inside the branch channel into this basin. These channel bottom features create an inlet sill at 0.0 ft NAVD 88. However, if sea level were to rise by 2 ft. according to the maximum sea level rise prediction in 2050, the available tidal range is not sufficient to prevent a rise in subtidal elevations in Pond # 15 of either restoration alternative. This amount of sea level rise will raise the elevations of the

zonation of all habitat types. This upward displacement of wetland zonation is largest for the linear superposition scenario of sea level rise, because the spectral correction scenario predicts a larger tidal range of about 1.0 ft. Under the 24 in. spectral sea level rise scenario at 2050, intertidal wetland habitat would begin at an elevation of between -0.25 ft. and -0.20 ft NAVD, and the mud flat habitat would reside about 0.4 ft. to 0.5 ft. lower than under the linear super-position scenario; while the low marsh habitat would reside about 0.25 ft. lower than under the linear super-position scenario. Therefore there are some apparent differences between the habitat mix predictions of these two sea-level rise prediction methods; although both give the same estimate of the maximum elevation of high salt marsh wetland zonation in both of the proposed basins of the restoration alternatives.

From model simulations of tidal currents throughout complete spring-neap tidal cycles, it is concluded that both source water inlets to the tidal basins of the Intertidal and Subtidal Alternatives are stable and immune to closure or restriction by sedimentation under dry weather tidal exchange. (Wet-weather conditions are addressed in a companion study, Everest, 2014). Inlet sedimentation due to influxes of wave driven long-shore transport of sand (as occurs on the open coast), does not occur in the fetch limited environment of South San Diego Bay. The mouth of the Otay River that supplies source water to the floodplain tidal basin is in a dynamic steady-state equilibrium that is neither depositional nor erosional; while the inlet to Pond 15 will remain in a non-equilibrium stationary state (as-built) in the absence of a local sediment sources or adequate fluid forcing by waves and currents that might otherwise import sediment from more distant sources.

Table ES-1: Elevations of Upper Limits of Habitat Breaks Intertidal Plan Floodplain Basin

Elevation of Habitat Breaks (Units of ft. NAVD 88)	@ Present Sea Level	@ 4.68 in. linear Sea Level Rise	@ 24 in. linear Sea Level Rise	@ 24 in. spectral Sea Level Rise
Sub-tidal	0.00 ft.	0.00 ft.	0.25 ft.	0.00 ft.
Frequently Flooded Mud Flat	2.40 ft.	3.40 ft.	4.50 ft.	4.10 ft.
Frequently Exposed Mud Flat	2.70 ft.	3.70 ft.	4.85 ft.	4.45 ft.
Low Marsh	4.30 ft.	4.90 ft.	6.55 ft.	6.25 ft.
Mid Marsh	6.30 ft.	6.80 ft.	8.55 ft.	8.50 ft.
High Marsh	7.55 ft.	8.05 ft.	9.71 ft.	9.71 ft.

Table ES-2: Elevations of Upper Limits of Habitat Breaks in the Intertidal Plan Pond 15 Basin

Elevation of Habitat Breaks (Units of ft. NAVD 88)	@ Present Sea Level	@ 4.68 in. linear Sea Level Rise	@ 24 in. linear Sea Level Rise	@ 24 in. spectral Sea Level Rise
Sub-tidal	-1.65 ft.	-1.70 ft.	0.25 ft.	-0.25 ft.
Frequently Flooded Mud Flat	2.40 ft.	2.50 ft.	4.50 ft.	4.10 ft.
Frequently Exposed Mud Flat	2.70 ft.	2.85 ft.	4.85 ft.	4.45 ft.
Low Marsh	4.30 ft.	4.50 ft.	6.50 ft.	6.25 ft.
Mid Marsh	6.30 ft.	6.55 ft.	8.55 ft.	8.50 ft.
High Marsh	7.50 ft.	7.90ft.	9.72 ft.	9.72 ft.

Table ES-3: Elevations of Upper Limits of Habitat Breaks in the Subtidal Plan Floodplain Basin

Elevation of Habitat Breaks (Units of ft. NAVD 88)	@ Present Sea Level	@ 4.68 in. linear Sea Level Rise	@ 24 in. linear Sea Level Rise	@ 24 in. spectral Sea Level Rise
Sub-tidal	0.00 ft.	0.00 ft.	0.25 ft.	0.00 ft.
Frequently Flooded Mud Flat	2.38 ft.	3.40 ft.	4.50 ft.	4.15 ft.
Frequently Exposed Mud Flat	2.70 ft.	3.70 ft.	4.85 ft.	4.50 ft.
Low Marsh	4.30 ft.	4.90 ft.	6.52 ft.	6.25 ft.
Mid Marsh	6.27 ft.	6.80 ft.	8.55 ft.	8.50 ft.
High Marsh	7.55 ft.	8.10 ft.	9.71 ft.	9.71 ft.

Table ES-4: Elevations of Upper Limits of Habitat Breaks in the Subtidal Plan Pond 15 Basin

Elevation of Habitat Breaks (Units of ft. NAVD 88)	@ Present Sea Level	@ 4.68 in. linear Sea Level Rise	@ 24 in. linear Sea Level Rise	@ 24 in. spectral Sea Level Rise
Sub-tidal	-1.65 ft.	-1.70 ft.	0.25 ft.	-0.20 ft.
Frequently Flooded Mud Flat	2.35 ft.	2.50 ft.	4.50 ft.	4.15 ft.
Frequently Exposed Mud Flat	2.70 ft.	2.85 ft.	4.85 ft.	4.50 ft.
Low Marsh	4.30 ft.	4.50 ft.	6.50 ft.	6.25 ft.
Mid Marsh	6.30 ft.	6.55 ft.	8.55 ft.	8.50 ft.
High Marsh	7.50 ft.	7.90ft.	9.72 ft.	9.72 ft.

Table ES-5: Intertidal Alternative Predicted Habitat Distribution, acres 2018

Vegetation Community to be Created	Otay River Floodplain Site Acres	Pond 15 Site
SubTidal	0.00	9.53
Mudflat – Frequently Flooded	4.45	16.36
Mudflat – Frequently Exposed	0.70	1.57
Low Marsh	10.34	15.73
Mid Marsh	10.99	34.47
High Marsh	3.23	5.61
Total Marsh	29.26	80.68
Transitional	0.45	2.59
Total Created Habitat	**29.71**	**83.27**

Table ES-6: Intertidal Alternative Predicted Habitat Distribution, acres 2050

Vegetation Community to be Created	Otay River Floodplain Site Acres	Pond 15 Site
SubTidal	0	9.35
Mudflat – Frequently Flooded	8.84	17.06
Mudflat – Frequently Exposed	2.21	1.85
Low Marsh	7.91	17.32
Mid Marsh	10.36	35.38
High Marsh	0.52	2.87
Total Created Habitat	**29.84**	**83.83**

Table ES-7: Subtidal Alternative Predicted Habitat Distribution, acres, 2018

Vegetation Community to be Created	Otay River Floodplain Site Acres	Pond 15 Site
Subtidal	4.48	9.17
Mudflat – Frequently Flooded	5.26	14.70
Mudflat – Frequently Exposed	1.79	1.32
Low Marsh	8.64	11.77
Mid Marsh	7.90	33.25
High Marsh	1.64	11.78
Total Salt Marsh	29.71	82.00
Transitional	0.45	2.15
Total Created Habitat	**29.26**	**79.85**

Table ES-8: Subtidal Alternative Predicted Habitat Distribution, acres, 2050

Vegetation Community to be Created	Otay River Floodplain Site Acres	Pond 15 Site
Subtidal	4.48	9.0
Mudflat – Frequently Flooded	110.01	15.28
Mudflat – Frequently Exposed	1.70	1.58
Low Marsh	5.43	12.68
Mid Marsh	6.71	41.20
High Marsh	0.52	3..06
Total Created Habitat	**29.85**	**82.80**

Tidal Hydraulics Analysis of the Otay River Estuary Restoration Plan

by: Scott A. Jenkins, Ph. D. and Joseph Wasyl

1) Introduction:

The Otay River Estuary Restoration Project (ORERP) is a partnership between Poseidon Water (Channelside) L.P. (Poseidon), the U.S. Fish and Wildlife Service (Service or USFWS), and San Diego Bay National Wildlife Refuge (Refuge). The ORERP project involves the creation, restoration, and enhancement of coastal wetlands to benefit native fish, wildlife, and plant species and to provide habitat for migratory seabirds and shorebirds and salt marsh-dependent species within the South San Diego Bay Unit of the Refuge (Figure 1).

There are two restoration alternatives considered in this study: *The Intertidal Plan*, and *The Sub-tidal Plan*. Both alternatives involve restoration of the two noncontiguous sites outlined in red in Figure 2, including the Otay River Floodplain Site (identified in Figure 3) and the Pond 15 Site, as labeled in Figure 1. The approximately 78-acre Otay River Floodplain Site is located west of Interstate 5 (I-5) between Main Street to the north and Palm Avenue to the south (cf Figures 2 & 3). The approximately 90-acre Pond 15 Site is located approximately 0.75 miles north of the Otay River Floodplain Site and directly south of the Chula Vista Marina (cf Figure 1).

Both alternatives involve restoration of a portion of the Otay River Floodplain Site and Pond 15 Site to native habitat by lowering the existing ground elevations in the Otay River Floodplain Site and using the excavated soils from the Otay River Floodplain Site as fill material in the Pond 15 Site. Both alternatives would impact identical footprints on the two noncontiguous sites shown in Figure 2, with the variance relating to the habitat implemented within this site boundary. Both alternatives would permanently impact approximately 34 acres on the 78-acre Otay River Floodplain Site. The remaining 60 acres of the Otay River Floodplain Site east of Nestor Creek include soil contamination from prior agricultural use as well as cultural resources which would be avoided under both alternatives. Under both restoration alternatives, 88 acres of the approximately 90-acre Pond 15 Site would be permanently impacted by proposed habitat restoration. Under both restoration alternatives the Otay River Floodplain Site would be excavated to a range of elevations and then vegetated to create tidally influenced wetlands communities. The excavated materials from the Otay River Floodplain Site would be transferred to the Pond 15 Site to raise to the appropriate elevations to support a range of wetlands that would also be tidally influenced once an approximately 200 foot wide portion of the levee separating the Pond 15 Site from San Diego Bay is removed. Neither restoration alternative would require dredging the Otay River from the Otay River Floodplain Site to the San Diego Bay.

The Intertidal Alternative would involve lowering the elevation and contouring the Otay River Floodplain Site to create approximately 30 acres of tidally-influenced habitat, as shown in Figure 4. The grading design shown in Figure 4 is designed to achieve approximately 17% intertidal mudflat and, through increasing elevations on the site, 83% intertidal salt marsh habitat. The Intertidal Alternative would also involve raising the elevation and contouring the Pond 15

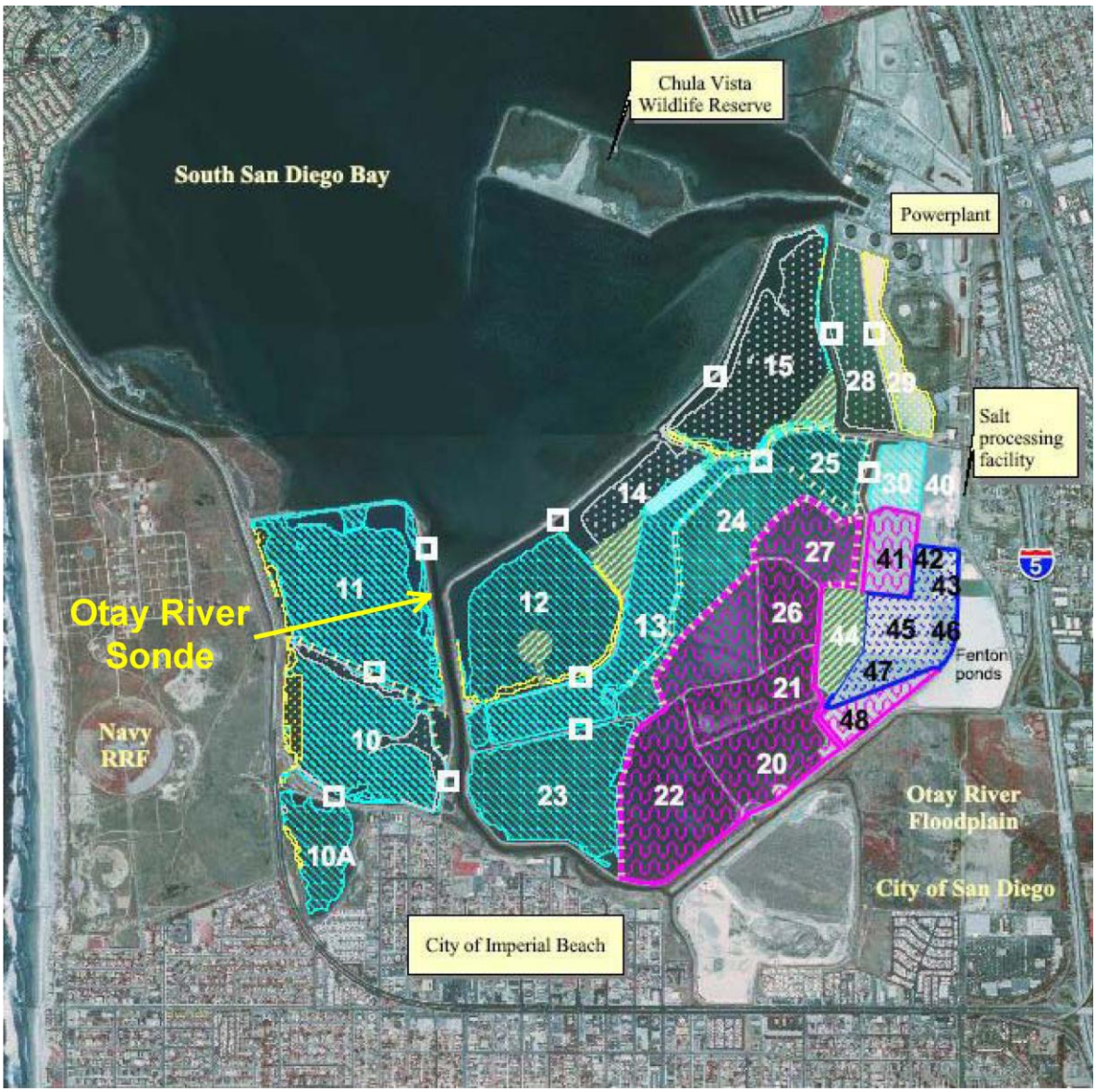


Figure 1: The Otay River Estuary Restoration Project Site in south San Diego Bay, CA.

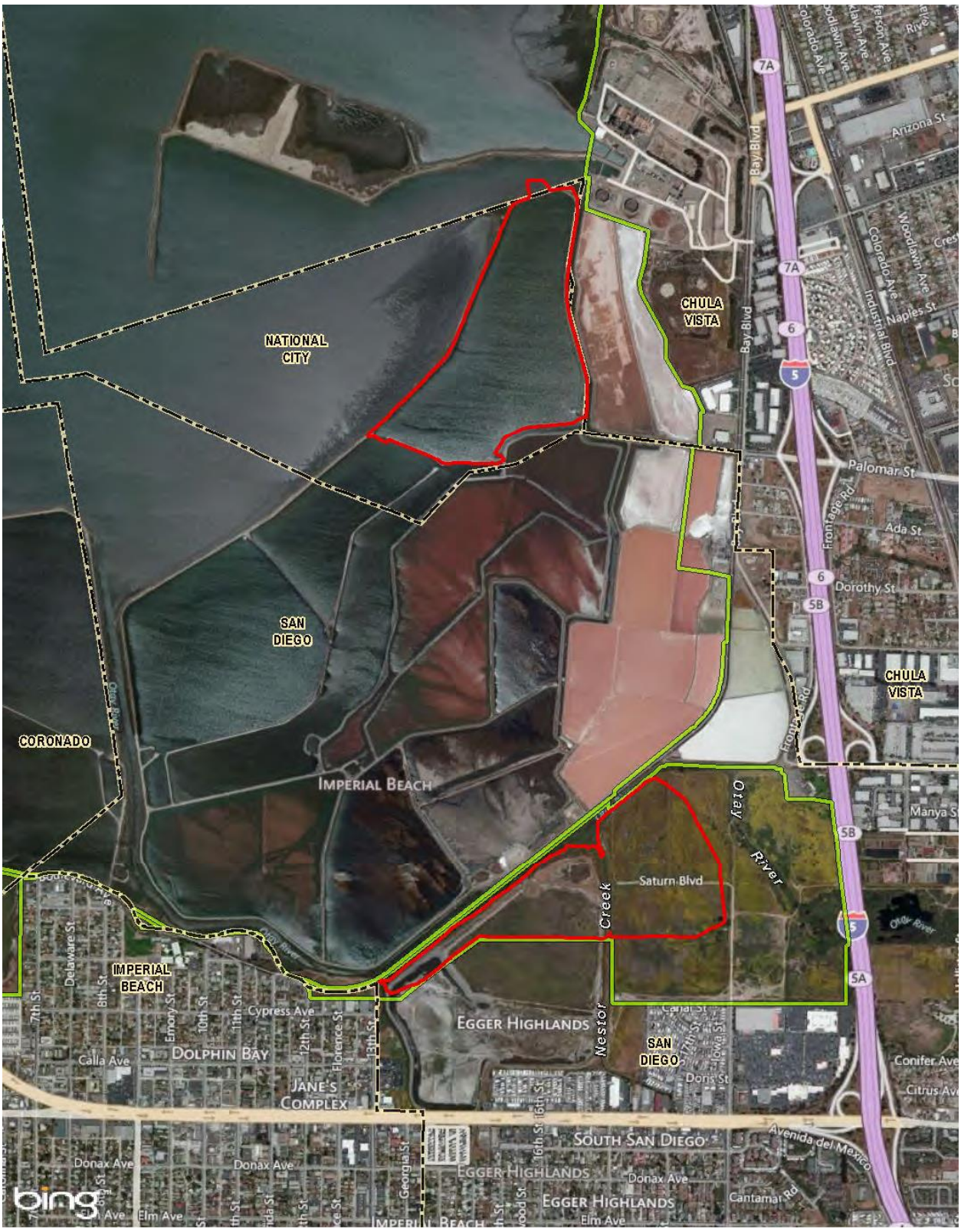


Figure 2: Noncontiguous restoration sites outlined in red.

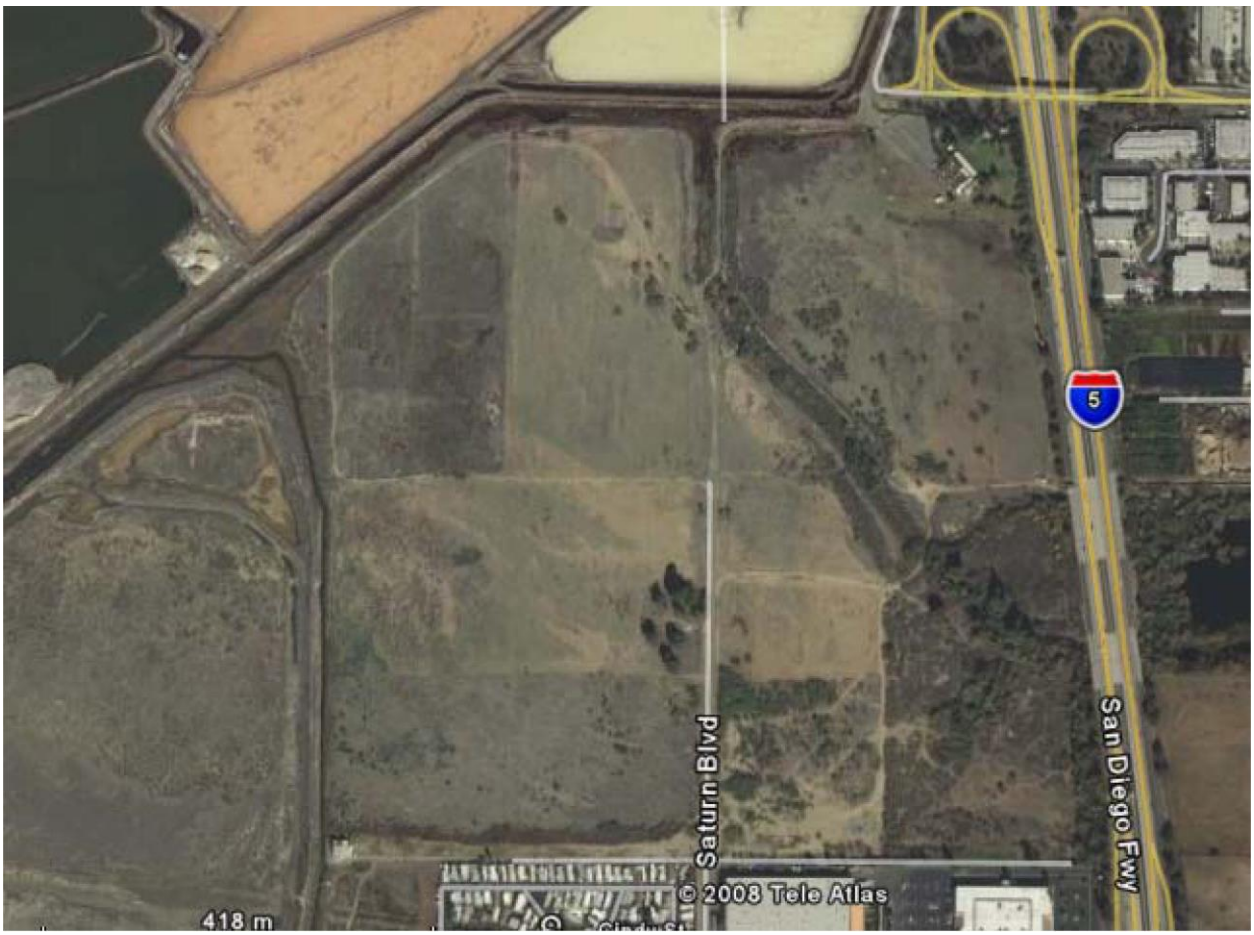


Figure 2: Otay River floodplain, site of the wetland restoration alternatives.

Site as shown in Figure 5, with grading contours intended to create approximately 11% subtidal channel, 22% intertidal mudflat and 67% intertidal salt marsh habitat. Both sites would be planted with a mix of native wetland vegetation that would mature into low marsh, mid marsh, and high marsh vegetative communities. The intertidal areas and the unvegetated mudflat would provide foraging habitat for adult and juvenile fish which form the basis of the food chain that would benefit larger fish, birds and other species on and off the site. Construction of the Intertidal Alternative would require excavation of approximately 320,000 cubic yards of soils at the Otay River Floodplain Site to lower the elevation to the necessary contours to establish a subtidal wetland on the site. The majority of the soil would be beneficially used as fill and cover within Pond 15 to raise the ground to elevations suitable to support coastal salt marsh habitat and nesting areas. The excavated material would also be disposed of on-site as fill for dikes, levees, and upland habitat creation.

The Subtidal Alternative would involve lowering the Otay River Floodplain Site and Pond 15 Site to an elevation lower than that proposed under the Intertidal Alternative to create a subtidal channel within the Otay River Floodplain Site. Under the Subtidal Alternative, the subtidal zone would be surrounded by mudflat and increasing elevations of salt marsh. The Subtidal Alternative would involve lowering the elevation and contouring the Otay River Floodplain Site. Here, the proposed grading plan for the Subtidal Alternative (Figure 6) is intended to create approximately 15% subtidal channel, 24% intertidal mudflat and 61% intertidal salt marsh mudflat. The grading plan of the Subtidal Alternative at the Pond 15 Site would involve raising the elevation and contouring the Pond 15 Site to create approximately 11% subtidal channel, 20% intertidal mudflat and 69% intertidal salt marsh mudflat as shown in Figure 7. Again, both excavated and fill sites would be planted with a mix of immature plants that would mature into low marsh, mid marsh, and high marsh vegetative communities. The subtidal areas would provide spawning and foraging habitat, and the unvegetated mudflat would provide foraging habitat for adult and juvenile fish during high tides. Combined, the habitat would provide habitat for the basis of the food chain that would benefit larger fish, birds and other species on and off the site. Construction of the Subtidal Alternative would require excavation of approximately 370,000 cubic yards of soils at the Otay River Floodplain Site to lower the elevation the necessary contours to establish a subtidal wetland on the site. In addition, between 50,000 and 60,000 cubic yards of soil would be excavated from Pond 15. The majority of the soil would be beneficially used as fill and cover within Pond 15 to raise the ground to elevations suitable to support coastal salt marsh habitat and nesting areas. The excavated material would also be disposed of on-site as fill for dikes, levees, and upland habitat creation.

The Intertidal Preferred Alternative would require fewer truck trips or a shorter construction window for either the conveyor belt or pipeline haul methods, due to the decreased amount of soil that would need to be hauled to Pond 15 as compared to the Subtidal Alternative. This in turn results in less air quality and greenhouse gas emissions, less construction traffic, and generally less environmental impacts related to construction.

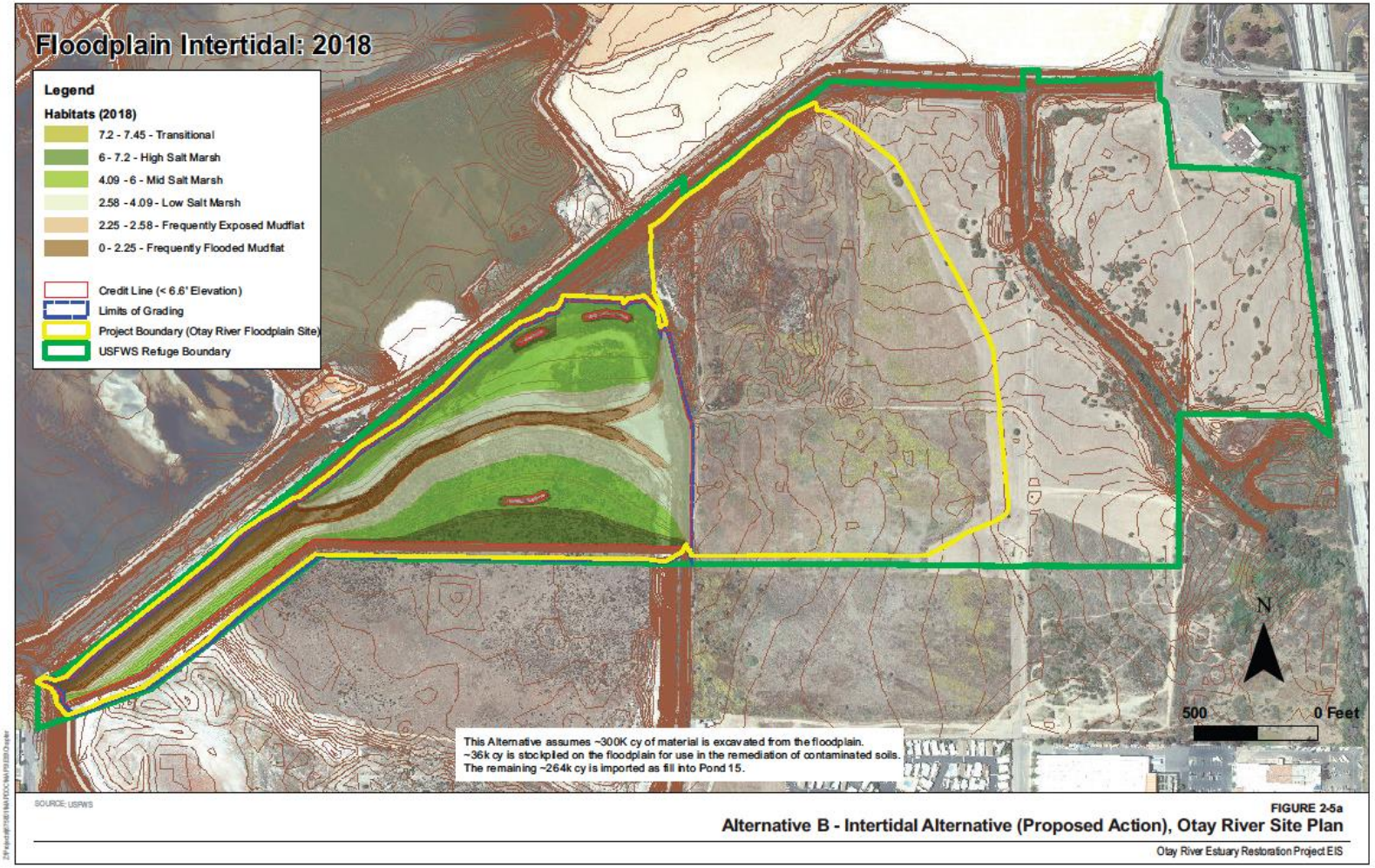


Figure 4: Grading plan for the Otay River Floodplain Tidal Basin under the Intertidal Alternative.



Figure 5: Pond 15 grading plan under the Intertidal Alternative.

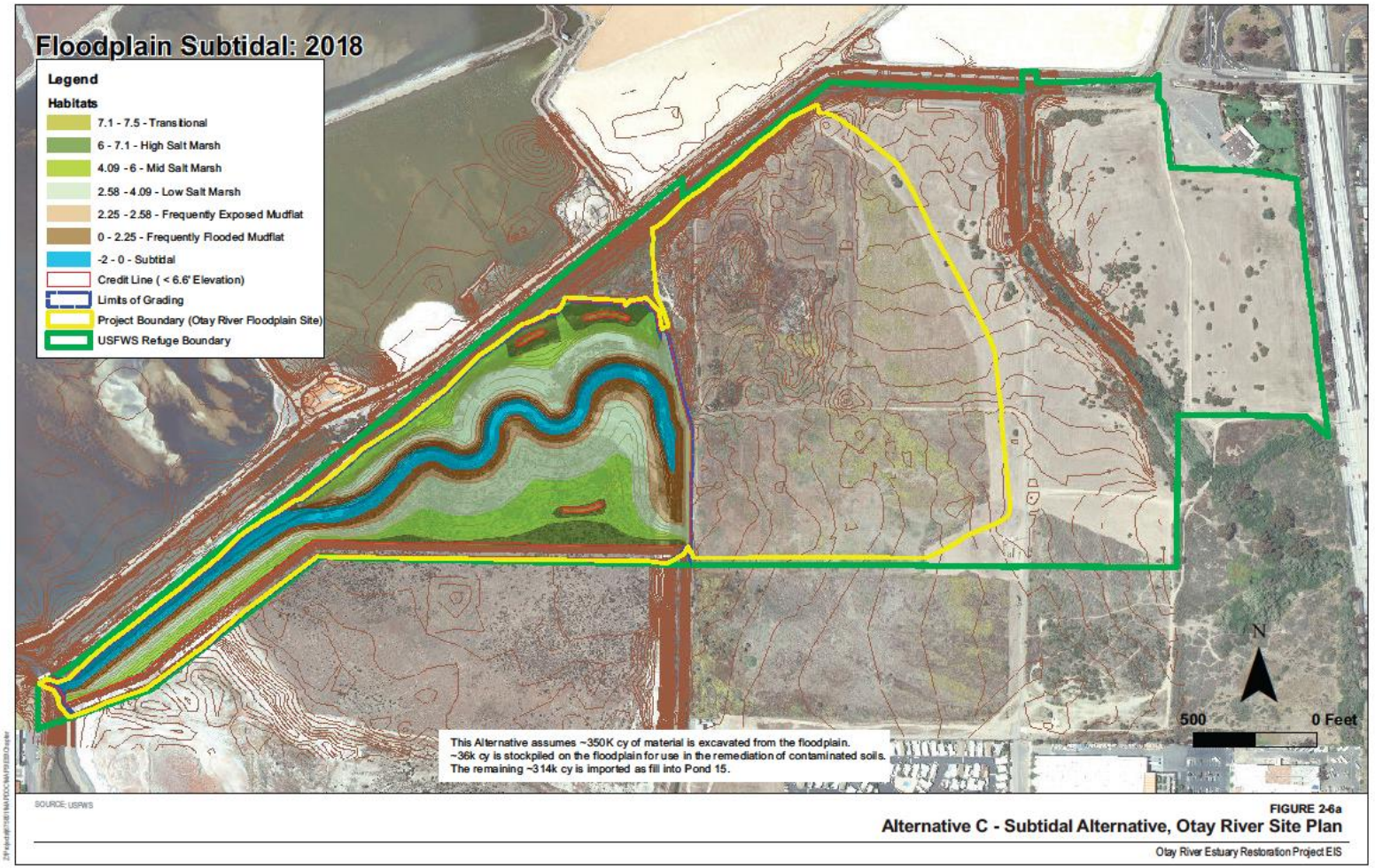


Figure 6: Grading plan for the Otay River Floodplain Tidal Basin under the Subtidal Alternative



Figure 7: Pond 15 grading plan under the Subtidal Alternative

The objective of this study is to perform hydrodynamic simulation of the tidal exchange that would occur in each of these restoration alternatives, and make quantitative evaluation of the acreages of each habitat type that would be created. The hydrodynamic simulations will also asses the velocities of tidal flows and the stability and potential maintenance requirements of the approximately 7,000 ft long river channel that connects the new tidal basin in the Otay River Floodplain with south San Diego Bay.

2.0) Technical Approach

This study employs a well-tested and peer-reviewed hydrodynamic model to evaluate the tidal hydraulics the Intertidal Alternative and the Subtidal Alternative based on updated bathymetry provided by Wetlands Research Associates (WRA) and latest updates to San Diego Bay tides for the 1983-2001 tidal epoch. The computer models used in this study are finite element types. The tidal hydraulics model is the research model, *TIDE_FEM*, [Inman & Jenkins, 1996] and the littoral transport model is TIDE_FEM/SEDXPORT**.** TIDE_FEM was built from some well-studied and proven computational methods and numerical architecture that have been successful in predicting shallow water tidal propagation in Massachusetts Bay [Connor & Wang, 1974] and estuaries in Rhode Island, [Wang, 1975], and have been reviewed in basic text books [Weiyan, 1992] and symposia on the subject, e.g., Gallagher (1981). A discussion of the physics of TIDE_FEM is given in Jenkins and Wasyl (2003 & 2005).

In its most recent version, the TIDE_FEM/TIDE_FEM/SEDXPORT modeling system has been integrated into the Navy's Coastal Water Clarity Model and the Littoral Remote Sensing Simulator (LRSS) (see Hammond, et al., 1995). The TIDE_FEM/SEDXPORT code has been validated in mid-to-inner shelf waters (see Hammond, et al., 1995; Schoonmaker, et al., 1994). A detailed description of the architecture and codes of the TIDE_FEM/SEDXPORT is given in Jenkins and Wasyl (2005) that is available on-line at the University of California digital library at: http://repositories.cdlib.org/sio/techreport/58/.

Validation of the TIDE_FEM/SEDXPORT code was shown by three independent methods: 1) direct measurement of suspended particle transport and particle size distributions by means of a laser particle sizer; 2) measurements of water column optical properties; and, 3) comparison of computed stratified plume dispersion patterns with LANDSAT imagery. Besides being validated in coastal waters of Southern California, the TIDE_FEM/SEDXPORT modeling system has been extensively peer reviewed. Although some of the early peer review was confidential and occurred inside the Office of Naval Research and the Naval Research Laboratory, the following is a listing of 5 independent peer review episodes of TIDE_FEM/SEDXPORT that were conducted by 9 independent experts and can be found in the public records of the State Water Resources Control Board, the California Coastal Commission and the City of Huntington Beach.

1997- Reviewing Agency: State Water Resources Control Board
Project: NPDES 316 a/b Permit renewal, Scripps Beach, Carlsbad, CA
Reviewer: Dr. Andrew Lissner, SAIC, La Jolla, CA

1998- Reviewing Agency: California Coastal Commission
Project: Coastal Development Permit, San Dieguito Lagoon Restoration
Reviewers: Prof. Ashish Mehta, University of Florida, Gainesville;
Prof. Paul Komar, Oregon State University, Corvallis;
Prof. Peter Goodwin, University of Idaho, Moscow

2000- Reviewing Agency: California Coastal Commission
Project: Coastal Development Permit, Crystal Cove Development
Reviewers: Prof. Robert Wiegel, University of California, Berkeley;
Dr.Ron Noble, Noble Engineers, Irvine, CA

2002- Reviewing Agency: California Coastal Commission
Project: Coastal Development Permit, Dana Point Headland Reserve
Reviewers: Prof. Robert Wiegel, University of California, Berkeley;
Dr. Richard Seymour, University of California, San Diego

2003- Reviewing Agency: City of Huntington Beach
Project: EIR Certification, Poseidon Desalination Project
Reviewer: Prof. Stanley Grant, University of California, Irvine

The model, analysis methods, and supporting data bases used herein are the same as those utilized in the Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the San Dieguito Wetland Restoration Project, (EIR/EIS, 2000), and for the preparation of the San Dieguito Wetlands Restoration Project, Final Restoration Plan, (SCE, 2005). Monitoring data for the newly completed San Dieguito Lagoon Restoration Project was also used to calibrate tidal hydraulics model. San Dieguito Lagoon was selected as a proxy for the restoration alternatives because of morphologic similarities: in particular, both restoration sites have a long "goose-neck" feeder channel connecting source water to interior tidal basins of comparable acreage and distance from the source water. Habitat surveys conducted during the San Dieguito Lagoon Restoration Project by Josselyn & Whelchel (1999), and then later updated by vegetation surveys in the lower Otay River flood plain by Josselyn (2012), were used to develop functional relationships between habitat breaks and amounts of time for wetting and drying (hydroperiod functions). These relationships were used to transpose tidal hydraulics model output into calculations of acreage of various wetland habitat types created by the two restoration alternatives.

2.1 Tidal Hydraulics Model Physics: The tidal hydraulics are treated herein as a vertically well-mixed, two-dimensional, homogeneous flow because of a number of factors, including: the shallow depths in both the existing Otay River; the episodic and usually infrequent river flow events; and the enormous complexity of attempting to model a continuously stratified, brackish system. Salinity measurements from 1994-1997 by Boland (1998) suggest that this is not an unrealistic approximation. These salinity measurements indicate fairly uniform seawater salinities exist in the estuary most of the time, with relatively brief periods of fresh water dominance when high river flow rates prevent saline intrusion, e.g., the February 1995 flood series. Consequently, the lower Otay River is a tidally dominated system throughout most any given long-term period of record.

A finite element approach was adapted in preference to more common finite difference shallow water tidal models, e.g., Leendertse (1970), Abbott et al (1973), etc. Finite difference models employ rectangular grids which would be difficult to adapt to the complex geometry of the systems of channels of the Otay. It is believed that large errors would accumulate from attempting to approximate the irregular boundaries of the Otay system with orthogonal segments. On the other hand, finite element methods allow the computational problem to be contained within a domain bounded by a continuous contour surface, such as the S_f contours stored within the ***bathym*** file.

A finite element tidal hydraulics model, **TIDE_FEM**, [Inman and Jenkins, 1996] was employed to evaluate the tidal hydraulics of the existing conditions. **TIDE_FEM** was built from some well-studied and proven computational methods and numerical architecture that have done well in predicting shallow water tidal propagation in Massachusetts Bay [Connor and Wang, 1974] and estuaries in Rhode Island, [Wang, 1975], and have been reviewed in basic text books [Weiyan, 1992] and symposia on the subject, e.g., Gallagher (1981).

TIDE_FEM employs a variant of the vertically integrated equations for shallow water tidal propagation after Connor and Wang (1975). These are based upon the Boussinesq approximations with Chezy friction and Manning's roughness. The finite element discretization is based upon the commonly used ***Galerkin weighted residual method*** to specify integral functionals that are minimized in each finite element domain using a variational scheme, see Gallagher (1981). Time integration is based upon the simple ***trapezoidal rule*** [Gallagher, 1981]. The computational architecture of **TIDE_FEM** is adapted from Wang (1975), whereby a transformation from a **global** coordinate system to a **natural** coordinate system based on the unit triangle is used to reduce the weighted residuals to a set of order-one ordinary differential equations with constant coefficients. These coefficients (***influence coefficients***) are posed in terms of a ***shape function*** derived from the natural coordinates of each nodal point. The resulting systems of equations are assembled and coded as banded matrices and subsequently solved by ***Cholesky's method***, see Oden and Oliveira (1973 and Boas (1966).

We adapt the California coordinates as our **global** coordinate system (x, y) to which the nodes are referenced, with **x** (easting) and **y** (northing). The vertical coordinate **z** is fixed at 0.0 ft NGVD and is positive upward. The local depth relative to 0.0 ft NGVD is **h** and the mean surface elevation about 0.0 ft NGVD is **η**. The total depth of water at any node is **H = h + η**. The vertically averaged xy-components of velocity are $(\bar{u}, \bar{v})$. The continuity and momentum equations may be written from Connor and Wang, (1974), as:

$$\frac{\partial}{\partial t}\rho H + \frac{\partial}{\partial x}q_x + \frac{\partial}{\partial y}q_y = 0$$
$$\frac{\partial}{\partial t}q_x + \frac{\partial}{\partial x}\bar{u}q_x + \frac{\partial}{\partial y}\bar{u}q_y = B_x + \frac{\partial}{\partial x}\left(F_{xx} - F_p\right) + \frac{\partial}{\partial x}F_{yx} \qquad (1)$$
$$\frac{\partial}{\partial t}q_y + \frac{\partial}{\partial x}\bar{v}q_x + \frac{\partial}{\partial y}\bar{v}q_y = B_y + \frac{\partial}{\partial y}\left(F_{yy} - F_p\right) + \frac{\partial}{\partial x}F_{xy}$$

Here $\mathbf{q_x}$, $\mathbf{q_y}$ are mass flux components

$$q_x = \rho\int_{-h}^{\eta}\bar{u}dz \qquad (2)$$

$$q_y = \rho\int_{-h}^{\eta}\bar{v}dz \qquad (3)$$

and $\mathbf{q_I}$ is the mass flux through the ocean inlet due to water surface elevation changes in the estuary:

$$q_I = \rho\frac{\partial}{\partial t}\left(\frac{\partial s}{\partial \eta}\right) \qquad (4)$$

$\mathbf{F_p}$ is the pressure force resultant and $\mathbf{F_{xx}}$, $\mathbf{F_{xy}}$, $\mathbf{F_{yy}}$ are "equivalent" internal stress resultants due to turbulent and dispersive momentum fluxes

$$F_p = \int_{-h}^{\eta} p dz = \frac{\rho g H^2}{2}$$
$$F_{xx} = 2\varepsilon\frac{\partial}{\partial x}q_x$$
$$F_{yy} = 2\varepsilon\frac{\partial}{\partial y}q_y \qquad (5)$$
$$F_{yx} = F_{xy} = \varepsilon\left(\frac{\partial}{\partial y}q_y + \frac{\partial}{\partial x}q_x\right)$$

and ε is the eddy viscosity. $\mathbf{B_x}$ and $\mathbf{B_y}$ are the bottom stress components

$$B_x = \tau_x + \rho g H \frac{\partial h}{\partial x}$$
$$B_y = \tau_y + \rho g H \frac{\partial h}{\partial y} \qquad (6)$$

In Equation (6), $\boldsymbol{\tau_x}$ and $\boldsymbol{\tau_y}$ are the bottom shear stress components that are quasi-linearized by Chezy-based friction using Manning's roughness factor, $\mathbf{n_0}$:

$$\tau_x = -\frac{g}{\rho H^2 C_z^{\,2}} q_x \left(q_x^{\,2} + q_y^{\,2}\right)^{1/2}$$
$$\tau_y = -\frac{g}{\rho H^2 C_z^{\,2}} q_y \left(q_x^{\,2} + q_y^{\,2}\right)^{1/2} \qquad (7)$$

where $\mathbf{C_z}$ is the Chezy coefficient calculated as:

$$C_z = \frac{1.49}{n_0} H^{1/6} \qquad (8)$$

Boundary conditions are imposed at the locus of possible land/water boundaries, $\mathbf{S_f}$ in the ***bathym*** file and at the ocean inlet, $\mathbf{S_0}$. Flux quantities normal to these contours are denoted with "n" subscripts and tangential fluxes are given "s" subscripts. At any point along a boundary contour, the normal and tangential mass fluxes are:

$$q_n = \int_{-h}^{\eta} \rho u_n dz = \alpha_{nx} q_x + \alpha_{ny} q_y$$
$$q_s = \int_{-h}^{\eta} \rho u_s dz = -\alpha_{nx} q_x + \alpha_{ny} q_y \qquad (9)$$
$$\alpha_{nx} = \cos(n, x)$$
$$\alpha_{ny} = \cos(n, y)$$

Components of momentum fluxes across a boundary are equivalent to internal force resultants according to:

$$F_{nx} = \alpha_{nx}(F_{xx} - F_p) + \alpha_{ny} F_{yx}$$
$$F_{ny} = \alpha_{ny}(F_{yy} - F_p) + \alpha_{nx} F_{xy} \qquad (10)$$

On land boundary contours, the flux components are prescribed

$$q_n = q_s = 0 \qquad \text{on land} \qquad (11)$$

On the ocean boundary, the normal boundary forces (due to sea surface elevation) are continuous with ocean values, and the mass exchange is limited by the storage capacity of the estuary.

Hence

$$F_{nm} = \bar{F}_{nm} \quad \text{and} \quad q_{nm} = q_I \qquad \text{at inlet} \tag{12}$$

In the problem at hand $\bar{F}_{nn}$ is prescribed at the inlet by the ocean tidal elevation, η_0 , and the inlet sill depth, $\mathbf{h_o}$ according to

$$\bar{F}_{nm} = \frac{\rho g}{2}\left(\eta_0 + h_0\right)^2 \qquad \text{on } S_0 \tag{13}$$

Ocean ***tidal forcing functions*** η_0 were developed in Section 3. The ocean boundary condition as specified by Equation (12) places a dynamic boundary condition on the momentum equations and a kinematic boundary condition on the continuity equation that is constrained by the storage rating curve. Solutions are possible by specifying only the dynamic boundary condition, but then mass exchanges are controlled by the wetting and drying of individual grid cells with associated discretization and interpolation errors which threaten mass conservation. The technique of over specifying the ocean boundary condition with both a dynamic and kinematic condition is discussed in the book by Weiyan (1992).

The governing equations and the boundary conditions are cast as a set of integral functionals in a variational scheme, [Boas, 1966]. Within the domain of each element of the mesh, $\mathbf{A_i}$ the unknown solution to the governing equations is simulated by a set of ***trial functions*** $(\hat{H}, \hat{q})$ having adjustable coefficients. The trial functions are substituted into the governing equations to form ***residuals,*** $\mathbf{(R_H, R_q)}$. The residuals are modified by ***weighting functions,*** $\mathbf{(\Delta H, \Delta q)}$. The coefficients of the trial functions are adjusted until the weighted residuals vanish. The solution condition on the weighted residuals then becomes:

$$\iint_{A_i} R_H \Delta H dA = 0$$

$$\iint_{A_i} R_q \Delta q dA = 0$$

By the Galerkin method of weighted residuals, [Finlaysen, 1972], the weighting functions are set equal to nodal ***shape functions***, **<N>**, or:

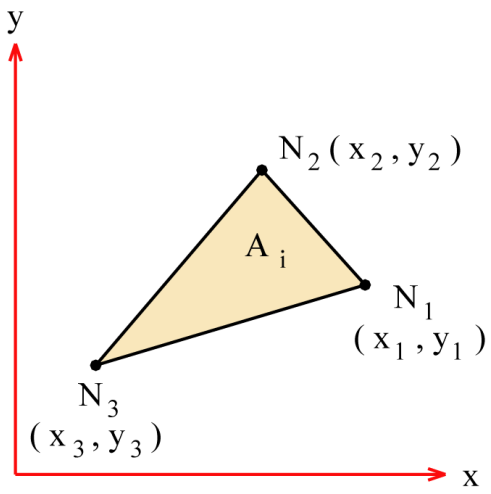
$$\Delta H \sim N_i$$

$$\Delta q \sim N_j$$

The shape function, <N>, is a polynomial of degree which must be at least equivalent to the order of the highest derivative in the governing equations. The shape function also provides the mechanism to discretized the governing equations. The shape function polynomial is specified in terms of ***global (California)*** coordinates (Figure 8a) for the first nodal point, $\mathbf{N_1}$ of a generalized

Specifying the Shape Function <N> for any 3-Node Triangular Element

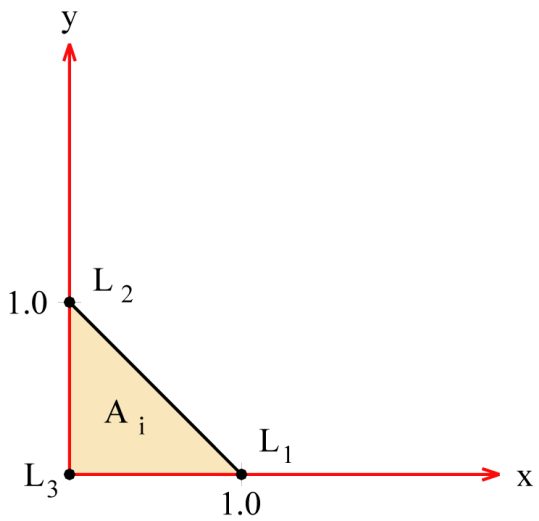
a) Global (California) Coordinates



Coordinate Transform

$N_i = L_i$

b) Natural Coordinates



$$\langle N \rangle = (N_1, N_2, N_3)$$

$$N_1 = [(x_2 y_3 - x_3 y_2) + (y_2 - y_3) x + (x_3 - y_2) y] / 2 A_i$$

$$2 A_i = (x_1 - x_3) (y_2 - y_3) - (x_2 - x_3) (y_1 - y_3)$$

$$x = L_1 x_1 + L_2 x_2 + L_3 x_3$$

$$y = L_1 y_1 + L_2 y_2 + L_3 y_3$$

$$L_1 + L_2 + L_3 = 1.0$$

Figure 8: Shape function polynomial and transform to natural coordinates for a generalized 3-node triangular element; (a) 3-node element in California coordinates; (b) 3-node element in natural coordinates.

3-node triangular element of area $\mathbf{A_i}$,. Wang (1975) obtained significant numerical efficiency in computing the weighted residuals when the shape functions of each nodal point, $\mathbf{N_i}$, are transformed to a system of ***natural*** coordinates based upon the unit triangle, giving $\mathbf{N_i} \rightarrow \mathbf{L_i}$, see Figure 8b. The shape functions also permit semi-discretization of the governing equations when the trial functions are posed in the form:

$$\begin{aligned} \hat{H}(x,y,t) &= \sum_i H_i(t) N_i(x,y) \\ \hat{q}(x,y,t) &= \sum_j q_j(t) N_j(x,y) \end{aligned} \qquad (14)$$

Discretization using the weighting and trial functions expressed in terms of the nodal shape functions allows the ***distribution*** of dependent variables over each element to be obtained from the values of the independent variables at discrete nodal points. However, the shape function at any given nodal point, say $\mathbf{N_1}$, is a function of the independent variables of the two other nodal points which make up that particular 3-node triangular element. Consequently, the computations of the weighted residuals leads to a series of influence coefficient matrices defined

$$\begin{aligned} a_{ij} &= \frac{1}{A_i} \iint N_i N_j \, dA \\ s_{ij} &= \frac{1}{A_i} \iint N_i \frac{\partial N_j}{\partial x} dA \\ t_{ij} &= \frac{1}{A_i} \iint N_i \frac{\partial N_j}{\partial y} dA \\ g_{ijk} &= \frac{1}{A_i} \iint N_i N_j \frac{\partial N_k}{\partial x} dA \\ h_{ijk} &= \frac{1}{A_i} \iint N_i N_j \frac{\partial N_k}{\partial y} dA \end{aligned} \qquad (15)$$

The influence coefficient matrices given by equation (15) are evaluated in both global and natural coordinates. Once the influence coefficients have been calculated for each 3-node element, the weighted residuals reduce to a set of order-one ordinary differential with constant coefficients. The continuity equation becomes:

$$\sum\left(a_{ij}\frac{dH_i}{dt}\right)=-\sum_i\sum_k\left[g_{ijk}\left(H_i q_{xk}+H_k q_{xi}\right)+h_{ijk}\left(H_i q_{yk}+H_k q_{yi}\right)\right]$$

$$\sum\left(a_{ij}\frac{dq_{xj}}{dt}\right)=-\sum_j\sum_k\left[g_{ijk}\left(q_{xk}q_{xj}\right)+h_{ijk}\left(q_{yj}q_{xk}\right)\right]+N_i\sum_j N_j S_{fj}+g\sum_i s_{ij}H_i \qquad (16)$$

$$\sum\left(a_{ij}\frac{dq_{yj}}{dt}\right)=-\sum_j\sum_k\left[g_{ijk}\left(q_{xj}q_{yk}\right)+h_{ijk}\left(q_{yj}q_{xk}\right)\right]+N_i\sum_j N_j S_{fj}+g\sum_i t_{ij}H_i$$

Equations (16) are essentially simple oscillator equations forced by the collection of algebraic terms appearing on the right hand side; and are therefore easily integrated over time. The time integration scheme used over each time step of the tidal forcing function is based upon the ***trapezoidal rule***, see Gallagher 1981) or Conte and deBoor (1972). This scheme was chosen because it is known to be unconditionally stable, and in tidal propagation problems has not been known to introduce spurious phase differences or damping. It replaces time derivatives between two successive times, $\Delta t = t_{n+1} - t_n$, with a truncated Taylor series. For the water depth it would take on the form:

$$\frac{dH}{dt}=\eta(t)$$

$$H_{n+1}-H_n=\frac{\Delta t}{2}\left(\eta_{n+1}+\eta_n\right)+E\Delta t \qquad (17)$$

$$E=\frac{1}{12}\left(\Delta t\right)^2\left|\frac{d^2\eta}{dt^2}\right|$$

To solve equation (17), iteration is required involving successive forward and backward substitutions.

The influence and friction slope coefficient matrices together with the trapezoidal rule reduce equations to a system of algebraic equations [Grotkop, 1973] which are solved by Cholesky's method per a numerical coding scheme by Wang (1975). For more details, refer to the TIDE_FEM code in Appendix-I of Jenkins and Wasyl (1996), and Gallagher (1981) or Oden and Oliveira (1973).

3.0) Model Initialization

Tidal basin water levels and tidal currents are studied using numerical transport models that are run over a historic surrogate time period for which environmental forcing is well-known. In all such *boundary value problems* input variables are divided between two general classes, forcing functions and boundary conditions. The primary forcing function is San Diego Bay water level variation. The important boundary conditions are basin and feeder channel bathymetry, sediment grain size, and river channel scour configurations. Input for San Diego Bay water level

variations are discussed below in Sections 3.1 and 3.2. The remaining variables are site specific and will be dealt with separately for the Intertidal Alternative in Section 4, and the Subtidal Alternative in Section 5.

3.1) San Diego Bay Circulation: Currents in San Diego Bay are predominately produced by tides (Wang et al. 1998). This tidal exchange between the ocean and the bay is a result of a phenomenon called "tidal pumping" (Chadwick, et al.. 1997). The "pumping" of water is due to the flow difference between the ebb and the flood flows. Being located at mid-latitude, tides and currents within the San Diego Bay are dominated by a mixed diurnal-semidiurnal component (Peeling 1975). Typical tidal current speeds range between 0.3-0.5 m/s near the inlet and 0.1 m/s to 0.2 m/s in the southern region of the bay. The phase propagation suggests that the tides behave almost as standing waves with typical lags between the mouth and the back portion of the bay of 10 min and an increase in tidal amplitude in the inner bay compared to the outer bay. The overall tidal prism for the bay is 5.5×10^7 m^3 and the tidal excursion is larger than the mouth with a value of 4.4 km (Chadwick and Largier 1999b). Chu, et al. (2012) measured mass exchange between San Diego Bay and the Pacific Ocean using a combination of flow measurements by acoustic Doppler current profiling and tracer measurements using a naturally occurring ultraviolet fluorescence tracer. They found that variations in exchange with tidal range could be isolated by separately evaluating the ebb and flood tidal transport budgets. The tracer transport during the ebb increased rapidly with tidal range, while during the flood tide, the transport increased more gradually. The resulting difference in tidal transport between the ebb and flood accounts for the exchange between the bay and ocean. For weak tides, the exchange tends to increase rapidly with increasing tidal range, while for stronger tides, the exchange is more constant.

3.2 San Diego Bay Tidal Regime: The flow of sea water into and out of the Otay River Channel, the South Bay salt ponds and the proposed restoration tidal basins are driven by the time variation in San Diego Bay water level. The nearest NOAA tide gage to the Otay River and South Bay salt ponds is located at the Navy Pier in San Diego Bay. This tide gage (NOAA #941-0170) was last leveled using the 1983-2001 tidal epoch. Elevations of tidal datums referred to NAVD 88 are given in the second column of Table 1.

Tidal data in Table 1 indicates that tidal ranges in San Diego Bay are greater than those found on the open coast. Mean diurnal tidal ranges are 5.72 ft as compared to 5.33 ft on the open coast, an increase of 0.39 ft of diurnal range in San Diego Bay. The extreme water level range is 11.23 ft in San Diego Bay as compared to 10.51 ft on the open coast, an increase of 0.72 ft of extreme range in the bay. All high water datum in the bay exceed those on the open coast and all the low water level datum are lower in the bay than on the open coast. This occurs because San Diego Bay is a resonant tidal system where higher harmonics of the K1 lunar-solar diurnal tidal constituent and the M2 principal lunar semi-diurnal tidal constituent are bathymetrical trapped in the bay, leading to a build-up in tidal amplitude. The tidal resonance of San Diego Bay provides additional tidal energy for forcing tidal inundation of the proposed tidal basins in the Otay River floodplain and in Salt Pond #15, and is an attribute of this site that increases the chance of achieving a sustainable functioning wetland restoration.

TABLE 1: Tidal datums for SAN DIEGO BAY at NOAA #941-0170 Navy Pier:

LENGTH OF DATA SERIES: 19 Years
TIME PERIOD: January 1983 - December 2001
TIDAL EPOCH: 1983-2001

HIGHEST WATER LEVEL (01/27/1983) = 7.71 ft NAVD (8.1402 ft MLLW)
MEAN HIGHER HIGH WATER MHHW = 5.292 ft NAVD (5.7253 ft MLLW)
MEAN HIGH WATER MHW = 4.5507 ft NAVD (4.9838 ft MLLW)
MEAN TIDE LEVEL MTL = 2.5264 ft NAVD (2.9595 ft MLLW)
MEAN SEA LEVEL MSL = 2.5067 ft NAVD (2.9398 ft MLLW)
MEAN LOW WATER MLW = 0.5020 ft NAVD (0.9351 ft MLLW)
North American Vertical Datum NAVD88 = 0.00 ft NAVD (0.4331 ft MLLW)
MEAN LOWER LOW WATER MLLW = -0.4331 ft NAVD (0.000 ft MLLW)
LOWEST WATER LEVEL (12/17/1937) = -3.5238 ft NAVD (-3.0907 MLLW ft)

In spite of the resonant tidal system in the deeper middle and outer portions of San Diego Bay, there is significant muting of the tidal range in the far southern portions of the Bay in the neighborhood of the mouth of the Otay River and the South Bay salt ponds. NOAA lists four other tide gages in San Diego Bay, including: Ballast Point, NOAA # 9410155; Sweetwater Channel, NOAA #9410136; North Island Navy Wharf, NOAA # 9410169; and US Coast Guard AirStation, NOAA #9410175. However no data is available (or exists) for any of these other four NOAA tide gages in The Bay. Tide information at other locations in The Bay are model predictions of the kind in the Wang et al, 1998 paper. However, the Southwest Wetland Interpretive Association (SWIA) has operated a self-recording water quality monitoring station since 2007 at the mouth of the Otay River at the location noted in yellow in Figure 1. This monitoring station (referred to as the Otay River Sonde) has recorded water level, salinity and dissolved oxygen at 15 minute intervals from December 2007 through December 2011. Figure 9 gives a comparison between the measured water levels at the NOAA #941-0170 Navy Pier tide gage versus the Otay River Sonde. Both monitoring stations give the same mean tidal level, but maximum water levels are slightly higher at the Otay River Sonde, and minimum water levels are significantly higher, indicating *low-tide muting* of the tides in the extreme South Bay. Lowest water levels recorded at the Otay River Sonde are -1.6108 ft. NAVD as compared with -3.5238 ft NAVD at the Navy Pier. This response is believed to be the result of bottom friction effects and additional resonances associated with the K1 and M2 barotropic tidal constituents flowing over the shallows of the *South Bay Shelf*. This hypothesis is supported by a spectral decomposition (distribution of tidal energy with frequency) of the water level measurements shown in Figure 10a. The principal spectral peaks show an enhanced second harmonic of the K1 lunar-solar diurnal tidal constituent at the mouth of the Otay River, indicating the effect of bottom friction over the shallow South Bay Shelf. There is also an enlarged resonant triad sub-harmonic (difference frequency) between the K1 lunar-solar diurnal tidal constituent and the M2 principal lunar semi-diurnal tidal constituent measured at the mouth of the Otay River, indicating

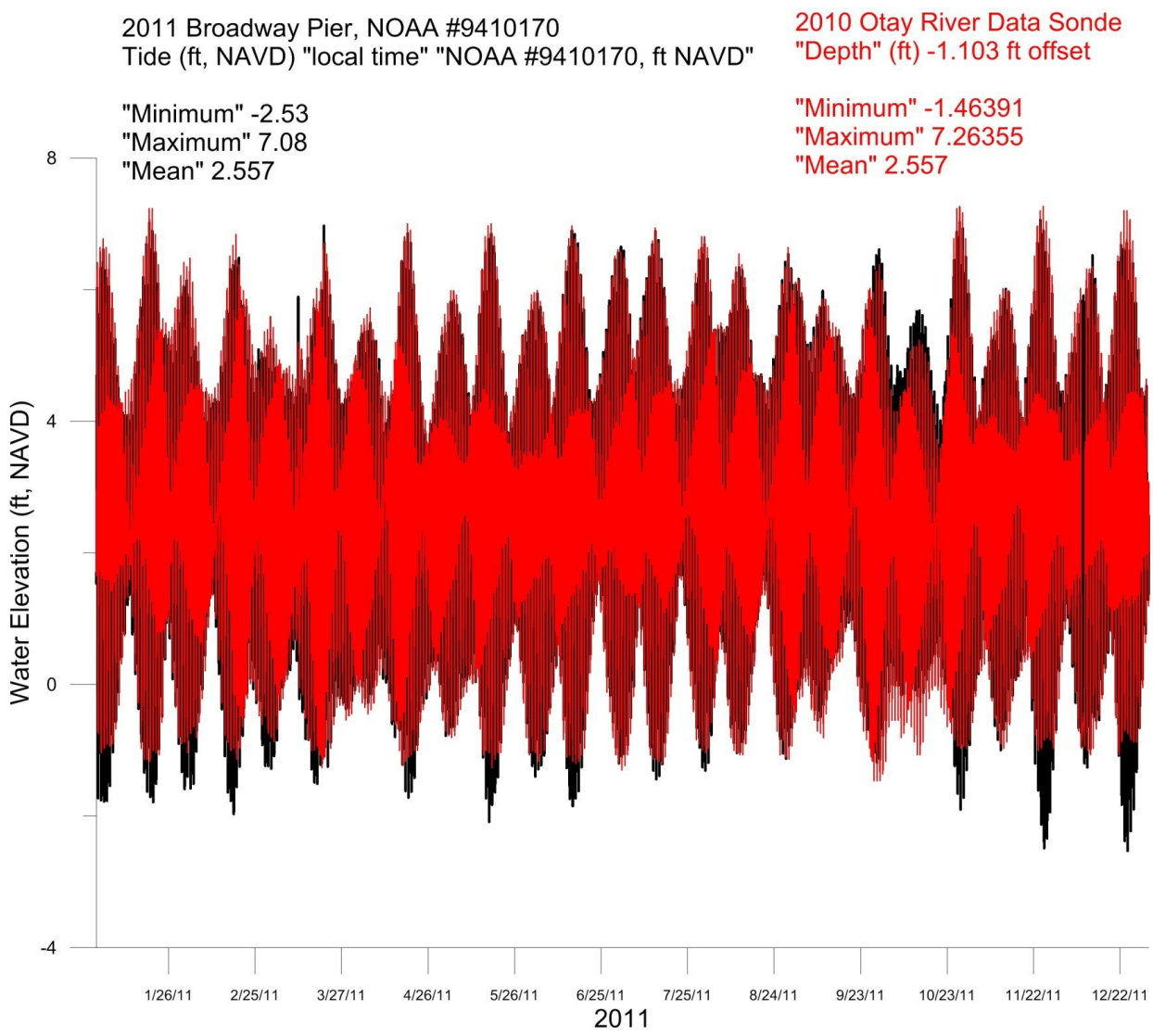


Figure 9: Comparison of mid-bay tides at the Navy Pier (black) versus south-bay tides at the mouth of the Otay River (red).

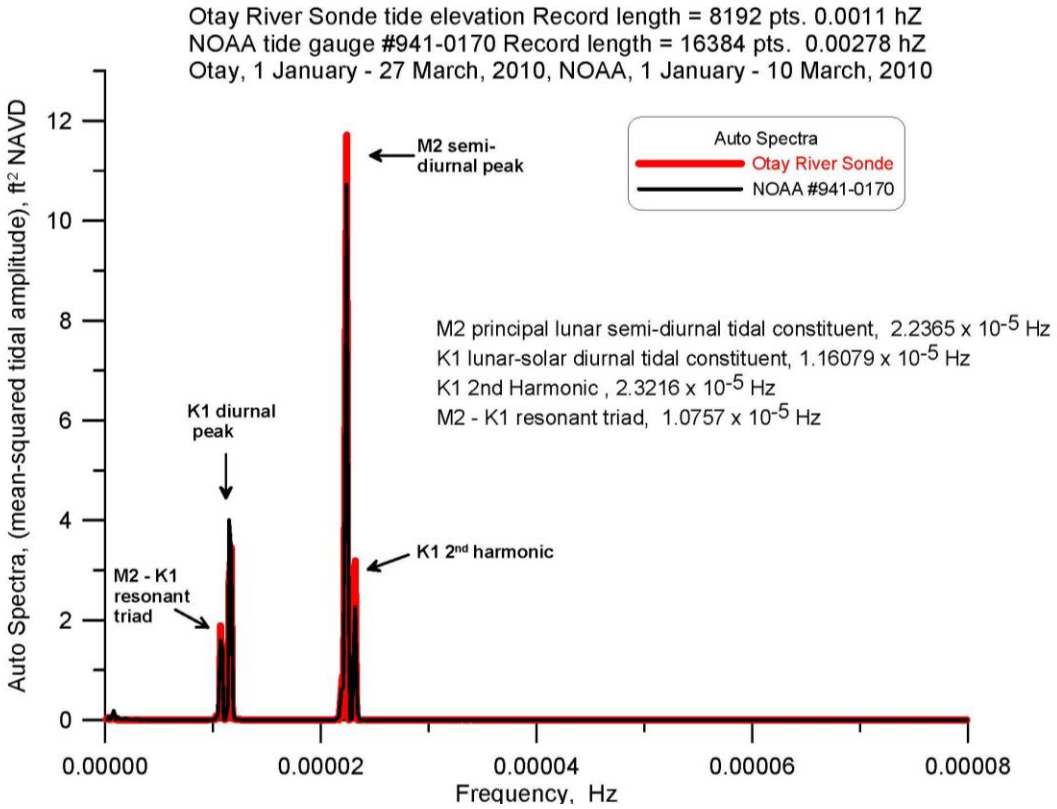


Figure 10a: Auto spectra (mean-squared tidal amplitude) of the Otay River Sonde measurements (red), versus the NOAA Navy Pier tidal record (black).

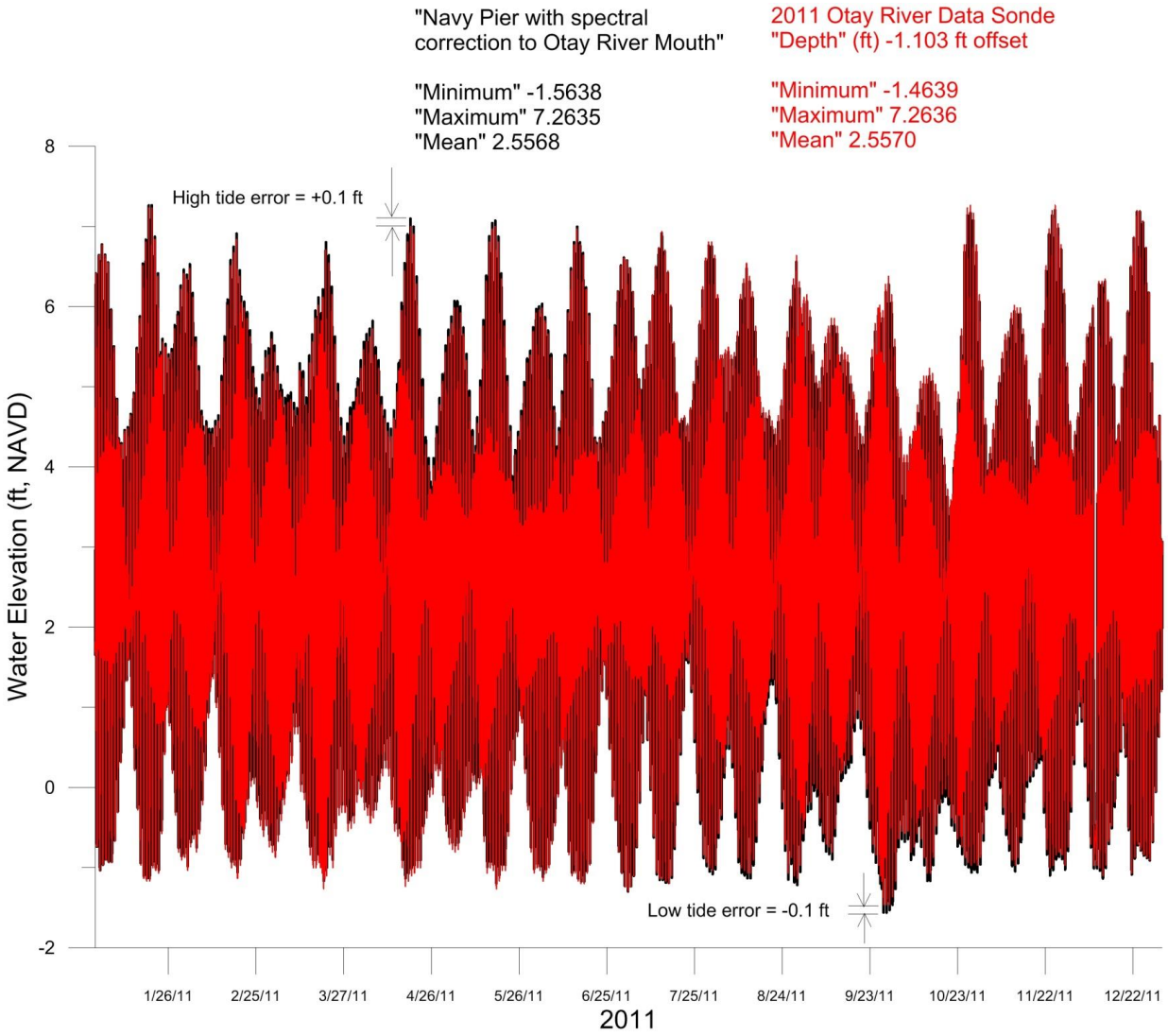


Figure 10b: Comparison of spectrally corrected Navy Pier tides (black) versus south-bay tides at the mouth of the Otay River (red). The spectral correction is made to transform Navy Pier tides to equivalent tides at the mouth of the Otay River. Transform error is +/- 0.1 ft.

bathymetrically trapped tidal oscillations on the South Bay Shelf.

The importance of the tidal spectra in Figure 10a is that it permits the very long term tidal records at the Navy Pier to be converted into long term records of the tides at the mouth of the Otay River. The published NOAA tidal constituents for the Navy Pier are modified to conform to the spectral harmonics for the Otay River tides in Figure 10a, and then re-assembled in the time domain as shown Figure 10b. This process gives a long term tidal records (30 year in length) of the South Bay tides at the mouth of the Otay River to within an error of +/- 0.1 ft. The analytic requirement for these long term South Bay tides is to have tidal forcing for the hydrodynamic models that captures the extremes of tidal inundation over many years. These extremes in tidal inundation are a determining factor in Natures adaptations to upper and lower limits of wetland habitat, while the frequency of long term tidal inundation at various intermediate elevations determines the zonation of wetland habitat types.

3.3) San Diego Bay Water Quality: The quality of the water that enters the Otay River mouth is another important aspect to the quality and distribution of wetland habitat that can recruit in the Otay River Floodplain. The Otay River Sonde (noted in yellow in Figure 1) has recorded salinity and dissolved oxygen at 15 minute intervals from December 2007 through April 2010. Figure 11 gives the temporal variation of the salinity in parts per thousand (ppt) recorded by the Otay River Sonde, while Figure 12 gives the dissolved oxygen in mg/L. The maximum salinity reached during the dry, evaporative summer months is 42.57 ppt, while the minimum salinity during wet winter periods reaches as low as 0.2 ppt, but the average salinity is 33.52 ppt, identical to the average salinity recorded on the open coast at Scripps Pier. These salinity ranges are comparable to what has been measured in the San Dieguito Lagoon on the open coast by Boland (1998), and are suitable for sustaining a healthy functioning salt water wetland. The dissolved oxygen readings (DO) in Figure 12 show a maximum DO reached during the wet, winter months of 17.5 mg/L, while the minimum DO occurs during summer and can reach 0.0 mg/L. However, the average DO is 6.47 mg/L, about the same as found in nearshore waters along the open coast as measured at Scripps Pier. DO readings at the Otay River Sonde are roughly equivalent to what Boland (1998) reported for San Dieguito Lagoon. Percent departures from the mean for salinity and DO are compared in Figure 13 indicating that DO maximums occur when Otay River flooding occurs and the salinity is depressed to minimum values, and conversely, DO minimums occur during warm evaporative months in summer when south San Diego Bay waters turn hyper saline. Regardless, variability in salinity and dissolved oxygen at the Otay River Sonde are within normal limits of a healthy functioning salt water wetland.

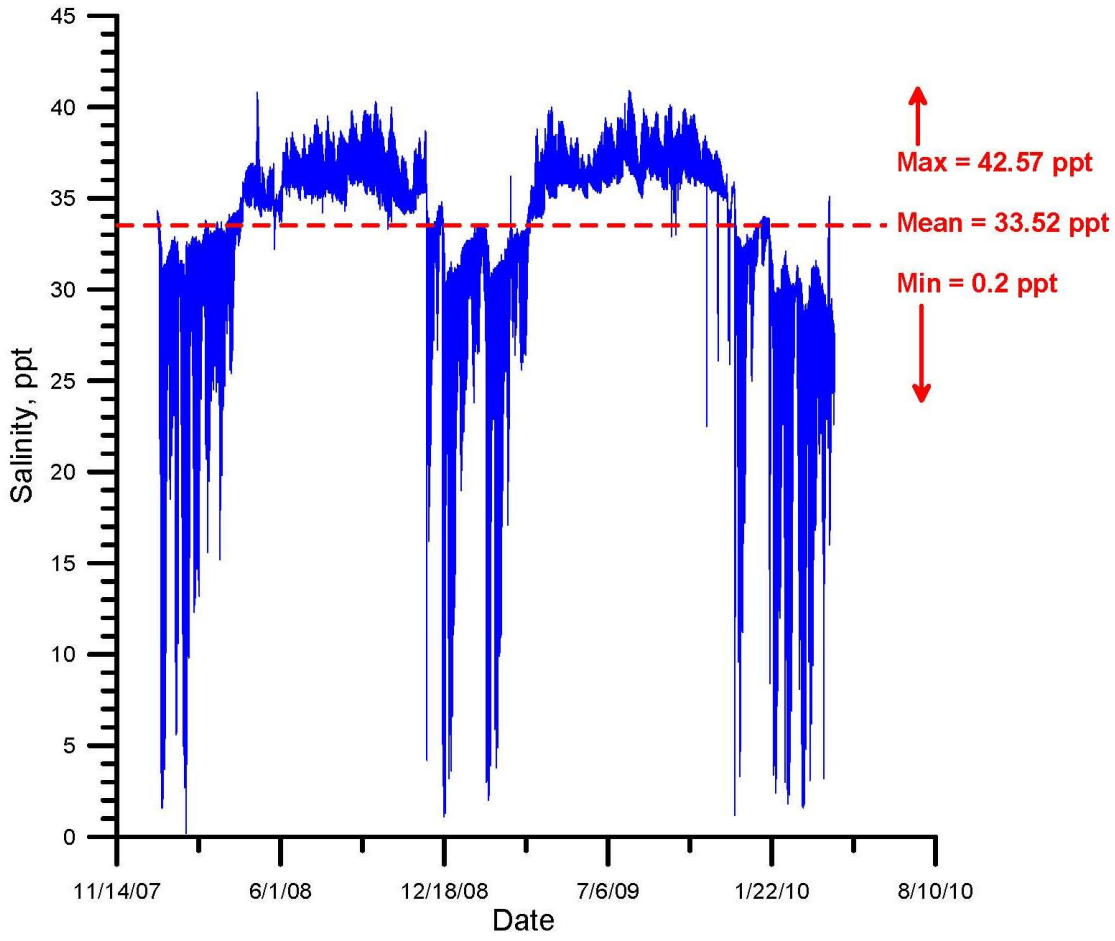


Figure 11: Salinity variation in south San Diego Bay at the Otay River mouth. Data from Otay River Sonde, 2007-2010.

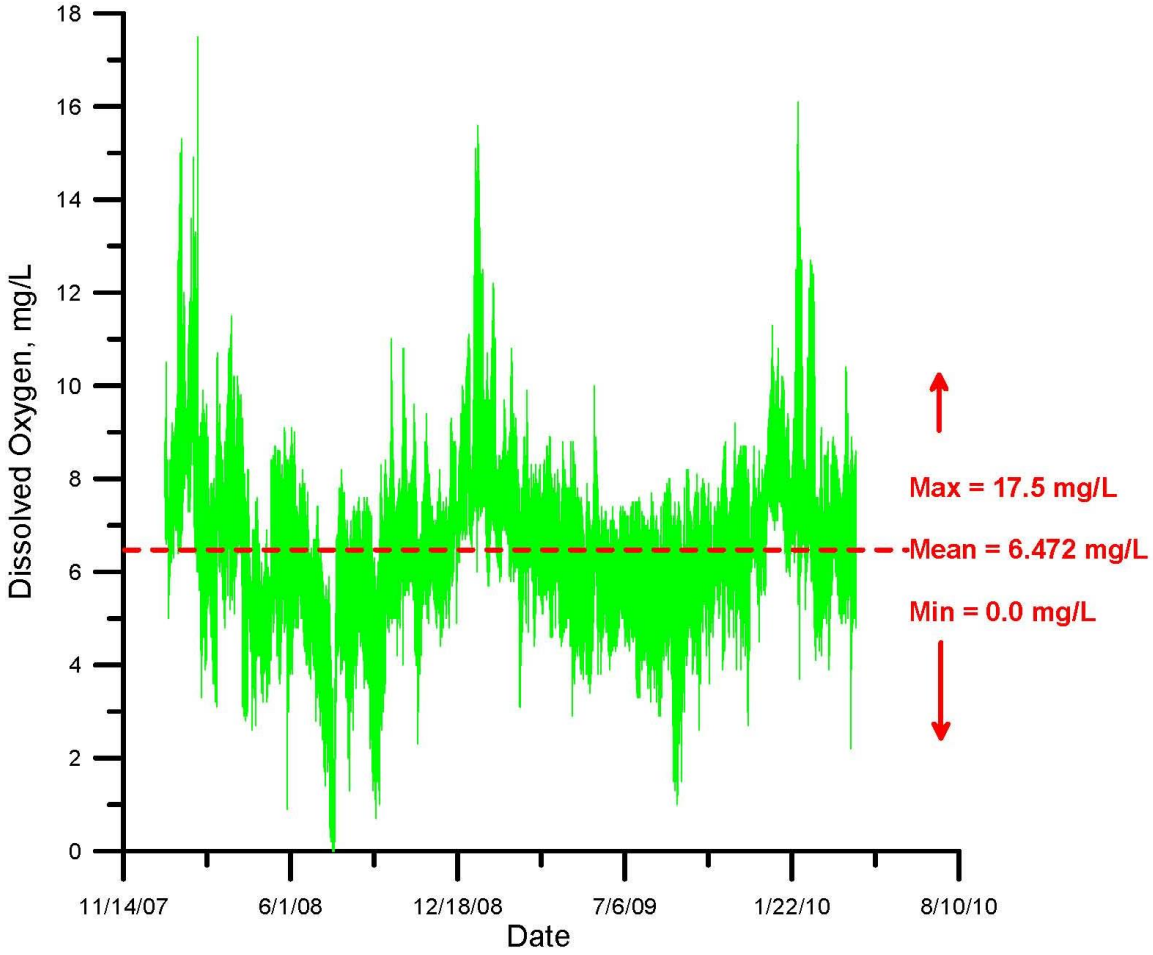


Figure 12: Dissolved Oxygen (DO) variation in south San Diego Bay at the Otay River mouth. Data from Otay River Sonde, 2007-2010.

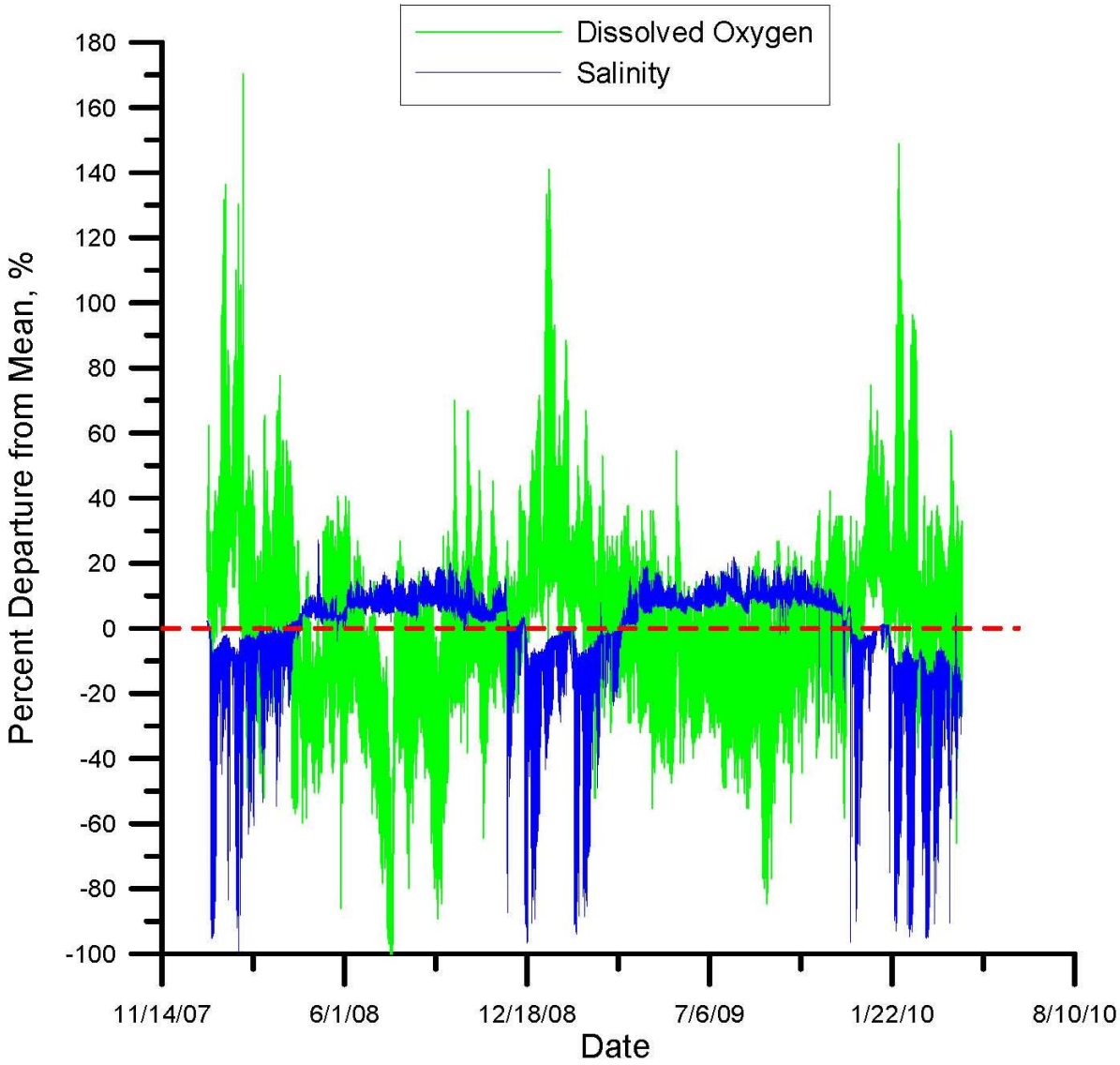


Figure 13: Variation in departure from the mean of salinity and dissolved oxygen at the Otay River mouth, from Otay Sonde data base, 2007-2010.

3.4 Sea Level Rise Effects on San Diego Bay Water Levels: Globally, oceans rose at an average rate of 0.7 inches (18 mm) per decade from 1961 to 2003.2 Local, or relative, sea level rise is affected by global sea level rise, as well as key additional factors such as El Nino events, circulation patterns, and land elevations changes. As shown in Figure 14, sea level rise has been documented in the San Diego Bay since 1906 with a rise of 0.8 inches (20.6mm) per decade over the past century.

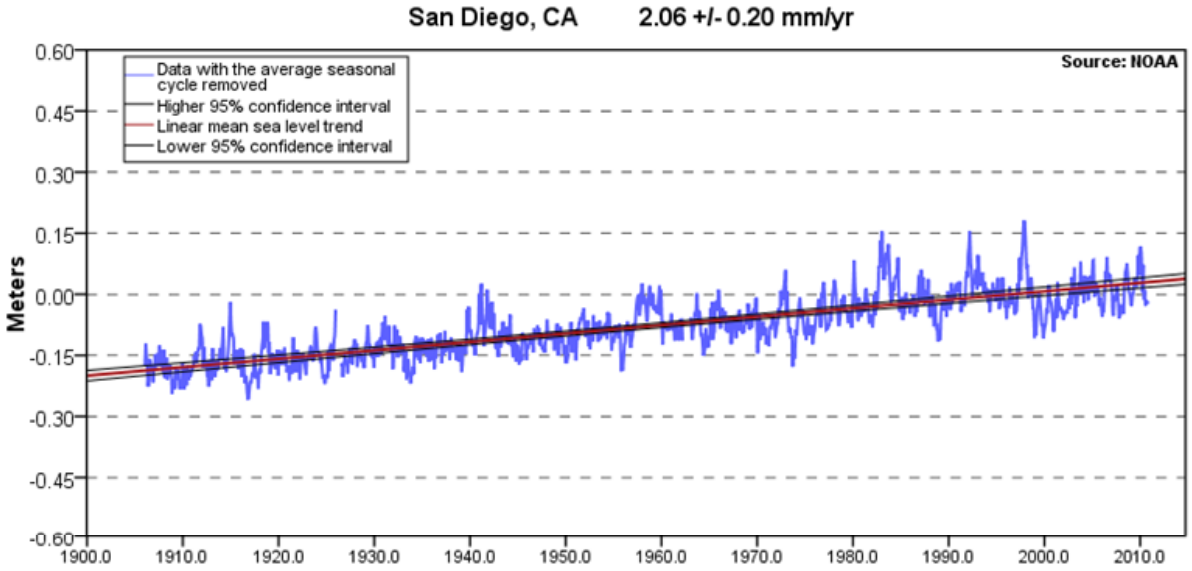


Figure 14: Observed sea level in San Diego Bay, 1900-2010, (from ICLEI, 2012)

Despite uncertainty, global climate experts have used greenhouse gas emissions scenarios and other methods to create a range of possible future sea level rise amounts. Figure 16 shows an estimated range of future global sea level rise trajectories from 7 different climate models. In California, the State is recommending the use of projections of between 4 and 24 inches (10.1 to 61 cm) in 2050 and of 31 to 69 inches (78 to 176 cm) in 2100. The restoration project will design for and evaluate sea level rise impacts based on State recommended projections for 2050. By the California State CAT-OPC guidance, sea level rise projections range between 4.68 and 24 inches (12 to 61 cm) by 2050. To calculate the tidal hydraulic responses of the restoration alternatives to these potential future sea levels, it is necessary to anticipate the tidal response inside San Diego Bay to these ranges of sea level rise on the open coastline. Two approaches are used. The first is linear superposition of the open ocean sea level rise on to the present 30 year time series of south San Diego Bay tides developed from spectral corrections to the NOAA Navy Pier tides detailed in Section 3.2. The second is to apply a spectral correction derived from the Navy's Bay tide model for sea level rise (ICLEI, 2012).

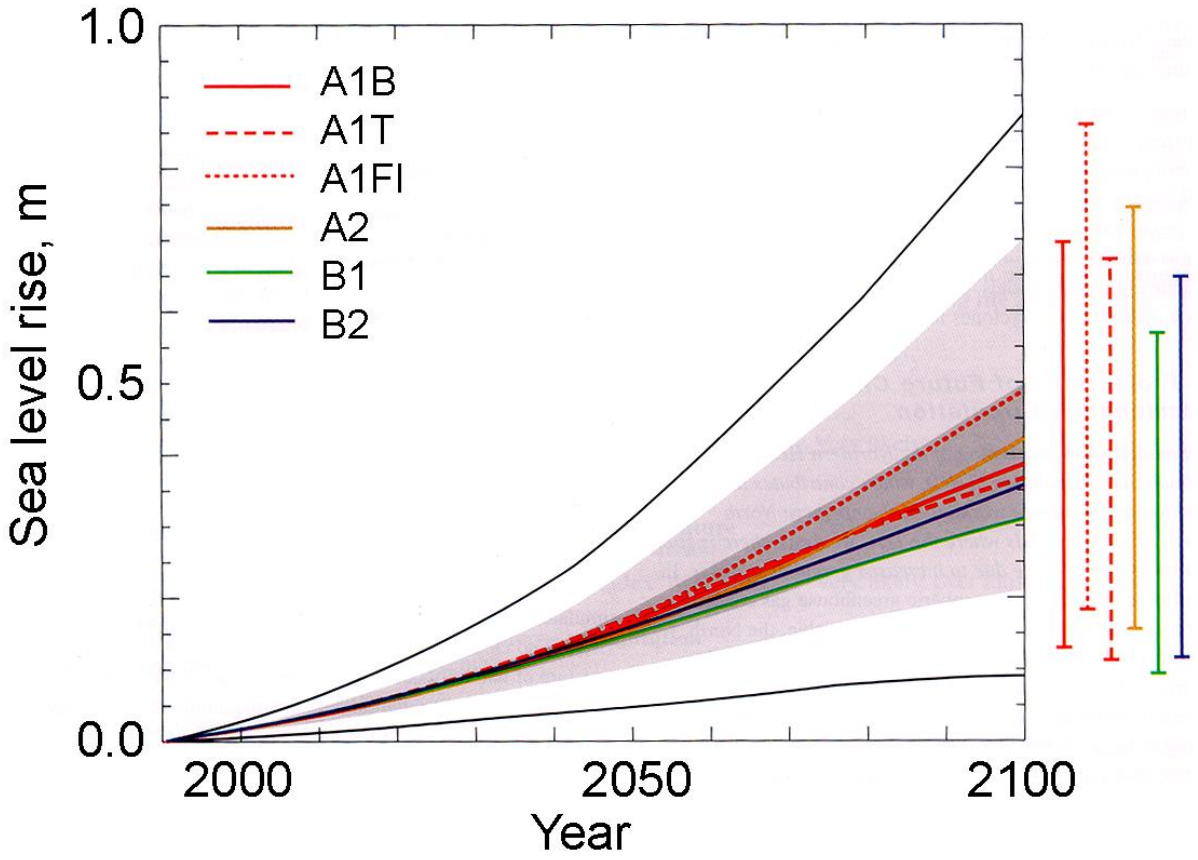


Figure 16: Range of sea level rise scenarios predicted out to year 2100 by seven separate global climate models (from IPCC, 2007)

Figure 17a shows a data snippet comparing tides at the mouth of the Otay River at present sea level (gray) versus the South Bay tidal response predicted for 2050 by the linear superposition method (red) and by the spectral correction method (blue). Obviously the higher-high and lower-low water levels will all be higher in 2050 based on the maximum CAT OPC guidance for sea level rise of 24 inches. The decisive issue is what the South Bay tidal range will be at these higher sea levels. The linear superposition method predicts the exact same tidal range as present, only oscillating around a 2 ft. higher sea level (Figure 17 a & b). The spectral correction method predicts the exact same higher high water levels as the linear superposition method, but yields a larger tidal range (Figure 17a & c). This is due to the fact that the 2050 tidal spectra derived from the Navy's Bay tide model predicts principle spectral peaks with a diminished second harmonic of the K1 lunar-solar diurnal tidal constituent at the mouth of the

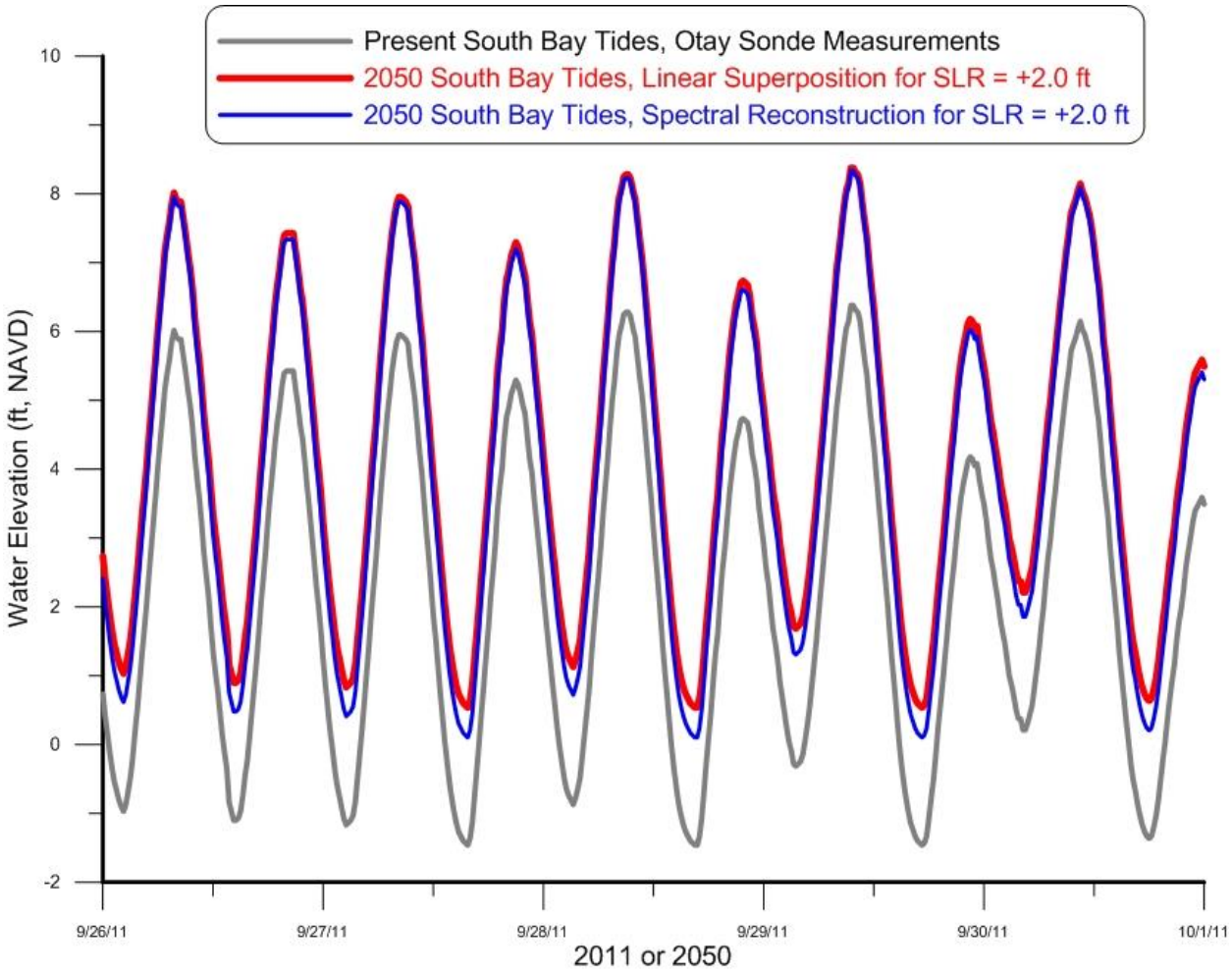


Figure 17a: Comparison of South San Diego Bay tides for present sea level (gray) versus South Bay tidal response on 2050 by the linear superposition method (red) and the spectral correction method (blue).

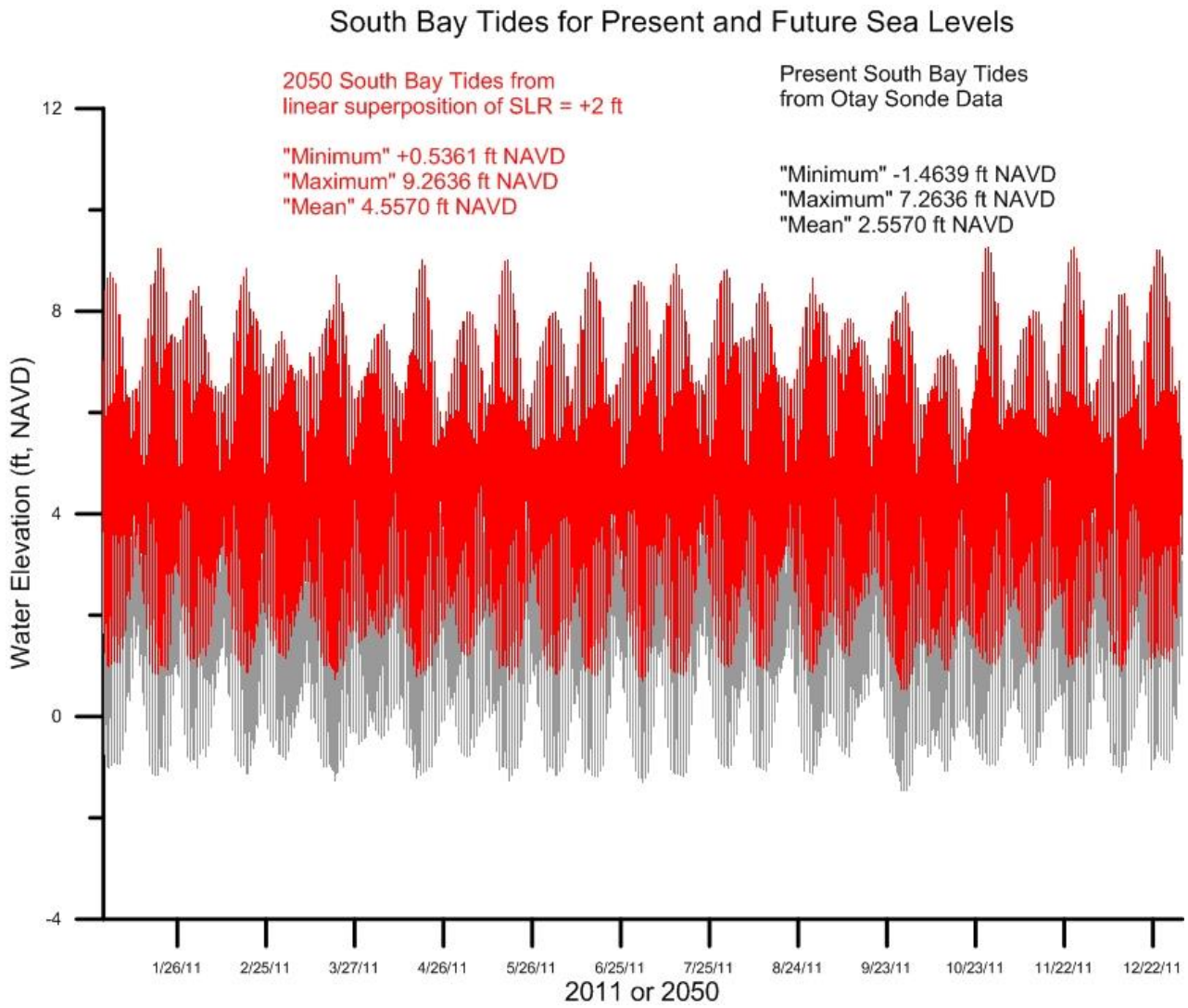


Figure 17b: Comparison of a typical year of South San Diego Bay tides for present sea level (gray) versus South Bay tidal response on 2050 by the linear superposition method (red).

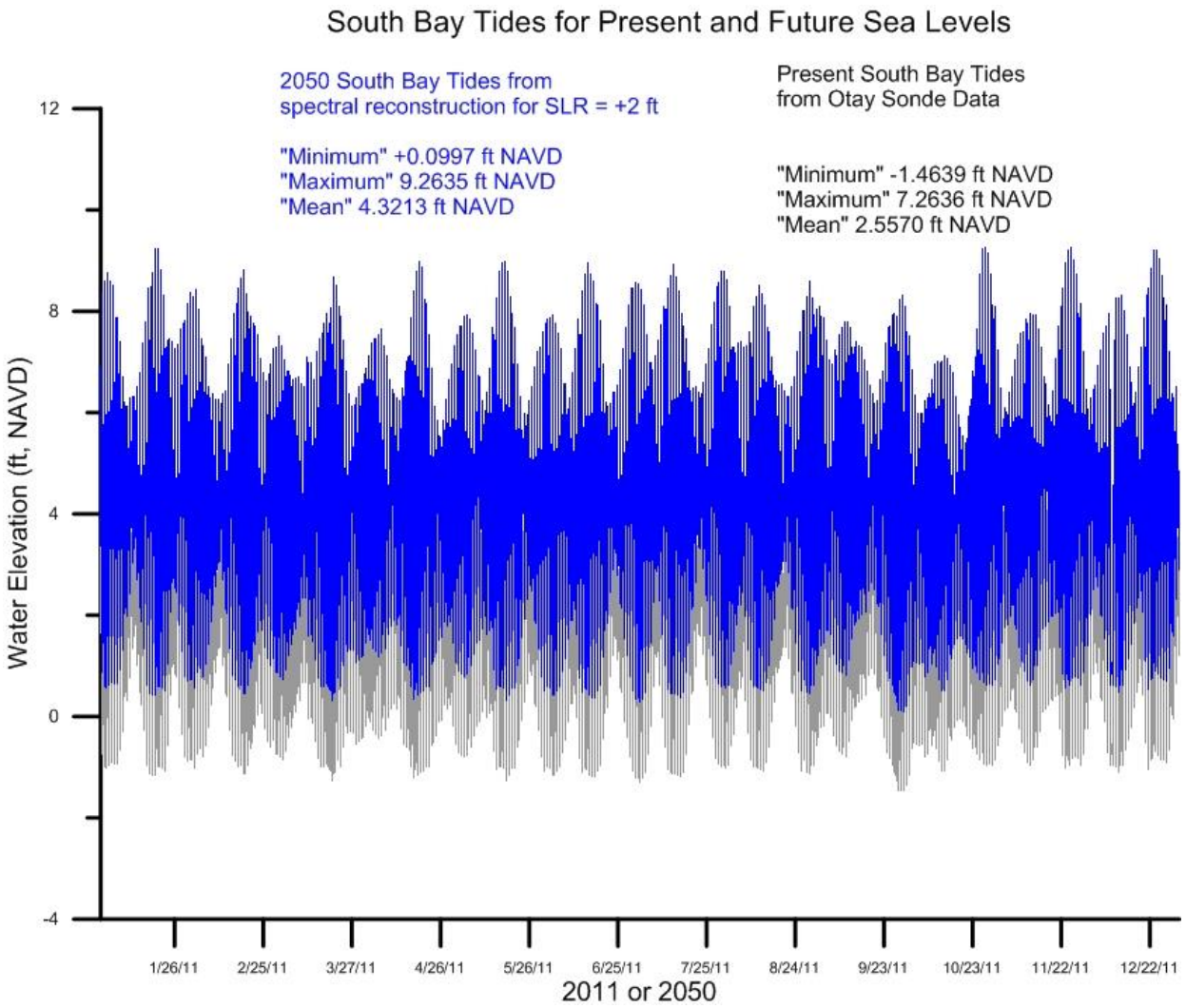


Figure 17c: Comparison of a typical year of South San Diego Bay tides for present sea level (gray) versus South Bay tidal response on 2050 by the spectral correction method (blue).

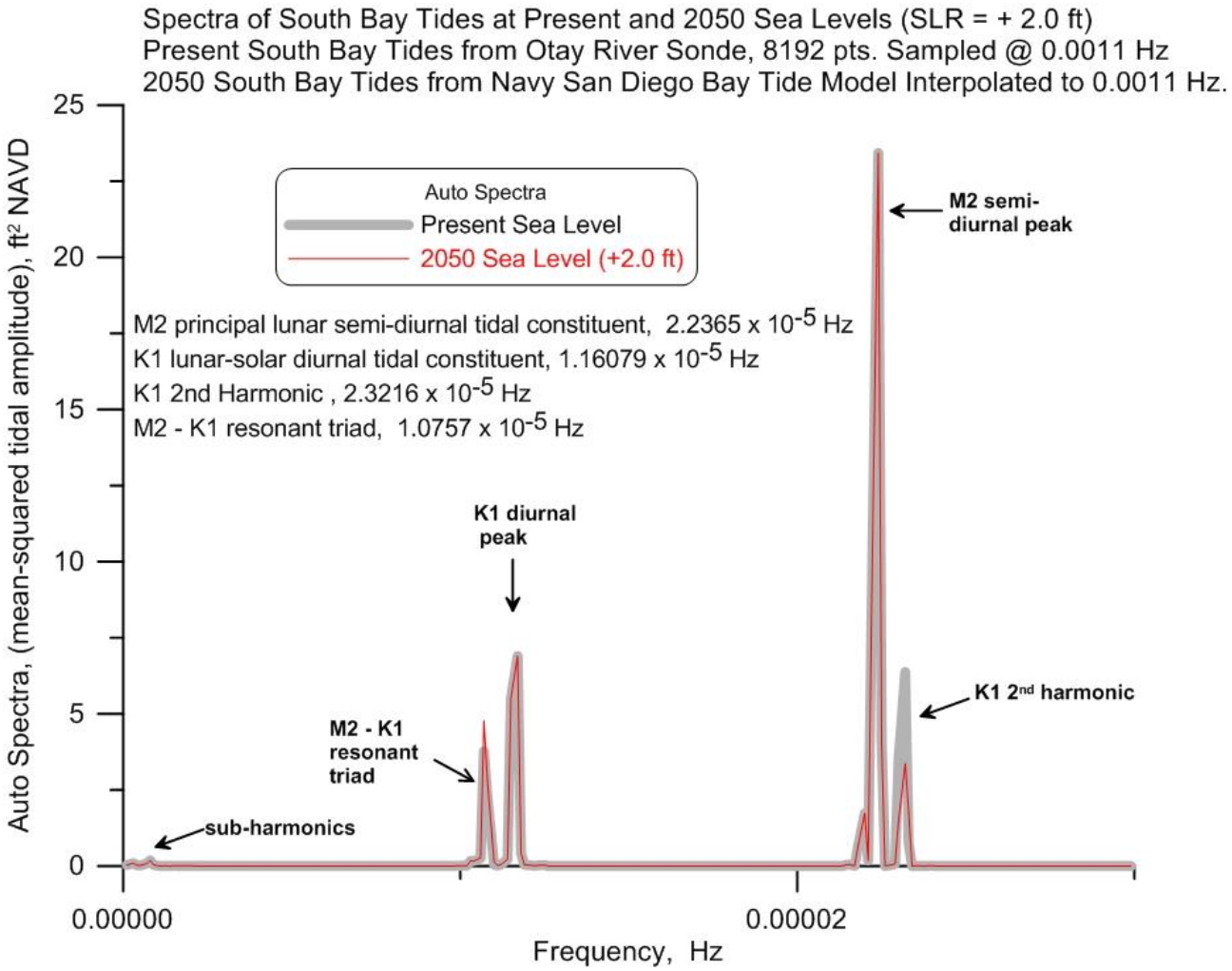


Figure 18: Comparison of spectra South San Diego Bay tides for present sea level (gray) versus South Bay tidal response for maximum estimated sea level rise in 2050 (red).

Otay River, (Figure 18), indicating diminished bottom friction over the South Bay Shelf due to feet of additional water depth at higher sea level. Also there is further enhancement of resonant triad sub-harmonic in Figure 18, (difference frequency) between the K1 lunar-solar diurnal tidal constituent and the M2 principal lunar semi-diurnal tidal constituent measured at the mouth of the Otay River, indicating bathymetrically trapped tidal oscillations on the South Bay Shelf has intensified in the presence of deeper water and diminished bottom friction.

Inundation refers to a condition when land that was once dry becomes permanently wet. Sea level rise could result in certain currently dry locations around the San Diego Bay being inundated by daily high tides. This potential future inundation in the Bay at 2050 is projected in Figure 19. Inspection of this figure reveals significant inundation impacts in South San Diego

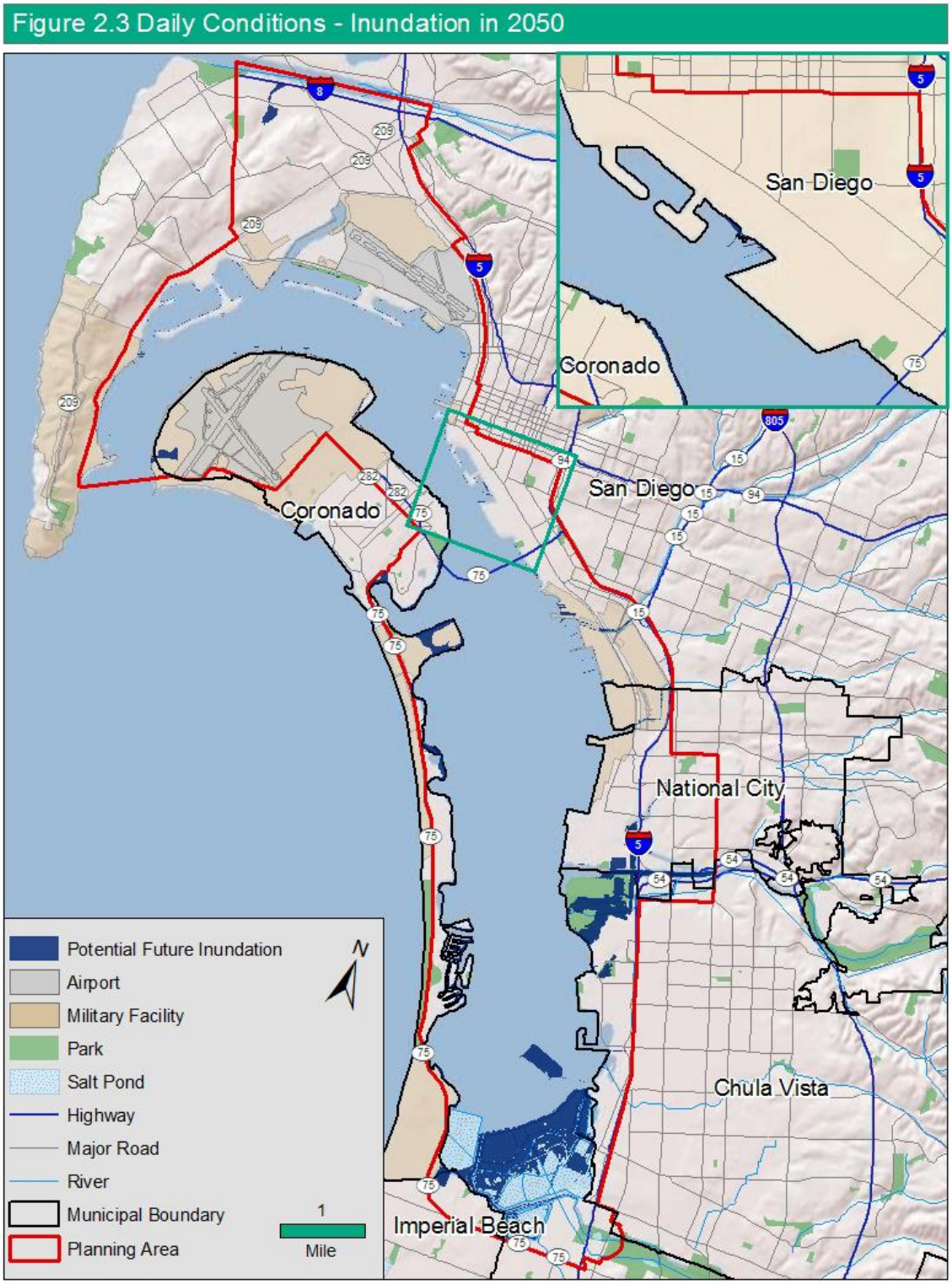


Figure 19: Projected Inundation impact areas in San Diego Bay due to 2050 sea level rise, (from ICLEI, 2012).

Bay by projected 2050 sea level rise. The Chula Vista Wildlife Reserve, and nearly all of the Pond #12 - #28 complex will be completely inundated, as well as most of Pond #10a. In addition to the clear threats inundation poses to the built environment, this impact is also predicted to impact natural systems or ecosystems in several key ways. Inundation is expected to cause the landward migration of intertidal and upland natural environments, such as marshes, tidal flats, and dunes. However, if there is nowhere for these features to migrate due to adjacent development, then inundation could result in the complete loss or fracturing of these systems. The loss of these intertidal habitats would be highly destructive to the many species that rely heavily on their existence.

3.5) Model Calibration: We use monitoring data for the newly completed San Dieguito Lagoon Restoration Project to calibrate the TIDE_FEM tidal hydraulics model; and then use that calibration to simulate tidal inundation of the three wetland restoration alternatives in the Otay River flood plain. The San Dieguito Lagoon monitoring data was collected by Coastal Environments (2009) during September 2009. We select the W-16 tidal basin at San Dieguito Lagoon as a proxy for the proposed tidal basin in the Otay River floodplain because of morphologic similarities between the two cases: in particular both have a long "goose-neck" feeder channel connecting source water to interior tidal basins of comparable acreage and distance from the source water.

Spring, neap and mean tidal range simulations of the tidal hydraulics of San Dieguito Lagoon were performed using astronomic tidal forcing functions at = 2 sec time step intervals for the period 1980-2007. Computed water surface elevations and depth averaged velocities from the global solution matrix were converted to lagoon waterline contours and flow trajectories. Calibrations for determining the appropriate Manning factors and eddy viscosities were performed by running the TIDE_FEM model on the San Dieguito bathymetry file and comparing calculated water surface elevations in the W-16 tidal basins against water level measurements by Coastal Environments (2009) during the monitoring period of 14-18 September 2009. Iterative selection of Manning factor n_0 = 0.0261 and an eddy viscosity of ε = 7.129 ft^2/sec gave calculations of water surface elevation and inlet that reproduced the measured values to within 2% over the 2009 monitoring period at San Dieguito Lagoon.

Figure 20 provides a quantitative assessment of predictive skill of the calibrated model using water level measurements in the newly created W-16 Tidal Basin located east of I-5 off the north bank of the San Dieguito River. Here we compare W-16 Tidal Basin water level variations predicted by the model (purple trace) with the water level measurements (black crosses) during the post-construction monitoring of the Edison Plan by Coastal Environments, (2005). The W-16 Basin water level variations are found to lag the ocean water levels by as much as 3.79 hr during the mid-range tides of the monitoring period. High tide water levels equal or exceed those in the ocean due to trapping of higher harmonics of the K1 lunar-solar diurnal tidal constituent and the M2 principal lunar semi-diurnal tidal constituent, similar to what occurs in San Diego Bay. However, low tide water levels in the W-16 basin never drop below + 1.49 ft NGVD and are well above ocean low tide water levels due to frictional impedance and depth limiting travel time of the tidal wave propagation in the long sinuous feeder channels that connect the W-16 tidal basin

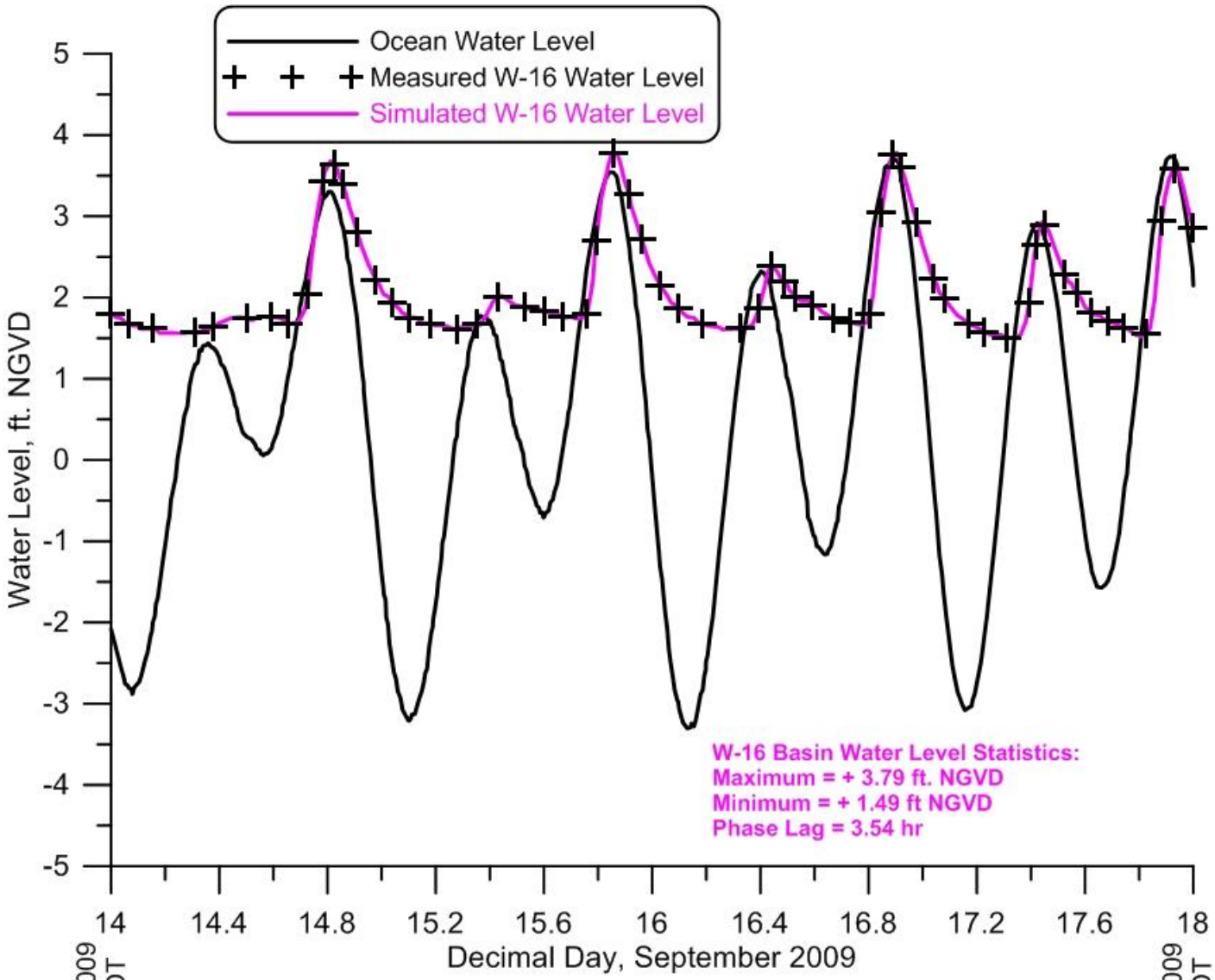


Figure 20. Water level calibration based on the W -16 tidal basin measurements, San Dieguito Lagoon, 14 - 18 September 2009. Ocean water level (black) compared to measured W-16 basin water levels (black crosses) vs calibrated model simulation (red). Measurements by Coastal Environments (2009).

with the ocean. Low tide levels in W-16 could fall no lower than +0.23 ft NGVD due to the present elevation of the hard channel bottom under the I-5 bridge. The amplitudes and degree of non-linearity in the W-16 Basin water level time series are accurately simulated by the model and closely duplicate those features observed in the measured lagoon tides.

4.0) Tidal Hydraulics of the Existing Otay River Floodplain

The TIDE_FEM bathymetric computational mesh was initialized for the updated Otay River Floodplain bathymetry derived from the 2011 WRA precision GPS surveys (Figure 21). The TIDE_FEM computational mesh is nested in the farfield of south San Diego Bay, and was subjected to 30 years of historic tidal forcing using the 1980-2009 period of record at the Navy Pier in San Diego Bay, after spectrally correcting that record to the mouth of the Otay River as detailed in Section 3.2 .

4.1) Tidal Current Simulations: Peak flooding currents during spring tides were simulated in the existing river channel in Figure 22, while ebbing currents during spring tides are found in Figure 23. These progressive vector diagrams show that flooding spring tidal currents are about 0.1 m/sec (0.33 ft/sec) at the river mouth and then accelerate to 0.18 m/sec (0.59 ft/sec) in the deeper sections of the inlet channel (north/south reach of the Otay River adjacent Ponds 10 and 11). Further up-river currents reach 0.15 m/sec (0.50 ft/sec) in the narrower east/west reach near the railroad bridge. Flood tide currents then decelerate to less than 0.01 m/sec (0.03 ft/sec) into the complex dendritic system of channels in the upper reaches of the flood plain.

The tidal currents calculated in the lower Otay River and feeder channel during spring tides (cf Figures 22 & 23) are compared against grain size data to estimate the potential for scour and erosion. A 2012 geotechnical investigation of the Otay River Floodplain was conducted by Calscience Environmental Laboratories, Inc. that included boring locations and some gradation curves in the lower Otay River channel. Figure 24a gives the grain size distribution from a composite sample of channel borings, indicating the river channel sediments are fairly well sorted (due to hydraulic sorting during river floods and perhaps relict wave action) with a median grain size of D_{50} = 0.3 mm. Comparing this median grain size against the Hjulstrom Curve in Figure 24b indicates these river channel sediments have a threshold scour speed of 0.66 ft/sec (0.2 m/s). Tidal current speeds between 0.27 ft/ sec (0.08 m/sec) and 0.66 ft/sec would lead to bed load transport but not erosion. Erosion and scour would only occur for tidal currents that exceed 0.66 ft/sec, while currents less 0.27 ft/sec would yield deposition. These transport thresholds of the native river bed sediments indicate that the only potentially problematic areas are the narrow, deep north-south reach of channel adjacent Ponds 10 and 11 and the two pinch points near the railroad bridge where a series of humps, shoals and scour holes are found in the river bathymetry. In the north/south reach adjacent to Ponds 10 and 11, the channel has already scoured to an equilibrium depth where maximum tidal currents reach but do not exceed the threshold scour speed of the channel sediments; and at the two pinch points near the railroad bridge maximum tidal currents approach but do not exceed the sediment incipient scour speeds. Under these conditions, tidal erosion does not occur since the sedimentary bed remains in a steady state of bed load transport. Thus a stable, quasi- equilibrium channel prevails, wherein there is incipient sediment transport without either erosion or deposition. One special attribute of

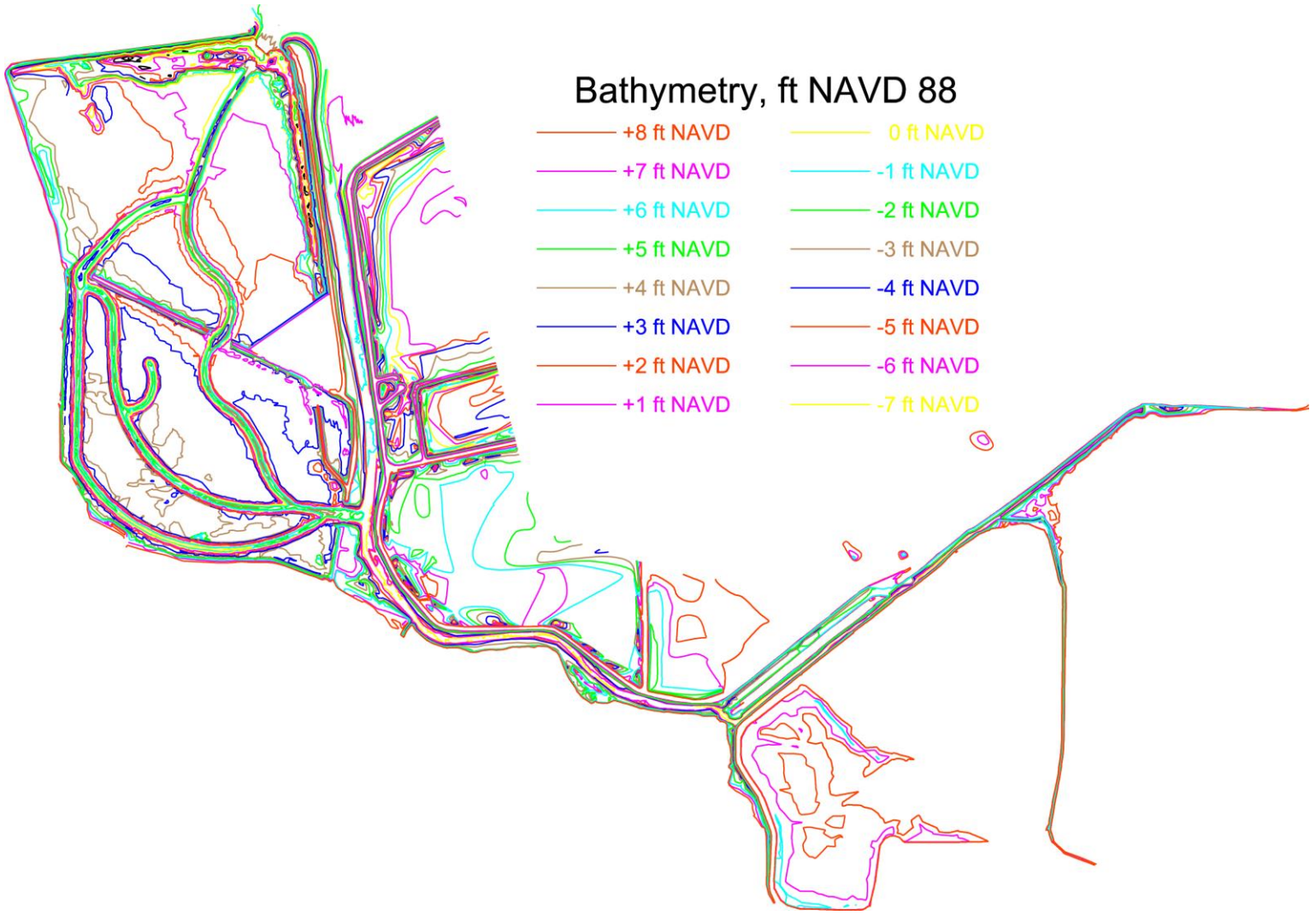


Figure 21: The updated Otay River Floodplain bathymetry derived from the 2011 WRA precision GPS survey.

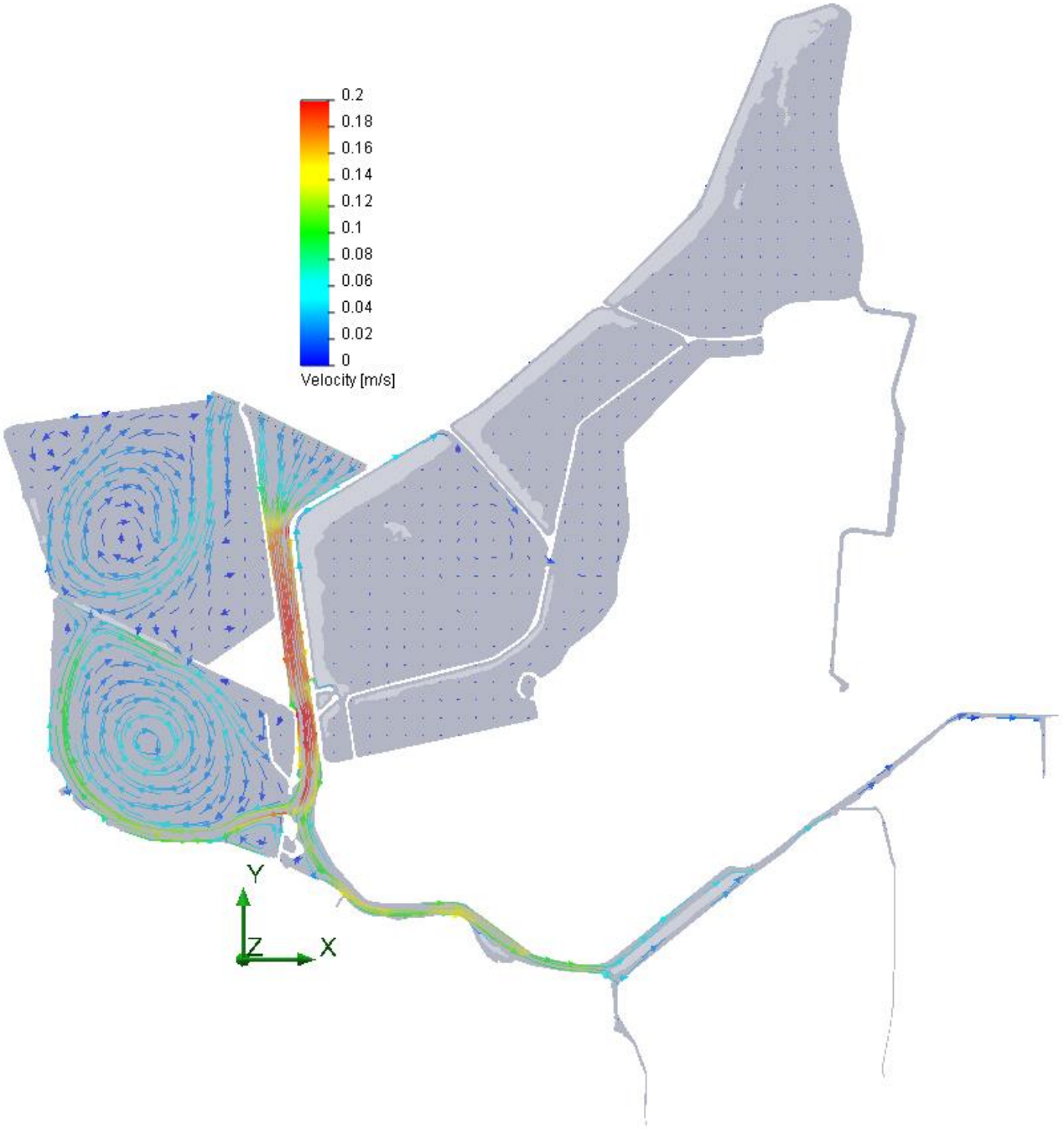


Figure 22: Hydrodynamic simulation of progressive vector flow distribution at 30 min time integration during maximum flood flow during spring tides for the existing lower Otay River and salt pond system based on 2011 WRA bathymetric survey and the 1983-2001 tidal epoch for San Diego Bay tides.

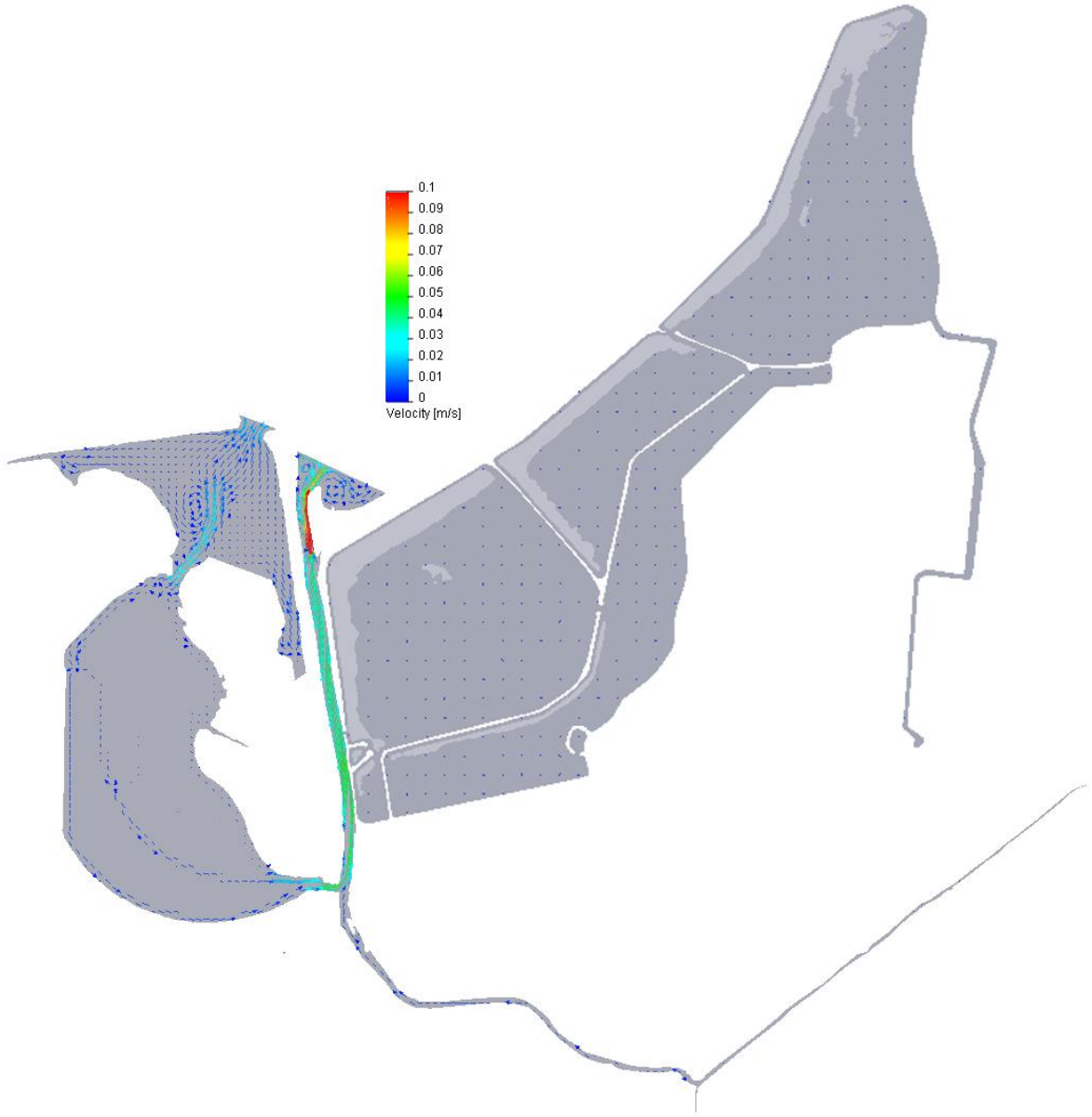


Figure 23: Hydrodynamic simulation of progressive vector flow distribution at 30 min time integration during maximum ebb flow during spring tides for the existing lower Otay River and salt pond system based on 2011 WRA bathymetric survey and the 1983-2001 tidal epoch for San Diego Bay tides.

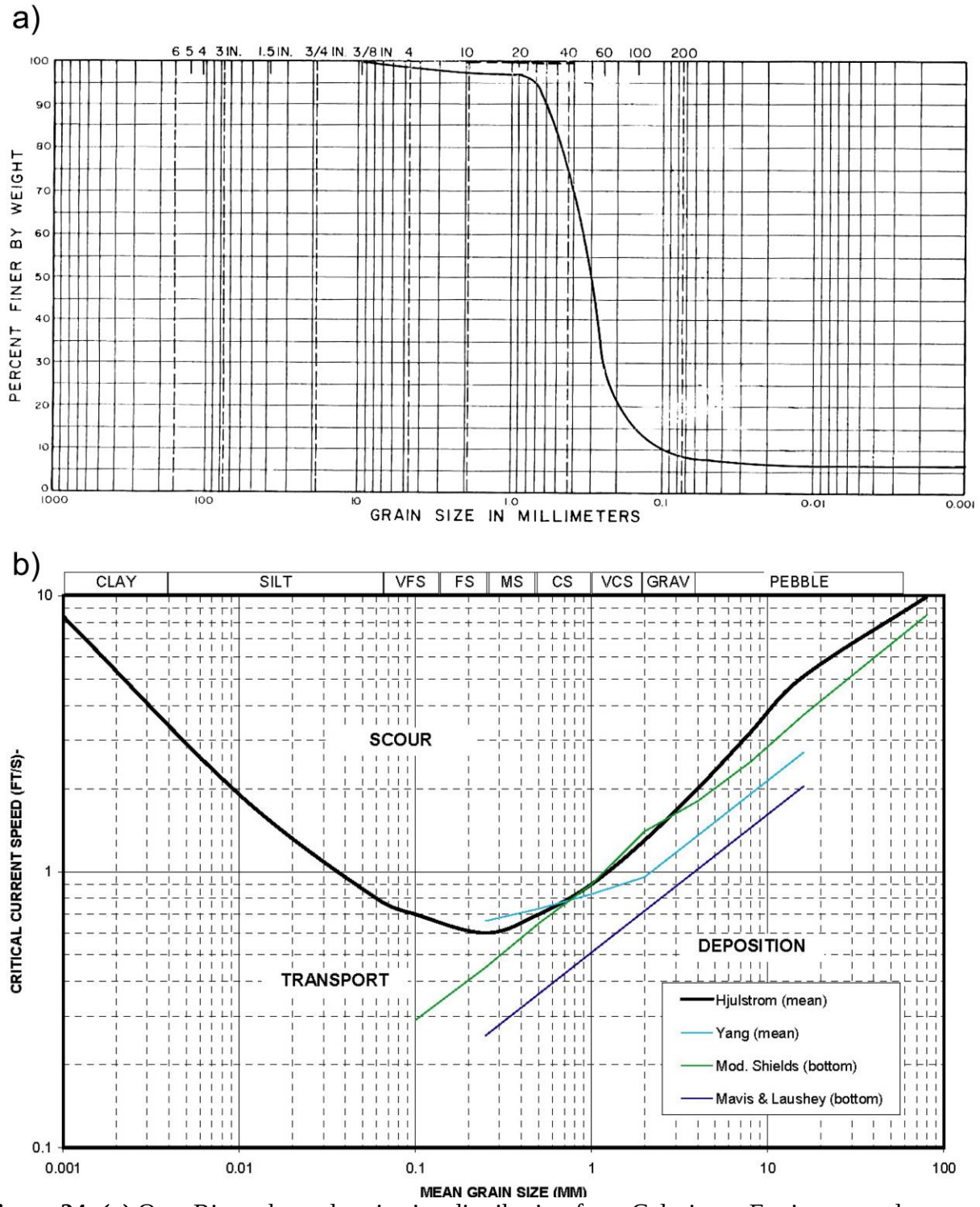


Figure 24: (a) Otay River channel grain size distribution from Calscience Environmental Laboratories, Inc., 15 May 2012. **(b)** Hjulstrom curve for critical current speeds of quartz sediment as a function of mean grain size, from Everest, (2007).

this site is that the inlet channel and the mouth of the Otay River are not subject to littoral transport by shoaling ocean waves, as south San Diego Bay provides complete sheltering from high energy shoaling swells. Consequently, the inlet channel is not likely to infill or close from sand influx in the source water, making the site significantly easier to maintain.

4.2 Hydroperiod Simulations: The hydroperiod function gives the percentage of exposure for each elevation throughout the full range of lagoon water level variation. This is the primary physical factor limiting the type of habitat that will thrive at a particular elevation in the wetland. These relationships are used later (Sections 4 & 5) to transpose tidal hydraulics model output into calculations of acreage of various wetland habitat types created by the two restoration alternatives.

The spectrally corrected San Diego Bay water levels for the 1980-2009 period of record were used to drive the TIDE_FEM model at the mouth of the Otay River in order to solve for the time series of the water level variation in the existing Otay River floodplain. The computations involved N_o = 2,629,800 time steps, each 6 minutes in length, in order to sweep the 30 year period of record. At each time step the average basin water elevation, $\hat{\eta}$ was calculated from the ensemble average of the solutions at the nodes in the computational mesh. Conditional if statements and counting loops inserted into the TIDE_FEM code would count the number time steps, N, for which the average lagoon water elevation was less than a particular elevation, Z_i. The percent time that elevation Z_i was exposed over the period of record was calculated as:

$$E_i = \frac{100\%}{N_o} \sum N(\hat{\eta} < Z_i) \qquad (18)$$

The elevations dividing the various sub-tidal and intertidal habitat types are based on biological surveys conducted during the San Dieguito Lagoon Restoration Project by Josselyn & Whelchel (1999), and then later updated by vegetation surveys in the lower Otay River flood plain by Josselyn (2012). These surveys are mapped according to elevations and are used to develop functional relationships (referred to as *a hydroperiod function*) between habitat breaks and the exposure times computed from equation (18). From this procedure, the following exposure times were assigned to each habitat break:

TABLE 2: Exposure Levels for Hydroperiod Habitat Breaks

Subtidal Exposure < 0%;
0% < **Frequently Flooded Mud Flat Exposure** < 38%
38% < **Frequently Exposed Mud Flat Exposure** < 45%;
45% < **Low Salt Marsh Exposure** < 75%
75% < **Mid Salt Marsh Exposure** < 95%
95% < **High Salt Marsh Exposure** < 99.6%
99.6% < **Transitional Exposure** < 100%

Figure 25 below gives the hydroperiod function that was determined by this analysis the existing Otay River flood plain, and which is subsequently applied to the grading plans of the proposed restoration alternatives to determine the numbers of restored acres of each wetland habitat type.While the shape of this curve may vary with the particular restoration alternatives, the percent exposure times will determine the elevations on at which a particular habitat break occurs, and those elevations will in turn map into the grading design to determine the amount of acreage of each habitat type.

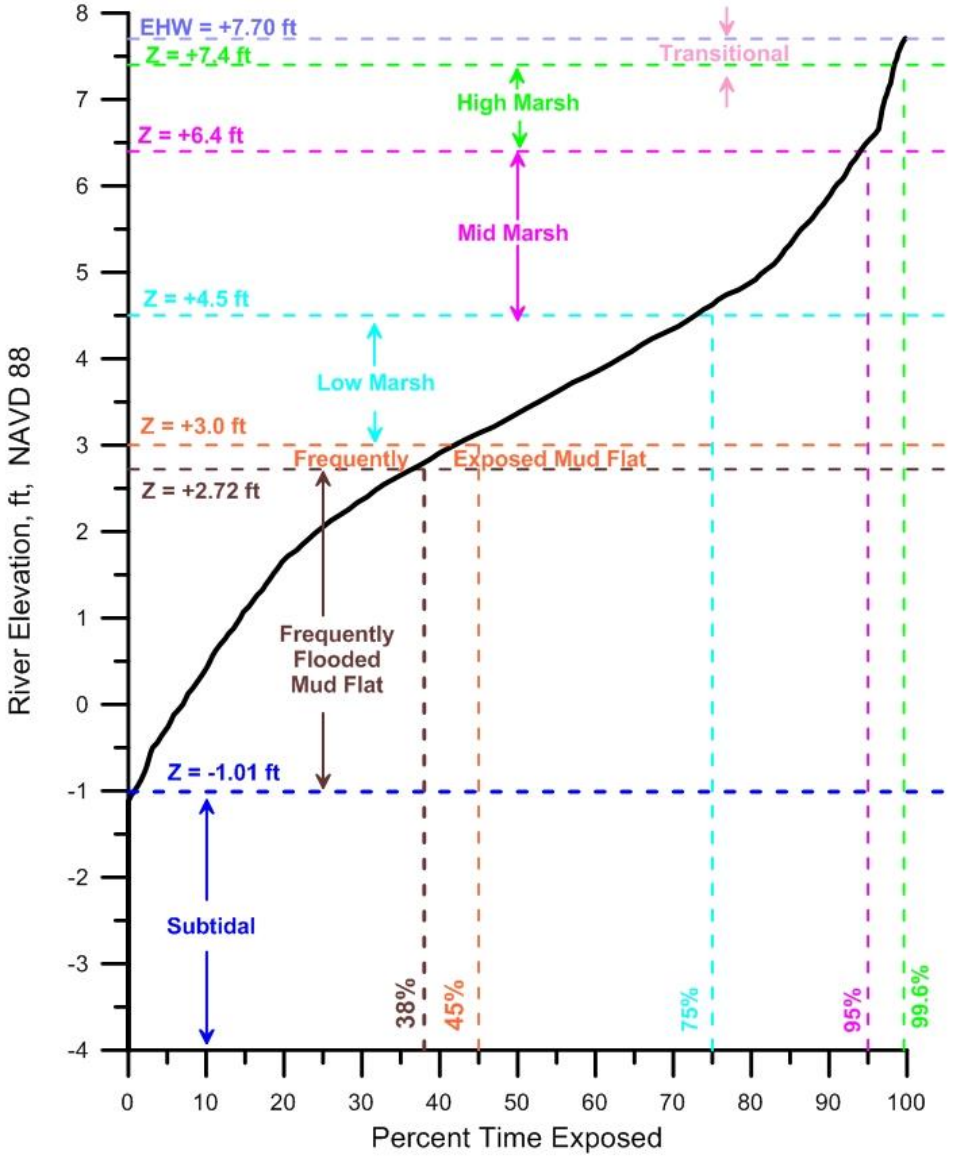


Figure 25. Hydroperiod function of the existing Otay River floodplain based on WRA 2011 bathymetric survey applied to water level data from NOAA tide gage #941-0170, for tidal epoch 1983-2001, with spectral correction from Otay River Sonde. Mannings roughness: n_0 = 0.0261

5.0 Analysis of the Intertidal Alternative:

The model, analysis methods, and supporting data bases used herein are the same as those utilized in the Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the San Dieguito Wetland Restoration Project, (EIR/EIS, 2000), and for the preparation of the San Dieguito Wetlands Restoration Project, Final Restoration Plan, (SCE, 2005). Monitoring data for the newly completed San Dieguito Lagoon Restoration Project was also used to calibrate tidal hydraulics model. San Dieguito Lagoon was selected as a proxy for the restoration alternatives because of morphologic similarities: in particular, both restoration sites have a long "goose-neck" feeder channel connecting source water to interior tidal basins of comparable acreage and distance from the source water. Habitat surveys conducted during the San Dieguito Lagoon Restoration Project by Josselyn & Whelchel (1999), and then later updated by vegetation surveys in the lower Otay River flood plain by Josselyn (2012), were used to develop functional relationships between habitat breaks and amounts of time for wetting and drying (hydroperiod functions). These relationships were used to transpose tidal hydraulics model output into calculations of acreage of various wetland habitat types created by the *Intertida*l restoration plan. Calculations of habitat creation were based on long-term tidal hydraulics simulations using tidal forcing at the mouth of the Otay River, derived from a spectral correction applied to the NOAA tide gage #941-0170 located at the Navy Pier (cf. Section 3.2)

5.1 Bathymetric Input for the Intertidal Alternative: Grading contours for the Intertidal Alternative were provided in 0.5 ft intervals between -4.0 ft NAVD and + 10 ft NGVD by KTU+A. The TIDE_FEM tidal hydraulics model presented in Jenkins and Inman (1999) was gridded for a computational mesh of the Intertidal Alternative built off the bathymetry in Figures 4 and 5. Figure 4 details the elevation grading contours of the Intertidal Alternative tidal basin in the Otay River floodplain merged with the Otay River bathymetry; while Figure 5 gives the elevation contours resulting from cut and fill of the Pond-15 tidal basin for the Intertidal Alternative. Of particular interest to the finite element mesh is the *hydraulic friction slope coefficient, S_{fj},* providing tidal muting effects. Two separate formulations are used. One is given for the 3-node triangular elements situated in the interior of the mesh which do not experience successive wetting and drying during each tide cycle. The other formulation is for the elements situated along the wet and dry boundaries of the lagoon. These have been formulated as 3-node triangular elements with one curved side based upon the cubic-spline matrices developed by Weiyan (1992). These two sets of elements were assembled into a computational mesh of the restoration whose upper boundary conforms to the + 10 ft. NGVD contours in Figures 4 and 5. The + 10 ft. NGVD contour was chosen to allow sufficient computational domain to evaluate tidal inundation at 2050 sea levels that are as much as + 2.0 ft above present sealevel. The wet-dry boundary coordinates of the curved waterline, (x', y'), are linearly interpolated for any given water elevation from the contours stored in the bathymetry file.

Aside from gridding the TIDE_FEM tidal model, storage rating functions were calculated from the bathymetric contours of Figures 4 and 5. Figure 26 gives the storage rating function of the floodplain tidal basin merged with the tidally influenced lower reach of the Otay River; while Figure 27 gives the storage rating function for the Pond 15 tidal basin as configured for the

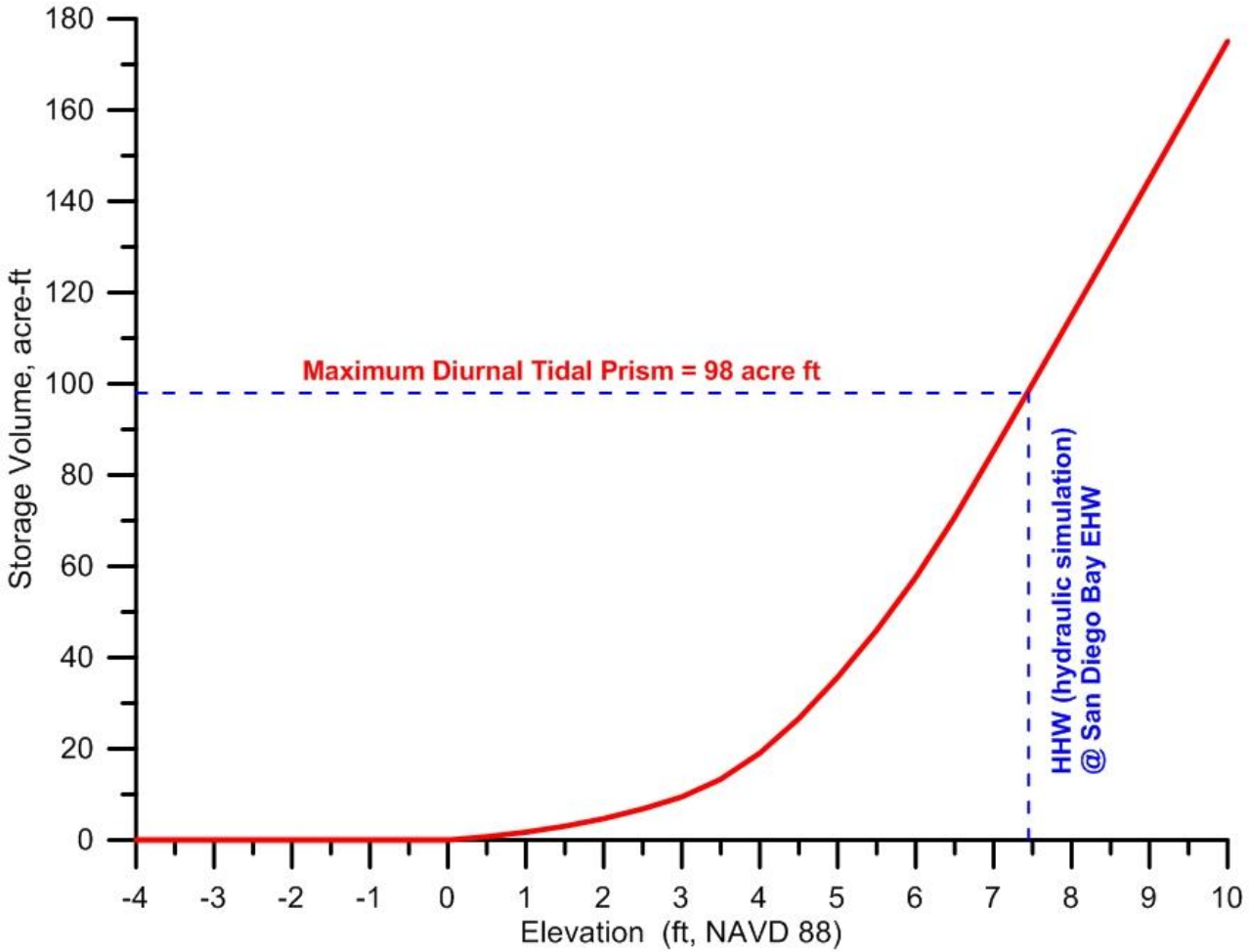


Figure 26: Storage rating function of the tidal basin in the Otay River floodplain for the Intertidal Alternative with no dredging of the existing river channel. Maximum diurnal tidal prism shown for extreme high-water event in San Diego Bay, 27 January 1983.

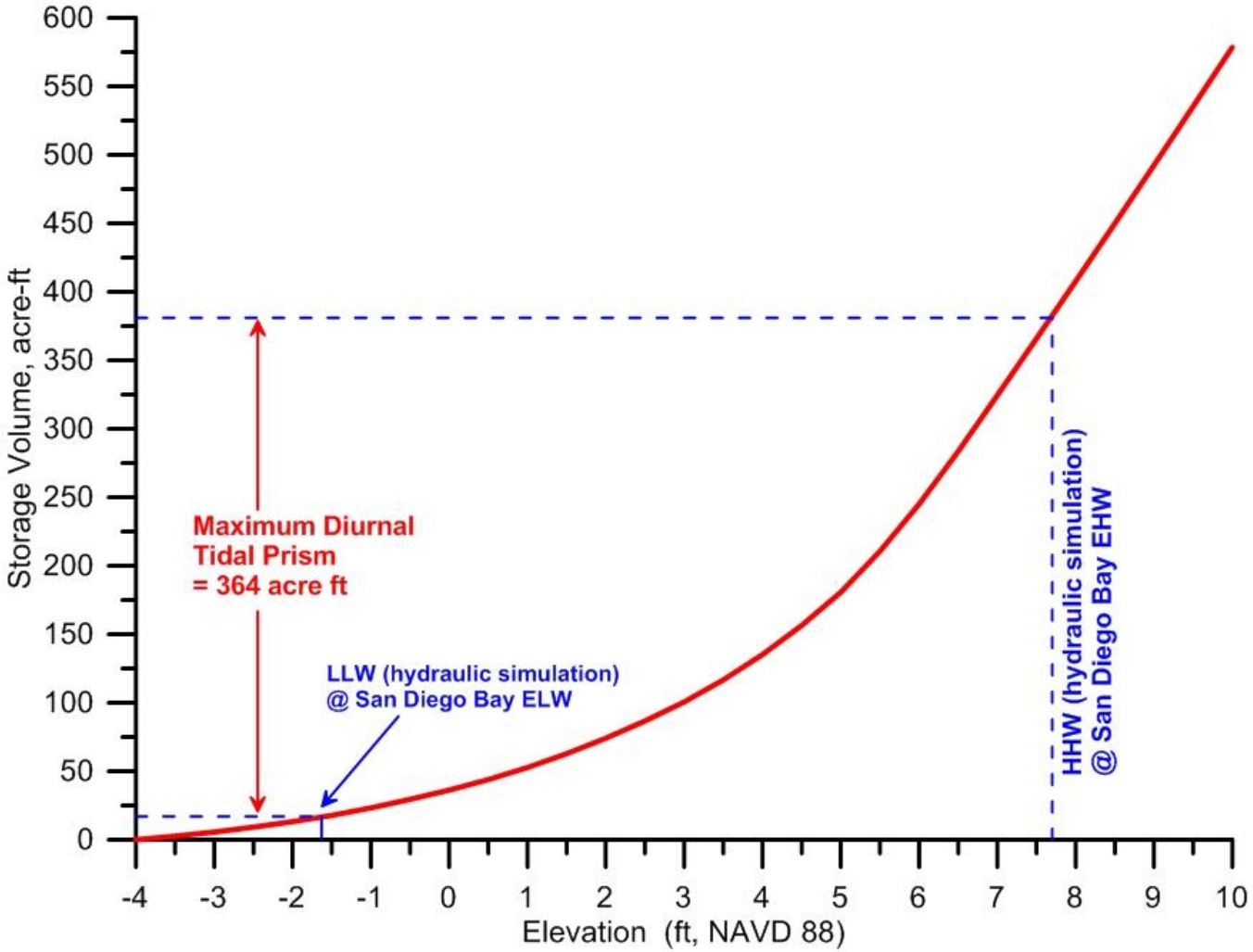


Figure 27: Storage rating function of the Pond 15 tidal basin for the Intertidal Alternative. Maximum diurnal tidal prism shown for extreme high-water event in San Diego Bay, 27 January 1983.

Intertidal Alternative. The storage rating functions are used in the initialization of the TIDE_FEM tidal hydraulics model in order to enforce mass conservation in the tidal inundation simulations (see Jenkins and Inman, 1999). The initialization involves fitting a series of high-order polynomials to the volumes of the storage rating function in Figure 26 & 27. To accommodate possible future sea level rise the polynomial fits were carried up to a daylight contour chosen at +10.0 ft NGVD, even though the tidal inundation in San Diego Bay has never been observed above +7.71 ft NGVD. A fifth- order polynomial was fitted to the storage rating functions in Figures 26 & 27 with a coefficient of determination of $r^2 = 0.998$.

For tidal inundation up to the historic extreme high water level of San Diego Bay (EHW = +7.71 ft NGVD, (upper dashed blue line in Figure 26), the maximum volume of San Diego Bay water that is exchanged with the Intertidal Alternative floodplain tidal basin is 98 acre-ft. The maximum potential diurnal tidal prism of the Pond 15 tidal basin of the Intertidal Alternative is 364 acre ft for an extreme high water event at present sea level.

5.2 Tidal Inundation Simulations of the Intertidal Alternative: Figure 28 gives the flow trajectories and depth averaged tidal currents for the Intertidal Alternative computed by the calibrated TIDE_FEM model during spring flooding tides on 18 September 2009. Velocities of tidal currents are portrayed according to the color coded velocity scale appearing in the lower left corner of the figure. Maximum flooding spring tidal currents at the mouth of the Otay River (in the neighborhood of the Otay Sonde) are about 0.10 m/sec (0.33 ft/sec), and then accelerate in the narrower north/south reach of the channel adjacent to Ponds 10 & 11 to 0.2 m/sec (0.66 ft/sec) where the channel has scoured under existing conditions to equilibrium depths on the order of -2.0 ft NAVD. After passing Pond 10, currents decelerate and then increase to 0.17 m/sec (0.55 ft/sec) near the two pinch points at the railroad bridge, before entering the floodplain tidal basin; where tidal currents entering the tidal basin initially form a well-defined jet at the west bank with speeds of about 0.08 m/s (0.26 ft/sec). This entry jet quickly diverges into a complex set of clockwise rotating eddies that populate the interior of the tidal basin. Eddy speeds in the tidal basin are on the order of 0.02 m/sec (0.07 ft/sec), insufficient to transport fine sand but an important stirring mechanism for mixing the tidal basin water mass to maintain high oxygen levels and to sustain fine silt and clay sized sediment particles in suspension. Maximum flooding spring tidal currents in the inlet channel to Pond #15 are about 0.07 m/sec (0.22 ft/sec), and then decelerate as a weak entry jet with speeds of about 0.05 m/s (0.16 ft/sec). This entry jet also quickly diverges into a complex set of counter rotating eddies that populate the interior of the tidal basin. Eddy speeds in the Pond #15 tidal basin are on the order of 0.01 m/sec (0.03 ft/sec), again insufficient to transport fine sand or cohesive silts, but also providing a stirring mechanism for mixing the Pond #15 water mass to maintain high oxygen levels and to sustain suspension of fine silt and clay sized sediment particles.

Figure 29 gives the flow trajectories and depth averaged tidal currents for the Intertidal Alternative computed by the TIDE_FEM model during spring ebbing tides on 18 September 2009. The wetted area of the floodplain tidal basin is significantly reduced relative to the flood tide area in Figure 28, due to the fact that the grading plan allows for almost complete drainage at mean low water tidal stages. In Figure 29, creeping flow drains from the remnant dendritic channel of the floodplain basin, forming a feeder current in the upper river channel with speeds

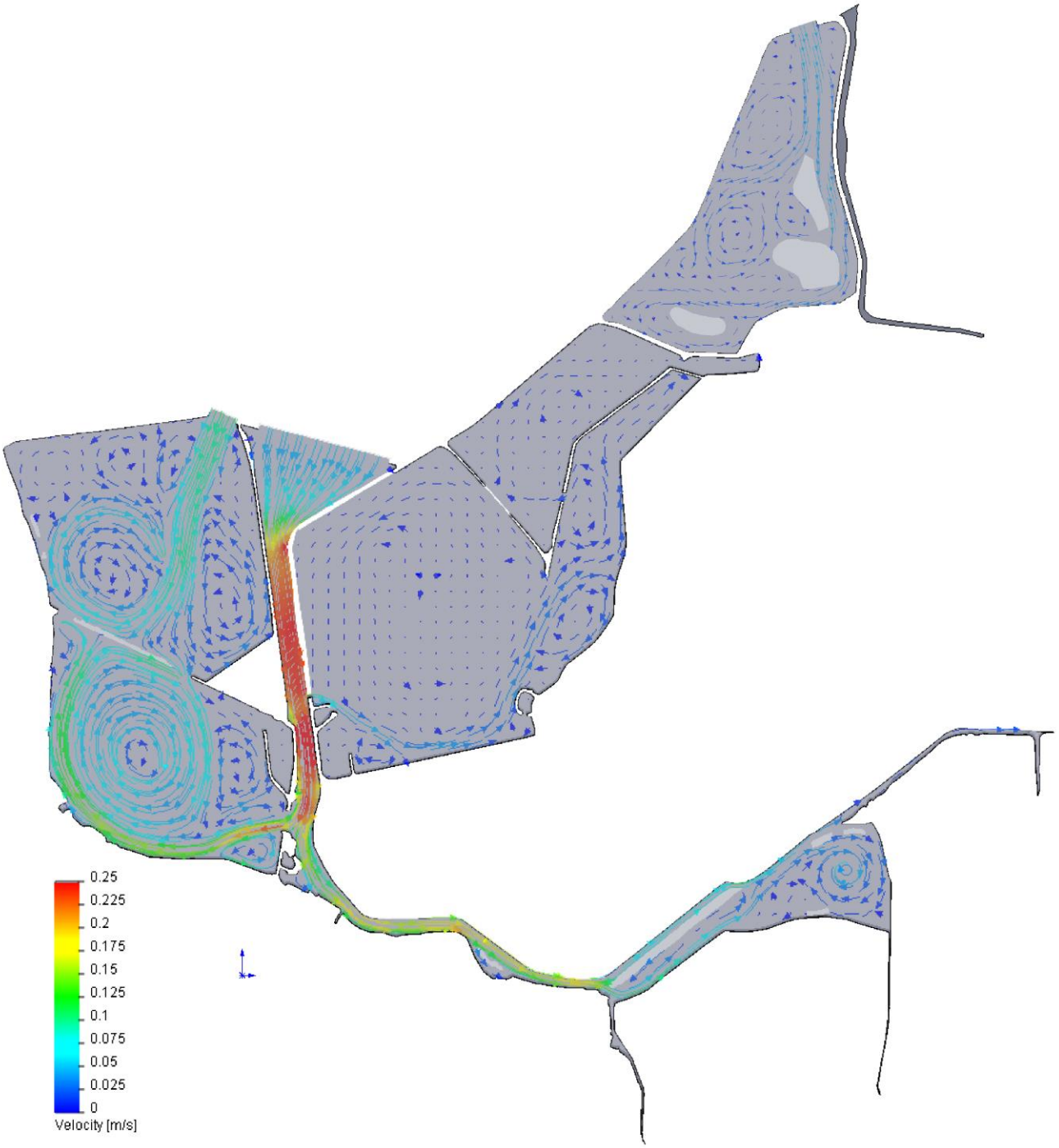


Figure 28: Intertidal Alternative flood tide progressive vector flow simulation at Mean High Water (MHW), where vector trajectories are plotted over 30 minute time integrations.

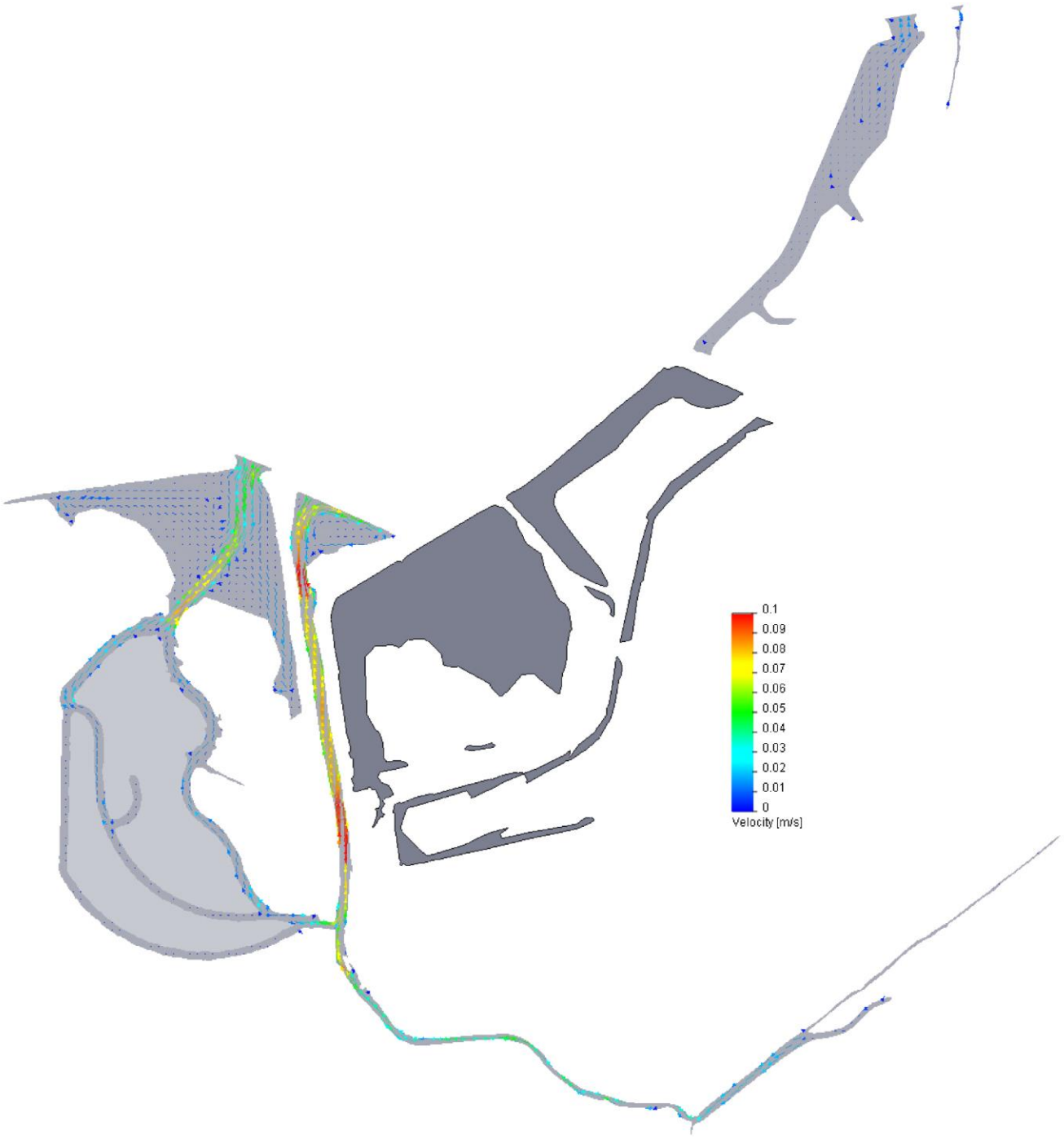


Figure 29: Intertidal Alternative ebb tide progressive vector flow simulation at Mean Low Water (MLW), where vector trajectories are plotted over 30 minute time integrations.

on the order of -0.01 m/sec, or (-0.03 ft/sec). This feeder current evacuates the tidal basin and then accelerates to -0.05 m/sec (-0.16 ft/sec) as it passes through the pinch point under the railroad bridge in the narrow east/west reach of channel. (We adopt the convention of negative velocities for ebb tide flows and positive velocities for flood tide flows). Ebb flow in the channel then accelerates further to -0.09 m/sec (-0.289 ft/sec) in the deeper north/south reach before discharging into San Diego Bay. In Pond #15 during ebb tide flow at mean low water level, the eastern half of the basin is completely drained and exposed, while a week feeder current evacuates the western half with ebb flow of about -0.02 m/sec (-0.07 ft/sec). This feeder current accelerates to about 0.06 m/sec (0.20 ft/sec), as it flows out the inlet of Pond #15, and is far below the threshold scour speed of the sediments along the bank of the Chula Vista Wildlife Reserve.

In Figure 30, tidal current speeds at the mouth of the Otay River for the Intertidal Alternative are simulated throughout an entire spring-neap tidal. These currents (plotted in red) are compared the threshold scour speeds for native river bed channel sediments as derived from the Hjulstrom Curve in Figure 24b based on grain size data in Figure 24a. These thresholds of incipient scour appear as red dashed lines for flood (positive) and ebb flow (negative) velocity sign conventions. It is apparent that ebb and flood flow velocities throughout a spring/neap cycle never reach the thresholds of incipient scour, where maximum flood flow velocity at the mouth of the Otay River is +0.329 ft./sec, while maximum ebb flow velocity reaches only – 0.289 ft./sec under the Intertidal Alternative. These flood and ebb flow maximums are consistent with the progressive vector simulations in Figures 28 & 29. Figure 31 gives the corresponding spring/neap velocity time series at the inlet to Pond 15 of the Intertidal Alternative. Because of the large non-equilibrium cross section engineered for this inlet, velocities are considerably less than at the mouth of the Otay River. For Pond 15, maximum flood flow velocity at the inlet is +0.224 ft./sec, while maximum ebb flow velocity reaches only – 0.196 ft./sec, well below the threshold scour speeds for the native sediments estimated to be +/- 0.66 ft./sec from the the Hjulstrom Curve in Figure 24b. Tidal current speeds between 0.27 ft/ sec (0.08 m/sec) and 0.66 ft/sec would lead to bed load transport but not erosion. Erosion and scour would only occur for tidal currents that exceed 0.66 ft/sec, while currents less 0.27 ft/sec would yield deposition. Therefore the mouth of the Otay River would be in steady state equilibrium that is neither depositional nor erosional under the Intertidal Alternative. However, the inlet to Pond 15 under the Intertidal Alternative could be depositional if there is an active sediment source nearby. However no such source appears to exist, other than perhaps very minimal and undocumented sediment yield from the Palomar Ditch during occasional El Nino floods. Littoral sediment transport by waves is generally de minimis due to the limited fetch across South San Diego Bay, and the inlet to Pond 15 is sheltered from direct wave exposure by the causeway of the Chula Vista Nature Reserve (cf. Figure 1).

Therefore, we conclude both source water inlets to the tidal basins of the Intertidal Alternative are stable and immune to closure or restriction by sedimentation under dry weather tidal exchange. (Wet-weather conditions are addressed in a companion study, Everest, 2014). Inlet sedimentation due to influxes of wave driven long-shore transport of sand (as occurs on the open coast), does not occur in the fetch limited environment of South San Diego Bay. The mouth of the Otay River that supplies source water to the floodplain tidal basin is in a dynamic steady-

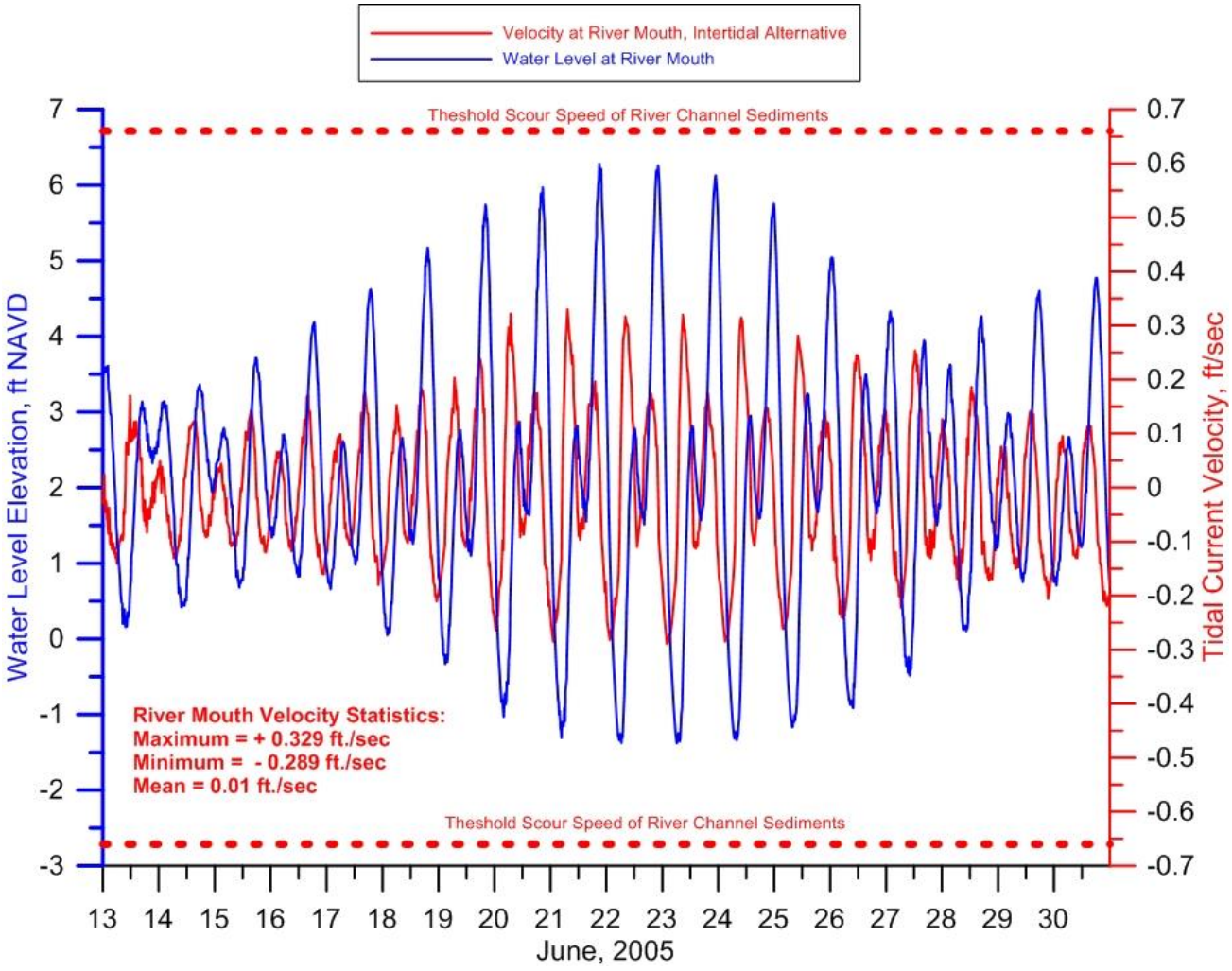


Figure 30: Tidal current speeds at the mouth of the Otay River as computed in red for the Intertidal Alternative throughout a spring-neap tidal cycle shown in blue. Threshold scour speeds for native river bed channel sediments shown as red dashed lines for flood and ebb flow conditions.

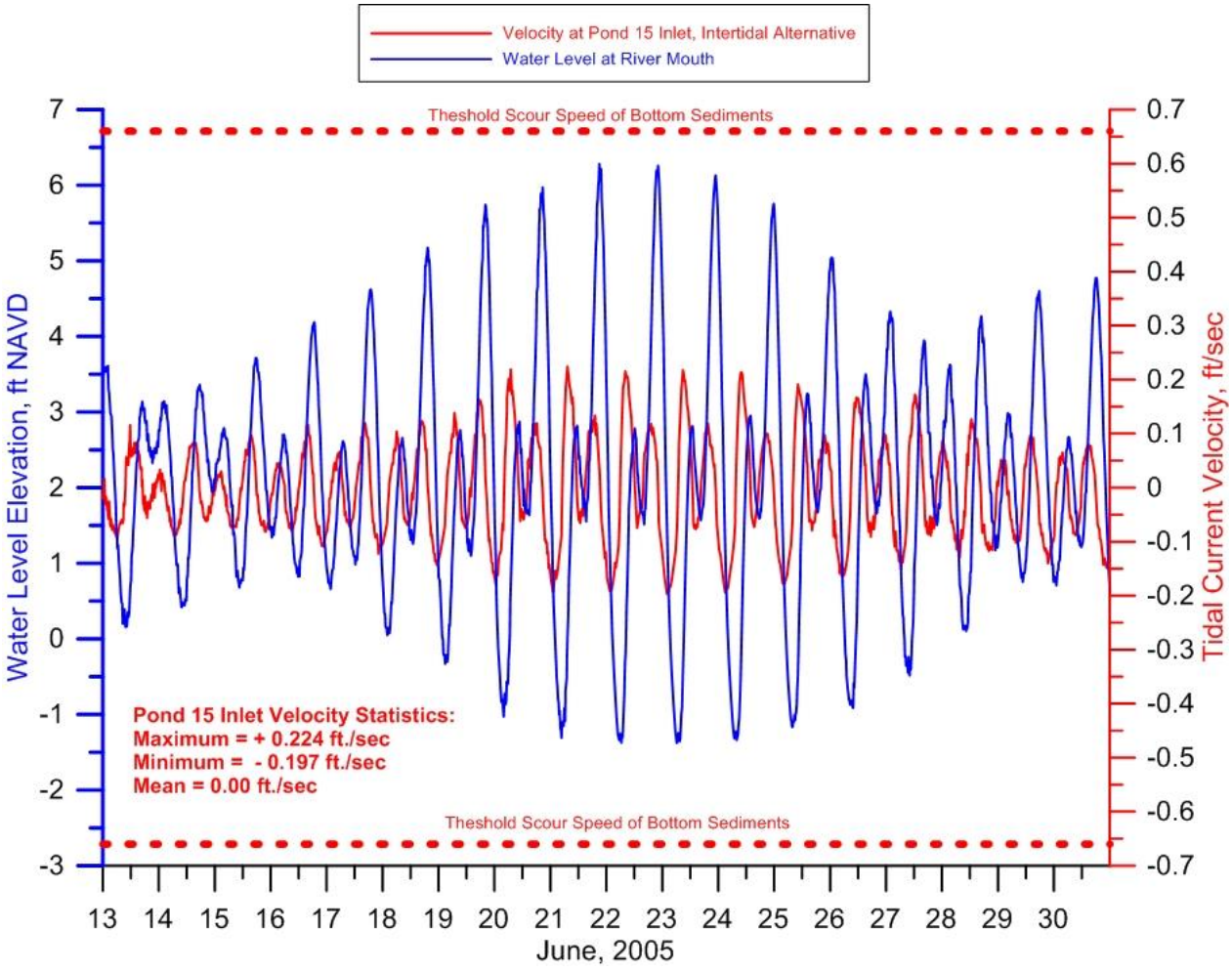


Figure 31: Tidal current speeds at the inlet to Pond 15 as computed in red for the Intertidal Alternative throughout a spring-neap tidal cycle shown in blue. Threshold scour speeds for native river bed channel sediments shown as red dashed lines for flood and ebb flow conditions.

state equilibrium that is neither depositional nor erosional, while the inlet to Pond 15 will remain in a non-equilibrium stationary state (as-built) in the absence of a local sediment sources or adequate fluid forcing by waves and currents that might otherwise import sediment from more distant sources.

Water elevations in the Intertidal Alternative floodplain basin are shown in Figure 32 for spring tides that occurred during 14-18 September, 2009, the same time period used for the model calibration with the proxy tidal system at San Dieguito Lagoon in Figure 20. Figure 32 provides a comparison between the water levels in the Intertidal Alternative floodplain tidal basin as predicted by the model (red trace) versus the actual San Diego Bay water level measurements (blue) reported by the Otay Sonde. The Intertidal Alternative floodplain tidal basin water level variations in red are found to lag the Bay water levels by as much as 27 minutes at higher high water (HHW) levels on flooding tides while this phase lag averages 2.46 hours at lower low water (LLW) level during ebb tides. These phase lags are an unavoidable consequence to frictional impedance and depth limited tidal propagation speeds down the 7,000 ft long channel that connects the floodplain tidal basin with the Bay. Lower low water levels in the Intertidal Alternative floodplain tidal basin are as much as 1.20 ft above South Bay water levels at the mouth of the Otay River due to the grading design which allows the floodplain basin to fully drain at LLW.

Higher high water levels in the Intertidal Alternative floodplain tidal basin sometimes exceed those in the South Bay at the river mouth by as much as +0.31 ft, (Figure 32), due to a trapped tidal modes (standing wave) typical of lagoons with large tidal basins and multiple choke point linkages to the ocean tides (Lamb, 1932; LeBlond & Mysak, 1978). Figure 33 shows these trapped modes are higher harmonics of the K1 lunar-solar diurnal tidal constituent and the M2 principal lunar semi-diurnal tidal constituent. Figure 14b plots the auto spectra of the Alternative-1 tidal basin tides and shows the predominant energy is centered on a diurnal frequency of the K1 lunar-solar diurnal tidal constituent at $f_{K1} = 1.16079 \text{ x } 10^{-5}$ Hz and the M2 principal lunar semi-diurnal tidal constituent, $f_{M2} = 2.2365 \text{ x } 10^{-5}$ Hz. The higher harmonics that lead to elevated basin high tide levels are a baroclinic *resonance* formed by a *triad* at the sum of the frequencies of the K1 and M2 barotropic tides, ie a diurnal third harmonic at a frequency $f_3 = f_{K1} + f_{M2} = 3.3973 \text{ x } 10^{-5}$ Hz. This diurnal third harmonic is a baroclinic tide excited by the barotropic K1 and M2 tides interacting with the bottom topography, principally the long inlet channel to the Intertidal Alternative floodplain tidal basin. Another baroclinic resonance apparent in the spectra of the ocean tides in Figure 33 is a second harmonic of the barotropic M2 tide appearing at a frequency of $2 f_{M2} = 4.4730 \text{ x } 10^{-5}$ Hz. An additional non-linear resonance appears as a triad formed by the sum of the K1 barotropic mode and the baroclinic second harmonic of the M2 tide, $f_{K1} + 2 f_{M2} = 5.6338 \text{ x } 10^{-5}$ Hz. Apparently this mode is excited by non-linear tidal interaction with the tidal basin and channel bathymetry.

The hydroperiod function (used to calculate the habitat acreage creation of the Intertidal Alternative) is calculated by the model for both present and future extremes of sea level in the year 2050 from estimates of both maximum and minimum sea level rise. Using the methods detailed in Sections 3.2 and 3.4 for providing long-term, locally relevant tidal forcing for the model, the hydroperiod functions are calculated at present and future sea levels for the Intertidal

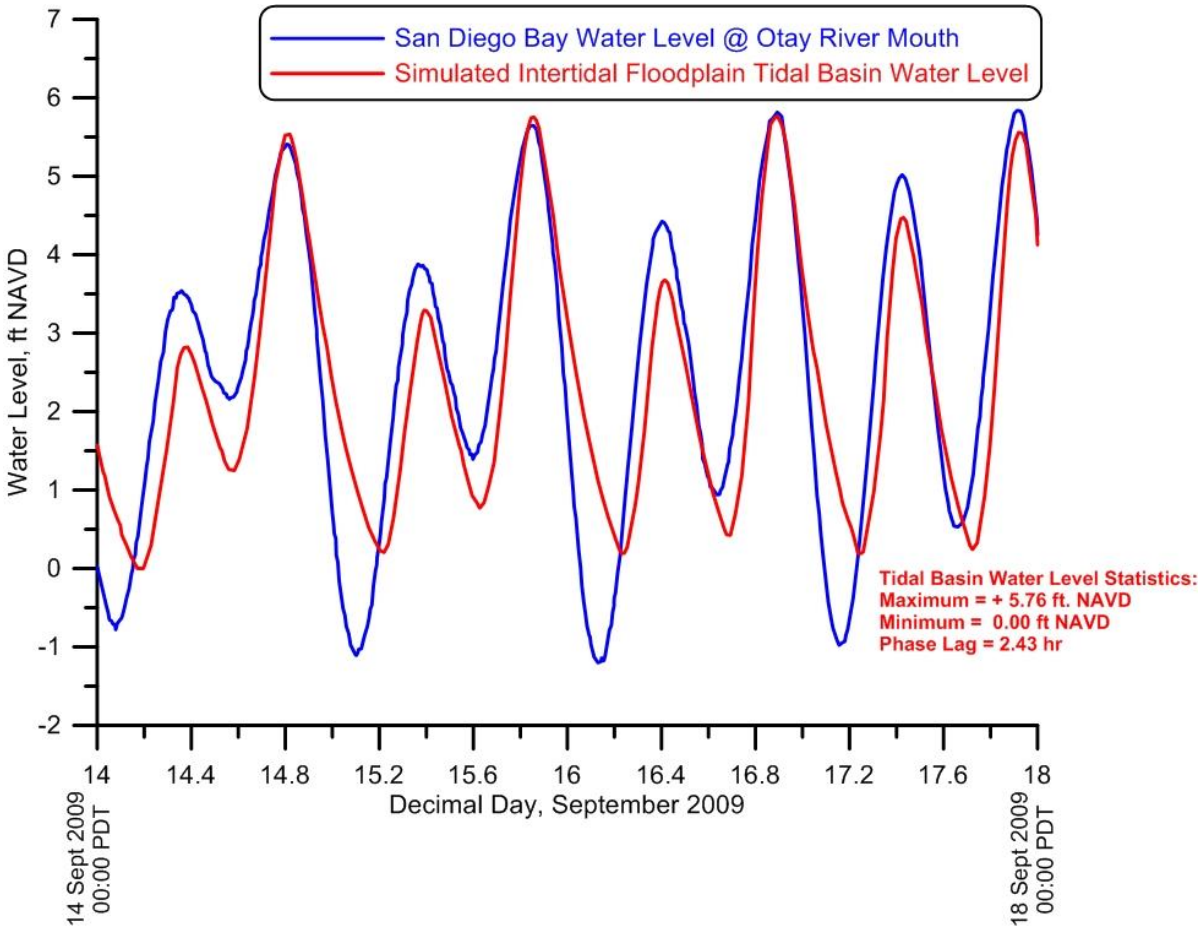


Figure 32: Water level elevations at the mouth of the Otay River (blue) compared to model simulation of Intertidal Alternative floodplain basin water levels (red) during spring tides, 14-18 September 2009.

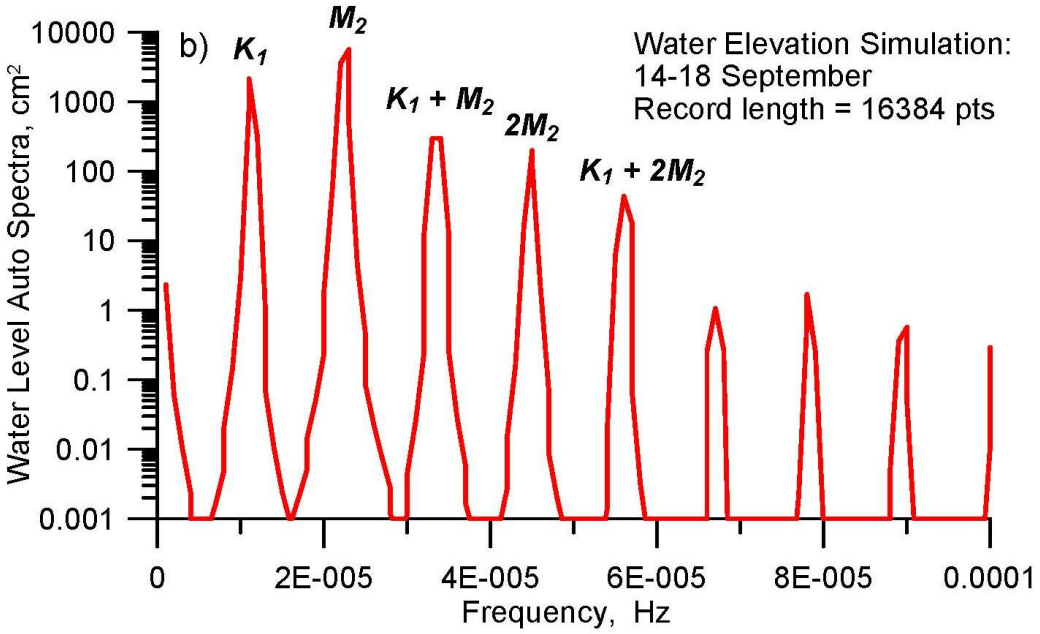


Figure 33: Auto spectra of water level elevations in the at the floodplain basin of the Intertidal Alternative during spring tides, 14-18 September 2009.

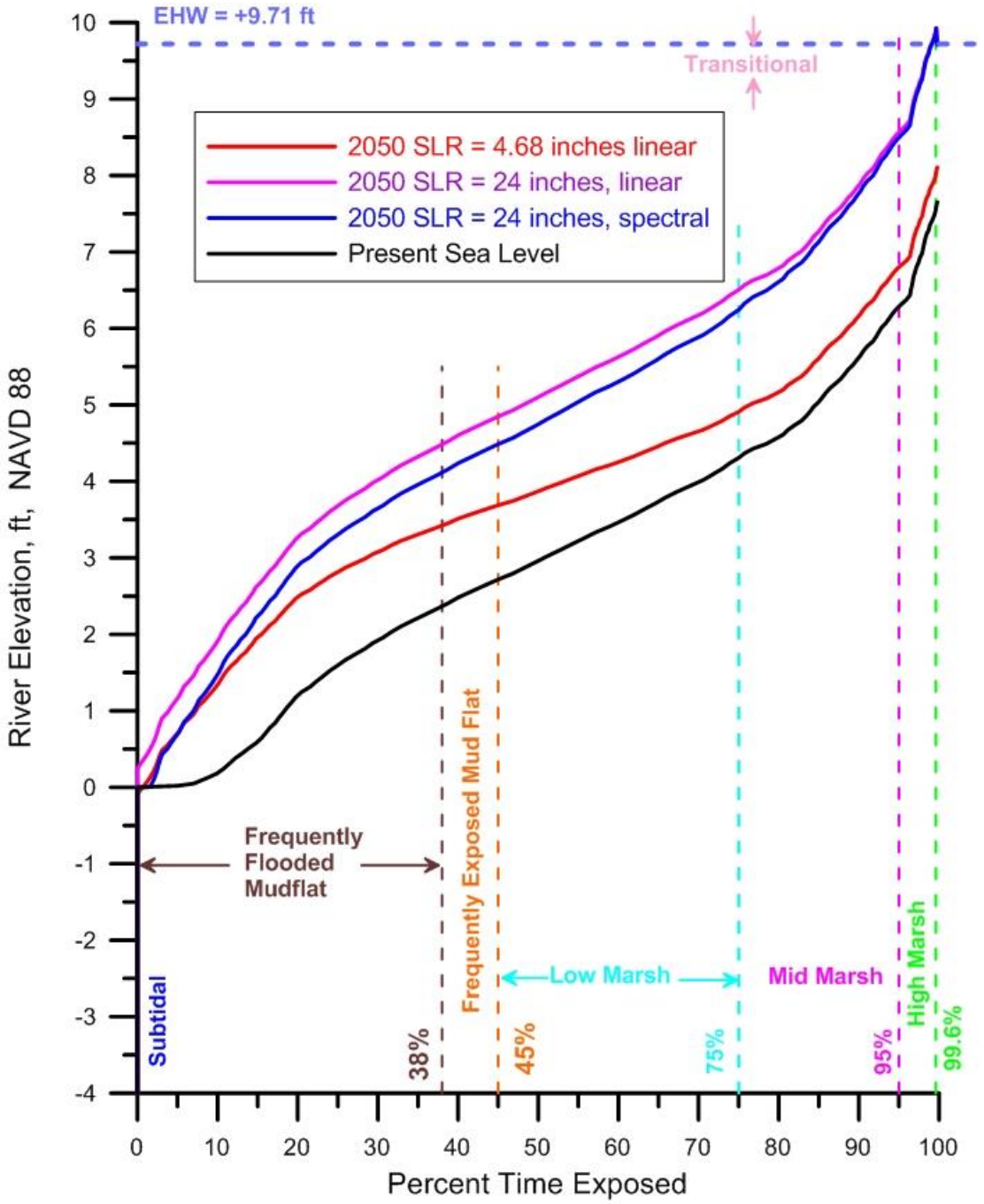


Figure 34: Hydroperiod Function for Intertidal Alternative, Otay Floodplain Tidal Basin for present sea level and 2050 sea level rise per CAT OPC guidance. Based on Otay Habitat Survey Data Evaluated By Josselyn (2012) and water level data from NOAA tide gage #941-0170, with spectral correction from Otay River Sonde. Manning's roughness, *n0* =0.0261

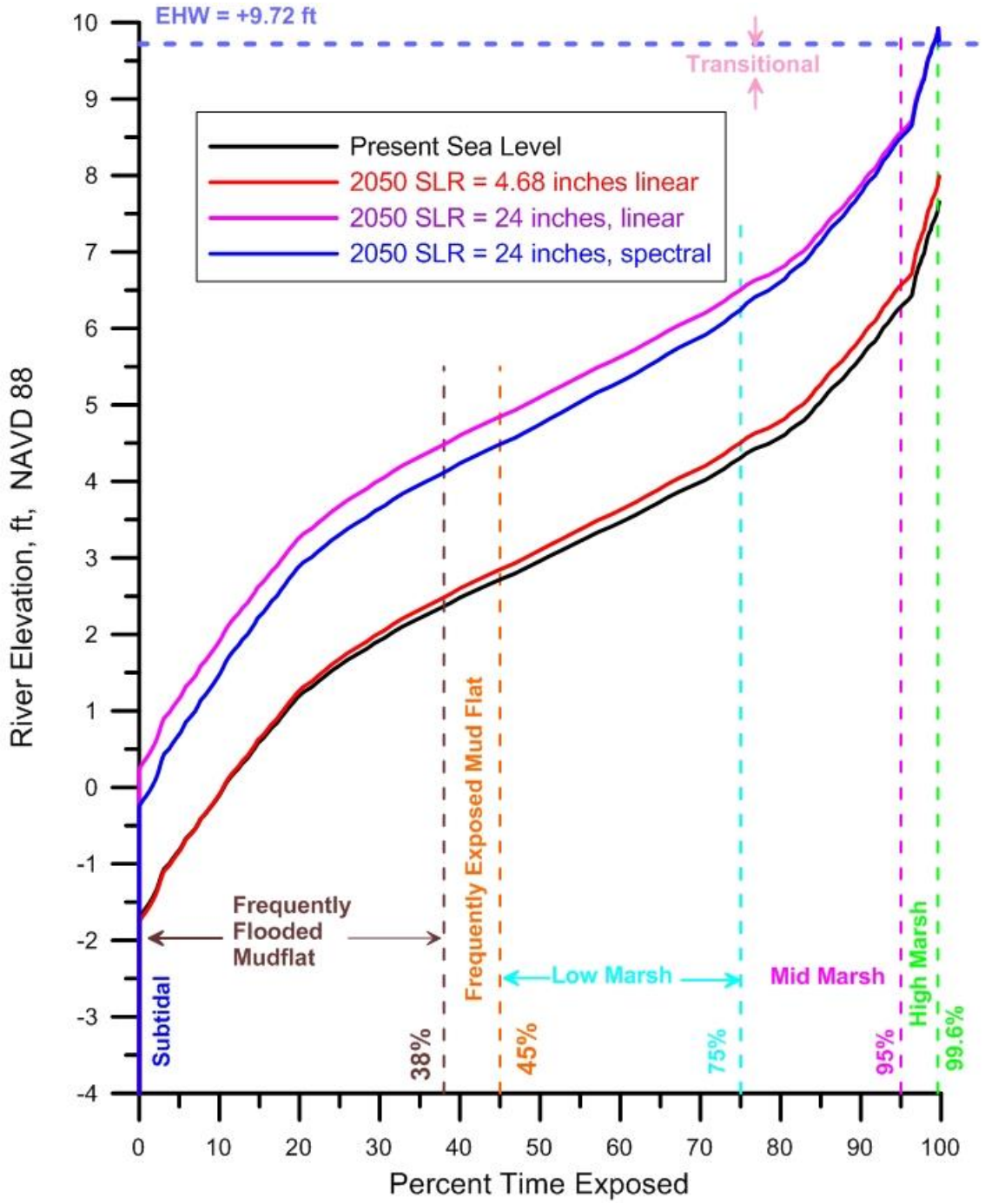


Figure 35: Hydroperiod Function for the Intertidal Alternative Pond #15 Tidal Basin for present sea level and 2050 sea level rise per CAT OPC guidance. Based on Otay Habitat Survey Data Evaluated By Josselyn (2012) and water level data from NOAA tide gage #941-0170, with spectral correction from Otay River Sonde. Manning's roughness, *n0* =0.0261.

Plan floodplain basin in Figure 34 and for the Pond #15 basin in Figure 35. The elevation breaks (zonation) between the different wetland habitat types from the hydroperiod curves are summarized in Tables 3 and Tables 4. The elevations for the habitat breaks in these figures and tables are applied to the KTUA grading designs and yield the acreages of habitat creation listed in Table 5 at present sea level, and at 2050 sea levels in Table 6.

Table 3: Elevations of Upper Limits of Habitat Breaks in the Intertidal Plan Floodplain Basin

Elevation of Habitat Breaks (Units of ft. NAVD 88)	@ Present Sea Level	@ 4.68 in. linear Sea Level Rise	@ 24 in. linear Sea Level Rise	@ 24 in. spectral Sea Level Rise
Sub-tidal	0.00 ft.	0.00 ft.	0.25 ft.	0.00 ft.
Frequently Flooded Mud Flat	2.40 ft.	3.40 ft.	4.50 ft.	4.10 ft.
Frequently Exposed Mud Flat	2.70 ft.	3.70 ft.	4.85 ft.	4.45 ft.
Low Marsh	4.30 ft.	4.90 ft.	6.55 ft.	6.25 ft.
Mid Marsh	6.30 ft.	6.80 ft.	8.55 ft.	8.50 ft.
High Marsh	7.55 ft.	8.05 ft.	9.71 ft.	9.71 ft.

Table 4: Elevations of Upper Limits of Habitat Breaks in the Intertidal Plan Pond 15 Basin

Elevation of Habitat Breaks (Units of ft. NAVD 88)	@ Present Sea Level	@ 4.68 in. linear Sea Level Rise	@ 24 in. linear Sea Level Rise	@ 24 in. spectral Sea Level Rise
Sub-tidal	-1.65 ft.	-1.70 ft.	0.25 ft.	-0.25 ft.
Frequently Flooded Mud Flat	2.40 ft.	2.50 ft.	4.50 ft.	4.10 ft.
Frequently Exposed Mud Flat	2.70 ft.	2.85 ft.	4.85 ft.	4.45 ft.
Low Marsh	4.30 ft.	4.50 ft.	6.50 ft.	6.25 ft.
Mid Marsh	6.30 ft.	6.55 ft.	8.55 ft.	8.50 ft.
High Marsh	7.50 ft.	7.90ft.	9.72 ft.	9.72 ft.

For all possible sea level scenarios, the elevation limit of subtidal habitat in the floodplain basin (Figure 34) is limited by the grading design (Figure 4) and by existing bars and channel bottom features at the inlet and inside the branch channel into this basin that create an inlet sill at 0.0 ft NAVD 88. The Intertidal Alternative calls for no construction dredging of the existing Otay River channel so as not to disrupt existing habitat residing down-river from the inlet to the proposed floodplain basin. That existing down-river habitat consists of additional mud flat residing below – 0.0 ft NAVD 88 and subtidal habitat below -1.01 ft NAVD 88 (cf. Section 4). Low tide drainage of the Pond # 15 (Figure 35) is constrained by the tidal muting of the South Bay Shelf (cf. Sections 3.2 & 3.4), which varies with sea level. At present sea level, Pond # 15 will not drain below – 1.65 ft. NAVD 88, producing the subtidal footprint shown in Figure 29. However, with a moderate amount of sea level rise, the linear SLR = 4.68 in. solution indicates a moderate improvement in drainage to – 1.70 ft NAVD 88. If sea level were to rise by 2 ft. according to the maximum sea level rise prediction in 2050, the available tidal range is not sufficient to prevent a rise in subtidal elevations in Pond # 15. This amount of sea level rise will raise the elevations of the zonation of all habitat types (Figure 35). This upward displacement of

Table 5: Intertidal Alternative Predicted Habitat Distribution, acres 2018

Vegetation Community to be Created	Otay River Floodplain Site Acres	Pond 15 Site
SubTidal	0.00	9.53
Mudflat – Frequently Flooded	4.45	16.36
Mudflat – Frequently Exposed	0.70	1.57
Low Marsh	10.34	15.73
Mid Marsh	10.99	34.47
High Marsh	3.23	5.61
Total Marsh	29.26	80.68
Transitional	0.45	2.59
Total Created Habitat	**29.71**	**83.27**

Table 6: Intertidal Alternative Predicted Habitat Distribution, acres 2050

Vegetation Community to be Created	Otay River Floodplain Site Acres	Pond 15 Site
SubTidal	0	9.35
Mudflat – Frequently Flooded	8.84	17.06
Mudflat – Frequently Exposed	2.21	1.85
Low Marsh	7.91	17.32
Mid Marsh	10.36	35.38
High Marsh	0.52	2.87
Total Created Habitat	**29.84**	**83.83**

wetland zonation is largest for the linear superposition scenario, because the spectral correction scenario predicts a larger tidal range of about 1.0 ft. Under the 24 in. spectral sea level rise scenario at 2050, intertidal wetland habitat would begin at an elevation of -0.25 ft NAVD, and the mud flat habitat would reside about 0.4 ft to 0.5 ft. lower than under the linear super-position scenario; while the low marsh habitat would reside about 0.25 ft. lower than under the linear super-position scenario. Therefore there is some apparent differences between the habitat mix predictions of these two sea-level rise prediction methods; although both give the same estimate of the maximum elevation of high salt marsh wetland zonation in both of the proposed basins of the Intertidal Plan (cf. Tables 3 & 4).

5.3) Residence Time of the Intertidal Alternative: Residence time refers to the average amount of time source water spends in a particular tidal system. Residence time begins from the moment a *material element of water* (a parcel that contains the same collection of water molecules) enters a tidal system on flooding tide and ends when that same element leaves the system on ebbing tide. At lowest order, the residence time in a particular tidal system can be approximated by *removal time*, which is a ratio of the storage capacity of that system at mean

higher high water to the rate of tidal exchange during a mean diurnal tidal period (Horikawa, 1988; Schwartz, 2005), or :

$$\bar{\tau} = \frac{V_s}{V_p} T$$

Where $\bar{\tau}$ is the removal time; V_s is the storage capacity of a particular restoration alternative at mean higher high water (including both the inlet channel and tidal basin); V_p is the mean diurnal tidal prism of a particular restoration alternative, and T is a diurnal tidal period equal to 1.0347 days (24 hours and 50 minutes). From this simple relation the removal time varies between each restoration alternative according to the ratio of storage capacity to diurnal tidal prism, V_s / V_p . However, removal time is only a simple algebraic proxy for residence time because the mean diurnal tidal prism for each of the basins is less than the storage capacity of those basins at MHHW, and it takes a number of tide cycles to completely replace all of the *old water* in each of those systems. Old water is defined here as water that remains in the tidal system (including both the inlet channel and tidal basin) after water outflow during ebb tide. As new water comes into the inlet channel and tidal basin, the old water becomes more diluted with each tidal cycle until all the old water is eventually replaced by new water. We utilize the mass conservation and transport algorithms of the TIDE_FEM model to solve for this progressive dilution of old water in each of the restoration alternatives. To facilitate comparisons of residence time calculations performed at other coastal lagoons, we adopt the convention of assigning residence time as the time required for old water to dilute to less than 2% of the storage capacity of the system (Elwany, et. al., 2005; Coastal Environments, 2009).

Figure 36 gives the TIDE_FEM hydrodynamic simulations of the time for dilution of old water in each of the tidal systems (inlet channel + tidal basin) of the Intertidal Alternative. Figure 36 presents the model results of residence time of South Bay water in the tidal basins of the Intertidal Alternative for the Otay River floodplain basin (blue) and the Pond #15 basin (red). Residence time of South Bay water is 2 days in the floodplain basin and 3 days in the Pond#15 basin. Residence time is less in the floodplain basin because its maximum storage volume at higher-high water level is only 98 acre ft. (4.27 million cubic ft.) and nearly completely drains at mean lower low water levels; whereas the maximum storage volume of the Pond #15 basin is 3.6 times greater at 15.9 million cubic ft., and about 700 hundred thousand cubic ft. of water fail to drain after one diurnal tidal cycle. Regardless, the residence time numbers for the restoration are rather good for marginalizing potential dissolve oxygen depletion, although the DO of South Bay water can become quite low during evaporative summer time conditions (cf. Section 3.3). Maximum diurnal tidal prisms at present sea levels are 98 acre ft. (4.3 million cubic ft.) for the proposed Otay River floodplain basin; and 364 acre ft. (15.9 million cubic ft.) for the proposed Pond #15 basin.

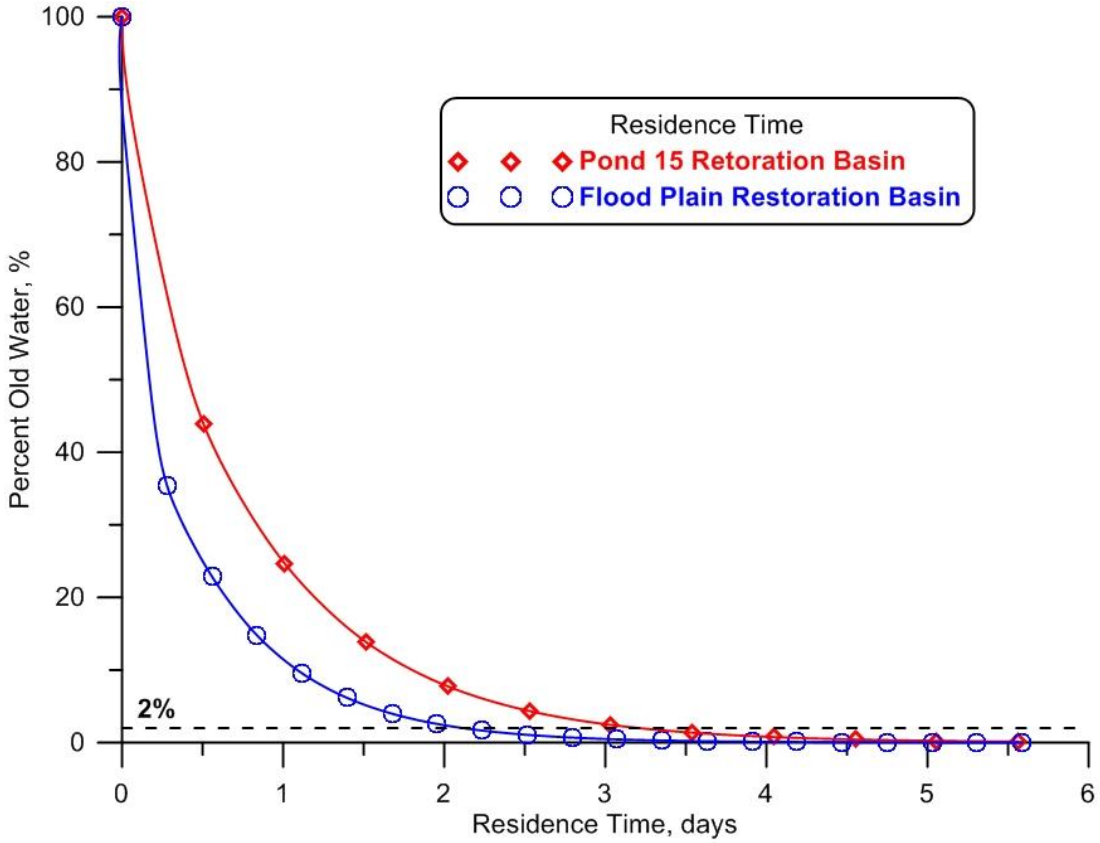


Figure 36: Residence time of South Bay water in the tidal basins of the Intertidal Alternative: Otay River floodplain basin (blue); Pond #15 basin (red).

6.0 Analysis of the Subtidal Alternative

The model, analysis methods, and supporting data bases used herein are the same as those utilized in the Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the San Dieguito Wetland Restoration Project, (EIR/EIS, 2000), and for the preparation of the San Dieguito Wetlands Restoration Project, Final Restoration Plan, (SCE, 2005). Monitoring data for the newly completed San Dieguito Lagoon Restoration Project was also used to calibrate tidal hydraulics model. San Dieguito Lagoon was selected as a proxy for the restoration alternatives because of morphologic similarities: in particular, both restoration sites have a long "goose-neck" feeder channel connecting source water to interior tidal basins of comparable acreage and distance from the source water. Habitat surveys conducted during the San Dieguito Lagoon Restoration Project by Josselyn & Whelchel (1999), and then later updated by vegetation surveys in the lower Otay River flood plain by Josselyn (2012), were used to develop functional relationships between habitat breaks and amounts of time for wetting and drying (hydroperiod functions). These relationships were used to transpose tidal hydraulics model output into calculations of acreage of various wetland habitat types created by the *Subtidal* restoration plan. Calculations of habitat creation were based on long-term tidal hydraulics simulations using tidal forcing at the mouth of the Otay River, derived from a spectral correction applied to the NOAA tide gage #941-0170 located at the Navy Pier (cf. Section 3.2)

6.1 Bathymetric Input for the Subtidal Alternative: Grading contours for the Subtidal Alternative were provided in 0.5 ft intervals between -4.0 ft NAVD and + 10 ft NGVD by KTU+A. The TIDE_FEM tidal hydraulics model presented in Jenkins and Inman (1999) was gridded for a computational mesh of the Subtidal Alternative built off the bathymetry in Figures 4 and 5. Figure 4 details the elevation grading contours of the Subtidal Alternative tidal basin in the Otay River floodplain merged with the Otay River bathymetry; while Figure 5 gives the elevation contours resulting from cut and fill of the Pond-15 tidal basin for the Subtidal Alternative. Of particular interest to the finite element mesh is the *hydraulic friction slope coefficient, S_{fj},* providing tidal muting effects. Two separate formulations are used. One is given for the 3-node triangular elements situated in the interior of the mesh which do not experience successive wetting and drying during each tide cycle. The other formulation is for the elements situated along the wet and dry boundaries of the lagoon. These have been formulated as 3-node triangular elements with one curved side based upon the cubic-spline matrices developed by Weiyan (1992). These two sets of elements were assembled into a computational mesh of the restoration whose upper boundary conforms to the + 10 ft. NGVD contours in Figures 4 and 5. The + 10 ft. NGVD contour was chosen to allow sufficient computational domain to evaluate tidal inundation at 2050 sea levels that are as much as + 2.0 ft above present sealevel. The wet-dry boundary coordinates of the curved waterline, (x', y'), are linearly interpolated for any given water elevation from the contours stored in the bathymetry file.

Aside from gridding the TIDE_FEM tidal model, storage rating functions were calculated from the bathymetric contours of Figures 4 and 5. Figure 37 gives the storage rating function of the floodplain tidal basin merged with the tidally influenced lower reach of the Otay River; while Figure 38 gives the storage rating function for the Pond 15 tidal basin as configured for the

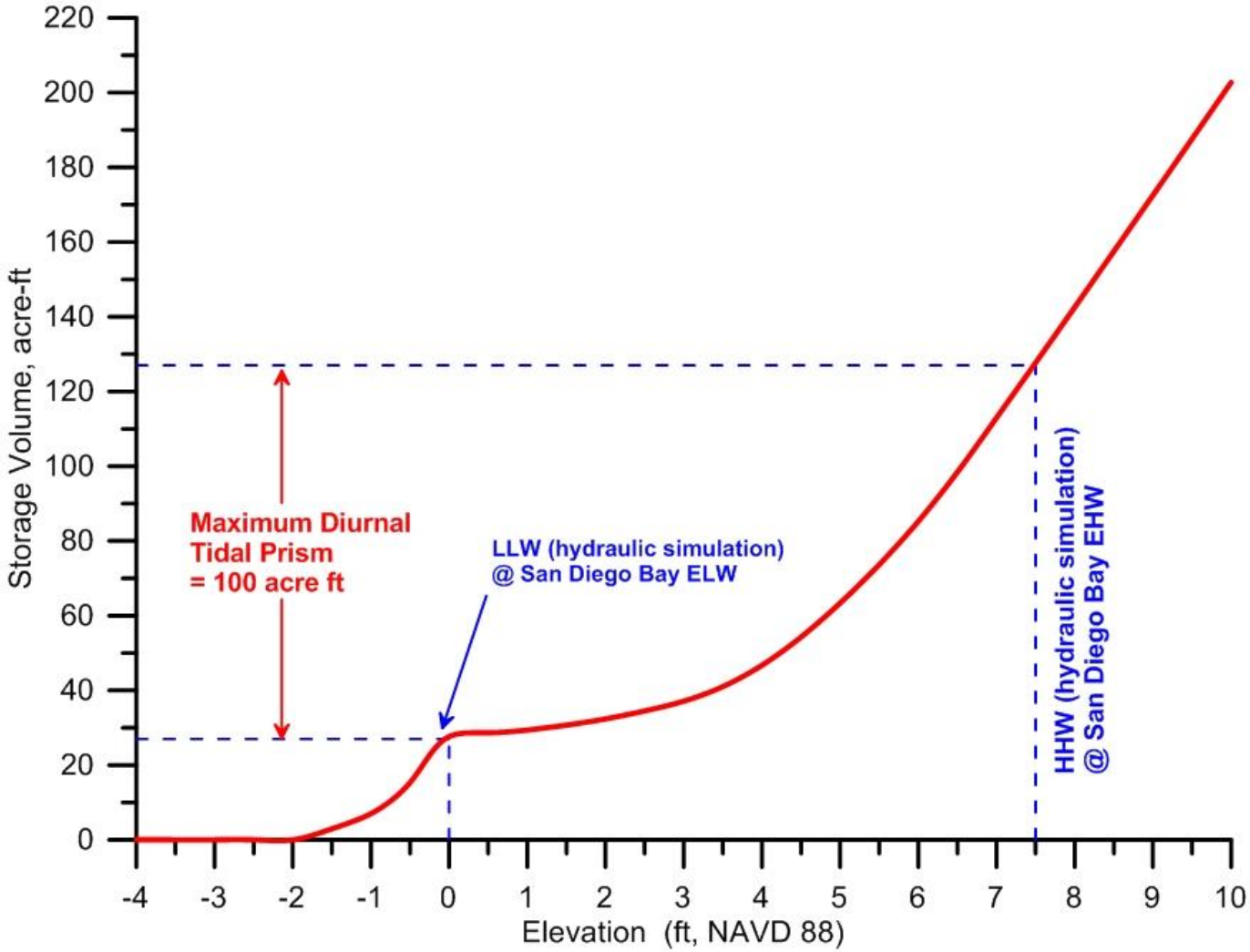


Figure 37: Storage rating function of the tidal basin in the Otay River floodplain for the Subtidal Alternative with no dredging of the existing river channel. Maximum diurnal tidal prism shown for extreme high-water event in San Diego Bay, 27 January 1983.

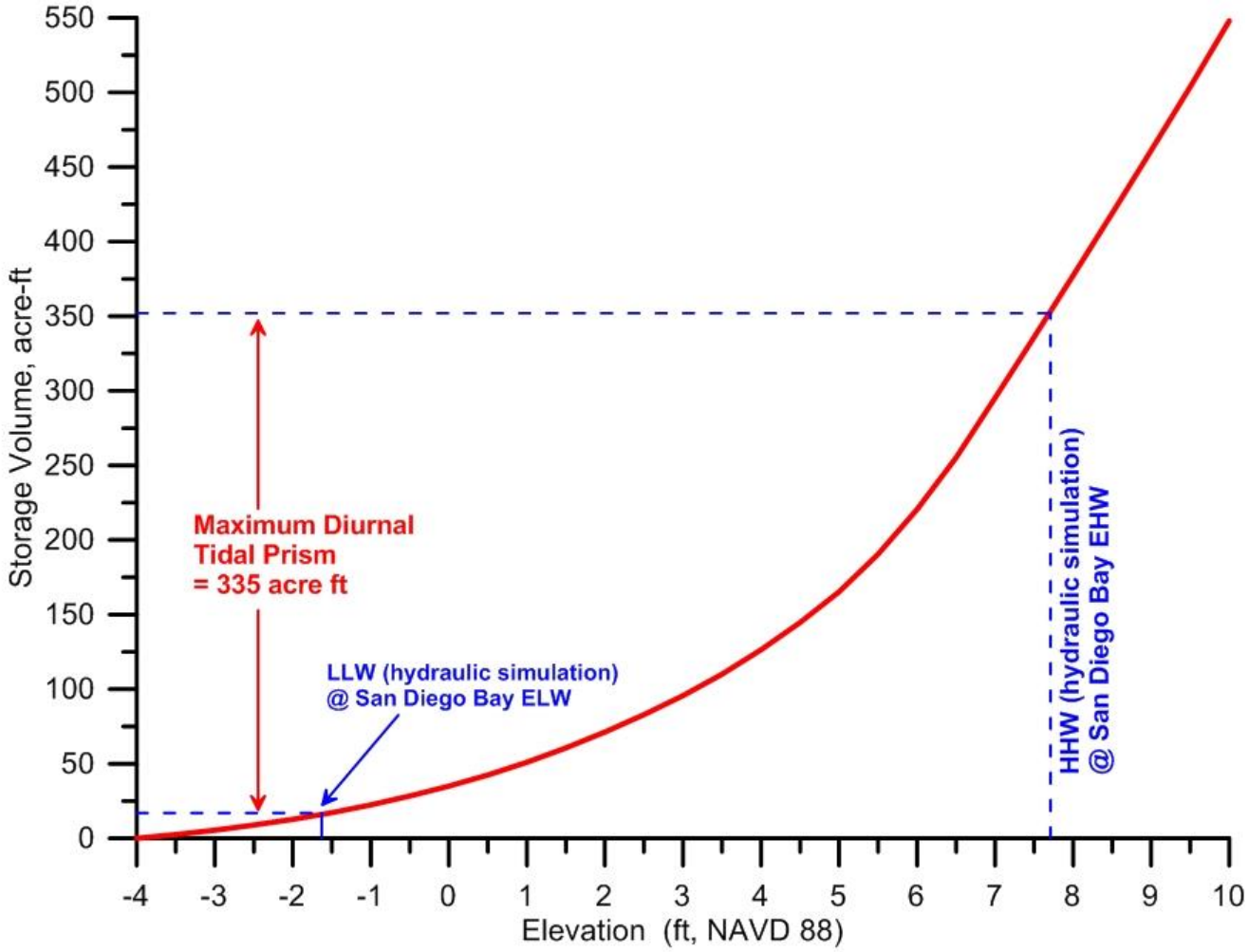


Figure 38: Storage rating function of the Pond 15 tidal basin for the Subtidal Alternative. Maximum diurnal tidal prism shown for extreme high-water event in San Diego Bay, 27 January 1983.

Subtidal Alternative. The storage rating functions are used in the initialization of the TIDE_FEM tidal hydraulics model in order to enforce mass conservation in the tidal inundation simulations (see Jenkins and Inman, 1999). The initialization involves fitting a series of high-order polynomials to the volumes of the storage rating function in Figure 37 & 38. To accommodate possible future sea level rise the polynomial fits were carried up to a daylight contour chosen at +10.0 ft NGVD, even though the tidal inundation in San Diego Bay has never been observed above +7.71 ft NGVD. A seventh- order polynomial was fitted to the storage rating functions in Figures 37 & 38 with a coefficient of determination of $r^2 = 0.996$.

For tidal inundation up to the historic extreme high water level of San Diego Bay (EHW = +7.71 ft NGVD, (upper dashed blue line in Figure 37), the maximum volume of San Diego Bay water that is exchanged with the Subtidal Alternative floodplain tidal basin is 100 acre-ft. Although this basin has a subtidal channel graded down to -2.0 ft NAVD, it does not drain much below lower low water levels due to bars, hummocks, and shoals that form a sill near the confluence of the Subtidal Floodplain basin and the Otay River channel as delineated in red in Figure 39. The maximum potential diurnal tidal prism of the Pond 15 tidal basin of the Subtidal Alternative is 335 acre ft for an extreme high water event at present sea level. The Subtidal Alternative Pond-15 basin has about 29 acre ft. less potential diurnal tidal prism than the Intertidal Alternative Pond-15 basin due to the disposal of additional dredge fill derived from the subtidal channel of the Subtidal Alternative Floodplain tidal basin.

6.2 Tidal Inundation Simulations of the Subtidal Alternative: Figure 40 gives the flow trajectories and depth averaged tidal currents for the Subtidal Alternative computed by the calibrated TIDE_FEM model during spring flooding tides on 18 September 2009. Velocities of tidal currents are portrayed according to the color coded velocity scale appearing in the lower left corner of the figure. Maximum flooding spring tidal currents at the mouth of the Otay River (in the neighborhood of the Otay Sonde) are about 0.10 m/sec (0.33 ft/sec), and then accelerate in the narrower north/south reach of the channel adjacent to Ponds 10 & 11 to 0.2 m/sec (0.66 ft/sec) where the channel has scoured under existing conditions to equilibrium depths on the order of -2.0 ft NAVD. After passing Pond 10, currents decelerate and then increase to 0.17 m/sec (0.55 ft/sec) near the two pinch points at the railroad bridge, before entering the floodplain tidal basin; where tidal currents entering the tidal basin initially form a well-defined jet at the west bank with speeds of about 0.08 m/s (0.26 ft/sec). This entry jet quickly diverges into a complex set of clockwise rotating eddies that populate the interior of the tidal basin. Eddy speeds in the tidal basin are on the order of 0.02 m/sec (0.07 ft/sec), insufficient to transport fine sand but an important stirring mechanism for mixing the tidal basin water mass to maintain high oxygen levels and to sustain fine silt and clay sized sediment particles in suspension. Maximum flooding spring tidal currents in the inlet channel to Pond #15 are about 0.06 m/sec (0.21 ft/sec), and then decelerate as a weak entry jet with speeds of about 0.05 m/s (0.16 ft/sec). This entry jet also quickly diverges into a complex set of counter rotating eddies that populate the interior of the tidal basin. Eddy speeds in the Pond #15 tidal basin are on the order of 0.01 m/sec (0.03 ft/sec), again insufficient to transport fine sand or cohesive silts, but also providing a stirring mechanism for mixing the Pond #15 water mass to maintain high oxygen levels and to sustain suspension of fine silt and clay sized sediment particles.

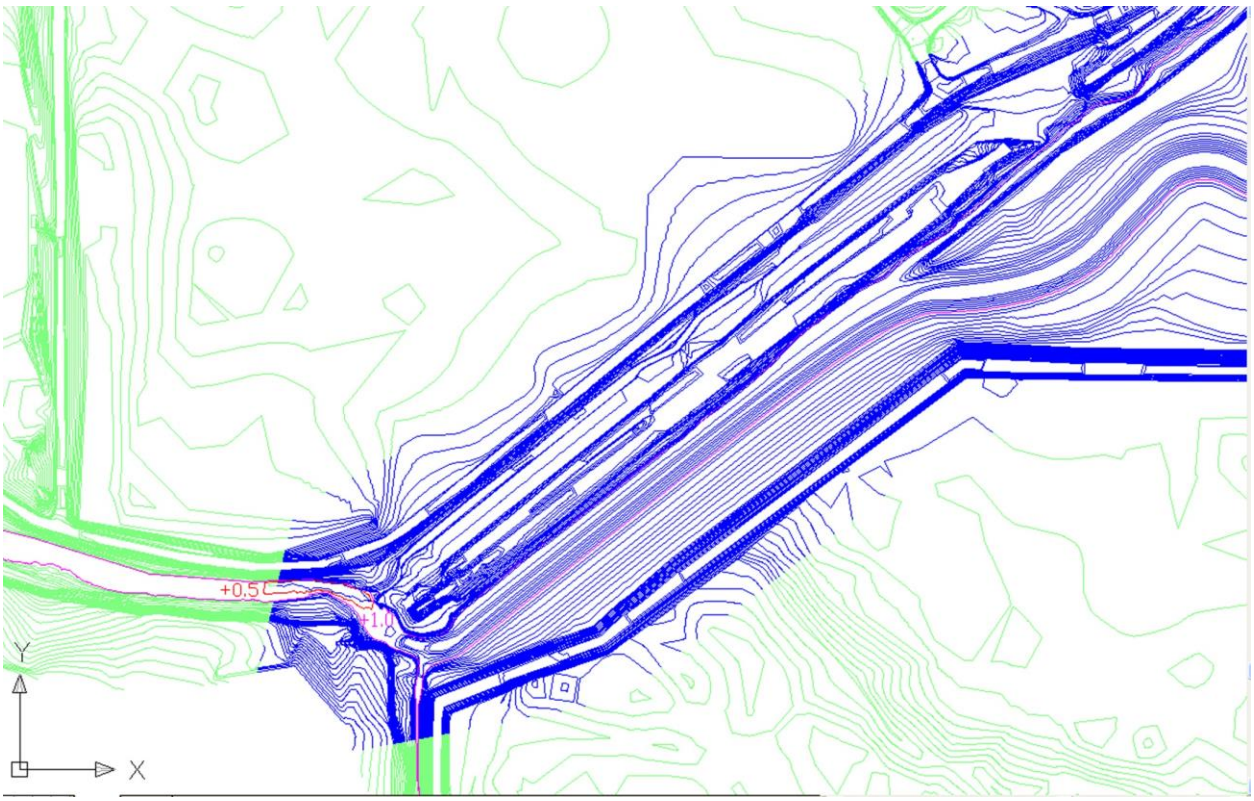


Figure 39: Existing Otay River channel bars and hummocks delineated in red limit drainage of Subtidal Floodplain Tidal Basin. Depth contours in ft. NAVD 88.

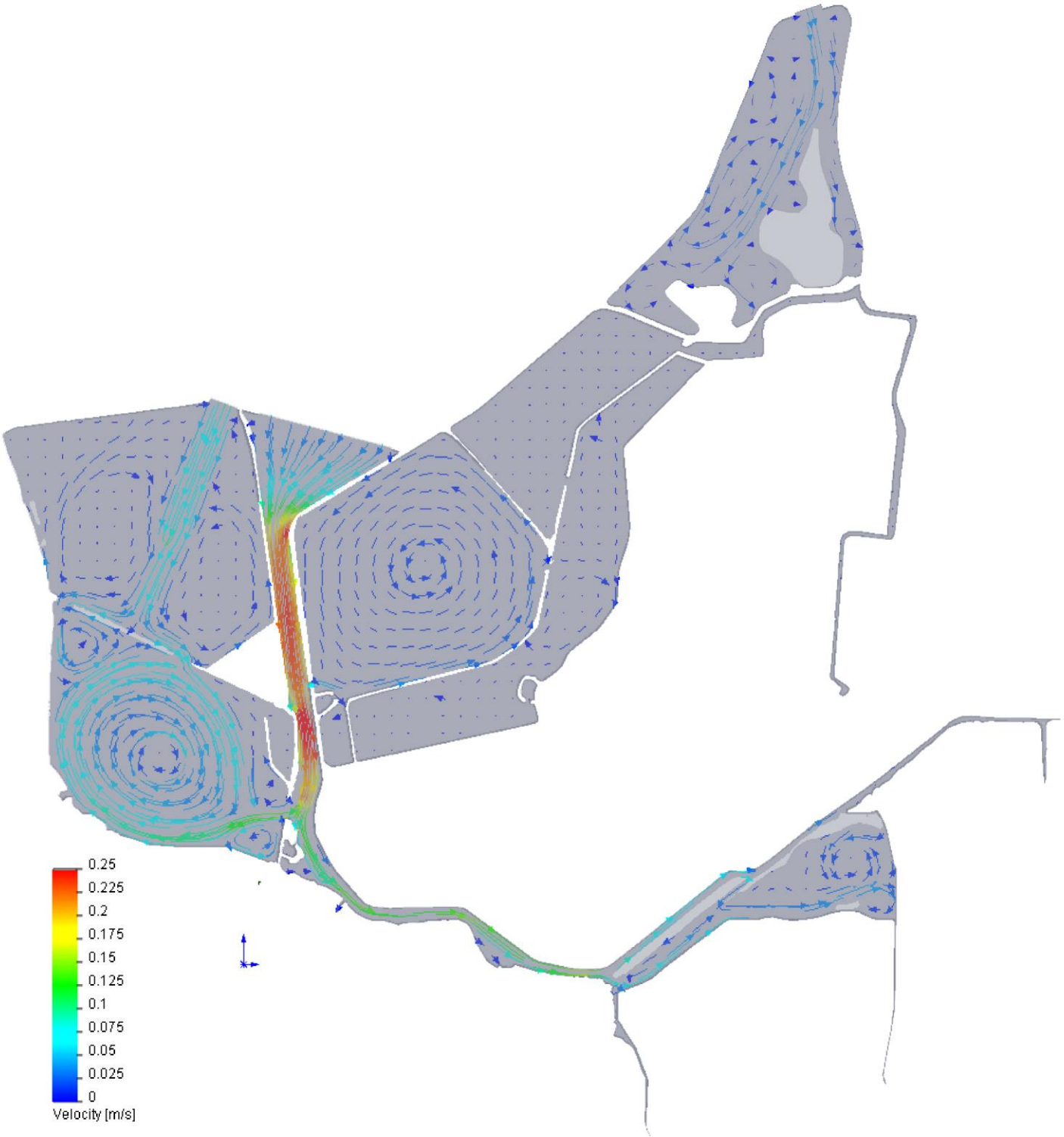


Figure 40: Subtidal Alternative flood tide progressive vector flow simulation at Mean High Water (MHW), where vector trajectories are plotted over 30 minute time integrations.

Figure 41 gives the flow trajectories and depth averaged tidal currents for the Subtidal Alternative computed by the TIDE_FEM model during spring ebbing tides on 18 September 2009. The wetted area of the floodplain tidal basin is significantly reduced relative to the flood tide area in Figure 40, due to the fact that the grading plan allows for almost complete drainage at mean low water tidal stages. In Figure 41, creeping flow drains from the remnant dendritic channel of the floodplain basin, forming a feeder current in the upper river channel with speeds on the order of -0.01 m/sec, or (-0.03 ft/sec). This feeder current evacuates the tidal basin and then accelerates to -0.05 m/sec (-0.16 ft/sec) as it passes through the pinch point under the railroad bridge in the narrow east/west reach of channel. (We adopt the convention of negative velocities for ebb tide flows and positive velocities for flood tide flows). Ebb flow in the channel then accelerates further to -0.091 m/sec (-0.298 ft/sec) in the deeper north/south reach before discharging into San Diego Bay. In Pond #15 during ebb tide flow at mean low water level, the eastern half of the basin is completely drained and exposed, while a week feeder current evacuates the western half with ebb flow of about -0.02 m/sec (-0.07 ft/sec). This feeder current accelerates to about 0.055 m/sec (0.181 ft/sec), as it flows out the inlet of Pond #15, and is far below the threshold scour speed of the sediments along the bank of the Chula Vista Wildlife Reserve.

In Figure 42, tidal current speeds at the mouth of the Otay River for the Subtidal Alternative are simulated throughout an entire spring-neap tidal. These currents (plotted in red) are compared the threshold scour speeds for native river bed channel sediments as derived from the Hjulstrom Curve in Figure 24b based on grain size data in Figure 24a. These thresholds of incipient scour appear as red dashed lines for flood (positive) and ebb flow (negative) velocity sign conventions. It is apparent that ebb and flood flow velocities throughout a spring/neap cycle never reach the thresholds of incipient scour, where maximum flood flow velocity at the mouth of the Otay River is +0.339 ft./sec, while maximum ebb flow velocity reaches only – 0.298 ft./sec under the Subtidal Alternative. These flood and ebb flow maximums are consistent with the progressive vector simulations in Figures 40 & 41. Figure 43 gives the corresponding spring/neap velocity time series at the inlet to Pond 15 of the Subtidal Alternative. Because of the large non-equilibrium cross section engineered for this inlet, velocities are considerably less than at the mouth of the Otay River. For Pond 15, maximum flood flow velocity at the inlet is +0.206 ft./sec, while maximum ebb flow velocity reaches only – 0.181 ft./sec, slightly less than the Pond-15 results of the Intertidal Alternative (due to smaller tidal prism), and well below the threshold scour speeds for the native sediments estimated to be +/- 0.66 ft./sec from the the Hjulstrom Curve in Figure 24b. Tidal current speeds between 0.27 ft/ sec (0.08 m/sec) and 0.66 ft/sec would lead to bed load transport but not erosion. Erosion and scour would only occur for tidal currents that exceed 0.66 ft/sec, while currents less 0.27 ft/sec would yield deposition. Therefore the mouth of the Otay River would be in steady state equilibrium that is neither depositional nor erosional under the Subtidal Alternative. However, the inlet to Pond 15 under the Subtidal Alternative could be depositional if there is an active sediment source nearby. However no such source appears to exist, other than perhaps very minimal and undocumented sediment yield from the Palomar Ditch during occasional El Nino floods. Littoral sediment transport by waves is generally de minimis due to the limited fetch across South San Diego Bay, and the inlet to Pond 15 is sheltered from direct wave exposure by the causeway of the Chula

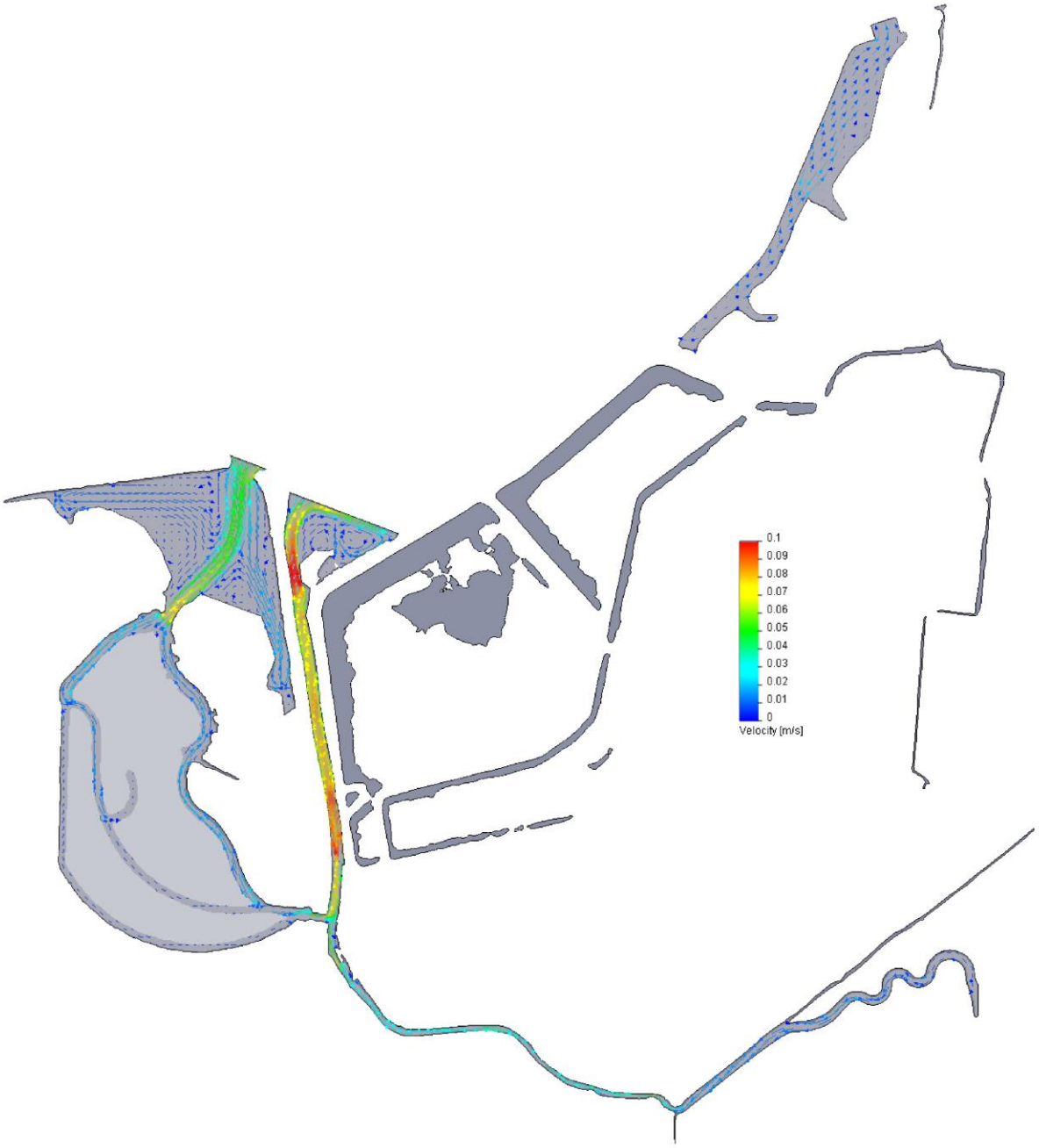


Figure 41: Subtidal Alternative ebb tide progressive vector flow simulation at Mean Low Water (MLW), where vector trajectories are plotted over 30 minute time integrations.

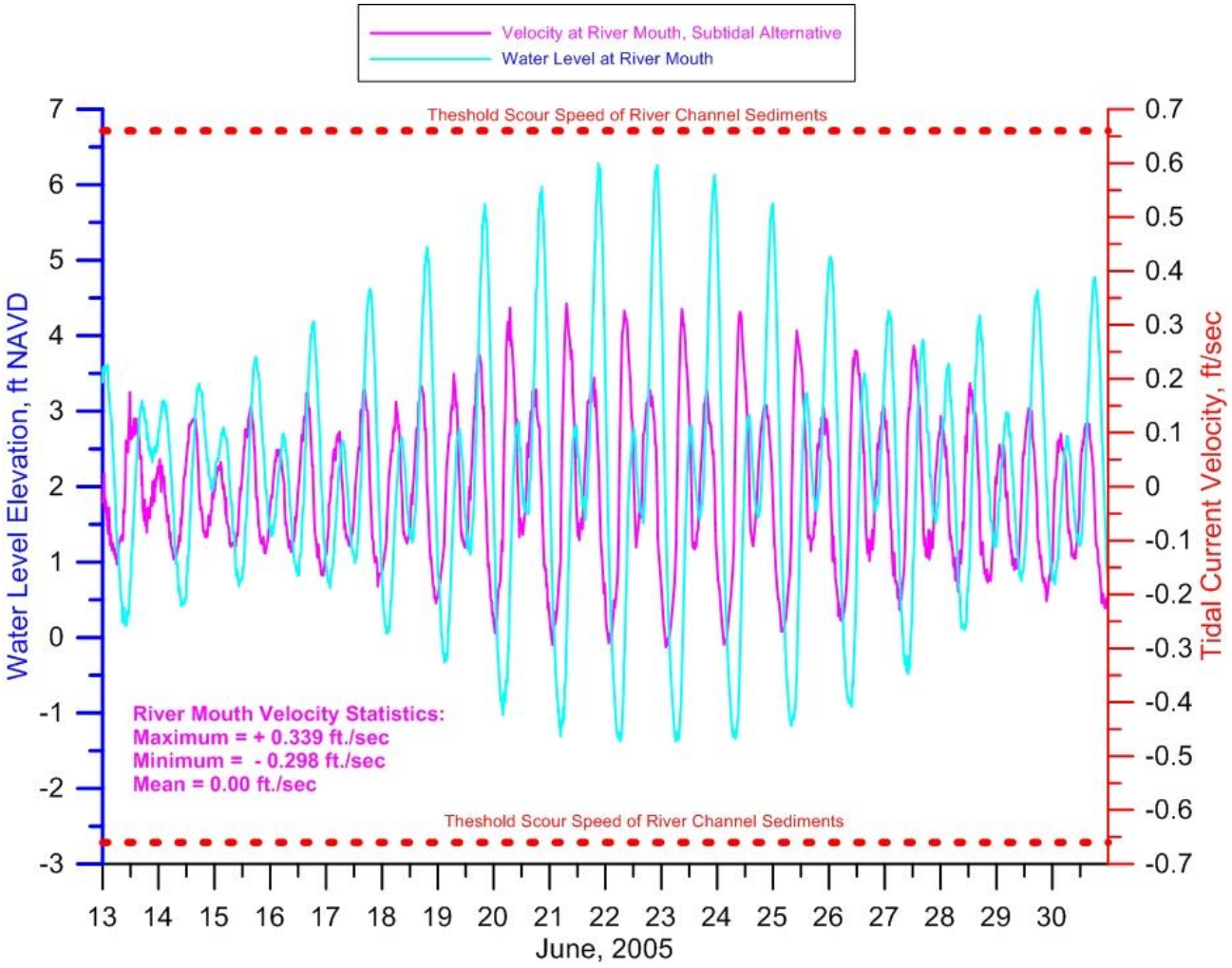


Figure 42: Tidal current speeds at the mouth of the Otay River as computed in magenta for the Subtidal Alternative throughout a spring-neap tidal cycle shown in cyan. Threshold scour speeds for native river bed channel sediments shown as red dashed lines for flood and ebb flow conditions.

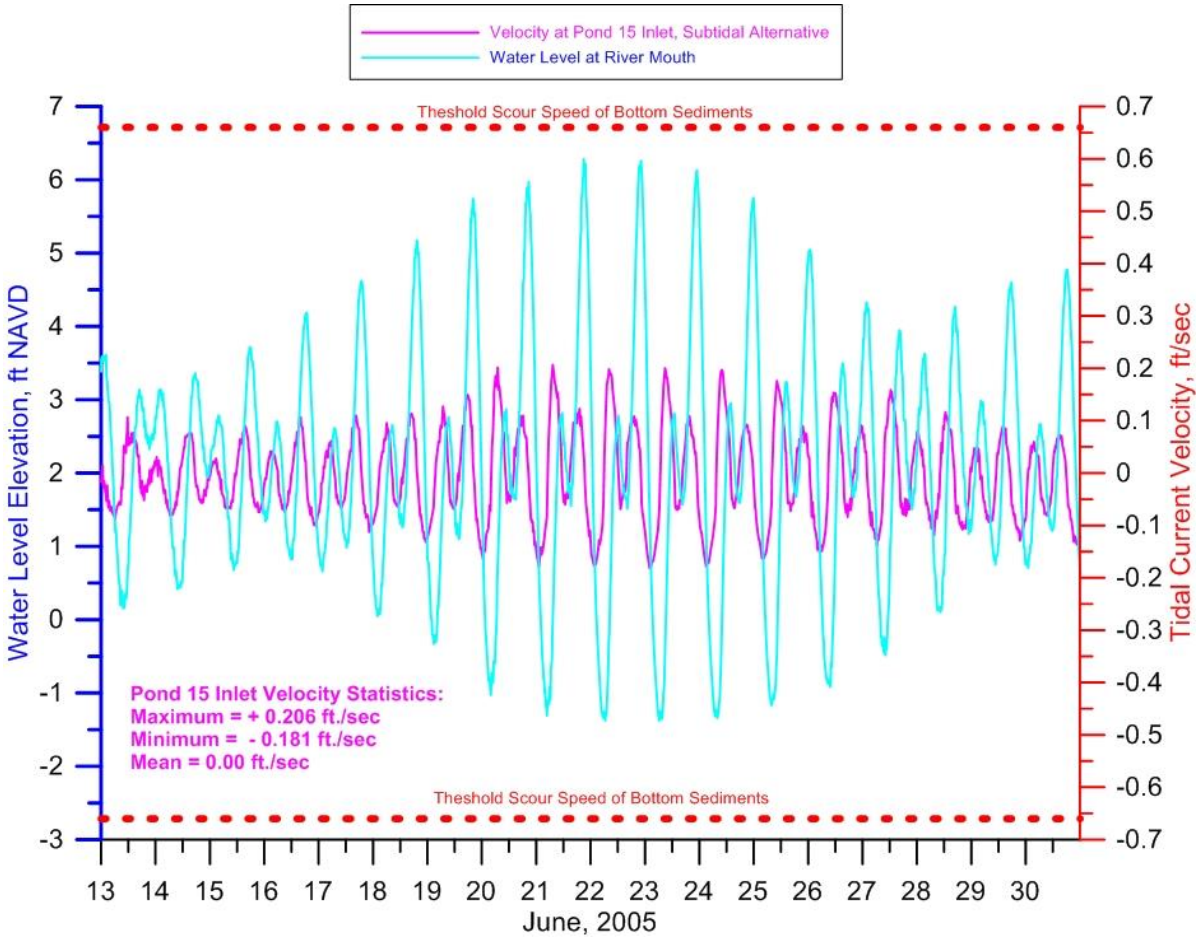


Figure 43: Tidal current speeds at the inlet to Pond 15 as computed in magenta for the Subtidal Alternative throughout a spring-neap tidal cycle shown in cyan. Threshold scour speeds for native river bed channel sediments shown as red dashed lines for flood and ebb flow conditions.

Vista Nature Reserve (cf. Figure 1).

Therefore, we conclude both source water inlets to the tidal basins of the Subtidal Alternative are stable and immune to closure or restriction by sedimentation under dry weather tidal exchange. Inlet sedimentation due to influxes of wave driven long-shore transport of sand (as occurs on the open coast), does not occur in the fetch limited environment of South San Diego Bay. The mouth of the Otay River supplying source water to the floodplain tidal basin is in a dynamic steady-state equilibrium that is neither depositional nor erosional, while the inlet toPond 15 will remain in a non-equilibrium stationary state (as-built) in the absence of a local sediment sources or adequate fluid forcing by waves and currents to import sediment from more distant sources.

Water elevations in the Subtidal Alternative floodplain basin are shown in Figure 44 for spring tides that occurred during 14-18 September, 2009, the same time period used for the model calibration with the proxy tidal system at San Dieguito Lagoon in Figure 20. Figure 44 provides a comparison between the water levels in the Subtidal Alternative floodplain tidal basin as predicted by the model (magenta trace) versus the actual San Diego Bay water level measurements (cyan) reported by the Otay Sonde. The Subtidal Alternative floodplain tidal basin water level variations in red are found to lag the Bay water levels by as much as 26 minutes at higher high water (HHW) levels on flooding tides while this phase lag averages 2.42 hours at lower low water (LLW) level during ebb tides. These phase lags are an unavoidable consequence to frictional impedance and depth limited tidal propagation speeds down the 7,000 ft long channel that connects the floodplain tidal basin with the Bay. Lower low water levels in the Subtidal Alternative floodplain tidal basin are as much as 1.28 ft above South Bay water levels at the mouth of the Otay River due to the grading design which allows the floodplain basin to fully drain at LLW. The auto spectra of the water levels in the floodplain tidal basin of the Subtidal Alternative are nearly indistinguishable from the spectra found for the Intertidal alternative in Figure 33.

The hydroperiod function (used to calculate the habitat acreage creation of the Subtidal Alternative) is calculated by the model for both present and future extremes of sea level in the year 2050 from estimates of both maximum and minimum sea level rise. Using the methods detailed in Sections 3.2 and 3.4 for providing long-term, locally relevant tidal forcing for the model, the hydroperiod functions are calculated at present and future sea levels for the Subtidal Plan floodplain basin in Figure 45 and for the Pond #15 basin in Figure 46. The elevation breaks (zonation) between the different wetland habitat types from the hydroperiod curves are summarized in Tables 7 and Tables 8. The elevations for the habitat breaks in these figures and tables are applied to the KTUA grading designs and yield the acreages of habitat creation listed in Table 9 at present sea level, and at 2050 sea levels in Table 10. Comparing Table 5 from Section 5.2 with Table 9 below, it is apparent that the Intertidal Alternative creates an additional 1.37 acres of habitat in 2018 than does the Subtidal Alternative.

For all possible sea level scenarios, the elevation limit of subtidal habitat in the floodplain basin (Figure 45) is limited by existing bars, hummocks and other channel bottom features at the inlet and inside the branch channel into this basin that create an inlet sill at 0.0 ft NAVD 88. The Subtidal Alternative calls for no construction dredging of the existing Otay River channel so as not to disrupt existing habitat residing down-river from the inlet to the proposed floodplain basin.

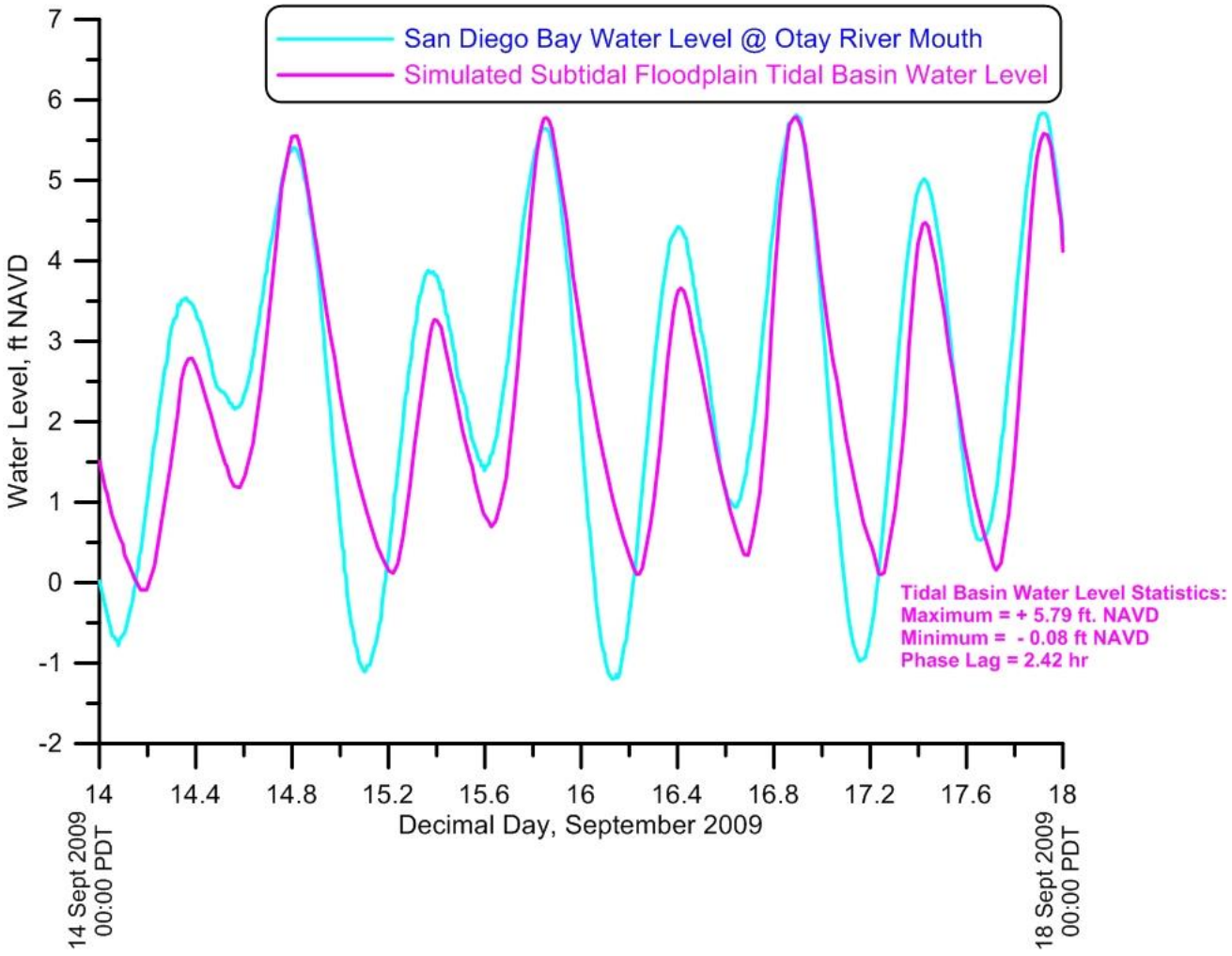


Figure 44: Water level elevations at the mouth of the Otay River (cyan) compared to model simulation of Subtidal Alternative floodplain basin water levels (magenta) during spring tides, 14-18 September 2009.

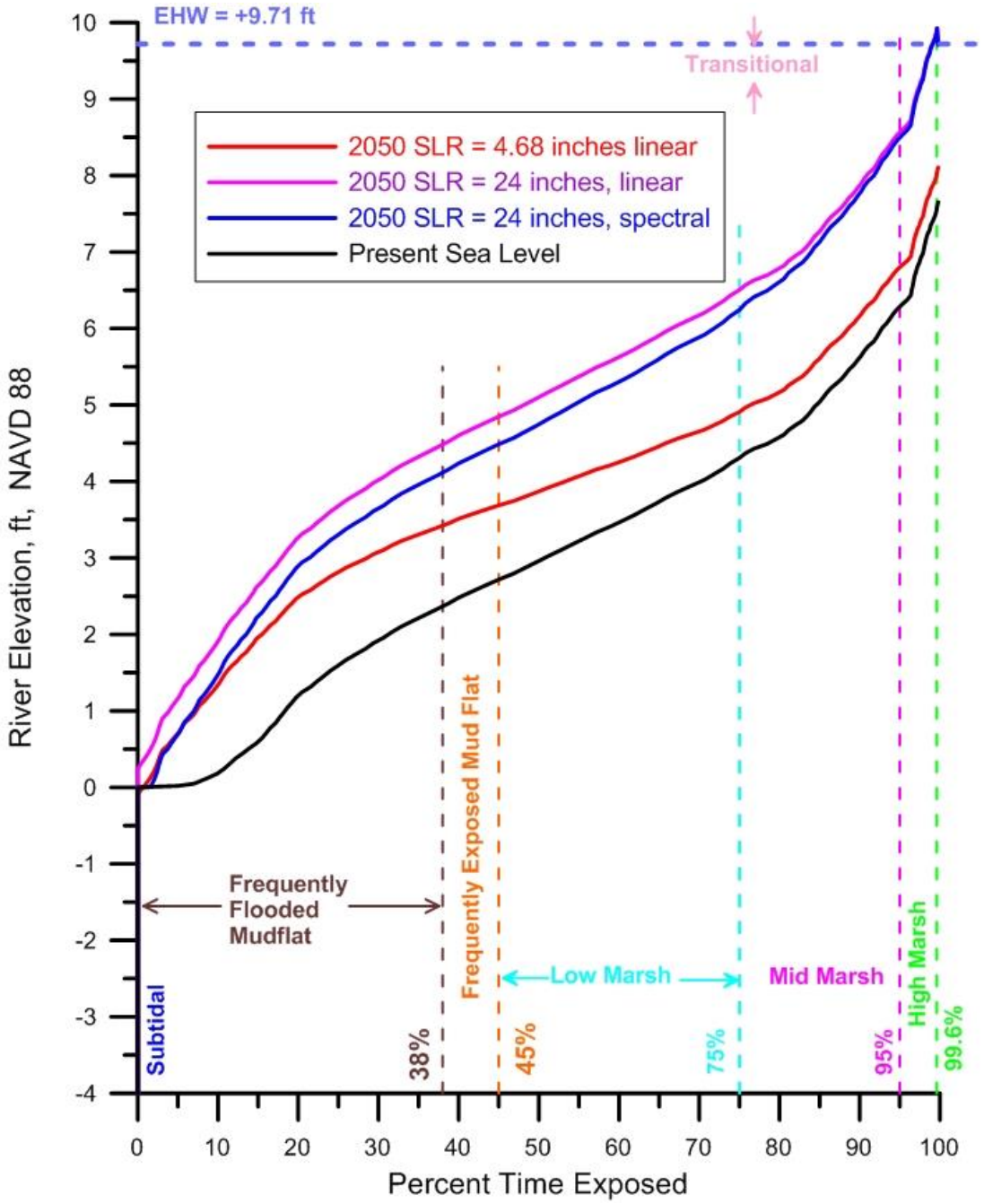


Figure 45: Hydroperiod Function for Subtidal Alternative, Otay Floodplain Tidal Basin for present sea level and 2050 sea level rise per CAT OPC guidance. Based on Otay Habitat Survey Data Evaluated By Josselyn (2012) and water level data from NOAA tide gage #941-0170, with spectral correction from Otay River Sonde. Manning's roughness, *n0* =0.0261

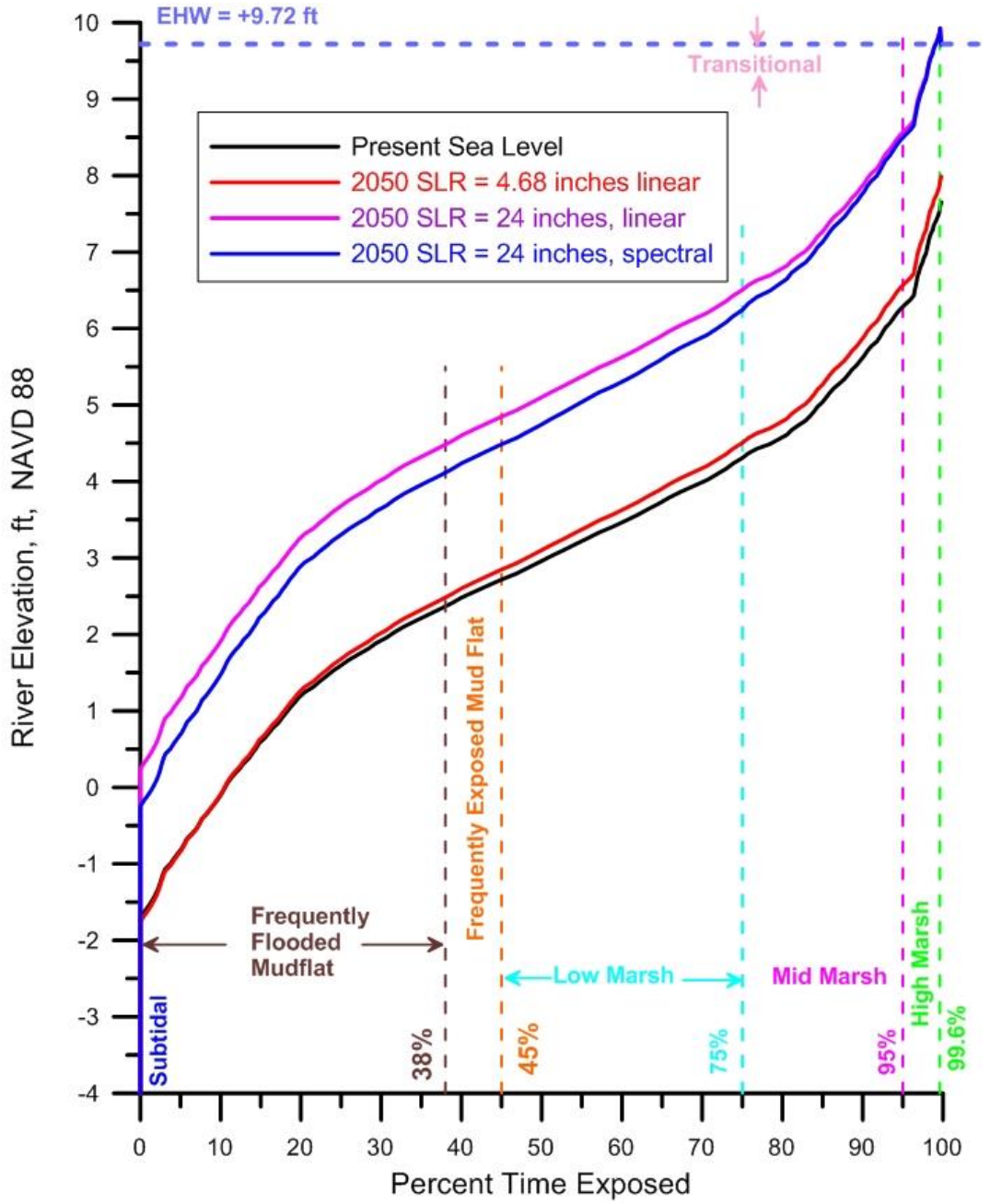


Figure 46: Hydroperiod Function for the Subtidal Alternative Pond #15 Tidal Basin for present sea level and 2050 sea level rise per CAT OPC guidance. Based on Otay Habitat Survey Data Evaluated By Josselyn (2012) and water level data from NOAA tide gage #941-0170, with spectral correction from Otay River Sonde. Manning's roughness, *n0* =0.0261.

Table 7: Elevations of Upper Limits of Habitat Breaks in the Subtidal Plan Floodplain Basin

Elevation of Habitat Breaks (Units of ft. NAVD 88)	@ Present Sea Level	@ 4.68 in. linear Sea Level Rise	@ 24 in. linear Sea Level Rise	@ 24 in. spectral Sea Level Rise
Sub-tidal	0.00 ft.	0.00 ft.	0.25 ft.	0.00 ft.
Frequently Flooded Mud Flat	2.38 ft.	3.40 ft.	4.50 ft.	4.15 ft.
Frequently Exposed Mud Flat	2.70 ft.	3.70 ft.	4.85 ft.	4.50 ft.
Low Marsh	4.30 ft.	4.90 ft.	6.52 ft.	6.25 ft.
Mid Marsh	6.27 ft.	6.80 ft.	8.55 ft.	8.50 ft.
High Marsh	7.55 ft.	8.10 ft.	9.71 ft.	9.71 ft.

Table 8: Elevations of Upper Limits of Habitat Breaks in the Subtidal Plan Pond 15 Basin

Elevation of Habitat Breaks (Units of ft. NAVD 88)	@ Present Sea Level	@ 4.68 in. linear Sea Level Rise	@ 24 in. linear Sea Level Rise	@ 24 in. spectral Sea Level Rise
Sub-tidal	-1.65 ft.	-1.70 ft.	0.25 ft.	-0.20 ft.
Frequently Flooded Mud Flat	2.35 ft.	2.50 ft.	4.50 ft.	4.15 ft.
Frequently Exposed Mud Flat	2.70 ft.	2.85 ft.	4.85 ft.	4.50 ft.
Low Marsh	4.30 ft.	4.50 ft.	6.50 ft.	6.25 ft.
Mid Marsh	6.30 ft.	6.55 ft.	8.55 ft.	8.50 ft.
High Marsh	7.50 ft.	7.90ft.	9.72 ft.	9.72 ft.

Table 9: Subtidal Alternative Predicted Habitat Distribution, acres, 2018

Vegetation Community to be Created	Otay River Floodplain Site Acres	Pond 15 Site
Subtidal	4.48	9.17
Mudflat – Frequently Flooded	5.26	14.70
Mudflat – Frequently Exposed	1.79	1.32
Low Marsh	8.64	11.77
Mid Marsh	7.90	33.25
High Marsh	1.64	11.78
Total Salt Marsh	29.71	82.00
Transitional	0.45	2.15
Total Created Habitat	**29.26**	**79.85**

Table 10: Subtidal Alternative Predicted Habitat Distribution, acres, 2050

Vegetation Community to be Created	Otay River Floodplain Site Acres	Pond 15 Site
Subtidal	4.48	9.0
Mudflat – Frequently Flooded	110.01	15.28
Mudflat – Frequently Exposed	1.70	1.58
Low Marsh	5.43	12.68
Mid Marsh	6.71	41.20
High Marsh	0.52	3..06
Total Created Habitat	**29.85**	**82.80**

That existing down-river habitat consists of additional mud flat residing below – 0.0 ft NAVD 88 and subtidal habitat below -1.01 ft NAVD 88 (cf. Section 4). Low tide drainage of the Pond # 15 (see Figure 46) is constrained by the tidal muting of the South Bay Shelf (cf. Sections 3.2 & 3.4), which varies with sea level. At present sea level, Pond # 15 will not drain below – 1.65 ft. NAVD 88, producing the subtidal footprint shown in Figure 41. However, with a moderate amount of sea level rise, the linear SLR = 4.68 in. solution indicates a moderate improvement in drainage to – 1.70 ft NAVD 88. If sea level were to rise by 2 ft. according to the maximum sea level rise prediction in 2050, the available tidal range is not sufficient to prevent a rise in subtidal elevations in Pond # 15. This amount of sea level rise will raise the elevations of the zonation of all habitat types (Figure 46). This upward displacement of wetland zonation is largest for the linear superposition scenario, because the spectral correction scenario predicts a larger tidal range of about 1.0 ft. Under the 24 in. spectral sea level rise scenario at 2050, intertidal wetland habitat would begin at an elevation of -0.20 ft NAVD, and the mud flat habitat would reside about 0.4 ft. to 0.5 ft. lower than under the linear super-position scenario; while the low marsh habitat would reside about 0.25 ft. lower than under the linear super-position scenario. Therefore there are some apparent differences between the habitat mix predictions of these two sea-level rise prediction methods; although both give the same estimate of the maximum elevation of high salt marsh wetland zonation in both of the proposed basins of the Subtidal Alternative (cf. Tables 7 & 8).

6.3) Residence Time of the Subtidal Alternative: A discussion at the beginning of Section 5.3 details the calculus of residence time and how it represents the average amount of time source water spends in a particular tidal system. Figure 47 gives the TIDE_FEM hydrodynamic simulations of the time for dilution of old water in each of the tidal systems (inlet channel + tidal basin) of the Subtidal Alternative. Figure 47 presents the model results of residence time of South Bay water in the tidal basins of the Subtidal Alternative for the Otay River floodplain basin (blue) and the Pond #15 basin (red). Residence time of South Bay water is 2.5 days in the floodplain basin and 3 days in the Pond#15 basin. Residence time in the floodplain basin is 0.5 days longer than for the Intertidal Alternative in Section 5.3 because a residual of 29 acre ft. in the subtidal channel of the Subtidal Alternative fails to drain at mean lower low water levels. Regardless, the residence time numbers for the Subtidal Alternative are

rather good for marginalizing potential dissolve oxygen depletion, although the DO of South Bay water can become quite low during evaporative summer time conditions (cf. Section 3,3). Maximum diurnal tidal prisms at present sea levels are 100 acre ft. (4.4 million cubic ft.) for the proposed Otay River floodplain basin; and 335 acre ft. (14.6 million cubic ft.) for the proposed Pond #15 basin.

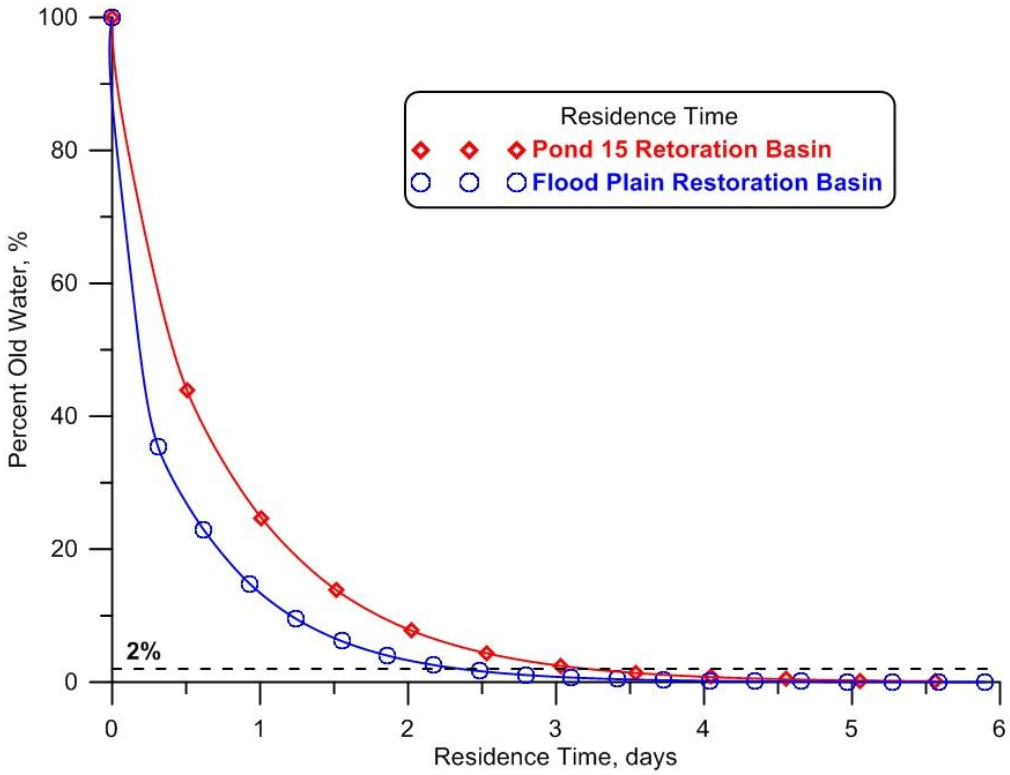


Figure 47: Residence time of South Bay water in the tidal basins of the Subtidal Alternative: Otay River floodplain basin (blue); Pond #15 basin (red).

7.0) Summary and Conclusions:

This study employs a well-tested and peer-reviewed hydrodynamic model to evaluate the tidal hydraulics the Intertidal Alternative and the Subtidal Alternative for the Otay River Estuary Restoration Project (ORERP). Both alternatives involve restoration of a portion of the Otay River Floodplain Site and Pond 15 Site to native habitat by lowering the existing ground elevations in the Otay River Floodplain Site and using the excavated soils from the Otay River Floodplain Site as fill material in the Pond 15 Site.

The model, analysis methods, and supporting data bases used herein are the same as those utilized in the Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the San Dieguito Wetland Restoration Project, (EIR/EIS, 2000), and for the preparation of the San Dieguito Wetlands Restoration Project, Final Restoration Plan, (SCE, 2005). The analysis is based on updated bathymetry provided by Wetlands Research Associates (WRA) and latest updates to San Diego Bay tides for the 1983-2001 tidal epoch supported by Otay Sonde tidal elevation measurements at the mouth of the Otay River. The computer models used in this study are 2-dimensional finite element types, built from some well-studied and proven computational methods and numerical architecture that have been successful in predicting shallow water tidal propagation. Monitoring data for the newly completed San Dieguito Lagoon Restoration Project was used to calibrate tidal hydraulics model. San Dieguito Lagoon was selected as a calibration proxy for the restoration alternatives because of morphologic similarities: in particular, both the San Dieguito and restoration sites have a long "goose-neck" feeder channel connecting source water to interior tidal basins of comparable acreage and distance from the source water. Habitat surveys conducted during the San Dieguito Lagoon Restoration Project by Josselyn & Whelchel (1999), and then later updated by vegetation surveys in the lower Otay River flood plain by Josselyn (2012), were used to develop functional relationships between habitat breaks and amounts of time for wetting and drying (hydroperiod functions). The hydroperiod functions were calculated by the model for both present and future extremes of sea level in the year 2050 from estimates of both maximum and minimum sea level rise. These relationships were used to transpose tidal hydraulics model output into calculations of acreage of various wetland habitat types created by the two restoration alternatives.

The elevation breaks (zonation) between the different wetland habitat types from the modeled hydroperiod curves are summarized below in Tables S-1 and S-2 for the Intertidal Alternative; and in Tables S-3 and S-4 for the Subtidal Alternative. The elevations for the habitat breaks in these tables are applied to the KTUA grading designs and yield the acreages of habitat creation listed in Table S-5 for the Intertidal Alternative at present sea level, and at 2050 sea levels in Table S-6.The companion set of habitat creation acres for the Subtidal Alternative are listed in Table S-7 at present sea level, and in Table S-8 at 2050 sea levels. Comparing Tables S-5 and S-7, it is apparent that the Intertidal Alternative creates an additional 1.37 acres of habitat in 2018 than does the Subtidal Alternative. For all possible sea level scenarios, the elevation limit of subtidal habitat in the floodplain basin of both restoration alternatives is limited by existing bars, hummocks and other channel bottom features at the inlet and inside the branch channel into this basin. These channel bottom features create an inlet sill at 0.0 ft NAVD 88. However, if sea level were to rise by 2 ft. according to the maximum sea level rise prediction in

2050, the available tidal range is not sufficient to prevent a rise in subtidal elevations in Pond # 15 of either restoration alternative. This amount of sea level rise will raise the elevations of the zonation of all habitat types. This upward displacement of wetland zonation is largest for the linear superposition scenario of sea level rise, because the spectral correction scenario predicts a larger tidal range of about 1.0 ft. Under the 24 in. spectral sea level rise scenario at 2050, intertidal wetland habitat would begin at an elevation of between -0.25 ft. and -0.20 ft NAVD, and the mud flat habitat would reside about 0.4 ft. to 0.5 ft. lower than under the linear super-position scenario; while the low marsh habitat would reside about 0.25 ft. lower than under the linear super-position scenario. Therefore there are some apparent differences between the habitat mix predictions of these two sea-level rise prediction methods; although both give the same estimate of the maximum elevation of high salt marsh wetland zonation in both of the proposed basins of the restoration alternatives.

From model simulations of tidal currents throughout complete spring-neap tidal cycles, it is concluded that both source water inlets to the tidal basins of the Intertidal and Subtidal Alternatives are stable and immune to closure or restriction by sedimentation under dry weather tidal exchange. (Wet-weather conditions are addressed in a companion study, Everest, 2014). Inlet sedimentation due to influxes of wave driven long-shore transport of sand (as occurs on the open coast), does not occur in the fetch limited environment of South San Diego Bay. The mouth of the Otay River that supplies source water to the floodplain tidal basin is in a dynamic steady-state equilibrium that is neither depositional nor erosional; while the inlet to Pond 15 will remain in a non-equilibrium stationary state (as-built) in the absence of a local sediment sources or adequate fluid forcing by waves and currents that might otherwise import sediment from more distant sources.

Table S-1: Elevations of Upper Limits of Habitat Breaks Intertidal Plan Floodplain Basin

Elevation of Habitat Breaks (Units of ft. NAVD 88)	@ Present Sea Level	@ 4.68 in. linear Sea Level Rise	@ 24 in. linear Sea Level Rise	@ 24 in. spectral Sea Level Rise
Sub-tidal	0.00 ft.	0.00 ft.	0.25 ft.	0.00 ft.
Frequently Flooded Mud Flat	2.40 ft.	3.40 ft.	4.50 ft.	4.10 ft.
Frequently Exposed Mud Flat	2.70 ft.	3.70 ft.	4.85 ft.	4.45 ft.
Low Marsh	4.30 ft.	4.90 ft.	6.55 ft.	6.25 ft.
Mid Marsh	6.30 ft.	6.80 ft.	8.55 ft.	8.50 ft.
High Marsh	7.55 ft.	8.05 ft.	9.71 ft.	9.71 ft.

Table S-2: Elevations of Upper Limits of Habitat Breaks in the Intertidal Plan Pond 15 Basin

Elevation of Habitat Breaks (Units of ft. NAVD 88)	@ Present Sea Level	@ 4.68 in. linear Sea Level Rise	@ 24 in. linear Sea Level Rise	@ 24 in. spectral Sea Level Rise
Sub-tidal	-1.65 ft.	-1.70 ft.	0.25 ft.	-0.25 ft.
Frequently Flooded Mud Flat	2.40 ft.	2.50 ft.	4.50 ft.	4.10 ft.
Frequently Exposed Mud Flat	2.70 ft.	2.85 ft.	4.85 ft.	4.45 ft.
Low Marsh	4.30 ft.	4.50 ft.	6.50 ft.	6.25 ft.
Mid Marsh	6.30 ft.	6.55 ft.	8.55 ft.	8.50 ft.
High Marsh	7.50 ft.	7.90ft.	9.72 ft.	9.72 ft.

Table S-3: Elevations of Upper Limits of Habitat Breaks in the Subtidal Plan Floodplain Basin

Elevation of Habitat Breaks (Units of ft. NAVD 88)	@ Present Sea Level	@ 4.68 in. linear Sea Level Rise	@ 24 in. linear Sea Level Rise	@ 24 in. spectral Sea Level Rise
Sub-tidal	0.00 ft.	0.00 ft.	0.25 ft.	0.00 ft.
Frequently Flooded Mud Flat	2.38 ft.	3.40 ft.	4.50 ft.	4.15 ft.
Frequently Exposed Mud Flat	2.70 ft.	3.70 ft.	4.85 ft.	4.50 ft.
Low Marsh	4.30 ft.	4.90 ft.	6.52 ft.	6.25 ft.
Mid Marsh	6.27 ft.	6.80 ft.	8.55 ft.	8.50 ft.
High Marsh	7.55 ft.	8.10 ft.	9.71 ft.	9.71 ft.

Table S-4: Elevations of Upper Limits of Habitat Breaks in the Subtidal Plan Pond 15 Basin

Elevation of Habitat Breaks (Units of ft. NAVD 88)	@ Present Sea Level	@ 4.68 in. linear Sea Level Rise	@ 24 in. linear Sea Level Rise	@ 24 in. spectral Sea Level Rise
Sub-tidal	-1.65 ft.	-1.70 ft.	0.25 ft.	-0.20 ft.
Frequently Flooded Mud Flat	2.35 ft.	2.50 ft.	4.50 ft.	4.15 ft.
Frequently Exposed Mud Flat	2.70 ft.	2.85 ft.	4.85 ft.	4.50 ft.
Low Marsh	4.30 ft.	4.50 ft.	6.50 ft.	6.25 ft.
Mid Marsh	6.30 ft.	6.55 ft.	8.55 ft.	8.50 ft.
High Marsh	7.50 ft.	7.90ft.	9.72 ft.	9.72 ft.

Table S-5: Intertidal Alternative Predicted Habitat Distribution, acres 2018

Vegetation Community to be Created	Otay River Floodplain Site Acres	Pond 15 Site
SubTidal	0.00	9.53
Mudflat – Frequently Flooded	4.45	16.36
Mudflat – Frequently Exposed	0.70	1.57
Low Marsh	10.34	15.73
Mid Marsh	10.99	34.47
High Marsh	3.23	5.61
Total Marsh	29.26	80.68
Transitional	0.45	2.59
Total Created Habitat	**29.71**	**83.27**

Table S-6: Intertidal Alternative Predicted Habitat Distribution, acres 2050

Vegetation Community to be Created	Otay River Floodplain Site Acres	Pond 15 Site
SubTidal	0	9.35
Mudflat – Frequently Flooded	8.84	17.06
Mudflat – Frequently Exposed	2.21	1.85
Low Marsh	7.91	17.32
Mid Marsh	10.36	35.38
High Marsh	0.52	2.87
Total Created Habitat	**29.84**	**83.83**

Table S-7: Subtidal Alternative Predicted Habitat Distribution, acres, 2018

Vegetation Community to be Created	Otay River Floodplain Site Acres	Pond 15 Site
Subtidal	4.48	9.17
Mudflat – Frequently Flooded	5.26	14.70
Mudflat – Frequently Exposed	1.79	1.32
Low Marsh	8.64	11.77
Mid Marsh	7.90	33.25
High Marsh	1.64	11.78
Total Salt Marsh	29.71	82.00
Transitional	0.45	2.15
Total Created Habitat	**29.26**	**79.85**

Table S-8: Subtidal Alternative Predicted Habitat Distribution, acres, 2050

Vegetation Community to be Created	Otay River Floodplain Site Acres	Pond 15 Site
Subtidal	4.48	9.0
Mudflat – Frequently Flooded	110.01	15.28
Mudflat – Frequently Exposed	1.70	1.58
Low Marsh	5.43	12.68
Mid Marsh	6.71	41.20
High Marsh	0.52	3..06
Total Created Habitat	**29.85**	**82.80**

REFERENCES

Batchelor, G. K., 1970, *An Introduction to Fluid Dynamics*, Cambridge at the University Press, 615 pp

Boland, J. M., "Water quality monitoring of San Dieguito Lagoon", prepared for *California Coastal Commission*, 15 pp.

Chadwick, D.B. 1997. Tidal Exchange at the Bay-Ocean Boundary. Ph.D. diss., University of California, San Diego.

Chadwick, D.B., J.L. Largier and R.T. Cheng. 1996. The role of thermal stratification in tidal exchange at the mouth of San Diego Bay. Proceedings of the 7th International Conference on the Physics of Estuaries and Coastal Seas, American Geophysical Union (submitted).

Coastal Environments, 2009, "2009 Monitoring Program for San Dieguito Lagoon: Topography, Hydrology, and Water Quality Surveys", submitted to Southern California Edison Company, 134 pp + app.

Connor, J. J. and J. D. Wang, 1973, "Finite element modeling of two-dimensional hydrodynamic circulation," MIT Tech Rpt., #MITSG 74-4, p. 1-57.

EIR/EIS, 2000, Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the San Dieguito Wetland Restoration Project.

Elwany, M. H. S., R. E. Flick, M. White, and K. Goodell, 2005, "Agua Hedionda Lagoon Hydrodynamic Studies," prepared for Tenera Environmental, 39 pp. + appens.

Everest, 2014 "Fluvial Analysis of the Otay River Estuary Restoration Plan", submitted to Poseidon Water, LLC, 75pp.

Flick, R. E. & D. R. Cayan, 1984, "Extreme sea levels on the coast of California," Coastal Engineering 1984, *Proc. 19th Int. Conf. (Houston)*, Amer. Soc. Civil Eng., New York, p. 886-96.

Gallagher, R. H., 1981, Finite Elements in Fluids, John Wiley & Sons, New York, 290pp.

ICLEI (2012), "Sea Level Rise Adaptation Strategy for San Diego Bay," January 2012, prepared by *ICLEI-Local Governments for Sustainability USA*, 66 pp.

Intergovernmental Panel on Climate Change (IPCC). 2007. *Climate Change 2007: Synthesis Report for the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Available Online: www.ipcc.ch/pdf/assessmentreport/ar4/syr/ar4_syr.pdf

Jenkins, S. A. & D. L. Inman, 1999, "Sand transport mechanics for equilibrium tidal inlets," *Shore & Beach* (Magoon Volume, Jan 99), v. 67, n. 1, p. 53–58.

Jenkins, S. A. & J. Wasyl, 1996, Wave Transport Corrections to the Inlet Closure Problem of the San Dieguito Lagoon CA,, submitted to *Southern California Edison Co.*, 101 pp.

Jenkins, S. A. & J. Wasyl, 1998, Analysis of Coastal Processes Effects due to the San Dieguito Lagoon Restoration Project: Final Report, submitted to *Southern California Edison Co.*, 333 pp.

Jenkins, S. A. & J. Wasyl, 1999a, Performance and Optimization of the Mixed Habitat Plan in Long-Term Inundations Simulation, submitted to Southern *California Edison Co.*, 62 pp. + 8 appens.

Jenkins, S. A. & J. Wasyl, 1999b, Long-Term Inundation Simulations of Alternative Restoration Plans* for the San Dieguito Lagoon, CA, submitted to *Southern California Edison Co.*, 57 pp.

Jenkins, S. A. & J. Wasyl, 1999c, Long-Term Tidal Inundation Frequency Analysis for Credit Evaluation of the San Dieguito Lagoon Restoration Alternatives, submitted to *Southern California Edison Co.*, 10 pp. + 8 appens.

Jenkins, S. A., M. Josselyn & J. Wasyl, 1999, Hydroperiod and Residence Time Functions for Habitat Mapping of Restoration Alternatives for San Dieguito Lagoon, submitted to *Southern California Edison Co.*, 30 pp. + 1 appen.

Jenkins, S. A. and J. Wasyl, 2005, "Coastal evolution model," Scripps Institution of Oceanography Tech. Rpt. No. 58, 179 pp. + appendices. http://repositories.cdlib.org/sio/techreport/58/

Jenkins, S. A. and J. Wasyl, 20101, "Tidal Hydraulics of Wetlands Restoration Alternatives in the Otay River Flood Plain, Carlsbad Desalination Project Marine Life Mitigation Plan" submitted to Poseidon Resources Corp., 75pp.

Josselyn, M. & A. Whelchel, 1999, Determining the Upper Extent of Tidal Marsh Habitat San Dieguito Lagoon, submitted to *Southern California Edison Co.*, 16 pp.

Josselyn, M., 2012, "TECHNICAL MEMORANDUM ELEVATIONS OF INTERTIDAL VEGETATION PROJECTIONS FOR ORERP" WRA, submitted Poseidon Resources, Corp, 17 February, 2012, 5pp.

Largier, J. , 1995, "A study of the circulation of water in San Diego Bay for the purpose of assessing, monitoring and managing the transport and potential accumulation of pollutants and sediment in San Diego Bay", submitted to California Water Resources Control Board, 19 pp. + app.

Longuet-Higgins, M.S., 1953, “Mass transport in water waves”, *Phil. Trans. R. Soc. Lond*., v. A245, pp535-581.

SCE, 2005, “ San Dieguito Wetlands Restoration Project, Final Restoration Plan” submitted to California Coastal Commission, prepared by Southern California Edison Company, November, 2005, 265 pp.

NOAA, 2013, “Verified/Historical Water Level Data” http://tidesonline.nos.noaa.gov

USACE, 1991, State of the Coast Report, San Diego Region, Coast of California Storm and Tidal Waves Study, *U. S. Army Corps of Engineers*, Los Angeles District, Chapters 1-10, Appen. A-I, 2 v.

Wang, P. F., Cheng, R. T., Richter, K., Gross, E. S., Sutton, D., and Gartner, J. W. (1998). “Modeling Tidal Hydrodynamics of San Diego Bay, California.” J. Amer. Water Res. Assoc., 34 (5), 1123-1140.

Weiyan, T., 1992, Shallow Water Hydrodynamics, Water & Power Press, Hong Kong, 434 pp.

Zedler, J. B. & G. W. Cox, 1985, “Characterizing wetland boundaries: a Pacific Coast example,” *Wetlands*, 4, p. 43-55.

Final: 20 January 2016

Technical Note on Possible Tidal Hydraulics Impacts of the Otay River Estuary Restoration Plan (ORERP) on Nestor Creek and the Upper Otay River Intertidal Zone

by: Scott A. Jenkins, Ph. D

ABSTRACT: The output of tidal hydraulics modeling results detailed in Appendix D of the draft EIR were re-evaluated to consider potential project impacts on areas outside the project boundaries, specifically Nestor Creek and the upper reach of the Otay River intertidal zone up-river from the Bayshore Bikeway Bridge**.** Based on comparisons of hydroperiod functions pre- and post-project, it is concluded that either restoration alternative under the ORERP (the *Intertidal* or *Subtidal Alternatives*) have a negligible effect on tidal inundation in the upper reach of the Otay River; and result in a slight reduction of tidal muting and improvement in high water tidal inundation of Nestor Creek.

1.0) Introduction: This technical note is a response to the following comment (4.3.1) on the draft EIR for the Otay River Estuary Restoration Plan (ORERP) that was made by the U.S. Army Corps of Engineers (USACE).

> *4.3.1 Impacts on Habitat and Vegetation Communities; direct impacts; Habitat and Vegetation Communities/Jurisdictional Waters; What about the indirect impacts to Nestor Creek or the Otay River based on altering the elevations and hydrology near these areas? Will there be a hydrologic change that could alter the functioning of waters?*

Responses to this comment are based on numerical tidal hydraulics modeling in the existing Otay River floodplain and on modeling of the tidal exchange in the floodplain after construction of either of two restoration alternatives for the ORERP, namely: *The Intertidal Plan*, and *The Sub-tidal Plan.* The details of the tidal hydraulics modeling are found in Appendix-D of the draft EIR. Appendix-D is entitled, "Tidal Hydraulics Analysis of the Otay River Estuary Restoration Plan," 113 pp. Because Nestor Creek and the intertidal reaches of the upper Otay River floodplain are outside the project boundaries of the ORERP, the discussion in the EIR Appendix-D did not explicitly discuss tidal exchange in these areas, although Nestor Creek and the upper Otay River were both included in the model domain. In the following sections we will re-visit those outer reaches of the model domain and elaborate on tidal exchange in the Nestor Creek and the intertidal reaches of the upper Otay River floodplain to provide a quantitative response to the USACE comment (4.3.1).

2.0) Review of Methodology: The EIR tidal hydraulics analysis (Appendix-D) employed a well-tested and peer-reviewed hydrodynamic model (TIDE_FEM) to evaluate the tidal hydraulics of both the existing Otay River floodplain as well as the Intertidal Alternative and the Subtidal Alternative for the Otay River Estuary Restoration Project (ORERP). The model, analysis methods, and supporting data bases used were the same as those utilized in the Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the San Dieguito Wetland Restoration Project, (EIR/EIS, 2000), and for the preparation of the San Dieguito Wetlands Restoration Project, Final Restoration Plan, (SCE, 2005). The analysis of the existing Otay River floodplain was based on updated bathymetry provided by Wetlands Research Associates (WRA) and latest updates to San Diego Bay tides for the 1983-2001 tidal epoch after spectrally

correcting that record to the mouth of the Otay River using tidal elevation measurements from the Otay River Sonde. The TIDE_FEM computer model used in this study are 2-dimensional finite element types, built from some well-studied and proven computational methods and numerical architecture that have been successful in predicting shallow water tidal propagation. Monitoring data for the newly completed San Dieguito Lagoon Restoration Project was used to calibrate the TIDE_FEM tidal hydraulics model. San Dieguito Lagoon was selected as a calibration proxy for the restoration alternatives because of morphologic similarities: in particular, both the San Dieguito and restoration sites have a long "goose-neck" feeder channel connecting source water to interior tidal basins of comparable acreage and distance from the source water. Habitat surveys conducted during the San Dieguito Lagoon Restoration Project by Josselyn & Whelchel (1999), and then later updated by vegetation surveys in the lower Otay River flood plain by Josselyn (2012), were used to develop functional relationships between habitat breaks and amounts of time for wetting and drying (hydroperiod functions). The hydroperiod functions were calculated by the model for both present and future extremes of sea level in the year 2050 from estimates of both maximum and minimum sea level rise. These relationships were used to transpose tidal hydraulics model output into calculations of acreage of various wetland habitat types created by the two restoration alternatives.

3.0) Existing Conditions, Nestor Creek and Upper Otay River Intertidal Zone:

The TIDE_FEM bathymetric computational mesh was initialized for the updated Otay River Floodplain bathymetry derived from the 2011 WRA precision GPS surveys (Figure 1). The TIDE_FEM computational mesh is nested in the farfield of south San Diego Bay, and was subjected to 30 years of historic tidal forcing using the 1980-2009 period of record at the Navy Pier in San Diego Bay, after spectrally correcting that record to the mouth of the Otay River as detailed in Section 3.2 of Appendix-D of the draft EIR. For the purposes of the present analysis, we select six nodal points in the computational mesh to serve as control points for evaluating the hydroperiod functions both pre- and post-project in Nestor Creek and the intertidal zone of the Otay River. These control pints are shown by the stars in Figure 1, all of which are located upriver from the Bayshore Bikeway Bridge and feeder channel to the proposed Floodplain Basin of the ORERP.

Peak flooding currents during spring tides (using 18 September 2009 as a proxy) were simulated in the existing river channel in Figure 2, while ebbing currents during spring tides are found in Figure 3. These progressive vector diagrams show that flooding spring tidal currents are about 0.1 m/sec (0.33 ft/sec) at the river mouth and then accelerate to 0.18 m/sec (0.59 ft/sec) in the deeper sections of the inlet channel (north/south reach of the Otay River adjacent Ponds 10 and 11). Further upriver, currents reach 0.15 m/sec (0.50 ft/sec) in the narrower east/west reach near the railroad bridge. Flood tide currents then decelerate to less than 0.01 m/sec (0.03 ft/sec) into the complex dendritic system of channels in the upper reaches of the intertidal zone of the Otay River and Nestor Creek. During ebb spring tides, Figure 3 shows that Nestor Creek completely drains while limited tidal inundation remains in the shallow SW to NE subtidal reach of the upper Otay River floodplain immediately upriver from the Bayshore Bikeway Bridge.

The hydroperiod function is derived from large numbers of simulations like those in Figures 2 and 3 to find the percentage of exposure for each elevation potentially subjected to tidal inundation throughout the full range of South Bay water level variation. The hydroperiod function is used to discriminate pre- and post-project changes in the tidal inundation of the upper

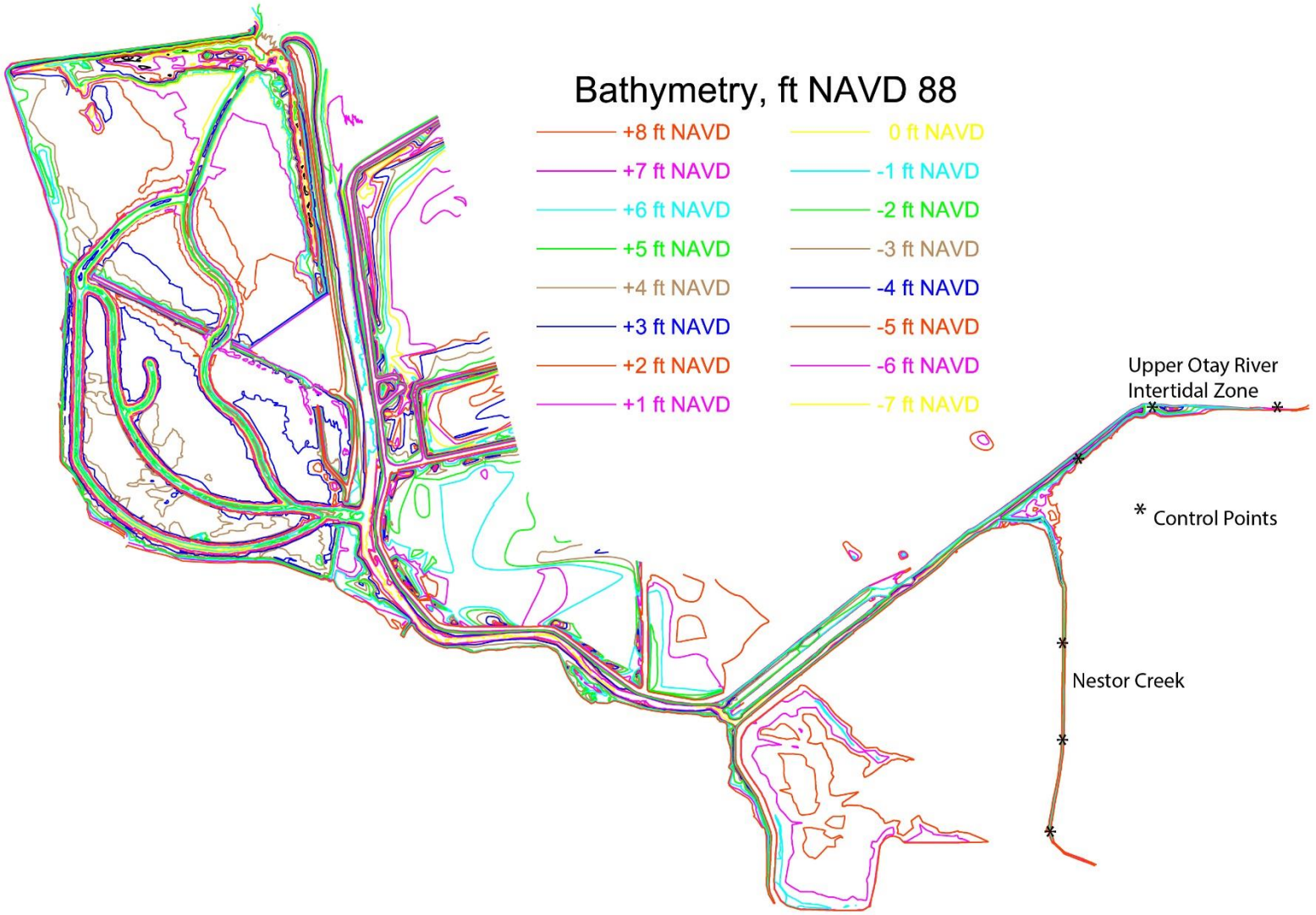


Figure 1: The updated Otay River Floodplain bathymetry derived from the WRA (2011) precision GPS survey. Control points for evaluating tidal exchange pre- and post-project in Nestor Creek and the tidally influenced upper Otay River are designated by stars.



Figure 2: Hydrodynamic simulation of progressive vector flow distribution at 30 min time integration during maximum flood flow during spring tides for the existing lower Otay River and salt pond system based on 2011 WRA bathymetric survey and the 1983-2001 tidal epoch for San Diego Bay tides.

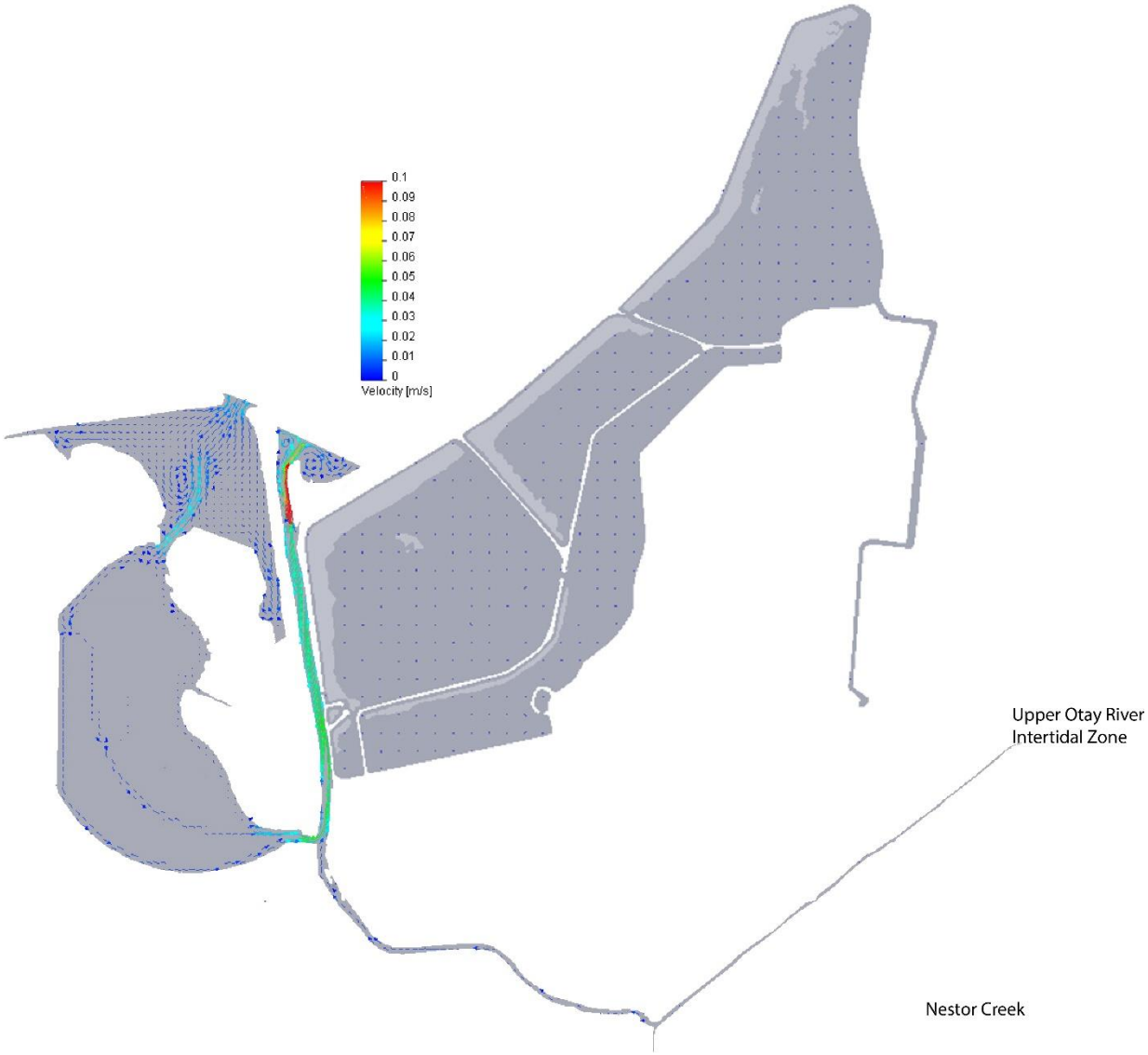


Figure 3: Hydrodynamic simulation of progressive vector flow distribution at 30 min time integration during maximum ebb flow during spring tides for the existing lower Otay River and salt pond system based on 2011 WRA bathymetric survey and the 1983-2001 tidal epoch for San Diego Bay tides.

Otay River and Nestor Creek. The computations involved N_o = 2,629,800 time steps, each 6 minutes in length, in order to sweep the 30 year period of record of San Diego Bay water levels spectrally corrected to the mouth of the Otay River. At each time step the water elevations at the control points in Figure 1, $\hat{\eta}$, were calculated. Conditional if statements and counting loops inserted into the TIDE_FEM code would count the number time steps, *N*, for which the average lagoon water elevation was less than a particular elevation, Z_i. The percent time that elevation Z_i was exposed over the period of record was calculated as:

$$E_i = \frac{100\%}{N_o} \sum N(\hat{\eta} < Z_i) \qquad (1)$$

Equation (1) gives the hydroperiod function at each control point in Figure 1. These are ensemble averaged and the elevations divided among the various sub-tidal and intertidal habitat types based on biological the surveys biological surveys discussed in Section 2 above. The various degrees of exposure for each of these habitat types were determined to be:

TABLE 1: Exposure Levels for Hydroperiod Habitat Breaks

Subtidal Exposure < 0%;
0% < **Frequently Flooded Mud Flat Exposure** < 38%
38% < **Frequently Exposed Mud Flat Exposure** < 45%;
45% < **Low Salt Marsh Exposure** < 75%
75% < **Mid Salt Marsh Exposure** < 95%
95% < **High Salt Marsh Exposure** < 99.6%
99.6% < **Transitional Exposure** < 100%

Figure 4 below gives the hydroperiod functions that were determined by this analysis for the existing upper and lower reaches of the Otay River flood plain, and for Nestor Creek. Here the lower reach of the Otay River extends from the mouth of the Otay River to the Bayshore Bikeway Bridge, site of the legacy railroad bridge where the inlet to the feeder channel of the proposed ORERP Floodplain Basin is located. The upper reach extends from the Bayshore Bikeway Bridge upriver to the furthest point of high water tidal inundation. Comparing the black and red curves in Figure 4 reveals a small degree of high-water tidal muting occurs in the upper reaches in the existing Otay River relative to the lower reach; with extreme high water inundation (EHW) in the upper reach occurring at +7.45 ft NAVD 88, or about 0.25 ft lower than in the lower reach below the Bayshore Bikeway Bridge. Close inspection of Figure 1 reveals that this is attributable to hydraulic control exerted by the Bayshore Bikeway Bridge, whose abutments and channel hardening create a choke point with an associated complex sand bars immediately up-river from Bayshore Bikeway Bridge. These bars create a sill at 0.0 ft NAVD 88 which also limits drainage of the upper reach. Consequently, intertidal habitat in the upper reach does not extend below 0.0 ft NAVD under existing conditions; whereas in the lower reach, intertidal mud flat resides below – 0.0 ft NAVD and subtidal habitat below -1.01 ft NAVD. High water tidal inundation in Nestor Creek is further muted with EHW reaching only 7.0 ft NAVD 88 under existing conditions. This muting begins with the choke point and sand bars at

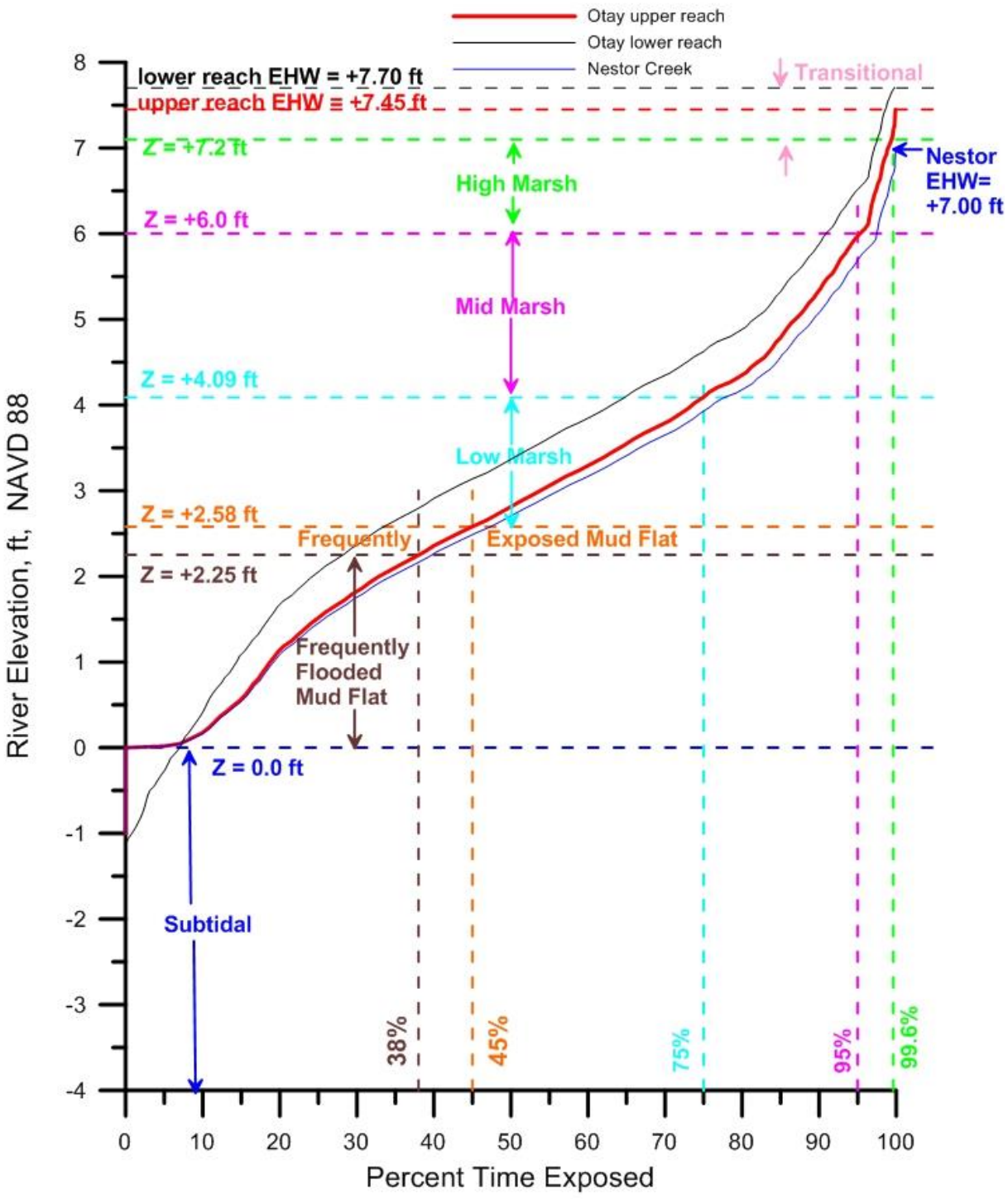


Figure 4. Hydroperiod functions of the existing Otay River lower reach (black), existing Otay River upper reach (red), and existing Nestor Creek (blue) based on WRA 2011 bathymetric survey applied to water level data from NOAA tide gage #941-0170, for tidal epoch 1983-2001, with spectral correction from Otay River Sonde. Mannings roughness: n_0 = 0.0261

the Bayshore Bikeway Bridge and is further exacerbated by the narrow, shallow channel of Nestor Creek which does not extend below 0.0 ft NAVD 88 under existing conditions and is as high as + 1.0 ft NAVD 88 in its backwater reaches. Consequently Nestor Creek completely drains during most ebb tide cycles.

4.0) Post-Project Conditions, Nestor Creek and Upper Otay River Intertidal Zone:

Figure 5 gives the flow trajectories and depth averaged tidal currents for the Intertidal Alternative computed by the calibrated TIDE_FEM model during spring flooding tides, using 18 September 2009 as a proxy. Velocities of tidal currents are portrayed according to the color coded velocity scale appearing in the lower left corner of the figure. Maximum flooding spring tidal currents at the mouth of the Otay River (in the neighborhood of the Otay Sonde) are about 0.10 m/sec (0.33 ft/sec), and then accelerate in the narrower north/south reach of the channel adjacent to Ponds 10 & 11 to 0.2 m/sec (0.66 ft/sec) where the channel has scoured under existing conditions to equilibrium depths on the order of -2.0 ft NAVD. After passing Pond 10, currents decelerate and then increase to 0.17 m/sec (0.55 ft/sec) near the choke point at the Bayshore Bikeway Bridge, before entering the floodplain tidal basin; where tidal currents entering the tidal basin initially form a well-defined jet at the west bank with speeds of about 0.08 m/s (0.26 ft/sec). This entry jet quickly diverges into a complex set of clockwise rotating eddies that populate the interior of the tidal basin. Eddy speeds in the tidal basin are on the order of 0.02 m/sec (0.07 ft/sec), insufficient to transport fine sand but an important stirring mechanism for mixing the tidal basin water mass to maintain high oxygen levels and to sustain fine silt and clay sized sediment particles in suspension. The lower reach of Nestor Creek has been incorporated along the east bank of the Floodplain Basin, thereby widening the channel cross section of Nestor Creek by a factor of 35 to 52; while the upper reach extends beyond of the southeast corner of the Floodplain Basin. The high water footprint of the upper reach of Nestor Creek under the Intertidal Alternative in Figure 5 appears larger relative to existing conditions in Figure 2, suggesting an improvement in high water tidal inundation under post-project conditions. On the other hand, the high water footprint of the upper reach of the Otay River intertidal zone under the Intertidal Alternative in Figure 5 appears about the same as existing conditions in Figure 2. In the lower reach of the Otay River, flood tide currents are swifter post-project than existing conditions, but generally remain below the threshold scour speeds for the native sediments, based on estimates from the Hjulstrom Curve.

Figure 6 gives the flow trajectories and depth averaged tidal currents for the Intertidal Alternative computed by the TIDE_FEM model during spring ebbing tides on 18 September 2009. The wetted area of the floodplain tidal basin is significantly reduced relative to the flood tide area in Figure 28, due to the fact that the grading plan allows for almost complete drainage at mean low water tidal stages. In Figure 6, creeping flow drains from the remnant dendritic channel of the floodplain basin, forming a feeder current in the upper river channel with speeds on the order of -0.01 m/sec, or (-0.03 ft/sec). This feeder current evacuates the tidal basin and then accelerates to -0.05 m/sec (-0.16 ft/sec) as it passes through the pinch point under the railroad bridge in the narrow east/west reach of channel. (We adopt the convention of negative velocities for ebb tide flows and positive velocities for flood tide flows). Ebb flow in the channel then accelerates further to -0.09 m/sec (-0.289 ft/sec) in the deeper north/south reach before discharging into San Diego Bay. Again, ebb tide currents in the lower reach of the Otay River, are swifter post-project than existing conditions, but generally remain below the threshold scour

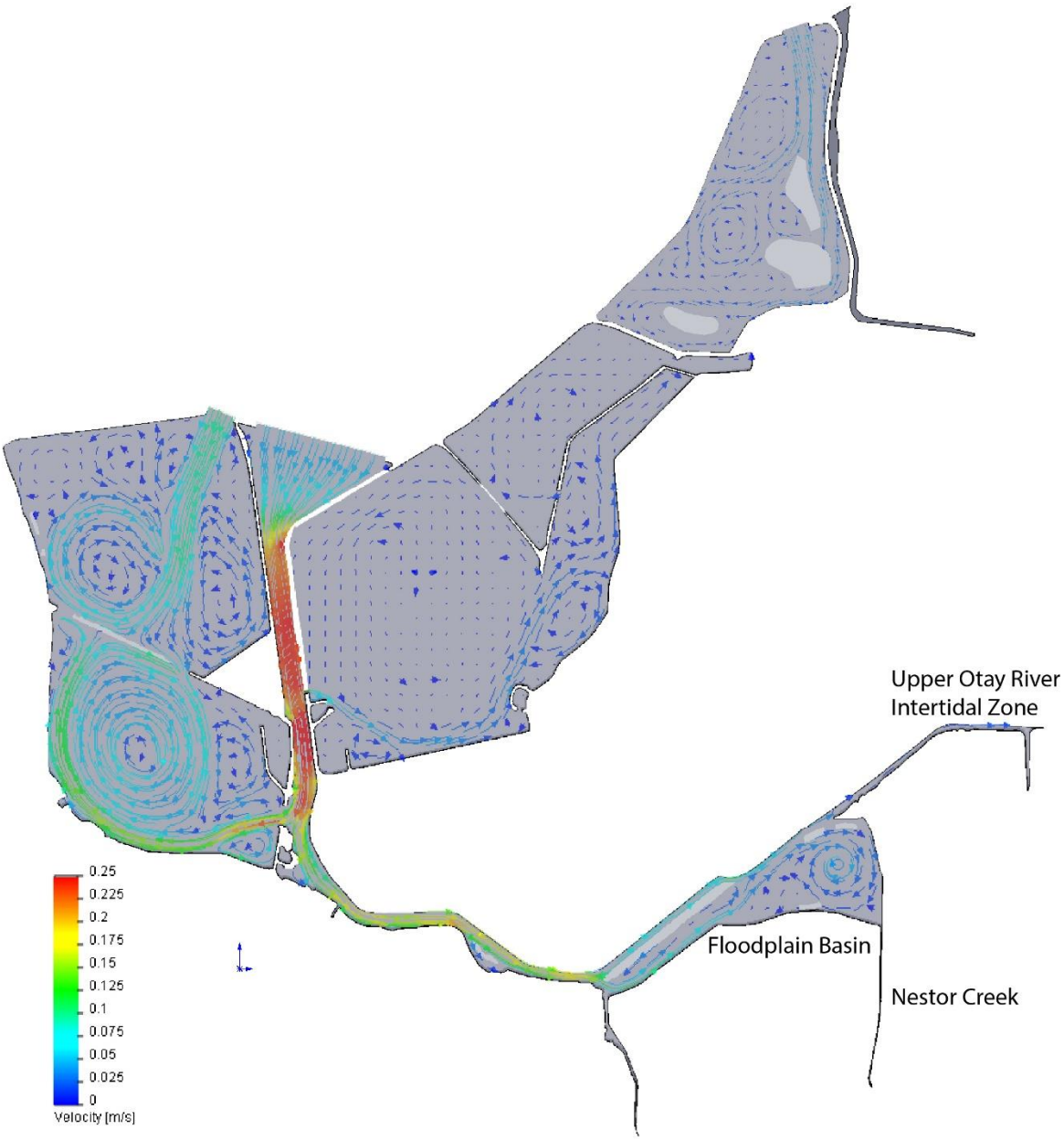


Figure 5: Intertidal Alternative flood tide progressive vector flow simulation at Mean High Water (MHW), where vector trajectories are plotted over 30 minute time integrations.

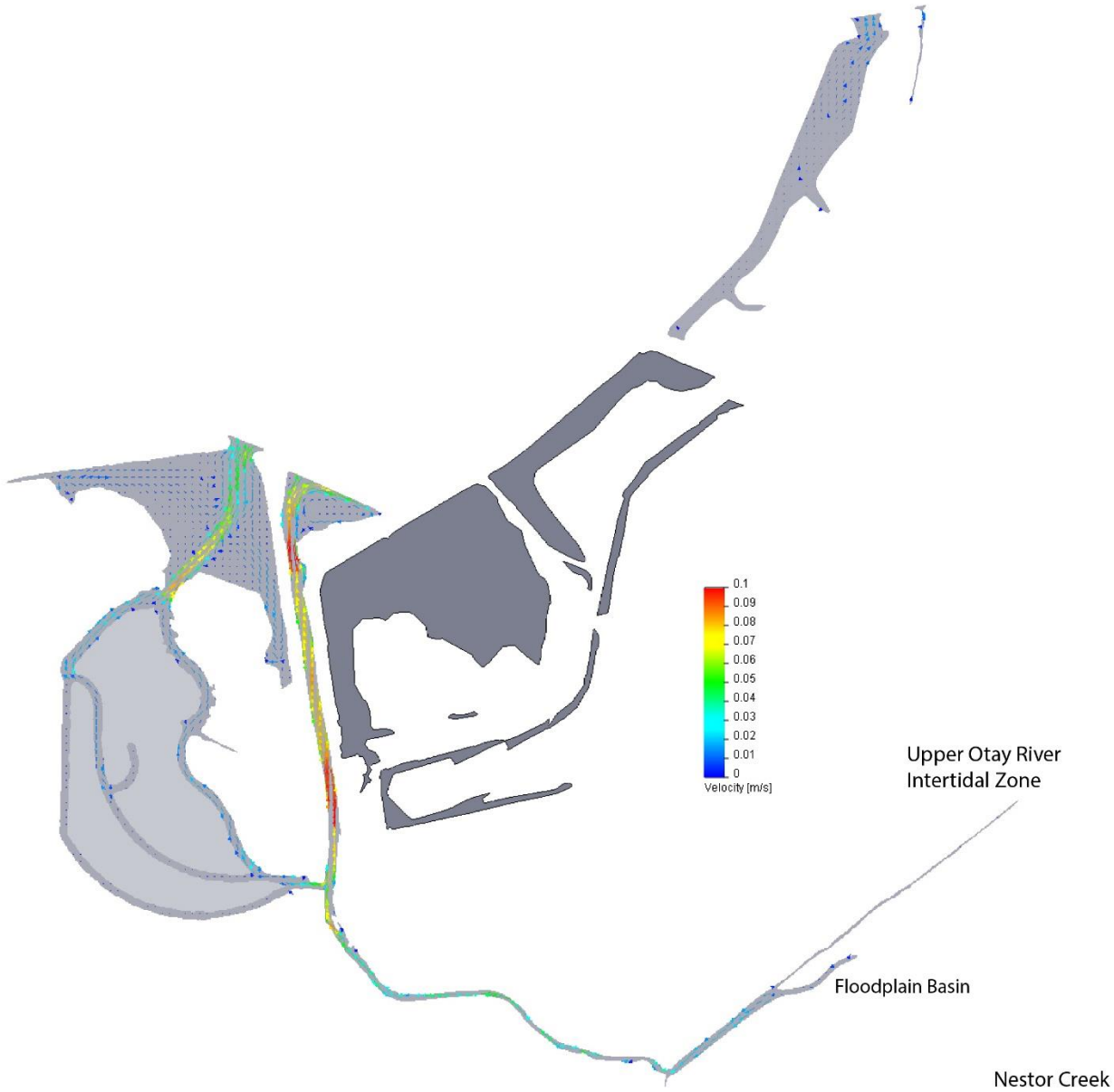


Figure 6: Intertidal Alternative ebb tide progressive vector flow simulation at Mean Low Water (MLW), where vector trajectories are plotted over 30 minute time integrations.

speeds for the native sediments, based on estimates from the Hjulstrom Curve. The low water footprint of Nestor Creek under the Intertidal Alternative in Figure 6 is completely vacated, the same as for existing conditions in Figure 3. The low water footprint of the upper reach ot the Otay River under the Intertidal Alternative in Figure 6 is about the same as for existing conditions in Figure 3, other than for a slight widening at the merge with the feeder channel for the Floodplain Basin.

Figure 7 gives the hydroperiod functions for the upper Otay River intertidal zone and for Nestor Creek under the post-project conditions for the ORERP Intertidal Alternative, as calculated by the procedures reviewed in Section 3. At the resolution of the model, the hydroperiod function for the upper reach of the Otay River in Figure 7 is unchanged from that reported for existing conditions in Figure 4, where both pre- and post-project tidal inundation produce the same extreme high water levels at 7.45 ft. NAVD 88, and both have the same habitat zonations and basement levels of intertidal habitat at 0.0 ft NAVD 88. The reason for this is that hydraulic control for both pre- and post-project conditions in the upper reach is established by the choke point at the Bayshore Bikeway Bridge, a feature that is unchanged by post-project conditions, at least within the rigid-boundary approximations of the TIDE_FEM model. On the other hand, the hydroperiod function for the Nestor Creek in Figure 7 reveals a small degree of reduction in high-tide muting as a result of the Intertidal Alternative, with post project EHW reaching 7.2 ft NAVD 88, or about 0.2 ft higher salt water inundation than existing conditions. The reason for this reduction in the high tide muting of Nestor Creek is that the post project conditions significantly increase its channel cross section, and thereby reduce the frictional damping of high water tidal elevations in Nestor Creek. Both pre- and post-project tidal inundation produce the same basement levels of intertidal habitat at 0.0 ft NAVD 88, while the post-project conditions increase the zonation elevation band for high marsh by about 0.3 ft.

Figure 8 gives the flow trajectories and depth averaged tidal currents for the Subtidal Alternative computed by the calibrated TIDE_FEM model during spring flooding tides, using 18 September 2009 as a proxy. Velocities of tidal currents are portrayed according to the color coded velocity scale appearing in the lower left corner of the figure. Maximum flooding spring tidal currents at the mouth of the Otay River (in the neighborhood of the Otay Sonde) are about 0.10 m/sec (0.33 ft/sec), and then accelerate in the narrower north/south reach of the channel adjacent to Ponds 10 & 11 to 0.2 m/sec (0.66 ft/sec) where the channel has scoured under existing conditions to equilibrium depths on the order of -2.0 ft NAVD. After passing Pond 10, currents decelerate and then increase to 0.17 m/sec (0.55 ft/sec) near the choke point at the Bayshore Bikeway Bridge, before entering the floodplain tidal basin; where tidal currents entering the tidal basin initially form a well-defined jet at the west bank with speeds of about 0.08 m/s (0.26 ft/sec). This entry jet quickly diverges into a complex set of clockwise rotating eddies that populate the interior of the tidal basin. Eddy speeds in the tidal basin are on the order of 0.02 m/sec (0.07 ft/sec), insufficient to transport fine sand but an important stirring mechanism for mixing the tidal basin water mass to maintain high oxygen levels and to sustain fine silt and clay sized sediment particles in suspension. The lower reach of Nestor Creek has been incorporated along the east bank of the Floodplain Basin, thereby widening the channel cross section of Nestor Creek by a factor of 35 to 52; while the upper reach extends beyond of the southeast corner of the Floodplain Basin. The high water footprint of the upper reach of Nestor Creek under the Subtidal Alternative in Figure 8 appears larger relative to existing conditions in Figure 2, suggesting an improvement in high water tidal inundation under post-project conditions. On the other hand, the high water footprint of the upper reach of the Otay

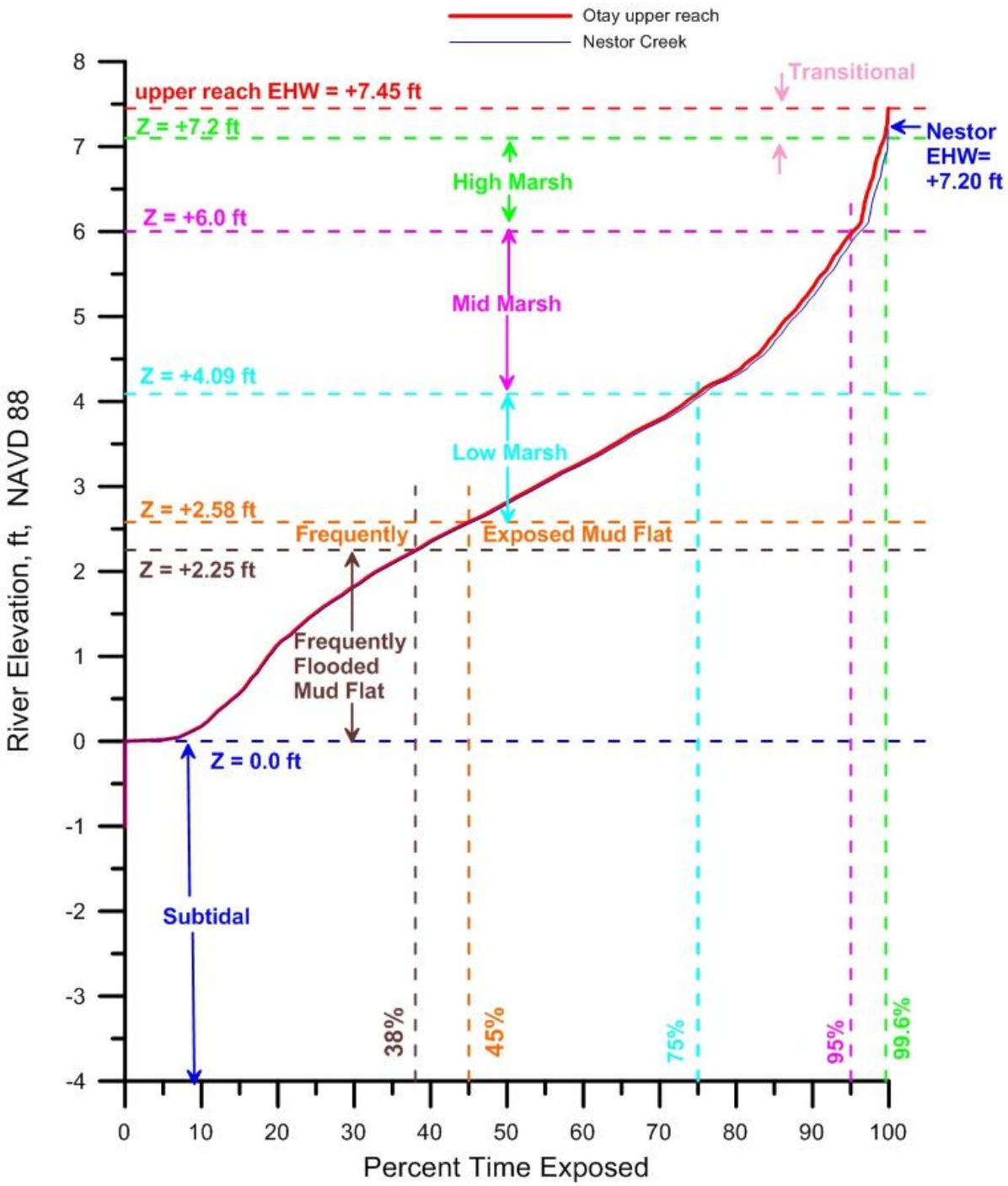


Figure 7. Post-project hydroperiod functions of the Otay River upper reach (red) and Nestor Creek (blue) for the ORERP Intertidal Alternative based on WRA 2011 bathymetric survey applied to water level data from NOAA tide gage #941-0170, for tidal epoch 1983-2001, with spectral correction from Otay River Sonde. Mannings roughness: n_0 = 0.0261

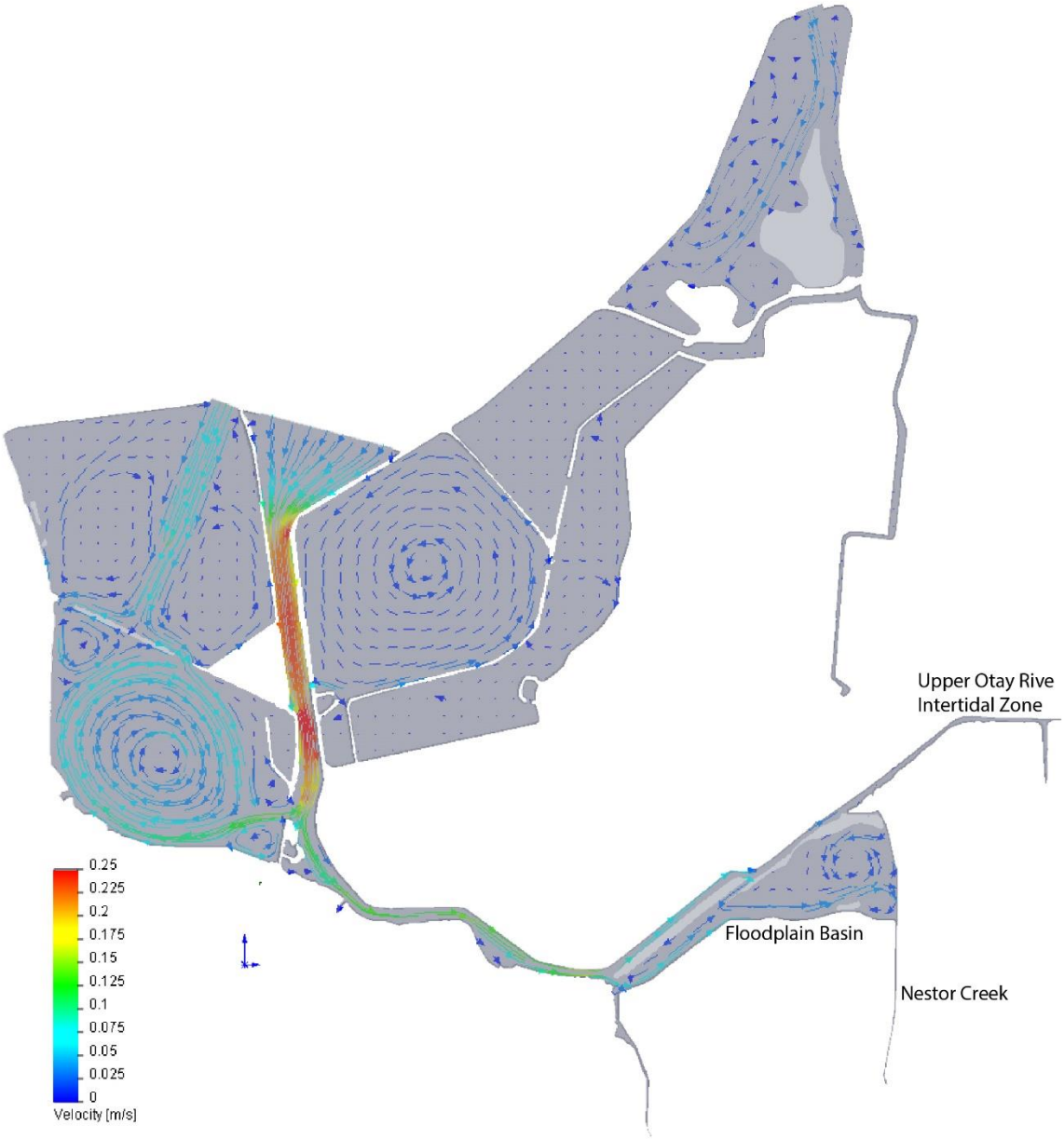


Figure 8: Subtidal Alternative flood tide progressive vector flow simulation at Mean High Water (MHW), where vector trajectories are plotted over 30 minute time integrations.

River intertidal zone under the Subtidal Alternative in Figure 8 appears about the same as existing conditions in Figure 2. In the lower reach of the Otay River, flood tide currents are swifter post-project than existing conditions, but generally remain below the threshold scour speeds for the native sediments, based on estimates from the Hjulstrom Curve.

Figure 9 gives the flow trajectories and depth averaged tidal currents for the Subtidal Alternative computed by the TIDE_FEM model during spring ebbing tides on 18 September 2009. The wetted area of the floodplain tidal basin is significantly reduced relative to the flood tide area in Figure 9, due to the fact that the grading plan allows for almost complete drainage at mean low water tidal stages. In Figure 9, creeping flow drains from the remnant dendritic channel of the floodplain basin, forming a feeder current in the upper river channel with speeds on the order of -0.01 m/sec, or (-0.03 ft/sec). This feeder current evacuates the tidal basin and then accelerates to -0.05 m/sec (-0.16 ft/sec) as it passes through the pinch point under the railroad bridge in the narrow east/west reach of channel. (We adopt the convention of negative velocities for ebb tide flows and positive velocities for flood tide flows). Ebb flow in the channel then accelerates further to -0.09 m/sec (-0.289 ft/sec) in the deeper north/south reach before discharging into San Diego Bay. Again, ebb tide currents in the lower reach of the Otay River, are swifter post-project than existing conditions, but generally remain below the threshold scour speeds for the native sediments, based on estimates from the Hjulstrom Curve. The low water footprint of Nestor Creek under the Subtidal Alternative in Figure 9 is completely vacated, the same as for existing conditions in Figure 3. The low water footprint of the upper reach ot the Otay River under the Subtidal Alternative in Figure 9 is about the same as for existing conditions in Figure 3, other than for a slight widening at the merge with the feeder channel for the Floodplain Basin.

Figures 8 and 9 indicate that flood and ebb velocities and inundation footprints in the Otay River and Floodplain Basin for the Subtidal Alternative are about the same as for the Intertidal Alternative in Figures 5 and 6. This is due to the fact that there is very little difference in the grading designs for the two alternatives, and neither alternative involves any dredging of the existing Otay River channel. The only difference in grading design is that the Subtidal Alternative has a subtidal channel graded down to -2.0 ft NAVD, but the tidal prisms of the two alternatives is about the same; 100 acre-ft. for the Subtidal Alternative as compared to 98 acre-ft. for the Intertidal Alternative. Consequently the hydroperiod functions for the upper Otay River intertidal zone and for Nestor Creek under the post-project conditions for the ORERP Subtidal Alternative in Figure 10 are essentially the same as those for the Intertidal Alternative in Figure 7. Under the Subtidal Alternative, the hydroperiod function for the upper reach of the Otay River in Figure 10 is unchanged from that reported for existing conditions in Figure 4, where both pre- and post-project tidal inundation produce the same extreme high water levels at 7.45 ft. NAVD 88, and both have the same habitat zonations and basement levels of intertidal habitat at 0.0 ft NAVD 88. Again, the reason for this is that hydraulic control for both pre- and post-project conditions in the upper reach is established by the choke point at the Bayshore Bikeway Bridge, a feature that is unchanged by post-project conditions. On the other hand, the hydroperiod function for the Nestor Creek in Figure 10 reveals a small degree of reduction in high-tide muting as a result of the Subtidal Alternative, with post project EHW reaching 7.2 ft NAVD 88, or about 0.2 ft higher salt water inundation than existing conditions. The reason for this reduction in the high tide muting of Nestor Creek is that the post project conditions significantly increase its channel cross section, and thereby reduce the frictional damping of high water tidal elevations in Nestor Creek. Both pre- and post-project tidal inundation produce the same basement levels of

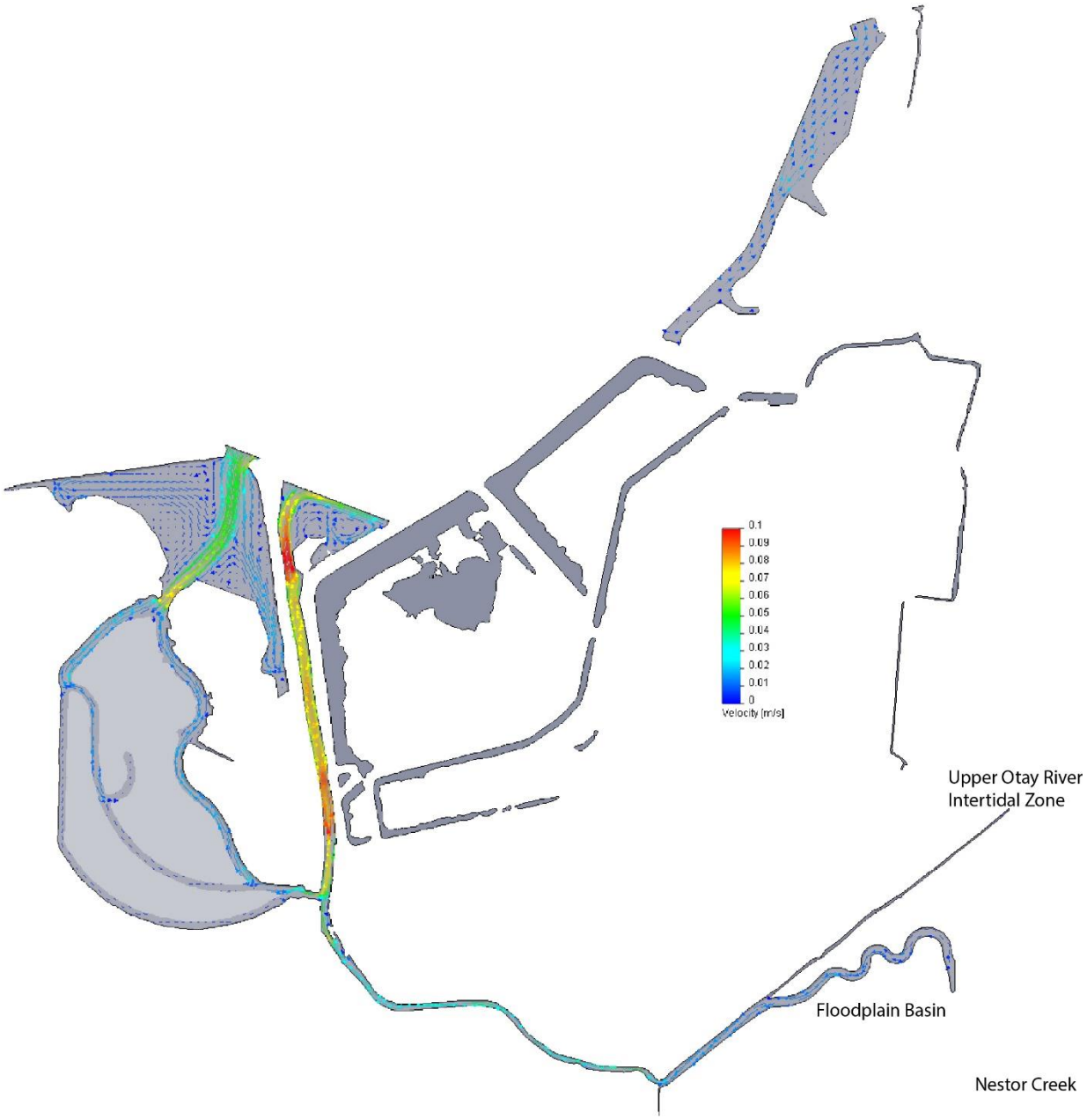


Figure 9: Subtidal Alternative ebb tide progressive vector flow simulation at Mean Low Water (MLW), where vector trajectories are plotted over 30 minute time integrations.

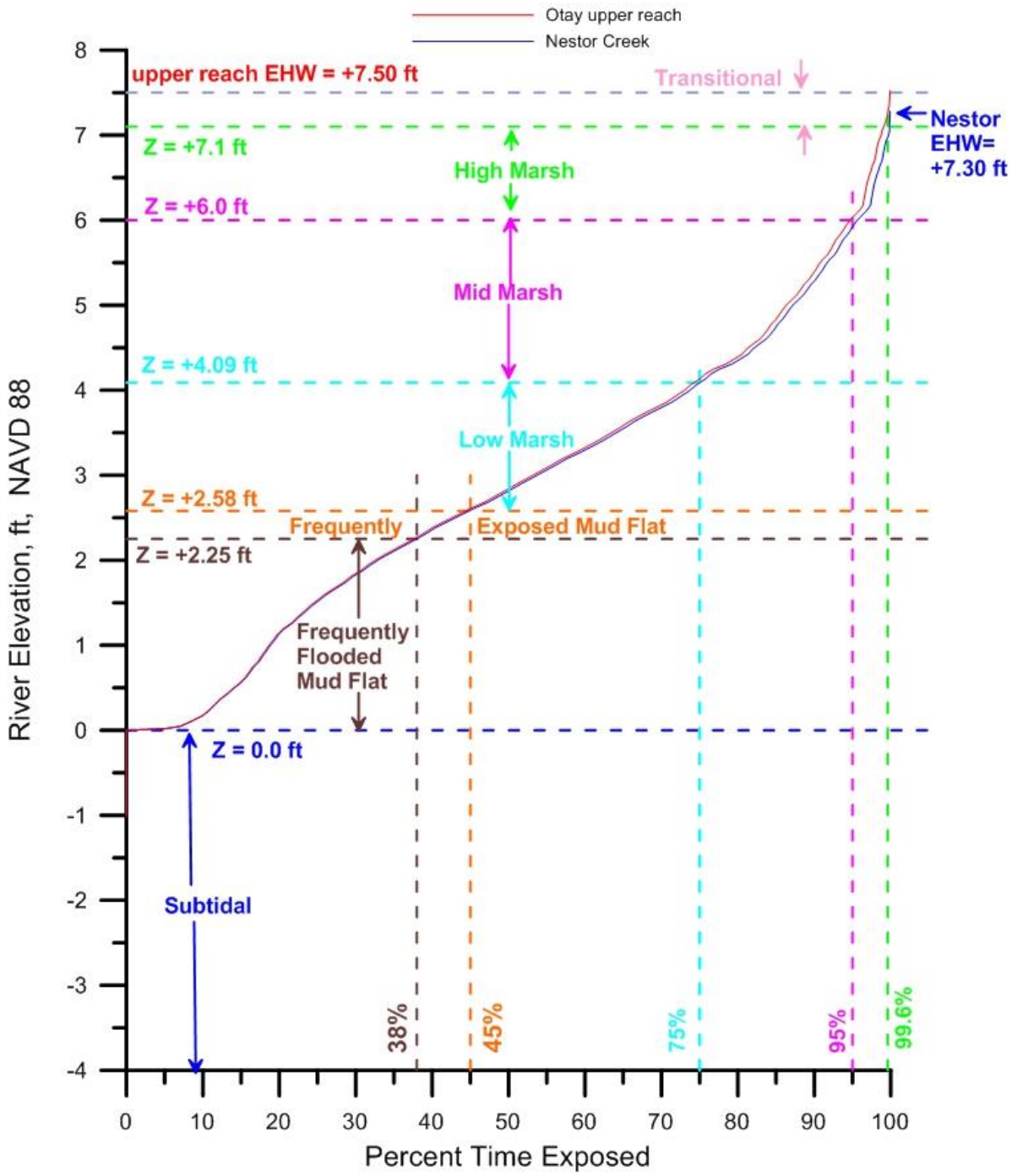


Figure 10. Post-project hydroperiod functions of the Otay River upper reach (red) and Nestor Creek (blue) for the ORERP Subtidal Alternative based on WRA 2011 bathymetric survey applied to water level data from NOAA tide gage #941-0170, for tidal epoch 1983-2001, with spectral correction from Otay River Sonde. Mannings roughness: n_0 = 0.0261

intertidal habitat at 0.0 ft NAVD 88, while the post-project conditions increase the zonation elevation band for high marsh by about 0.3 ft.

5.0) References:

Jenkins, S. A. & J. Wasyl, 1998, Analysis of Coastal Processes Effects due to the San Dieguito Lagoon Restoration Project: Final Report, submitted to *Southern California Edison Co.*, 333 pp.

Jenkins, S. A. & D. L. Inman, 1999, "Sand transport mechanics for equilibrium tidal inlets," *Shore & Beach* (Magoon Volume, Jan 99), v. 67, n. 1, p. 53–58.

Jenkins, S. A., M. Josselyn & J. Wasyl, 1999, Hydroperiod and Residence Time Functions for Habitat Mapping of Restoration Alternatives for San Dieguito Lagoon, submitted to *Southern California Edison Co.*, 30 pp. + 1 appen.

Jenkins, S. A. and J. Wasyl, 2005, "Coastal evolution model," Scripps Institution of Oceanography Tech. Rpt. No. 58, 179 pp. + appendices. http://repositories.cdlib.org/sio/techreport/58/

Jenkins, S. A., and J. Wasyl, 2014, "Tidal Hydraulics Analysis of the Otay River Estuary Restoration Plan," submitted to Poseidon Water LLC, 113 pp.

Josselyn, M. & A. Whelchel, 1999, Determining the Upper Extent of Tidal Marsh Habitat San Dieguito Lagoon, submitted to *Southern California Edison Co.*, 16 pp.

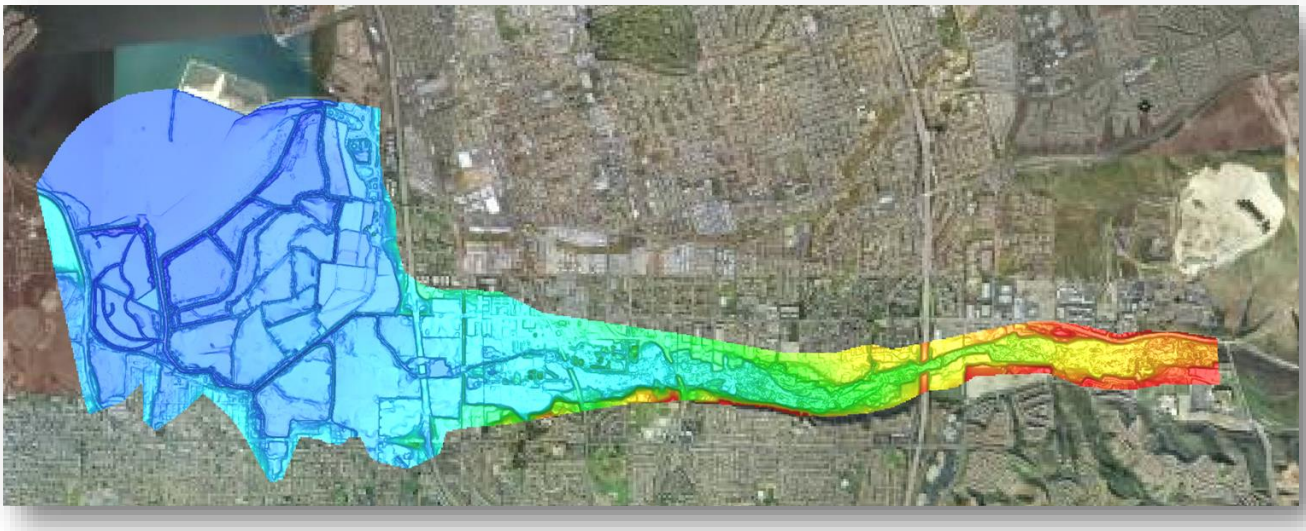
Josselyn, M., 2012, "TECHNICAL MEMORANDUM ELEVATIONS OF INTERTIDAL VEGETATION PROJECTIONS FOR ORERP" WRA, submitted Poseidon Resources, Corp, 17 February, 2012, 5pp.

APPENDIX H

Fluvial Hydraulics Study

Otay River Estuary Restoration Project

FLUVIAL HYDRAULICS STUDY



Prepared for
Poseidon Water LLC

Prepared by
Everest International Consultants, Inc.

December 2017

EVEREST

OTAY RIVER ESTUARY RESTORATION PROJECT

FLUVIAL HYDRAULICS STUDY

Prepared For:

Poseidon Water LLC
5780 Fleet Street, Suite 140
Carlsbad, CA 92008

Contact: Stan Williams

Prepared By:

Everest International Consultants, Inc.
444 West Ocean Boulevard, Suite 1104
Long Beach, CA 90802

Contact: David Cannon

Everest Project Number: P2164

December 2017

TABLE OF CONTENTS

1. INTRODUCTION 1.1
1.1 Background 1.1
1.2 Purpose 1.1
1.3 Objectives 1.1
2. EXISTING CONDITIONS DESCRIPTION 2.1
2.1 Project Location 2.1
2.2 Otay River 2.4
2.3 Otay River Floodplain and Estuary 2.4
3. PROPOSED PROJECT DESCRIPTION 3.1
3.1 Overview 3.1
3.2 Intertidal Alternative 3.2
3.3 Subtidal Alternative 3.5
4. STUDY APPROACH 4.1
4.1 Overview 4.1
4.2 Model Setup 4.1
4.3 Model Boundary Conditions 4.8
5. FLOOD IMPACT ANALYSES 5.1
5.1 Approach 5.1
5.2 Flood Modeling 5.1
5.3 Flood Impacts 5.14
5.4 Bike Path Impacts 5.19
5.5 Summary 5.22

6. EROSION IMPACT ANALYSIS 6.1
6.1 Approach 6.1
6.2 Velocity Results 6.1
6.3 Erosion Impacts 6.8
6.4 Summary 6.29
7. FLUVIAL SEDIMENTATION ANALYSIS 7.1
7.1 Approach 7.1
7.2 Sediment Loading from Otay River Watershed 7.1
7.3 Potential Sediment Delivery From Otay River to Proposed Wetland 7.6
7.4 Potential Sedimentation Rate at the Proposed Wetland 7.6
8. EFFECT OF SEA LEVEL RISE 8.1
8.1 Overview 8.1
8.2 Flood Modeling Results 8.3
9. CONCLUSIONS AND RECOMMENDATIONS 9.1
10. REFERENCES 10.1
APPENDIX A FLUVIAL ANALYSIS AT BAYSIDE PARK, IMPERIAL BEACH 1
APPENDIX B EROSION PROTECTION FOR THE SOUTH BAYSHORE BIKEWAY BRIDGE 1

LIST OF FIGURES

Figure 2.1 Project Location and Vicinity 2.2
Figure 2.2 Proposed ORERP Area 2.3
Figure 2.3 Otay River Watershed 2.5
Figure 2.4 Otay River Floodplain 2.6
Figure 2.5 Existing Topography and Bathymetry 2.7
Figure 3.1 Intertidal Alternative – ORF Site 3.3
Figure 3.2 Intertidal Alternative – Pond 15 Site 3.4
Figure 3.3 Subtidal Alternative – ORF Site 3.6
Figure 3.4 Subtidal Alternative – Pond 15 Site 3.7
Figure 4.1 Model Domain for Existing Conditions 4.2
Figure 4.2 Model Bathymetry for Existing Conditions 4.4
Figure 4.3 Model Bathymetry and Bathymetry Changes for Intertidal Alternative 4.6
Figure 4.4 Model Bathymetry and Bathymetry Changes for Subtidal Alternative 4.7
Figure 4.5 Parametric Mean Periodic Tide in San Diego Bay 4.9
Figure 4.6 100-Year Return Period Flood Hydrographs 4.11
Figure 5.1 Parametric Mean Periodic Tide and 100-Year Flood Hydrographs 5.2
Figure 5.2 100-Year Flood Maximum Water Elevations for Existing Conditions 5.4
Figure 5.3 Existing Conditions Comparison with FEMA 100-Year Flood Map 5.5
Figure 5.4 100-Year Flood Water Elevations for Existing Conditions 5.6
Figure 5.5 100-Year Flood Maximum Water Elevations for Intertidal Alternative 5.8
Figure 5.6 100-Year Flood Water Elevations for Intertidal Alternative 5.9
Figure 5.7 100-Year Flood Maximum Water Elevations for Subtidal Alternative 5.11
Figure 5.8 100-Year Flood Water Elevations for Subtidal Alternative 5.12

Figure 5.9 Comparisons of 100-Year Flood Water Elevations 5.13

Figure 5.10 Comparisons of 100-Year Flood Maximum Water Elevations 5.15

Figure 5.11 100-Year Flood Impacts – Change in Maximum Water Elevations when Compared with Existing Conditions 5.16

Figure 5.12 100-Year Flood Water Elevations at Ponds 14 and 28 ..... 5.18

Figure 5.13 100-Year Flood Impacts along Bike Path 5.20

Figure 5.14 15-Year and 100-Year Flood Elevations along Bike Path 5.21

Figure 6.1 100-Year Flood Maximum Velocities for Existing Conditions 6.2

Figure 6.2 100-Year Flood Maximum Velocities for Intertidal Alternative 6.3

Figure 6.3 Comparison of 100-Year Flood Maximum Velocities for Intertidal Alternative 6.5

Figure 6.4 100-Year Flood Maximum Velocities for Subtidal Alternative 6.6

Figure 6.5 Comparison of 100-Year Flood Maximum Velocities for Subtidal Alternative 6.7

Figure 6.6 100-Year Flood Erosion Impacts based on Maximum Velocities 6.9

Figure 6.7 Voronoi Diagram for Soils 0-1 foot below Ground – Cell Areas and DDT Concentrations 6.10

Figure 6.8 Hjulstrom Curve 6.12

Figure 6.9 Area with 100-year Flood Maximum Velocity Greater than 0.6 ft/s under Existing Conditions 6.13

Figure 6.10 Area with 100-Year Flood Maximum Velocity Greater than 0.6 ft/s under Proposed Conditions 6.14

Figure 6.11 Locations for Calculating the Time Duration when Flood Velocities are Higher than 0.6 ft/s 6.15

Figure 6.12 Velocity Time Series at Location 56 ..... 6.16

Figure 6.13 Maximum Velocity of ORF Site under Existing Conditions during a 5-year Flood Event and a 10-year Flood Event 6.18

Figure 6.14 Maximum Velocity of ORF Site under Intertidal Alternative Conditions during a 5-year Flood Event and a 10-year Flood Event 6.19

Figure 6.15 Maximum Velocity of ORF Site under Subtidal Alternative Conditions during a 5-year Flood Event and a 10-year Flood Event 6.20

Figure 6.16 Difference in Max Velocity Between Proposed Conditions and Existing Conditions for a 100-Year Flood Event 6.21

Figure 6.17 100-Year Flood Erosion Impacts along Bike Path 6.23

Figure 6.18 100-Year Flood Water Elevation and Velocity Comparisons at Location A..... 6.24

Figure 6.19 Proposed Revetment Location and Typical Cross-section 6.25

Figure 6.20 100-Year Flood Water Elevation and Velocity Comparisons at Location B..... 6.27

Figure 6.21 100-Year Flood Erosion Impacts near Pond 15..... 6.28

Figure 7.1 Historical Changes to the Otay River 7.2

Figure 7.2 Historical Maps of the Otay River near San Diego Bay 7.3

Figure 8.1 Parametric Mean Periodic Tides in Years 2050 and 2100 and 100-Year Flood Hydrographs 8.2

Figure 8.2 100-Year Flood Maximum Water Elevations under Existing Conditions for Current Sea Level, 2050 and 2100 SLR Scenarios..... 8.4

Figure 8.3 100-Year Flood Maximum Water Elevations in Floodplain under Existing Conditions for Current Sea Level, 2050 and 2100 SLR Scenarios 8.5

Figure 8.4 100-Year Flood Maximum Water Elevations under Existing and Proposed Conditions for 2050 SLR Scenario..... 8.6

Figure 8.5 Comparison of 100-Year Flood Maximum Water Elevations in Floodplain under 2050 SLR Scenario..... 8.7

Figure 8.6 100-Year Flood Maximum Water Elevations under Existing and Proposed Conditions for 2100 SLR Scenario..... 8.8

Figure 8.7 Comparison of 100-Year Flood Maximum Water Elevations in Floodplain under 2100 SLR Scenario..... 8.9

LIST OF TABLES

Table 4.1 Bathymetry and Topography Data Sources....4.3

Table 4.2 San Diego Bay Tidal Datums for the 1983 – 2001 Tidal Epoch....4.8

Table 4.3 Return Period Peak Discharges....4.10

Table 8.1 Potential Sea Level Rise Ranges Using Year 2000 as the Baseline for Southern California (NRC Report 2012)....8.1

LIST OF ACRONYMS

%	Percent
2-D	Two-dimensional
Alt	Alternative
Ave	Avenue; Average
Blvd	Boulevard
CCC	California Coastal Commission
CDP	Coastal development permit
cfs	cubic feet per second
CO-CAT	California Climate Action Team
COPC	California Ocean Protection Council
DEM	Digital Elevation Model
ERC	Exposure Reduction Cover
Everest	Everest International Consultants, Inc.
Exist.	Existing
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
ft	feet
hr	hour
I-5	Interstate Highway 5
in	inch
km^2	square kilometer
m^3	Cubic meter
max	maximum
MHHW	mean higher high water
mi^2	square mile
MLLW	mean lower low water
MLMP	Marine Life Mitigation Program

MLW	mean low water
mm	millimeter
MTL	mean tide level
N	north
NAVD88	North American Datum of 1988
NGVD29	National Geodetic Vertical Datum of 1929
NOAA	National Oceanic and Atmospheric Administration
NRC	National Research Council
NTDE	National Tidal Datum Epoch
ORERP	Otay River Estuary Restoration Project
ORF	Otay River Floodplain
PMP	Parametric Mean Periodic
Poseidon	Poseidon Water LLC
Refuge	South San Diego Bay National Wildlife Refuge
S	south
SLR	Sea level rise
SR	State Route
USACE	United States Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
yd^3	Cubic Yard
yr	year

1. INTRODUCTION

1.1 BACKGROUND

Poseidon Water LLC (Poseidon) is currently constructing a desalination plant near the ocean in Carlsbad, California in the western portion of Agua Hedionda Lagoon. To obtain a coastal development permit (CDP) for the desalination plant from the California Coastal Commission (CCC), Poseidon was required to develop and implement a Marine Life Mitigation Program (MLMP). One of the components of the MLMP was the planning, design, construction, operation, management, and monitoring of a coastal wetlands restoration project that would mitigate for the impacts to marine fish associated with operation of the desalination plant. Poseidon selected the Otay River Floodplain (ORF) located within the South San Diego Bay National Wildlife Refuge (Refuge) as the site for this restoration project, which is now known as the Otay River Estuary Restoration Project (ORERP). The ORERP will involve earthwork (cut and fill) within the floodplain to create the subtidal, unvegetated intertidal (mudflat), and vegetated coastal salt marsh habitats required under the MLMP. Earthwork within a floodplain has the potential to cause significant adverse impacts to flood conditions compared with the conditions that exist at present (existing conditions). Poseidon retained Everest International Consultants (Everest) to conduct a fluvial (riverine) hydraulic study to address the potential for the ORERP to cause significant adverse impacts to flooding. The purpose, objectives, methods, results, conclusions, and recommendations of the fluvial hydraulics study are summarized in this report.

1.2 PURPOSE

The purpose of the study summarized in this report was to determine whether the proposed alternatives that comprise the ORERP would result in significant adverse impacts to flooding and to develop mitigation measures to eliminate such significant adverse impacts.

1.3 OBJECTIVES

The following objectives were identified to achieve the study purpose.

- Estimate flood water levels and extent under existing and proposed conditions.
- Evaluate the impact of future projections of sea level rise on flood water levels.
- Evaluate the impact of erosion under existing and proposed conditions.
- Estimate fluvial sediment transport potential under existing and proposed conditions.

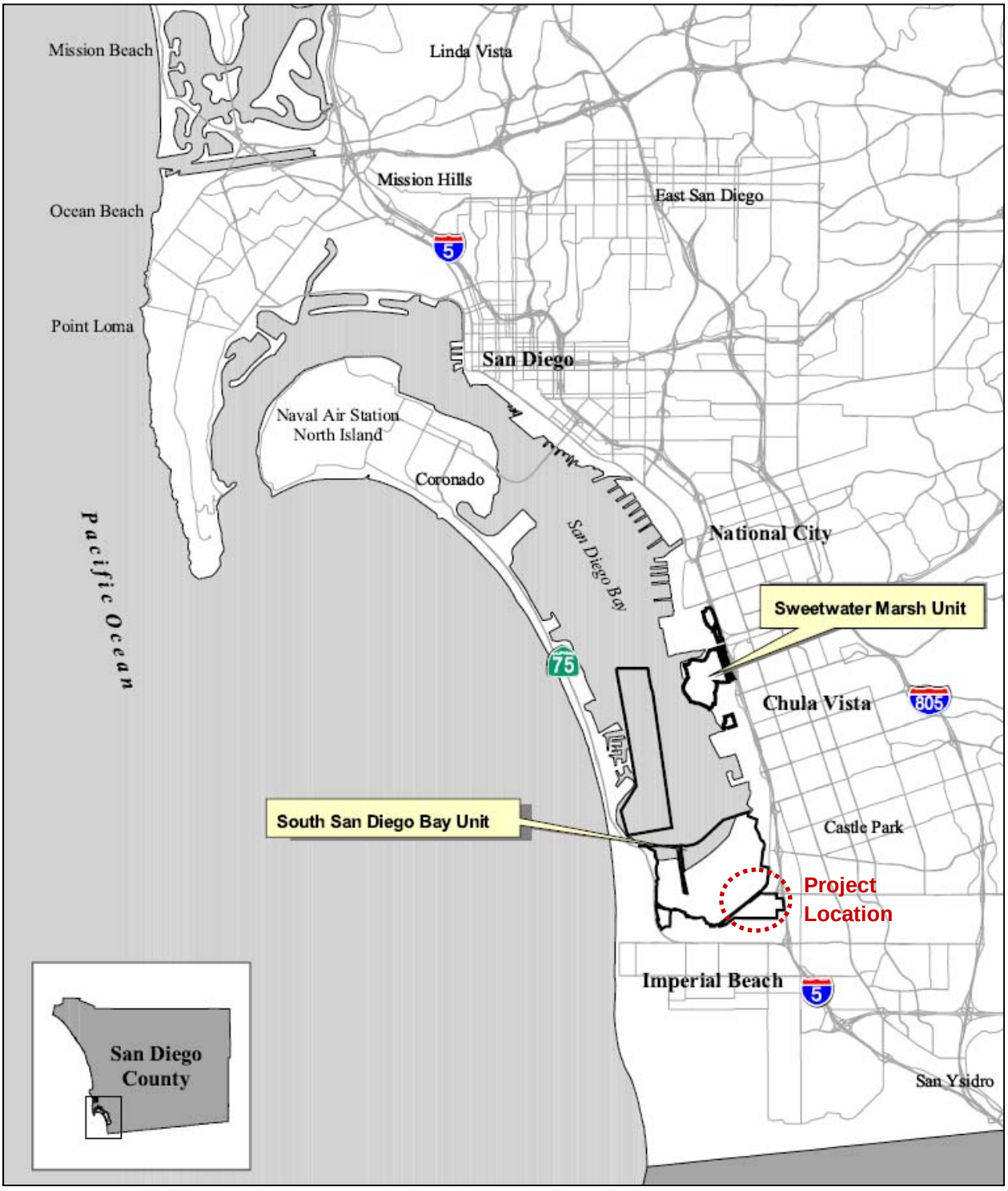
2. EXISTING CONDITIONS DESCRIPTION

A sufficient description of both the existing and proposed restoration physical conditions was necessary to perform the flood hydraulic analysis. The types of information that are crucial to these analyses are topography and bathymetry (existing and proposed conditions), ocean water levels, and surface runoff in the rivers (floods). These data were collected from field surveys conducted for this project as well as as-built drawings and other published reports gathered from the USFWS and National Oceanic and Atmospheric Administration (NOAA).

2.1 PROJECT LOCATION

The project is located at the southern end of San Diego Bay within the Refuge, as shown in Figure 2.1. The Refuge is managed by the U.S. Fish and Wildlife Service (USFWS) and consists of the Sweetwater Marsh Unit and South San Diego Bay Unit. The refuge is located about ten miles north of the United States and Mexico border in San Diego County, California and is surrounded by the Cities of National City, Chula Vista, San Diego, Imperial Beach, and Coronado.

The ORF site is situated within the Otay River Floodplain located within the Refuge South San Diego Bay Unit, as depicted in Figure 2.2. In the figure, the approximate limits of the South San Diego Bay Unit are indicated by the orange lines. The South San Diego Bay Unit extends from the ORF through the salt ponds and into San Diego Bay. The salt ponds are a system of diked evaporations ponds that covers approximately 1,060 acres. Three of the salts ponds (Ponds 10A, 10, and 11) are the site of the Western Salt Ponds Restoration Project, as indicated by the green lines. The proposed ORERP will involve earthwork in two of the existing salt ponds, Pond 20A within the ORF and Pond 15.



Source: USFWS 2006

Figure 2.1 Project Location and Vicinity



Image: Google Earth Pro

Figure 2.2 Proposed ORERP Area

2.2 OTAY RIVER

The Otay River originates in the Cleveland National Forest along Dulzura Creek, as shown in Figure 2.3. Tributaries include Hollenbeck Canyon Creek, Jamul Creek, and Proctor Valley Creek. Flows from the upper watershed are cutoff by two reservoirs that are a part of the City of San Diego water supply system. The Upper Otay Reservoir, which is the smaller of the two reservoirs, is located at the end of Procter Valley Creek. The upper reservoir is connected to the Lower Otay Reservoir formed by Savage Dam below the Dulzura and Jamul Creek confluence. Essentially all flows from the upper 68% of the watershed are impounded by the Lower Otay Reservoir. The upper watershed is largely comprised of undeveloped lands in unincorporated areas of San Diego County. The terrain is characterized by higher elevations and steep mountain slopes that are prone to wildfires.

The Otay River runs approximately 11 miles from Savage Dam to San Diego Bay. The river flows westward from Savage Dam through primarily undeveloped lands. The natural creek channel is transected by the South Bay Expressway (SR 125) and connected to several tributaries including Salt Creek, O'Neal Canyon Creek, Johnson Canyon, and Dennery Canyon. Downstream of the I-805, the watershed becomes urbanized and the river is heavily vegetated with sections of riprap banks. Major tributaries include Poggi Canyon Creek and Nestor Creek, which connect with the Otay River near the I-805 and I-5 bridges, respectively.

2.3 OTAY RIVER FLOODPLAIN AND ESTUARY

The Otay River conveys flows from the I-5 Bridge through the Otay River Floodplain and estuarine portion of the Otay River, as illustrated in Figure 2.4. The river channel extends northwest until reaching the salt ponds between Ponds 50 and 51 and then turns westward along the salt pond perimeter and then southwest along the Bayshore Bikeway (adjacent to Ponds 48, 22, and 20). Nestor Creek runs northward along the east edge of Pond 20A and joins the Otay River near Pond 20. The river is channelized between the salt pond dikes. After the confluence with Nestor Creek, the Otay channel is divided by a bike path bridge into two parallel segments along Pond 22. The Otay River then turns northwest beneath a second bike path bridge and then converges back into a single channel. The river continues along Pond 23 and then north along the Western Salt Pond Restoration until discharging into San Diego Bay.

The ORF and estuary area is generally flat ranging from 18 to -5 ft, NAVD88. The existing topography and bathymetry are illustrated in Figure 2.5. The existing bathymetry includes the Western Salt Ponds Restoration Project which will convert former salt ponds to approximately 230-acres of restored habitat area. The restoration site was opened tidal exchange in August 2011.

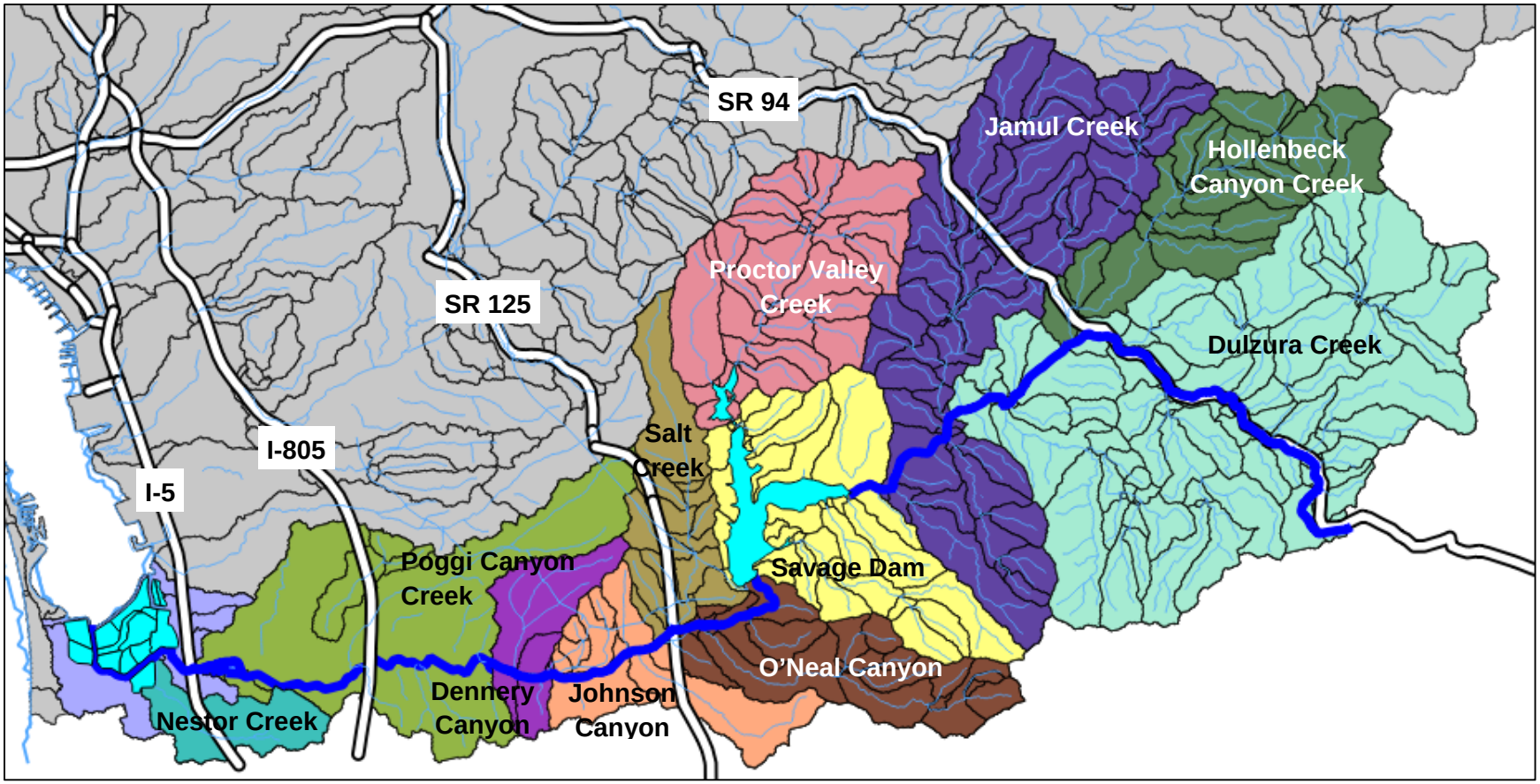


Figure 2.3 Otay River Watershed



Image: Google Earth Pro

Figure 2.4 Otay River Floodplain

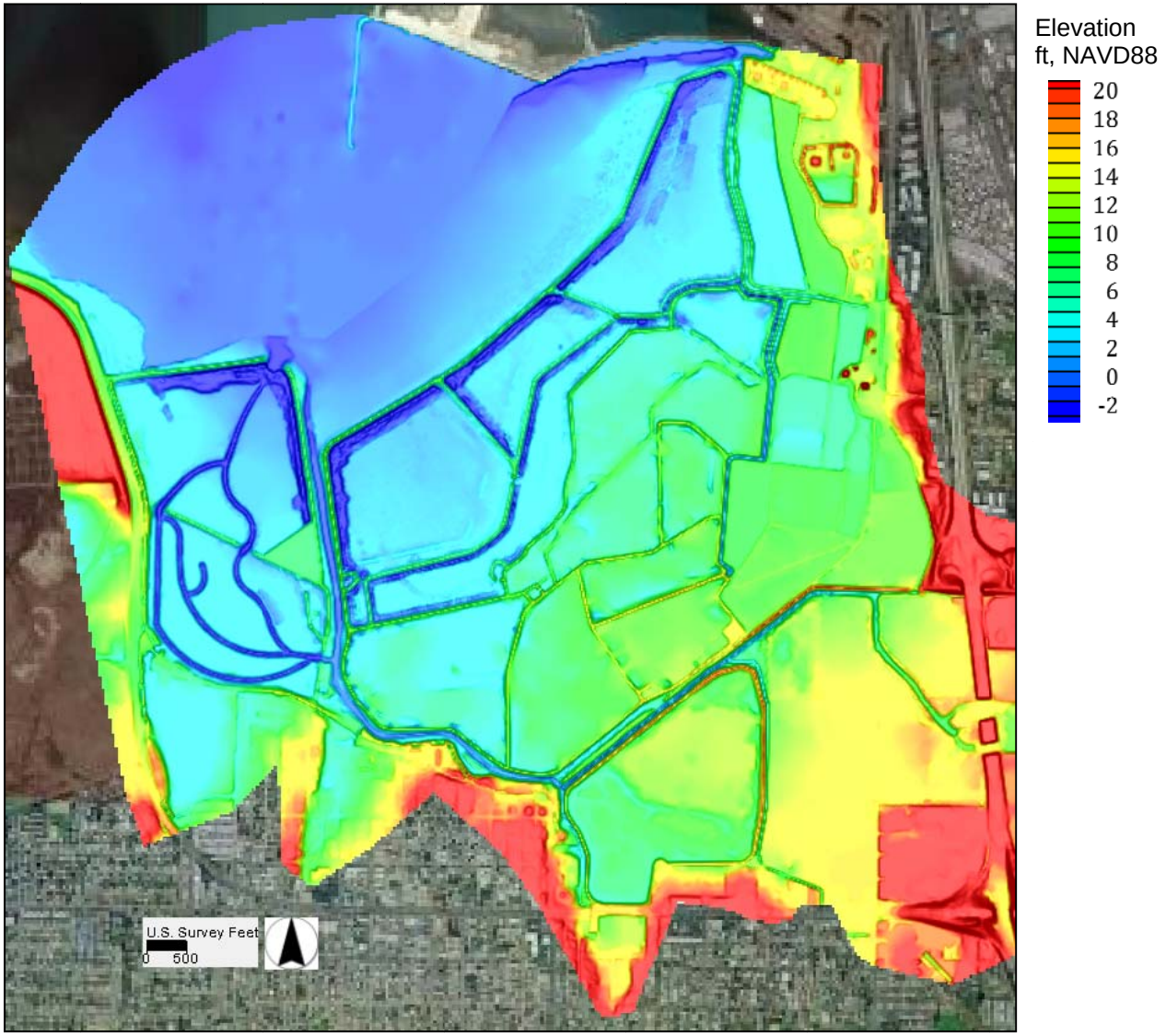


Figure 2.5 Existing Topography and Bathymetry

Hydraulic conditions along the Otay River are affected by a combination of tidal exchange with San Diego Bay and watershed flows from the Otay River. Tidal conditions in San Diego Bay are of the mixed, semi-diurnal type with two high and two low daily peaks. The mean tide range for San Diego Bay is 5.72 ft (NOAA 2007). Tidal influence extends from San Diego Bay towards the floodplain near Ponds 48 and 50. Fluvial flows from the Otay River pass through the ORF and can overtop the levees surrounding the salt ponds. For large floods, a portion of flood waters can be diverted through the salt ponds, filling the ponds and eventually overtopping the levees into San Diego Bay. Tide and flood water levels are discussed in greater detail in Section 4.3.

Sediment characteristics within the lower Otay River range from sandy gravel to clayey fine sand (GEOCON 1985). Boring data on sediment conditions in the floodplain area are available from GEOCON (1985), Geotechnics (2000), and USDA (2007).

3. PROPOSED PROJECT DESCRIPTION

3.1 OVERVIEW

The Otay River Estuary Restoration Project (ORERP) is located within the South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge (Refuge), in San Diego County, California. Restoration activities would occur at two separate non-contiguous locations within the Refuge: (i) the Otay River Floodplain (ORF) Site and (ii) the Pond 15 Site. The approximately 79-acre ORF Site is located west of Interstate 5 (I-5) between Main Street to the north and Palm Avenue to the south. The Pond 15 Site consists of an approximately 85-acre solar salt pond located in the northeast portion of the Refuge, to the northwest of the intersection of Bay Boulevard and Palomar Street in Chula Vista.

The ORERP would involve excavation of a portion of the ORF Site and fill of the Pond 15 Site to create elevations suitable for subtidal, intertidal mudflat, intertidal coastal salt marsh, and transitional habitats as well as associated uplands. Restoration conducted in the ORF Site would be limited to the portion of the floodplain located west of the Nestor Creek, as shown in Figure 3.1 and Figure 3.3. Within this portion of the ORF Site the ground would be lowered to elevations suitable to support the target wetland habitats and wetland-associated upland habitats. In addition, the existing dike running through Pond 20A would be removed and the flood protection functionality of this feature would be replaced through construction of a levee along the southern boundary of this portion of the ORF Site. No restoration activities would be conducted in the former agricultural areas east of Nestor Creek, but this area would be available and could be used for staging construction activities. In addition to the work in the ORF Fill and Pond 15 Site, a portion of the existing dike between Salt Ponds 22 and 23 would be raised two feet to offset potential project-induced flood impacts at Bayside Park in Imperial Beach. An analysis was conducted to identify potential mitigation measures to offset these potential project-induced flood impacts. This analysis is provided in Appendix A. Besides earthwork, the restoration project might include slope armoring (e.g., riprap) to protect the Bayshore Bikeway Bridge. A conceptual design for this slope protection is provided in Appendix B.

Two restoration alternatives were developed for the project. The first alternative is known as the Intertidal Alternative and the second alternative is known as the Subtidal Alternative. Both alternatives occupy the same footprint and achieve approximately 30 acres of wetland restoration in the ORF Site. In comparison with the Intertidal Alternative, the Subtidal Alternative would provide a deeper open water channel/area within the ORF Site. In addition, the Subtidal Alternative would provide higher elevations within the Pond 15 Site due to the additional fill material associated with the deeper excavation within the ORF Site. The two restoration alternatives are described below.

3.2 INTERTIDAL ALTERNATIVE

3.2.1 Habitat Distribution

The Intertidal Alternative is composed of approximately 8% of subtidal, 19% intertidal mudflat and 65% intertidal salt marsh as shown in Figures 3.1 and 3.2. Under this alternative no subtidal habitat is proposed within the ORF Site under existing conditions (i.e., without sea-level rise). This alternative would involve excavation and grading of the ORF Site (Figure 3.1) to create approximately 29.7 acres of tidally influenced habitats, consisting of 5.1 acres of intertidal mudflat and 24.6 acres of intertidal coastal salt marsh habitat. The Pond 15 Site (Figure 3.2) would be filled to create approximately 85.3 acres of tidally influenced habitats composed of 10.4 acres of subtidal habitat, 18.4 acres of intertidal mudflat, and 56.5 acres of intertidal salt marsh. Both the ORF Site and Pond 15 Site would be planted with a mix of native wetland vegetation that would mature into low marsh, mid marsh, and high marsh vegetative communities. The intertidal areas and unvegetated mudflat would provide foraging habitat for adult and juvenile fish.

3.2.2 Earthwork

The Intertidal Alternative would involve the excavation of 320,000 cubic yards (yd^3) of soil from the ORF Site. Approximately 21,100 yd^3 of this soil, assuming it is suitable, would be used to construct the levee along the southern boundary this portion of the ORF Site. Approximately 295,200 yd^3 of the excavated soil would be transported to and placed within the Pond 15 Site as beneficial reuse to raise the ground to elevations suitable to create tidal wetlands and associated upland habitats. The remaining material would be transported to the portion of the ORF Site east of Nestor Creek where it would be spread evenly over the existing ground where high concentrations of DDTs were identified. This exposure reduction cover (ERC) would be between 1 foot to 1.5 feet in thickness and approximately 23.4 acres in area.

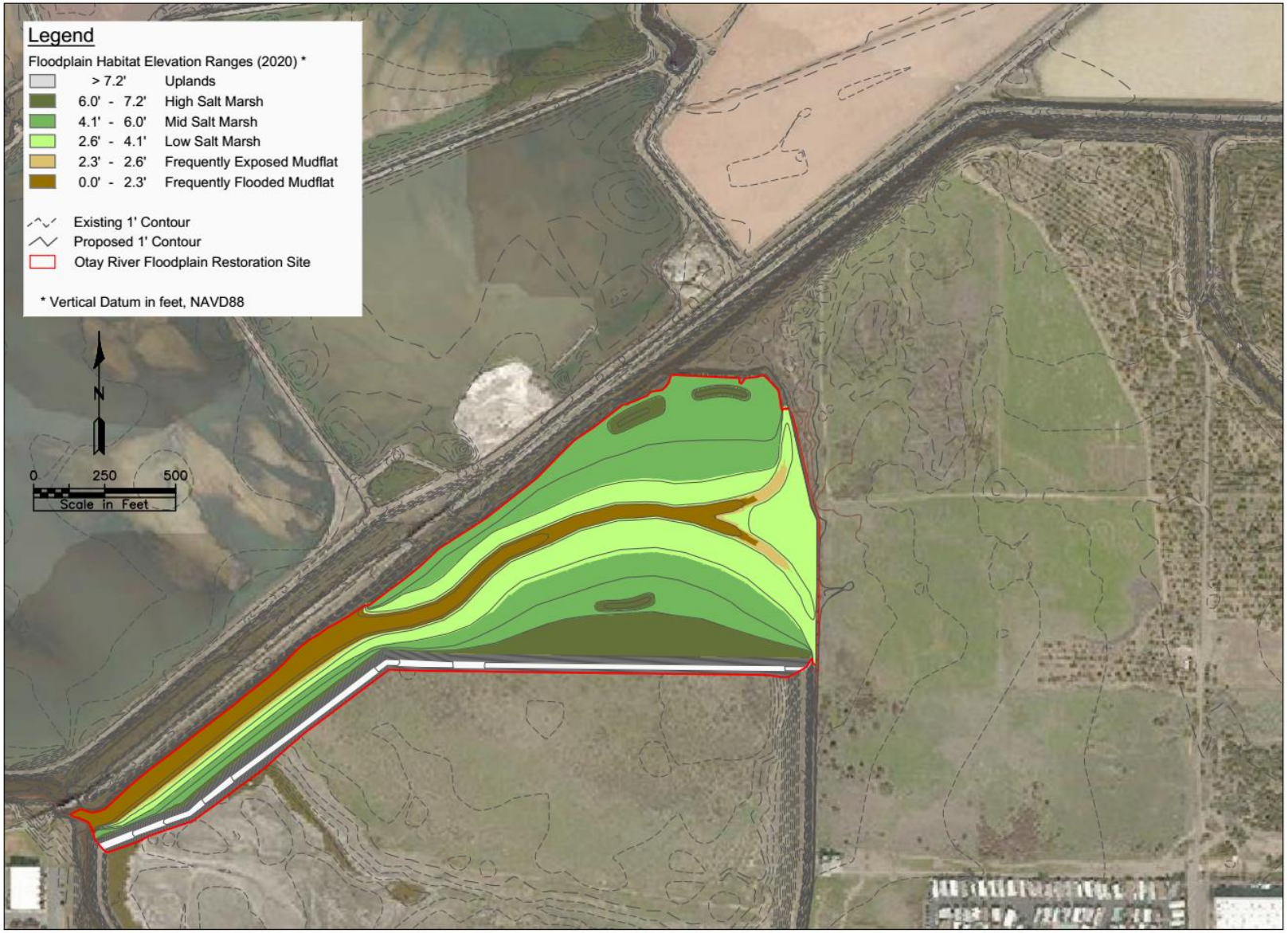


Figure 3.1 Intertidal Alternative – ORF Site

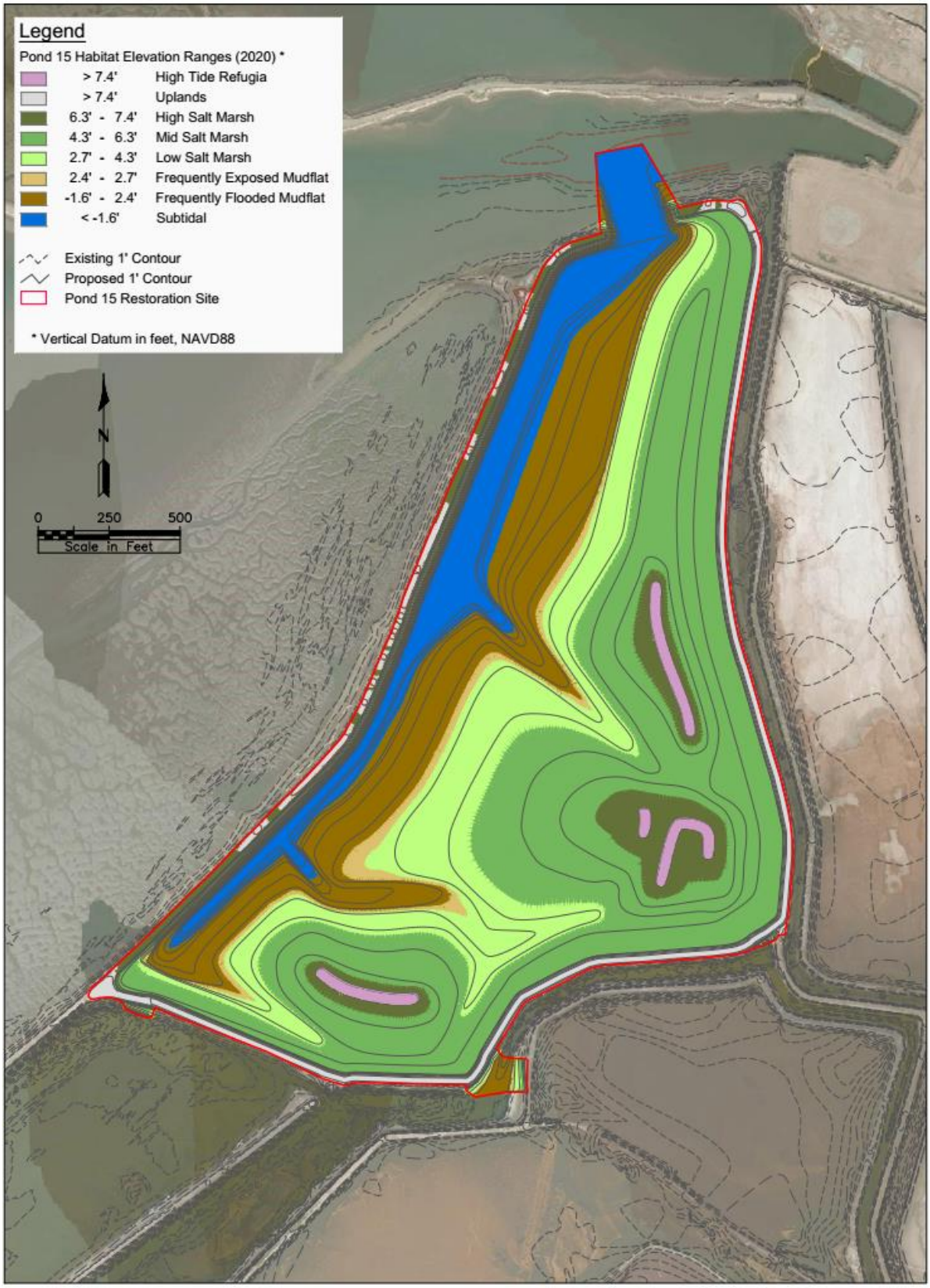


Figure 3.2 Intertidal Alternative – Pond 15 Site

3.3 SUBTIDAL ALTERNATIVE

3.3.1 Habitat Distribution

The Subtidal Alternative is composed of approximately 11% subtidal, 18% intertidal mudflat, and 61% intertidal salt marsh, as shown in Figures 3.3 and 3.4. This alternative would involve excavation and grading of the ORF Site (Figure 3.3) to create approximately 29.5 acres of tidally influenced habitats consisting of 4.5 acres of subtidal habitat, 6.6 acres of intertidal mudflat, and 18.4 acres of intertidal coastal salt marsh habitat. Filling of the Pond 15 Site (Figure 3.4) would result in 83.7 acres of tidally influenced habitats composed of 9.8 acres of subtidal habitat, 16.3 acres of intertidal mudflat, and 57.6 acres of intertidal salt marsh. Both the ORF Site and the Pond 15 Site would be planted with a mix of native wetland vegetation that would mature into low marsh, mid marsh, and high marsh vegetative communities. The subtidal areas would provide spawning and foraging habitat, and the unvegetated mudflat would provide foraging habitat for adult and juvenile fish.

3.3.2 Earthwork

The Subtidal Alternative would involve the excavation of 370,000 cubic yards (yd^3) of soil from the ORF Site. Approximately 21,600 yd^3 of this soil, assuming it is suitable, would be used to construct the levee along the southern boundary this portion of the ORF Site. Approximately 312,000 yd^3 of the excavated soil would be transported to and placed within the Pond 15 Site as beneficial reuse to raise the ground to elevations suitable to create tidal wetlands and associated upland habitats. The remaining material would be transported to the portion of the ORF Site east of Nestor Creek where it would be spread evenly over the soil where high concentrations of DDTs were identified. This exposure reduction cover (ERC) would be between 1 foot to 1.5 feet in thickness and approximately 23.4 acres in area.

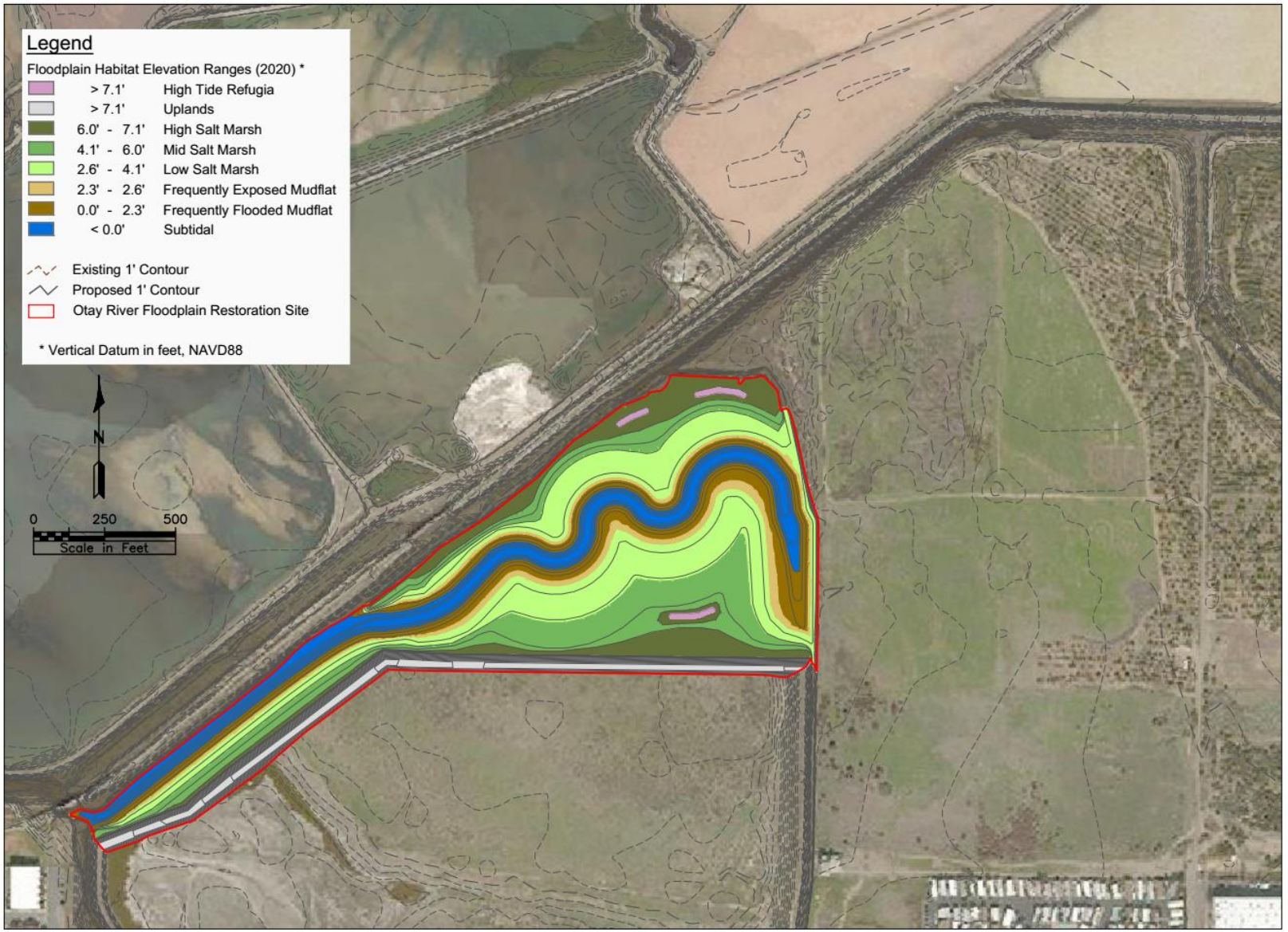


Figure 3.3 Subtidal Alternative – ORF Site

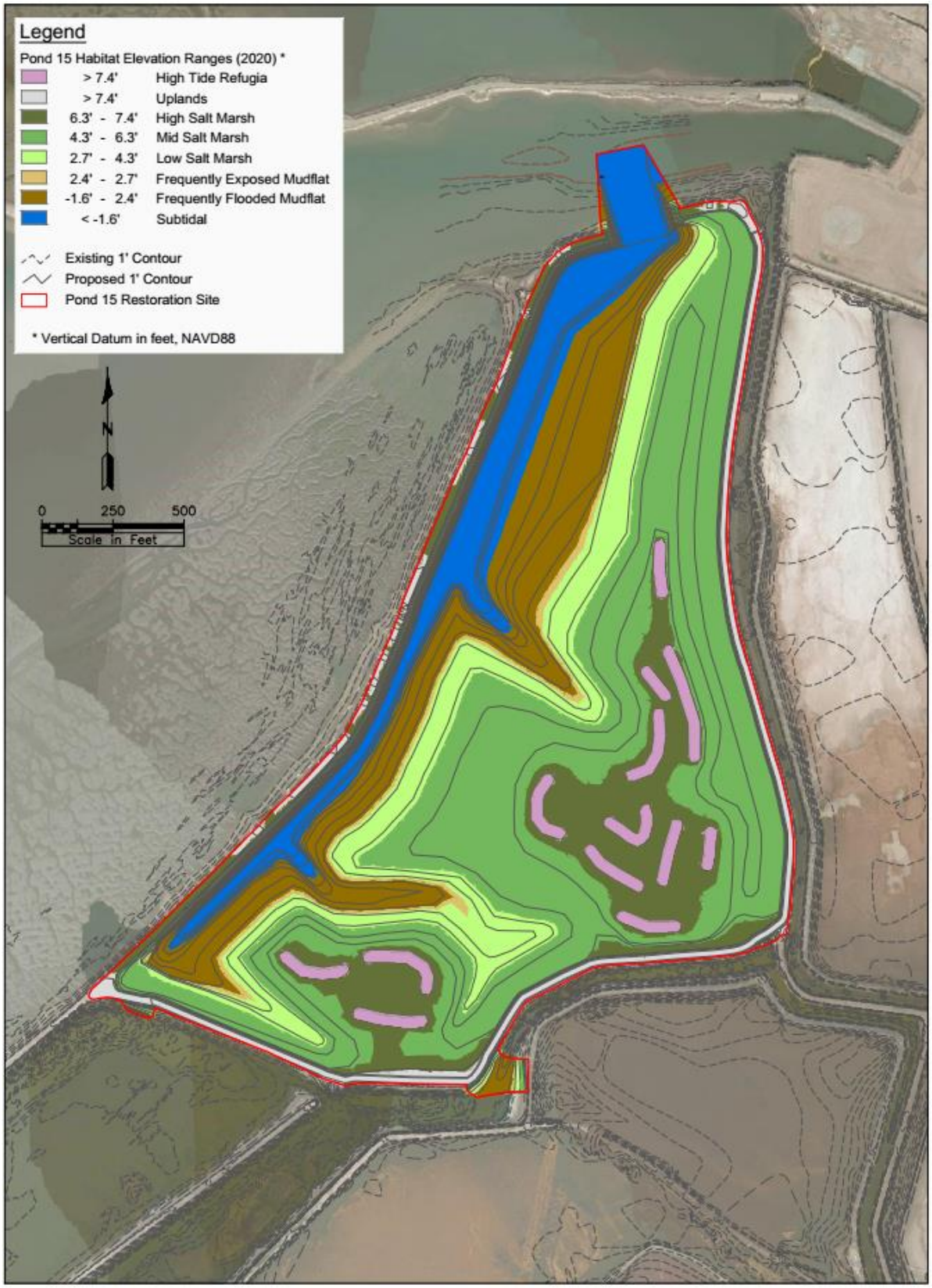


Figure 3.4 Subtidal Alternative – Pond 15 Site

4. STUDY APPROACH

4.1 OVERVIEW

Flood and erosion impacts were evaluated by comparing hydrodynamics under existing and proposed conditions. Water levels and velocities were assessed using a numerical model to simulate tidal and fluvial conditions in the project area. The flood impact analyses focused on changes to flood water levels associated with proposed conditions. The erosion impact analysis evaluated project-induced velocity changes as a surrogate for erosion (scour) potential.

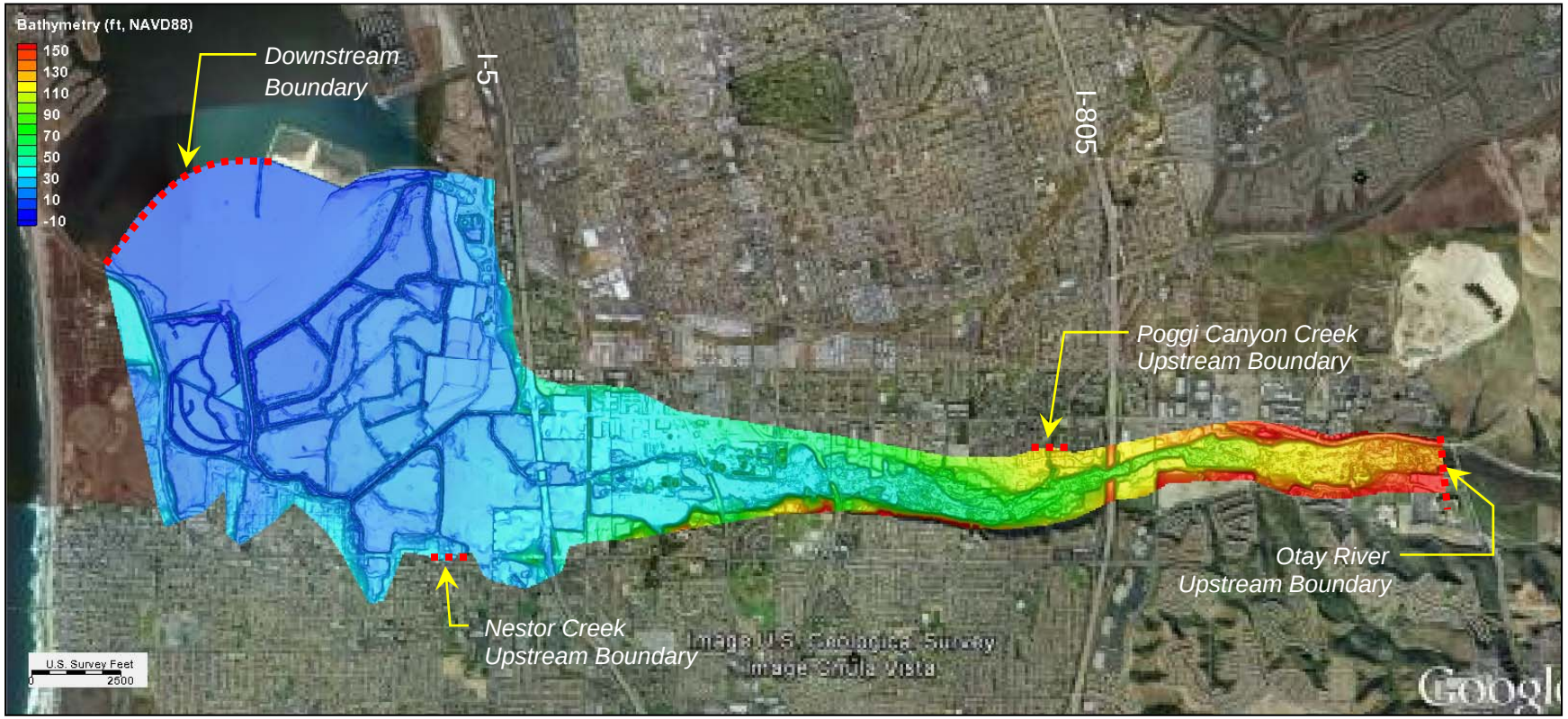
The two-dimensional (2-D) hydrodynamic model TUFLOW was selected for the fluvial hydraulic analysis because the model accounts for all the necessary analysis components – tidal fluctuations, flood flows, grading changes, water control structures (e.g., open channels, culverts, pipes, and weirs), levees, and salt pond configurations. TUFLOW is a finite difference model designed for tidal and fluvial hydraulics in rivers, estuaries, coastal bays, floodplains, and urban areas.

The fluvial sedimentation analysis was conducted to identify potential impacts regarding fluvial sediment delivery and sedimentation associated with the proposed project. Analytical methods and existing data were used to estimate fluvial sediment loads from the watershed, which were then used to estimate potential sedimentation of the proposed wetland.

4.2 MODEL SETUP

Model grids were developed for existing conditions and the two proposed alternatives. The model grid for existing conditions was created first. Model grids for the two proposed alternatives were then generated by modifying the existing conditions grid based on the proposed grading of the alternatives. Hence, all three grids have the same spatial extent and are the same outside of the proposed project area, including the Otay River and Western Salt Ponds (Ponds 10A, 10, and 11).

The model domain for existing conditions is shown in Figure 4.1. The model grid consists of a 40 ft by 40 ft grid. The model domain extends from upstream boundary of Otay River at Otay Valley Road to San Diego Bay at the downstream boundary. The model domain includes bridges and culverts as well as input locations for Poggi Canyon and Nestor Creek flows. Details for the model development are provided below.



Aerial Image: Google Earth Pro

Figure 4.1 Model Domain for Existing Conditions

4.2.1 Existing Conditions

The lower portion (floodplain) of the model domain for existing conditions downstream of the I-5 Bridge is shown in Figure 4.2. The model floodplain was selected to include higher elevations sufficient for anticipated flood water levels. Bathymetry and topography for existing conditions were compiled from various sources as summarized in Table 4.1. Elevations for the Otay River were based on a 2011 survey. In the floodplain area and salt ponds, elevations were obtained from a May 2000 survey. This data was updated based on additional surveys in 2011 and 2012. Bathymetry for Ponds 10A, 10, and 11 was based on the design and as-built surveys from the Western Salt Pond Restoration Project, which was constructed in 2011. Bathymetry for Salt Ponds 12 – 15 was surveyed in 2012. Additional bathymetry data was obtained from the NOAA DEM database.

Table 4.1 Bathymetry and Topography Data Sources

AREA	DATA	SOURCE
Otay River	Otay River survey	NWS 2011
Salt Ponds	Sweetwater Marsh and South San Diego Bay Units CCP Topographic Survey	DU 2001
Western Salt Ponds	Western Salt Pond Restoration Project	2011 Survey
Salt Ponds 12 – 15	Salt Ponds 12 -15 Survey	NWS 2012
Other	NOAA DEM Database	NOAA

The model also incorporates several bridges and culverts in the ORF (ORF). Flows beneath the I-5 Bridge and bike path crossings are obstructed from the bridge piers and deck which reduce the cross sectional area for flow, and were simulated as flow constrictions with a blockage factor. Blockage of the I-5 Bridge was estimated based on as-built drawings of the bridge. For the two bike path crossings, the blockages were approximated based on visual observations of the bridges. There are culverts located between Ponds 10 and 10A and along the river channel downstream of the bike path crossings. These culverts were simulated as a one-dimensional structure defined based on the culvert diameter and invert elevation.

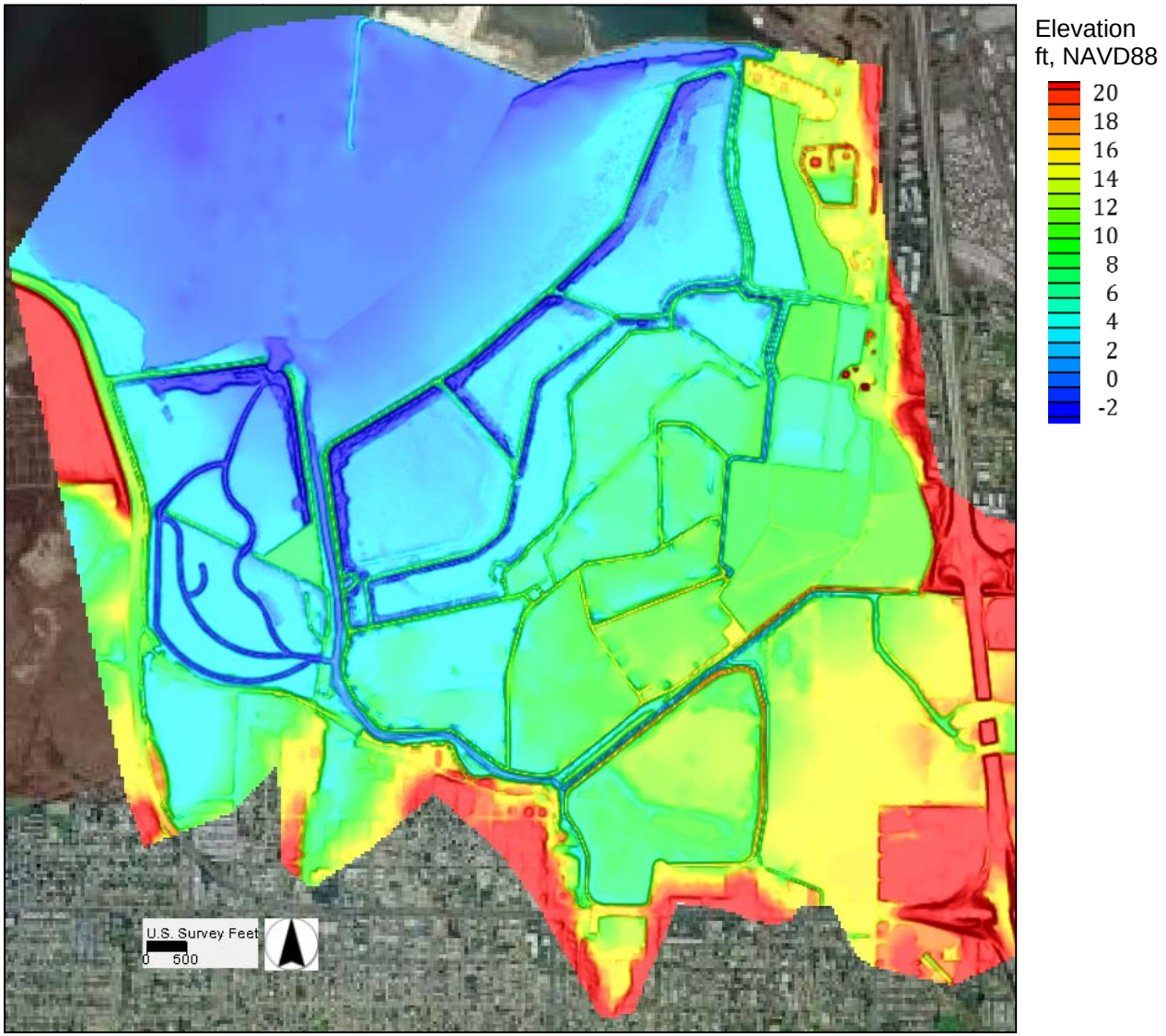


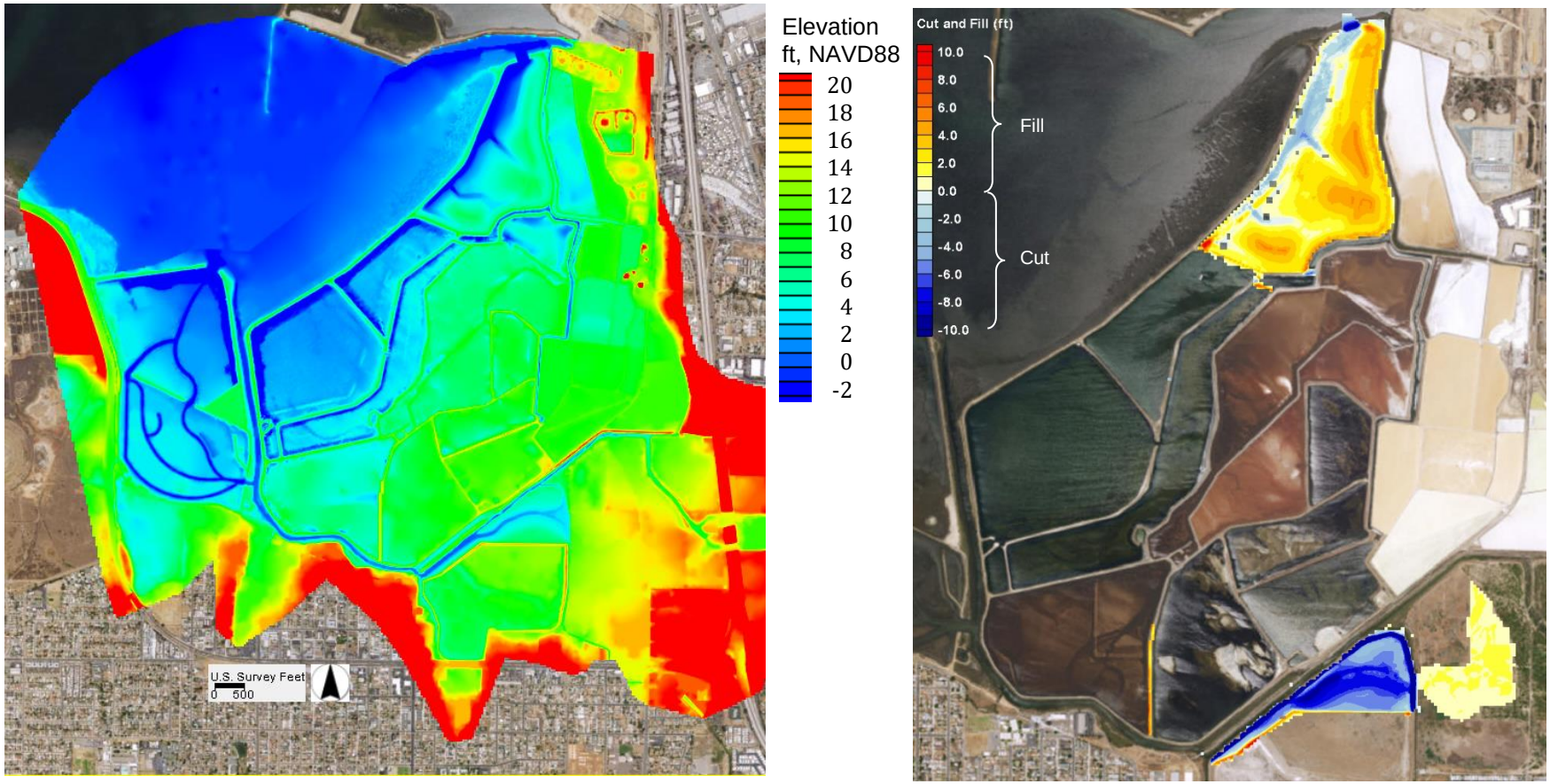
Figure 4.2 Model Bathymetry for Existing Conditions

4.2.2 Intertidal Alternative

The model grid for the Intertidal Alternative was created by modifying the existing conditions topography and bathymetry based on the proposed grading and sediment placement for this alternative as described previously in Section 3.2. The model topography and bathymetry for the Intertidal Alternative and the change in topography and bathymetry from existing condition are provided in Figure 4.3. In the figure, the left panel shows the topography and bathymetry under the Intertidal Alternative. Modifications to the topography and bathymetry include grading within the ORF, the ERC area within the ORF, and Pond 15. The topography and bathymetry changes from existing conditions are shown in the right panel. In the figure, locations with reductions in elevation (cut) are shown in blue while locations with increases in elevation (fill) are shown in yellow, orange, and red, which are primarily located in Pond 15. In addition, the ERC (the yellow shaded area) within the ORF would consist of excavated material between 1-foot and 1.5 feet thick.

4.2.3 Subtidal Alternative

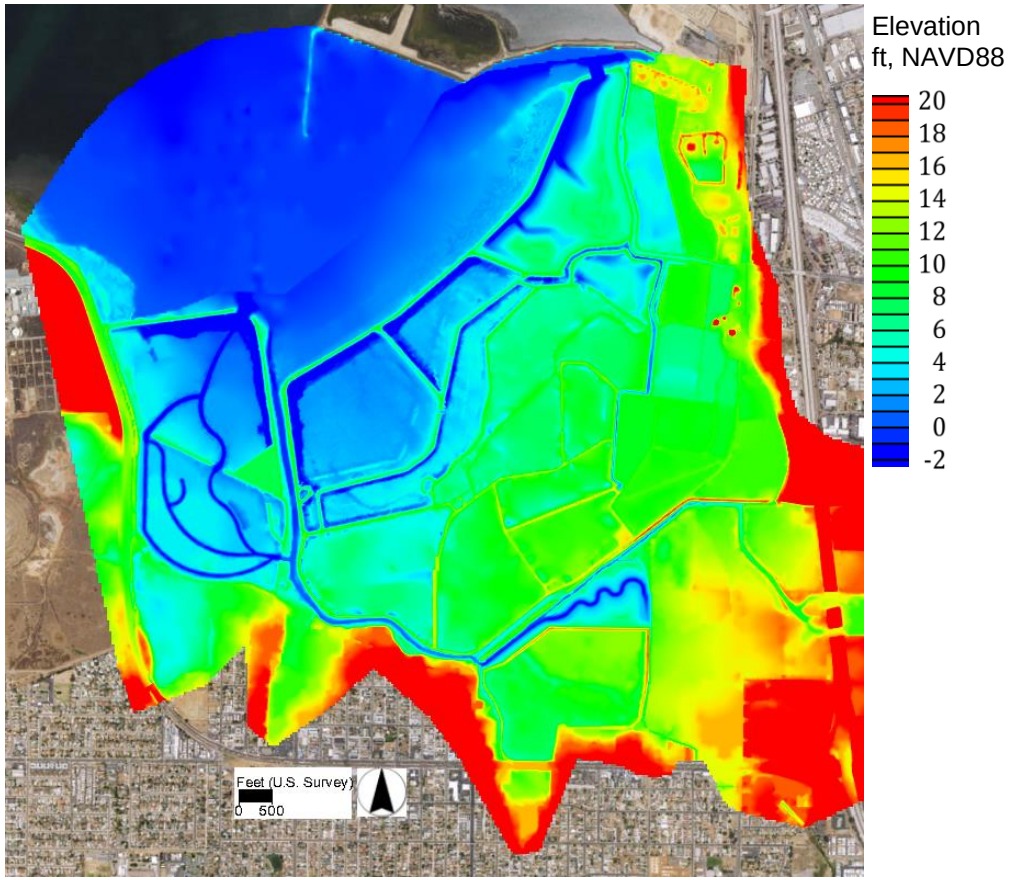
For the Subtidal Alternative, the existing model grid topography and bathymetry was modified based on the proposed grading and sediment placement described previously in Section 3.3. The model topography and bathymetry and the change in topography and bathymetry for the Subtidal Alternative are shown in Figure 4.4. The topography and bathymetry under the Subtidal Alternative is depicted in the left panel and the changes in topography and bathymetry from existing conditions are provided in the right panel. Under the Subtidal Alternative, a subtidal channel and associated intertidal habitats will be constructed within the portion of the ORF west of Nestor Creek and sediment will be placed in Pond 15 as well as the ERC area located within the portion of the ORF east of Nestor Creek.



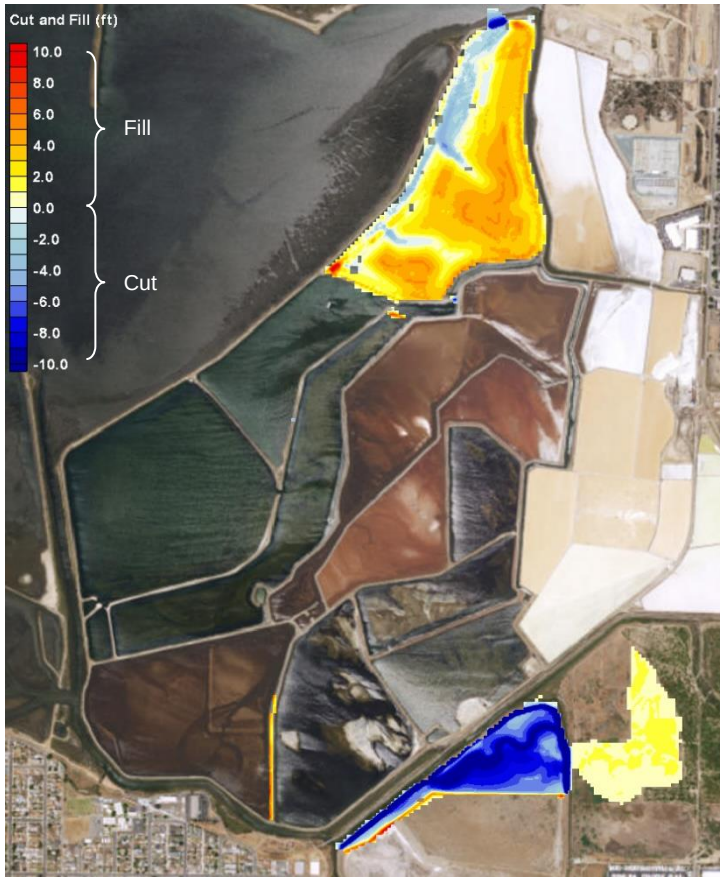
(a) Model Bathymetry

(b) Bathymetry Changes (Compared with Existing Conditions)

Figure 4.3 Model Bathymetry and Bathymetry Changes for Intertidal Alternative



(a) Model Bathymetry



(b) Bathymetry Changes (Compared with Existing Conditions)

Figure 4.4 Model Bathymetry and Bathymetry Changes for Subtidal Alternative

4.3 MODEL BOUNDARY CONDITIONS

4.3.1 Downstream Boundary Conditions

Since the Otay River is hydraulically linked to San Diego Bay, tidal input from San Diego Bay was used in the analysis. The nearest recording water level gage operated by NOAA is located at the Navy Pier in downtown San Diego (9410170). Tidal datums for San Diego relative to Mean Lower Low Water (MLLW) and NAVD88 are listed in Table 4.2.

Table 4.2 San Diego Bay Tidal Datums for the 1983 – 2001 Tidal Epoch

DATUM	ELEVATION (FT, MLLW)	ELEVATION (FT, NAVD88)
Highest Observed Water Level (1/27/1983)	8.14	7.71
Mean Higher High Water (MHHW)	5.72	5.29
Mean High Water (MHW)	4.99	4.56
Mean Tide Level (MTL)	2.96	2.53
National Geodetic Vertical Datum (NGVD) 1929	2.51	2.08
Mean Low Water (MLW)	0.94	0.51
North American Vertical Datum (NAVD) 1988	0.43	0.00
Mean Lower Low Water (MLLW)	0.00	-0.43
Lowest Observed Water Level (12/17/1937)	-3.09	-3.52

Source: NOAA 2007

A synthetic tidal series, referred to as a parametric mean periodic (PMP) tide, was developed for the downstream boundary condition. This time series was developed by fitting a sinusoidal curve to consecutive MHHW, MLLW, MHW, and MLW water surface elevations shown in Table 4.2 over a 24-hour period, and repeating for the modeling duration. This PMP tide, as shown in Figure 4.5, is representative of the mixed diurnal, semi-diurnal tide conditions found in San Diego Bay. The highest observed tide shown in Table 4.2 was not used for flood impact analysis because the probability of having a 100-year flood event which has only a one percent chance of occurring in any given year to enter the ORF during the highest observed tide is extremely small. The use of MHHW which statistically represents a water level that is higher than about 95 percent of all the water levels in a 19-year tidal epoch is considered sufficiently conservative for flood impact analysis.

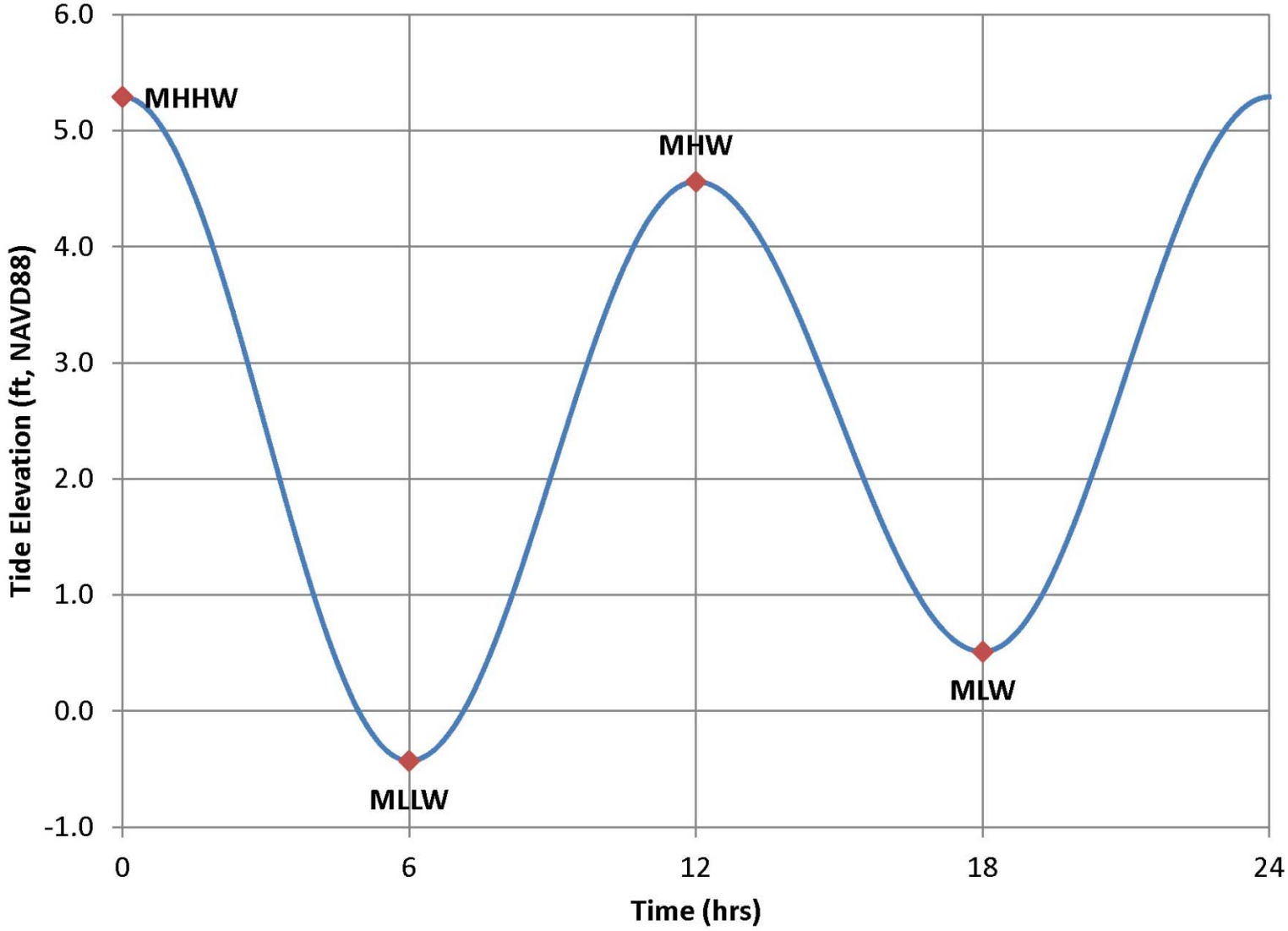


Figure 4.5 Parametric Mean Periodic Tide in San Diego Bay

4.3.2 Upstream Boundary Conditions

Upstream boundary conditions for the Otay River, Poggi Canyon Creek, and Nestor Creek were specified as flood hydrographs with given return periods (e.g., 100-year). The return period peak discharges for the Otay River, Poggi Canyon Creek, and Nestor Creek are summarized in Table 4.3. Peak discharges of the 10-, 50-, and 100-year return periods for the Otay River and Poggi Canyon Creek were obtained from the Federal Emergency Management Agency (FEMA) peak discharge estimates (FEMA 2006). For Nestor Creek, the 10- and 50-year return period peak flows were obtained from a prior hydrodynamic modeling analysis (PWA 2003) and the 100-year return period from the FEMA estimate (FEMA 2006). For all three streams, the 15- and 25-year peak flows were interpolated based on the flows associated with the other return periods.

Simplified assumptions were made to develop the flood hydrographs. The return period peak flows were applied to a simple triangular hydrograph to produce a theoretical flood hydrograph. The peak flow was assumed to occur 12 hours after flow initiation, returning to no flow after 24 hours. This is a simplified method originally applied for the salt ponds by PWA (2003) and also adopted for an earlier study evaluating the Otay River Floodplain (Everest 2007). For example, the 100-year flood hydrographs, as shown in Figure 4.6, were developed with peak flows corresponding to the 100-year peak flows provided in Table 4.3. In the figure, the flood hydrographs are shown with two different vertical axes due to the differences in flow. The 100-year flood hydrograph for the Otay River is shown based on the left vertical axis with a peak flow of 22,000 cfs. The smaller flood hydrographs for Poggi Canyon Creek and Nestor Creek are shown with the right vertical axis with peak flows of 1,400 and 1,093 cfs, respectively. These 100-year flood hydrographs were used for the flood impact analyses described in Section 5. Other return period flood hydrographs were used for the erosion analysis discussed in Section 6.

Table 4.3 Return Period Peak Discharges

RETURN PERIOD	OTAY RIVER AT OTAY VALLEY RD	POGGI CANYON CREEK	NESTOR CREEK
10-Year	1,200[A]	220 [A]	730 [B]
15-Year	2,700 [C]	320 [C]	770 [C]
25-Year	5,500 [C]	520 [C]	850 [C]
50-Year	12,000 [A]	930 [A]	990 [B]
100-Year	22,000 [A]	1,400 [A]	1,093 [A]

Peak discharges in cubic feet per second (cfs)
Source: [A] FEMA 2006; [B] PWA 2003; [C] Interpolated

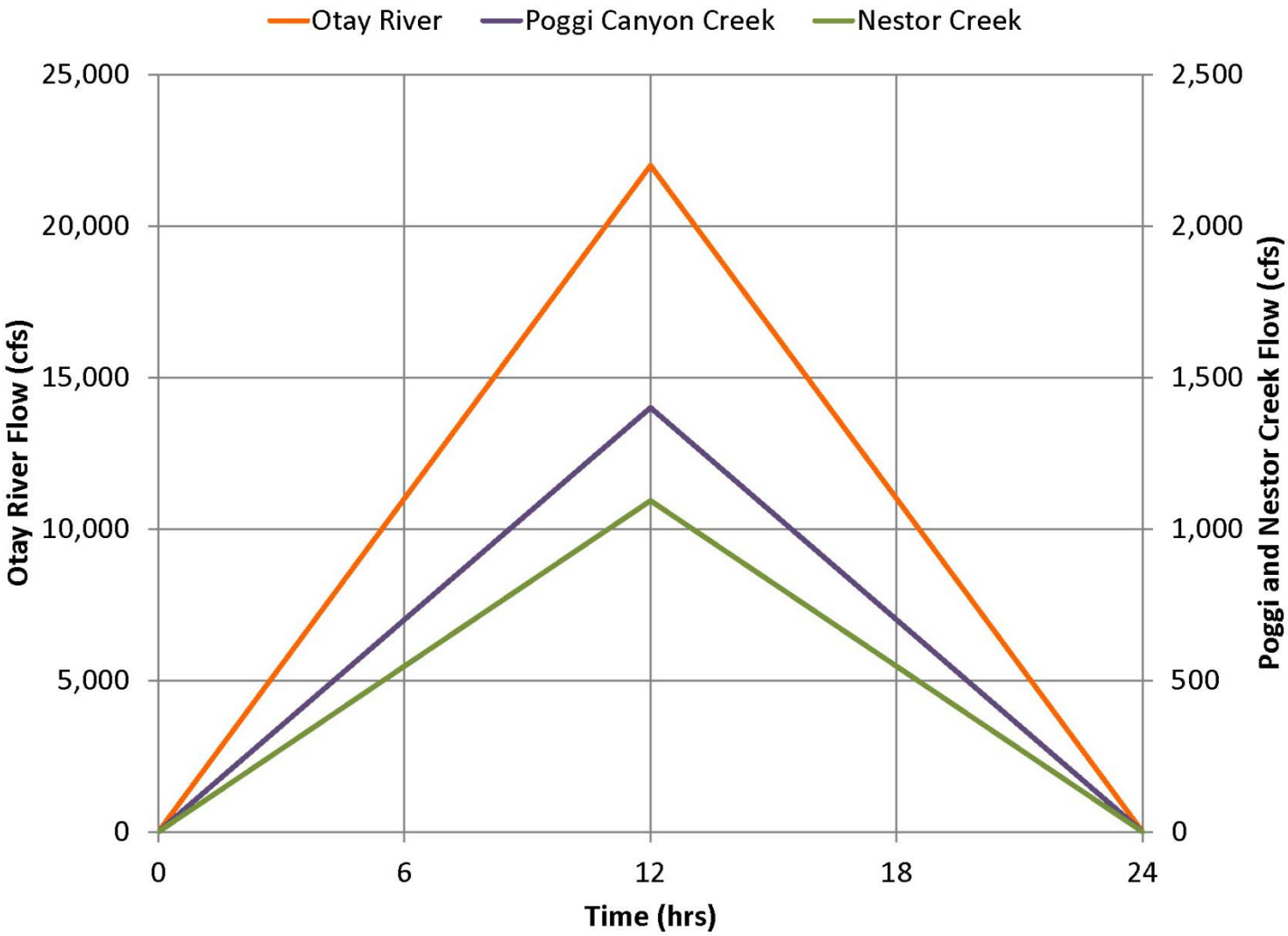


Figure 4.6 100-Year Return Period Flood Hydrographs

5. FLOOD IMPACT ANALYSES

5.1 APPROACH

The flood impact analysis was conducted to assess the impacts of the Otay River Estuary Restoration Project (ORERP) alternatives on flooding associated with the 100-year flood. Flood modeling was conducted to determine the flow pattern and water elevations during flood conditions. The results of the flood modeling under the 100-year event are summarized in Section 5.2 for existing conditions as well as the proposed project alternatives. The results under existing conditions were compared with the results under the ORERP alternatives to assess the project-induced differences as summarized in Section 5.3. An analysis of flood impacts to the Bayshore Bikeway was conducted and the results are discussed in Section 5.4. The potential impacts to erosion based on changes in flood velocities are discussed as part of the erosion analysis in Section 6.

5.2 FLOOD MODELING

The TUFLOW model was used to simulate hydrodynamic conditions of the 100-year flood for Existing Conditions as well as the Intertidal Alternative and Subtidal Alternative. Development of the flood hydrographs for Otay River, Poggi Canyon Creek, and Nestor Creek was previously discussed in Section 4.3.2. For the 100-year flood impact analyses, the flood hydrographs were timed so that the peak of the flow would coincide with MHHW to simulate high water flooding conditions, as shown in Figure 5.1. The 100-year flood hydrograph was simulated to start at hour 12 with peak occurring at hour 24 and MHHW. This timing of the flood hydrograph also allowed a spin-up period (12-hours) for the numerical model to establish hydrodynamic conditions for tidal flows. Initial water elevations were specified as 5.29 ft, NAVD88, corresponding to MHHW for tidally influenced areas including San Diego Bay and the Western Salt Ponds. An initial water elevation of 5.29 ft, NAVD88 was also specified for Ponds 12 – 15, which typically have some water. Initial water depths for these ponds ranged from 1 to 4 ft. The remaining salt ponds were assumed to be dry.

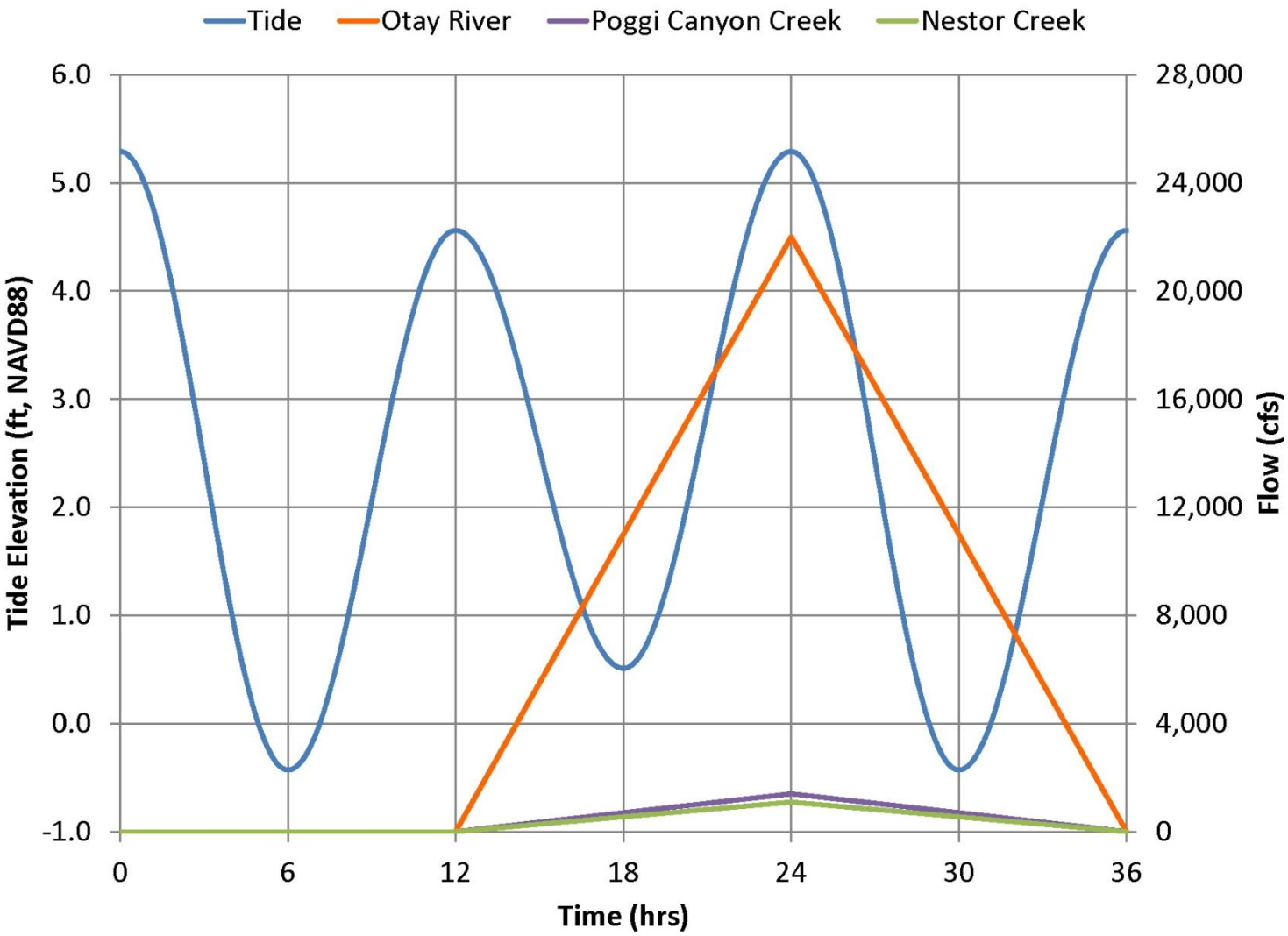


Figure 5.1 Parametric Mean Periodic Tide and 100-Year Flood Hydrographs

5.2.1 Existing Conditions

The 100-year flood was simulated to establish water elevations under Existing Conditions. Since the timing of the peak water elevation varies by location, results of the flood elevations are represented by the maximum water elevation that occurs at any point in time over the 36-hour simulation period. The spatial plot of the maximum water elevations over the entire model domain is provided in Figure 5.2. In general, the maximum water elevations follow the overall topography. Higher water elevations occur along the upper elevations along the Otay River and decrease towards the lower elevations in the ORF and salt ponds. The maximum water elevations also indicate the spatial extent of the flood inundation along the Otay River and ORF below the I-5 Bridge. The maximum water elevation was also compared with the FEMA 100-year flood map in Figure 5.3. The comparison shows that the spatial extent of the flood inundation for Existing Conditions is similar to the FEMA 100-year flood map with the exception of the Western Salt Ponds. The FEMA model represents the historical condition of Ponds 10a, 10, and 11, which were hydraulically separated from the Otay River and San Diego Bay by levees. The current model (TUFLOW) better represents the existing conditions since these three ponds were restored in 2011 resulting in hydraulic connectivity created by breaching the levees to restore tidal exchange between the ponds, San Diego Bay, and Otay River.

To illustrate the movement of the flood flow through the ORF, snapshots of the water elevations during the 100-year flood are provided in Figure 5.4. The color scale for the water elevations was selected to highlight the flood flows as indicated by the light blue to red areas. Water elevations below MHHW are shown by the blue areas, representing primarily tidal water elevations. A map of the salt ponds is provided in the lower right panel, next to the color scale. In the figure, snapshots of the water elevations in the ORF (downstream of the I-5 Bridge) are shown sequentially starting from the upper left panel, which depicts flood flows from the Otay River and Nestor Creek entering the ORF. The inset in the upper left panel indicates the timing of the five snapshots relative to the Otay River flood hydrograph. The arrival of the flood from the Otay River into the ORF occurs approximately six hours after the start of the hydrograph. This lag reflects the travel time from Otay Valley Road down to the ORF. Flows from the Otay River enter the ORF beneath the I-5 Bridge and move along the river channel towards Ponds 50 and 51. Flows from Nestor Creek move along the east edge of Pond 20A. Flood waters from Otay River and Nestor Creek continue to increase and inundate the ORF and then start to overtop levees as shown in the upper middle panel. Flows overtop the levees near the southeast corner of Pond 20A. Flood waters first enter the salt pond area through Pond 51 and start to inundate the ponds. The flood waters fill Ponds 50-54 and continue moving through the salt ponds into Ponds 41-43, 46, and 48. Farther downstream, flood flows overtop the bike path and levees at Ponds 20 and 22. At the bike path bridge, flows split westward to San Diego Bay or southward along the west side of Pond 20A. Three hours after the arrival of the flood (upper right panel), flood waters continue to inundate Ponds 20A, 20, and 22, as well as Ponds 40-48. In the lower left panel, the water elevations show the continued movement of the flood waters into the center portion of the salt ponds through Ponds 23-27. By nine hours after the arrival of

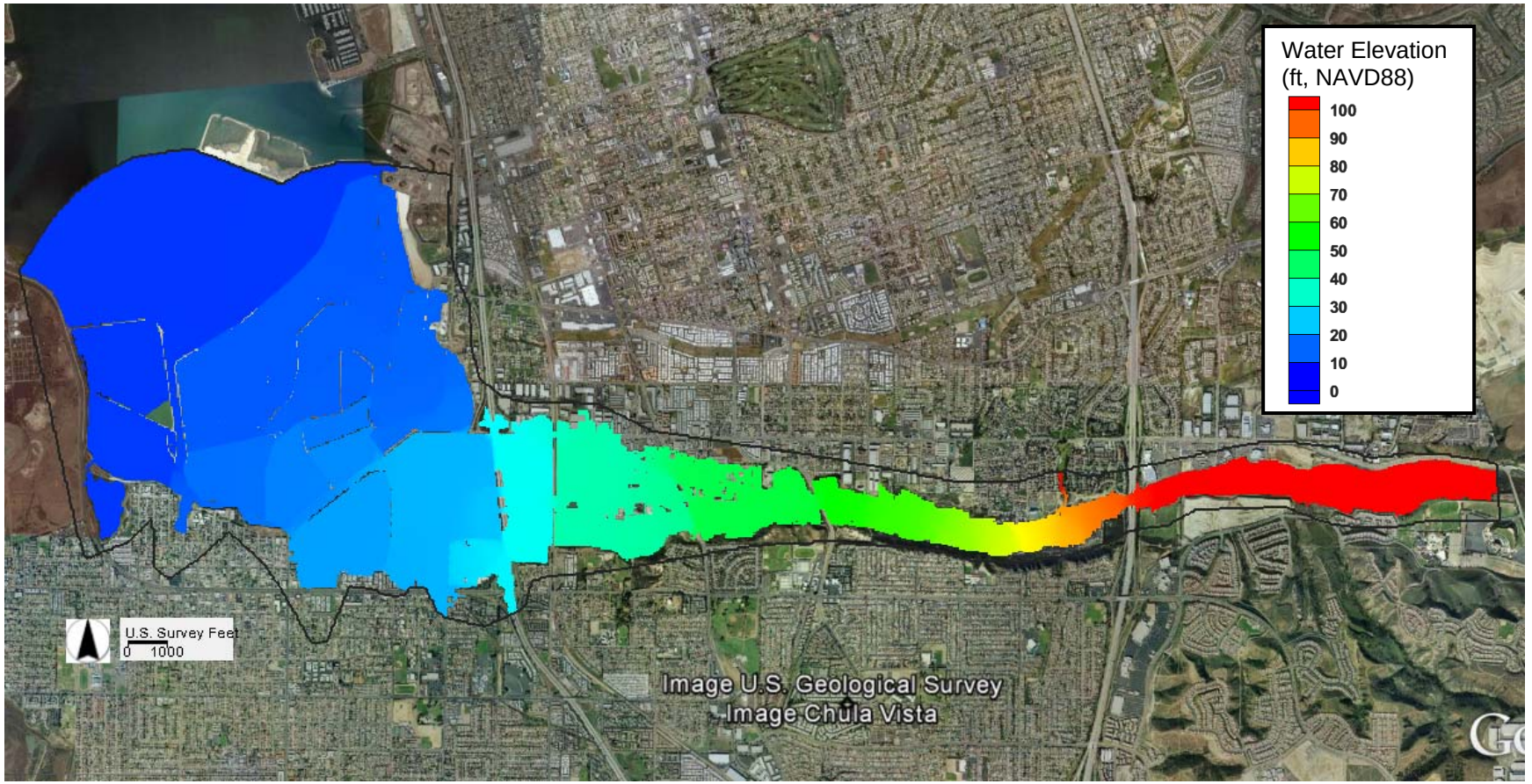


Figure 5.2 100-Year Flood Maximum Water Elevations for Existing Conditions

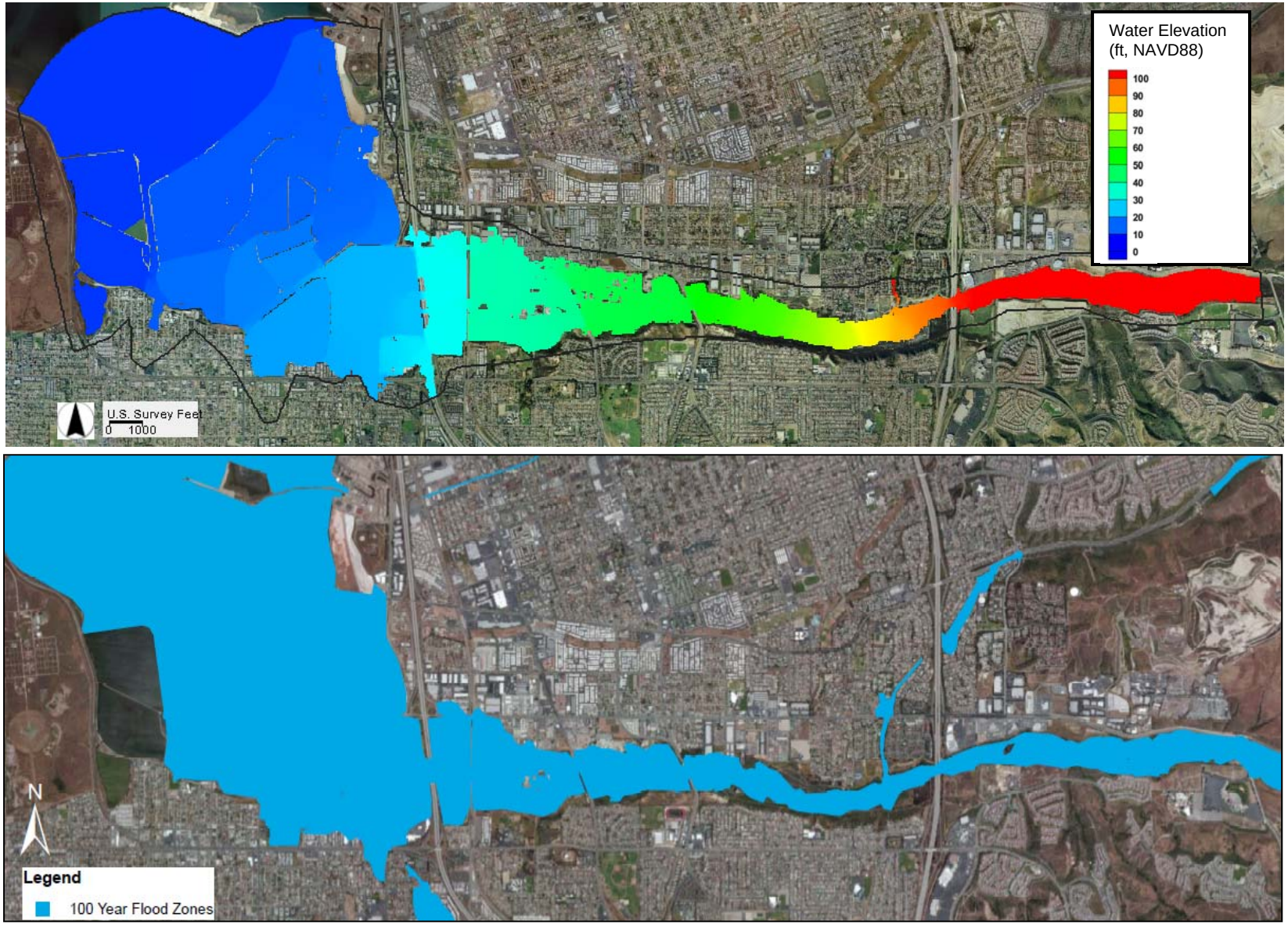


Figure 5.3 Existing Conditions Comparison with FEMA 100-Year Flood Map

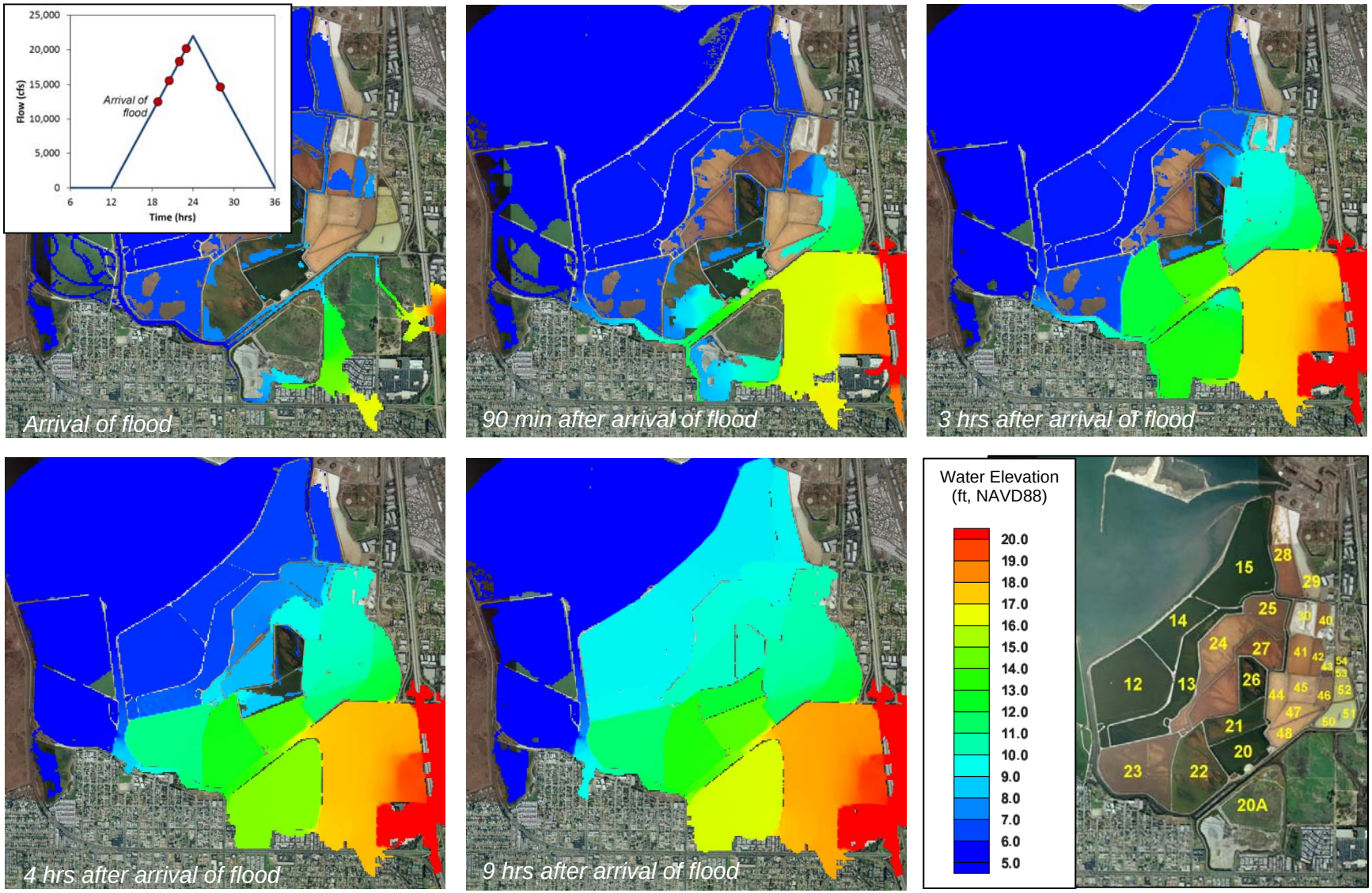


Figure 5.4 100-Year Flood Water Elevations for Existing Conditions

the flood, flood waters inundate the remaining ponds (Ponds 12-15, 21, 26, and 28), as shown in the lower middle panel. Under Existing Conditions, the 100-year flood will inundate the ORF and salt ponds and are generally dissipated in the tidally influenced areas.

5.2.2 Intertidal Alternative

The 100-year flood was simulated for the Intertidal Alternative to establish water elevations. Maximum water elevations for the Intertidal Alternative, provided in Figure 5.5, show a general gradation from upstream to downstream. The flood inundation based on the maximum water elevations show a similar spatial extent as Existing Conditions. For the Intertidal Alternative, flood elevations upstream from the I-5 Bridge are the same as Existing Conditions. Hence, the Intertidal Alternative does not adversely impact flood conditions upstream of the I-5 Bridge.

Water elevations at different times during the 100-year flood for the Intertidal Alternative are provided in Figure 5.6. Snapshots of the water elevations are shown in the same manner as previously shown for Existing Conditions. Water elevations at the arrival of the flood from the Otay River in the ORF are shown in the upper left panel. The darker blue areas indicate tidally influenced areas including the proposed wetland area, which receives flood waters from Nestor Creek. Flood flows inundate the ORF, as depicted in the upper middle panel, then overtop the levees into the salt ponds. Flood waters enter the salt ponds through Pond 51 and subsequently fill Ponds 50-54, and 46. Flood waters also flow over the bike path and levee into Pond 22. At three hours after the arrival of the flood (upper right panel), flood waters inundate Ponds 20A and 23, while flows through Pond 51 inundate Ponds 40-43 and 48. Flows continue to inundate the salt ponds from the west side into Ponds 12-14, 24, and 27 and also from the east side into Ponds 44, 45, 47 (lower left panel). Flow waters also fill Ponds 20 and 21. By nine hours after the arrival of the flood, flood waters inundate the remaining ponds (Ponds 25, 26, 28, 29, and 30), as shown in the lower middle panel. Differences in the flow pattern of the Intertidal Alternative compared with Existing Conditions are discussed in Section 5.2.4.

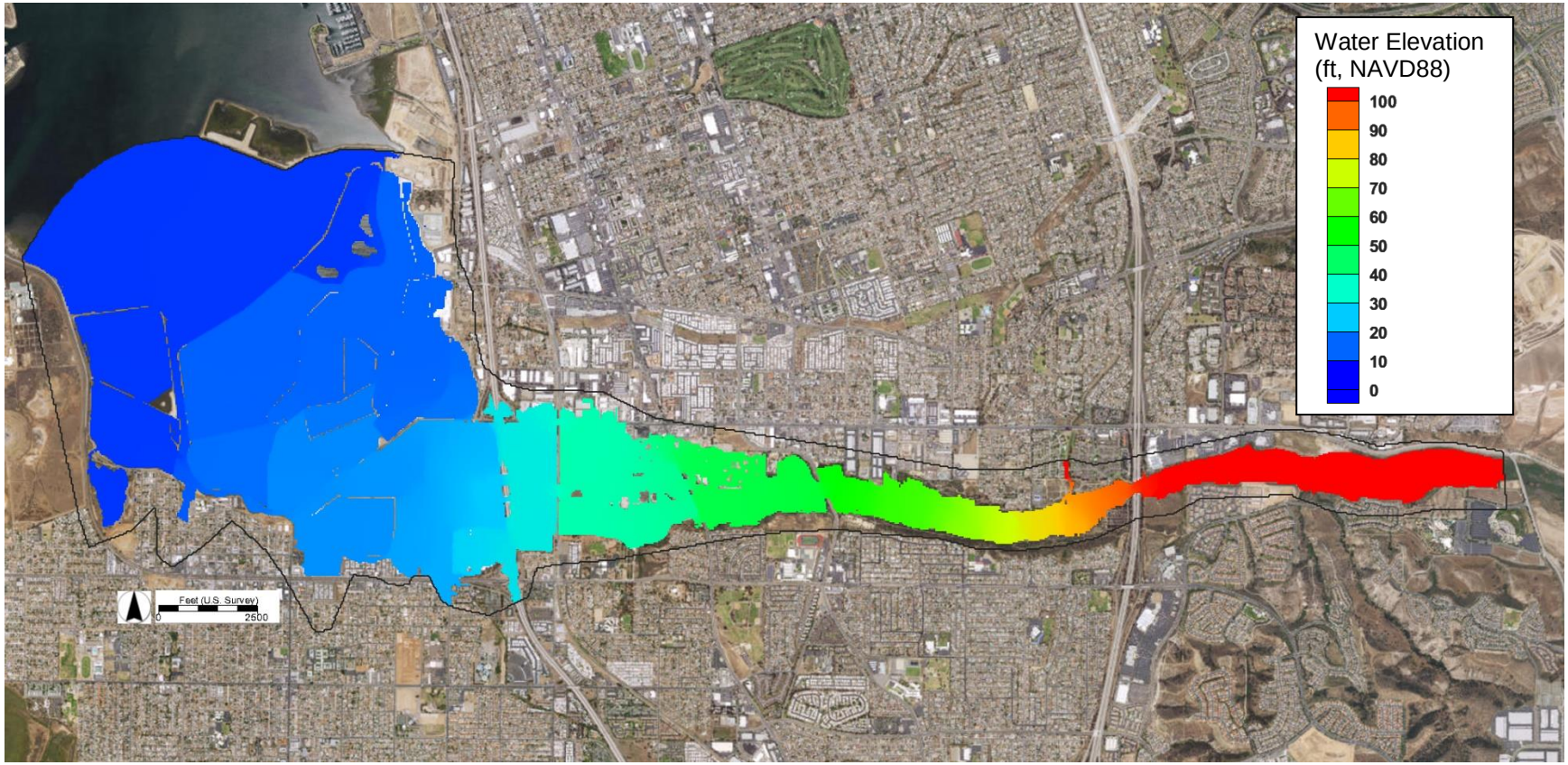


Figure 5.5 100-Year Flood Maximum Water Elevations for Intertidal Alternative

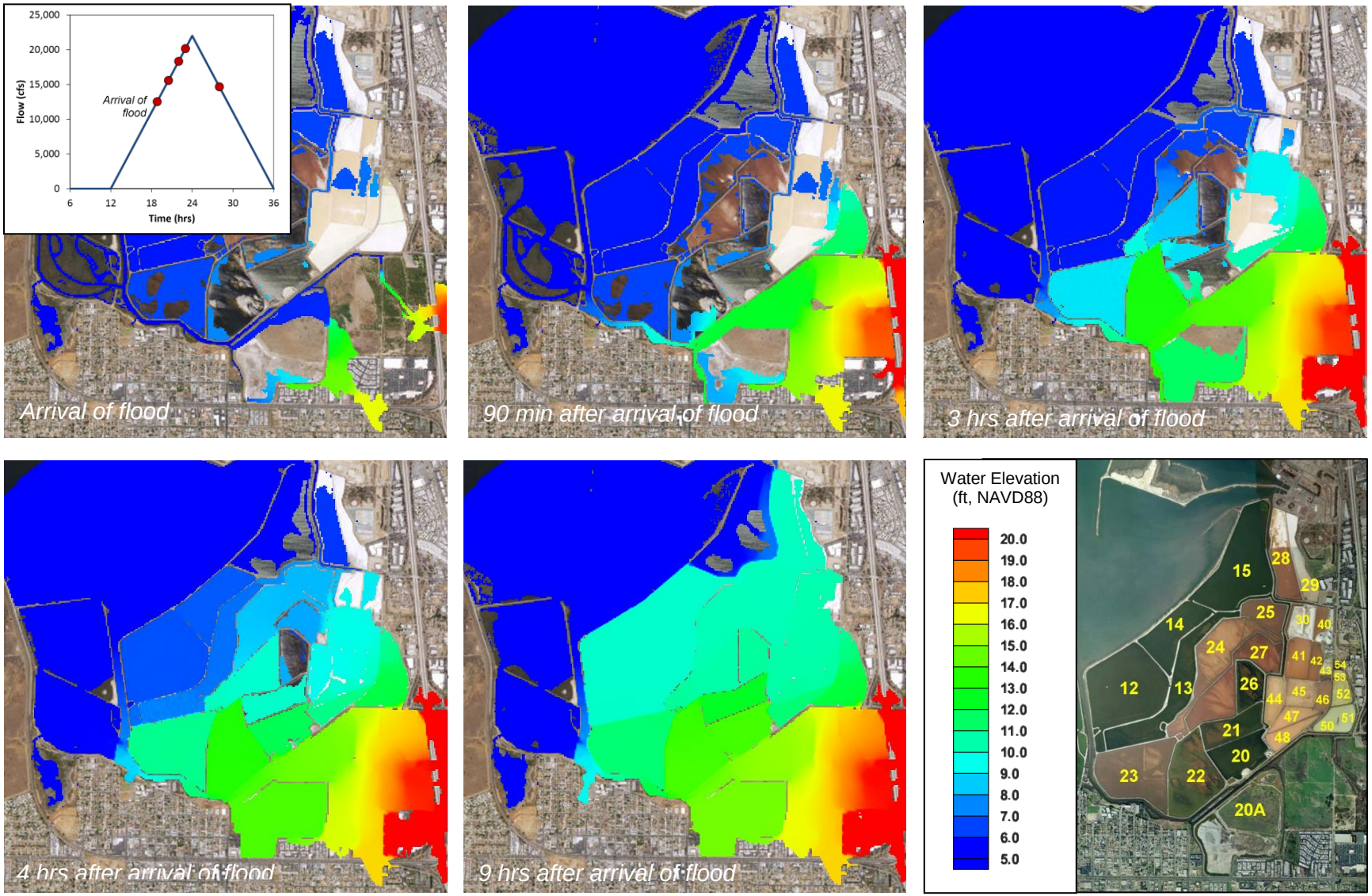


Figure 5.6 100-Year Flood Water Elevations for Intertidal Alternative

5.2.3 Subtidal Alternative

The 100-year flood was simulated for the Subtidal Alternative to establish water elevations. The overall flood modeling results for the Subtidal Alternative are provided in Figure 5.7. The flood results for the Subtidal Alternative are similar to the Intertidal Alternative. The maximum water elevations show a general gradation from upstream to downstream with a similar spatial extent as Existing Conditions. Flood elevations along the Otay River upstream of the I-5 Bridge are the same for the Subtidal Alternative as for Existing Conditions. Hence, the Subtidal Alternative does not adversely impact flood conditions upstream of the I-5 Bridge.

Water elevations during the 100-year flood for the Subtidal Alternative are shown in Figure 5.8. The movement of the flood flows through the project area and salt ponds is similar to the Intertidal Alternative. Flood waters entering the ORF are shown in the upper left panel. Water elevations continue to increase in these areas until overtopping of the levees into Ponds 51 and 22, as seen in the upper middle panel. Three hours after the arrival of the flood, Ponds 23 and 20A becomes inundated (upper right panel). The flood waters continue through the salt ponds along the west and east sides before inundating the center ponds, as illustrated in the lower left panel. The flood eventually inundates all of the salt ponds except for Pond 15, as shown in the bottom middle panel. Differences in the flow pattern of the Subtidal Alternative compared with Existing Conditions are discussed in Section 5.2.4.

5.2.4 Comparison of Alternatives

In general, the proposed alternatives redistribute the 100-year flood flows through the salt ponds resulting in changes to the flood elevations. This redistribution of flood flows is best illustrated by comparing water elevations at two different times during the flood – approximately 90 minutes and 4 hours after arrival of the flood. In Figure 5.9, the three top panels show snapshots of water elevations approximately 90 minutes after the arrival of the flood as the flood flows move into the salt ponds for Existing Conditions, Intertidal Alternative, and Subtidal Alternative; and water elevations about four hours after the arrival of the flood flows are compared in the lower three panels. In each panel, the flood pattern is emphasized by the white arrows, which show the general direction of flow. For Existing Conditions, the flood inundates the ORF and then enters the salt ponds from Ponds 51, 20, and 22, as indicated by the three arrows. Under the proposed alternatives, flood flows would be altered by expanding the flows through the project area. As a result, flood elevations in the ORF would be reduced and flows enter the salt ponds from Ponds 51 and 22. Changes in the flow pattern through the salt ponds under the proposed alternatives are illustrated in the lower three panels. For Existing Conditions, flood waters move through the salt ponds from Ponds 51, 20, and 22 with more

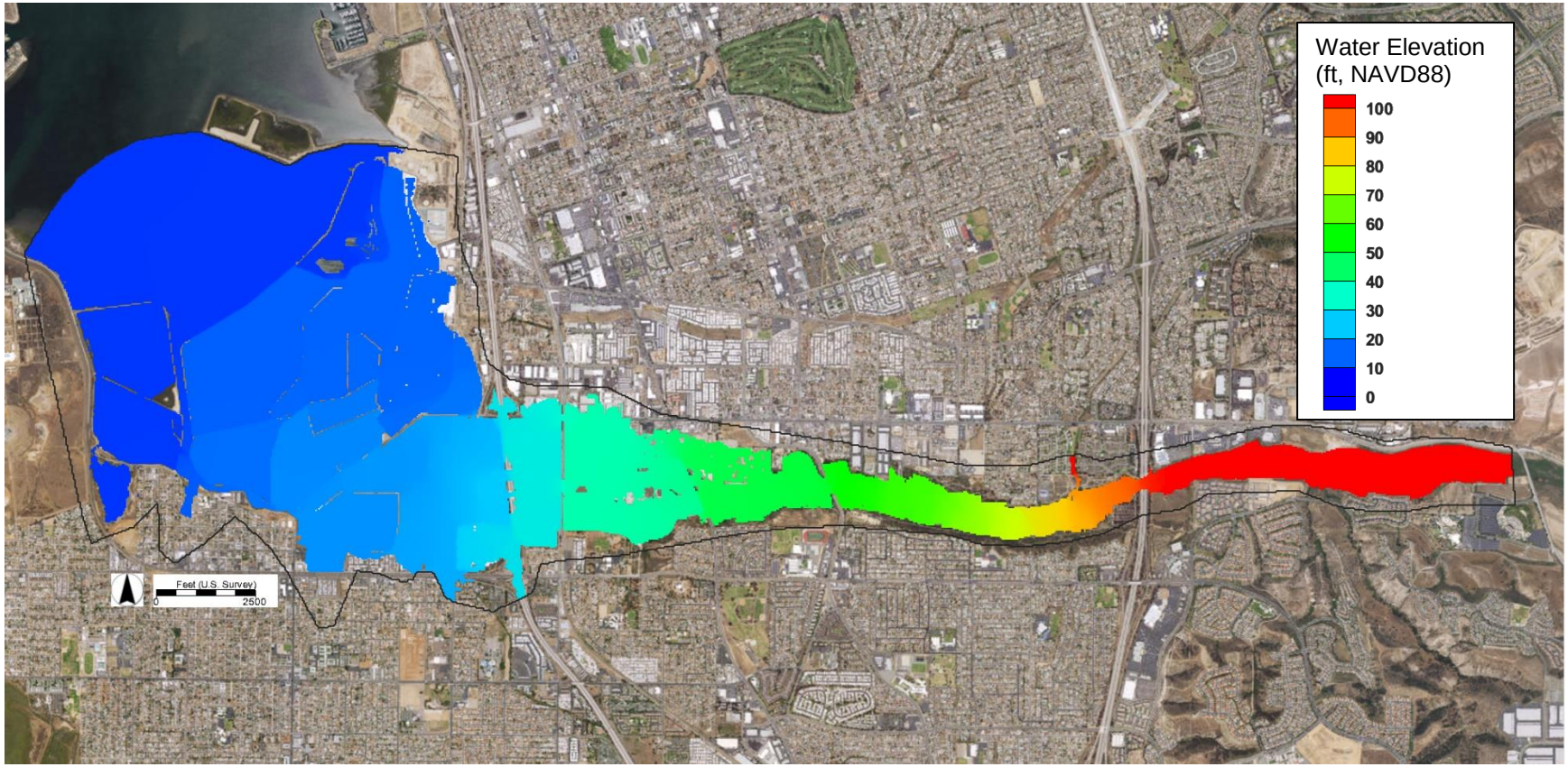


Figure 5.7 100-Year Flood Maximum Water Elevations for Subtidal Alternative

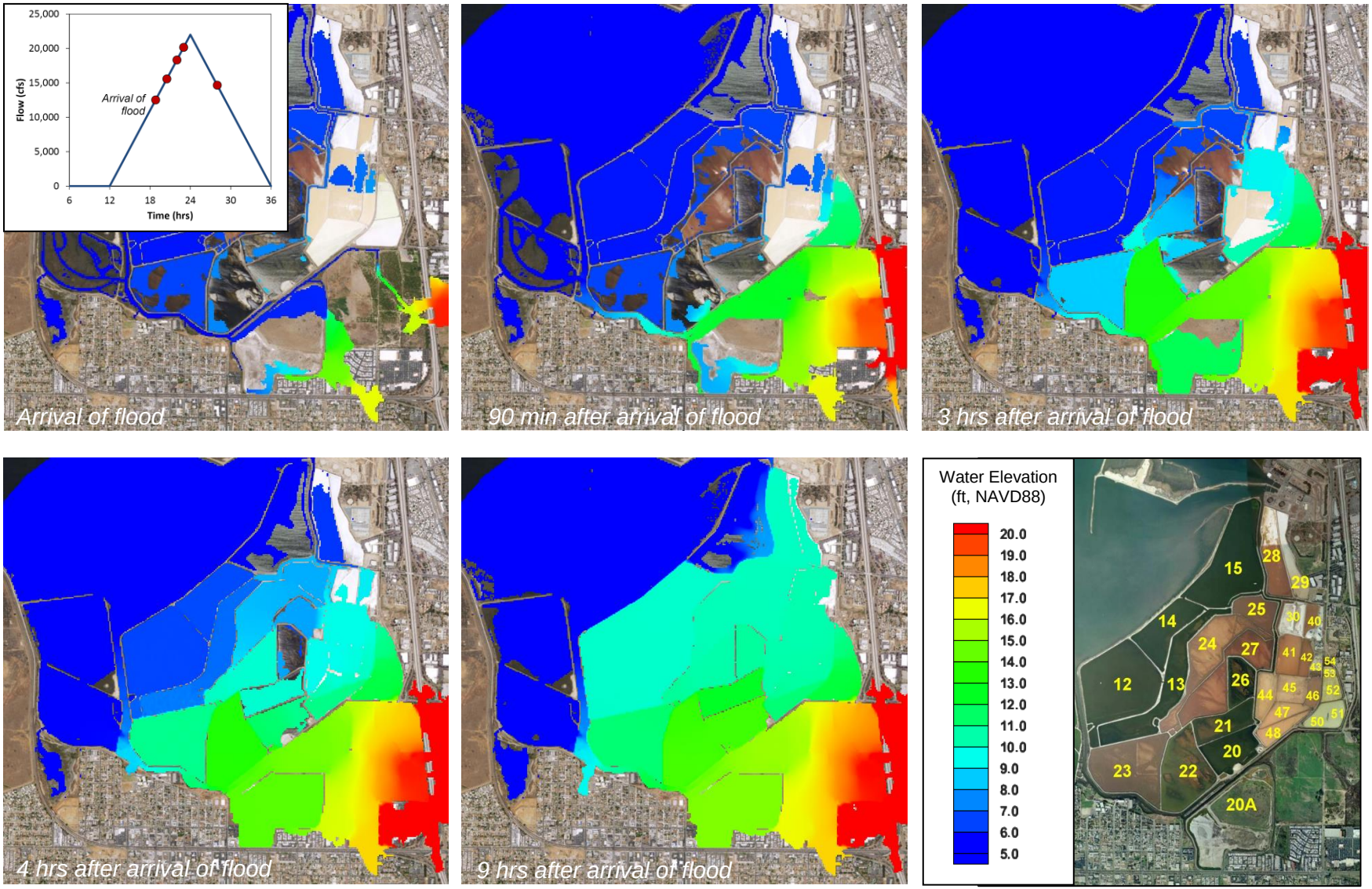


Figure 5.8 100-Year Flood Water Elevations for Subtidal Alternative

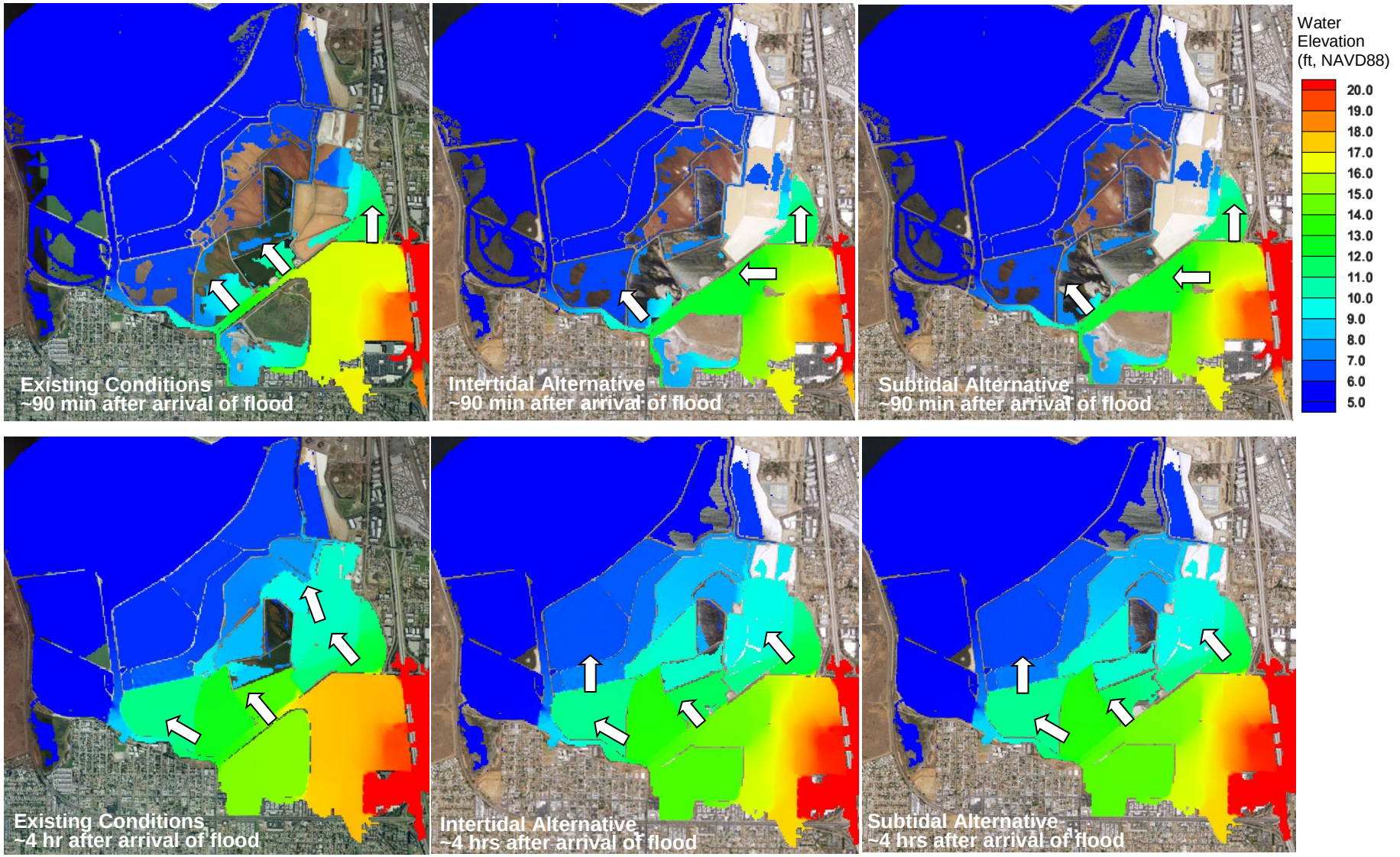


Figure 5.9 Comparisons of 100-Year Flood Water Elevations

flows from Pond 51. Under the proposed alternatives, a greater amount of flooding occurs from the west side of the salt ponds entering from Pond 22. This is highlighted by the two white arrows on the west side of the salt ponds. This results in higher water elevations in Ponds 12 – 14. Lower flows through the center of the salt ponds (Pond 20) are indicated by the lower water elevation compared with Existing Conditions. On the east side of the salt ponds (Pond 51), Existing Conditions show a larger inundated area compared with the alternatives, indicating that lower flows would be passing through the east side of the salt ponds under the proposed alternatives. The increase in flood elevations in Ponds 12 – 14 is discussed further below.

Flood elevations were evaluated based on the maximum water elevations that occurred during the 100-year flood event. The maximum water elevations downstream of the I-5 Bridge for Existing Conditions, Intertidal Alternative, and Subtidal Alternative are compared in Figures 5.10. These results are the same as previously shown for the entire model domain in Figures 5.2, 5.5, and 5.7, but the color scale has been changed to highlight the differences in water elevations for the area downstream of the I-5 Bridge. Comparisons between Existing Conditions and the proposed alternatives show differences in the spatial extent of flooding and flood elevations. The flooding of the residential area along Palm Avenue (south of Pond 20A) under Existing Conditions is reduced under either alternative. Additional flooding would occur for both alternatives at Pond 29, which is not flooded under Existing Conditions. Differences in flood elevations from Existing Conditions are apparent in the ORF and project areas (area south of the bike path). Both alternatives would result in lower water elevations in the ORF and project areas compared with Existing Conditions. Lower water elevations were also found in Pond 15, which is isolated from the flood waters under the alternatives. Higher water elevations for the alternatives are shown in Ponds 12 – 14 and 28. Under Existing Conditions, flood waters overtop the levees into San Diego Bay along Ponds 12, 14, and 15. Under the alternatives, overtopping of the levees into San Diego Bay occurs only along Ponds 12 and 14. Overtopping of the Ponds 12 and 13 levees adjacent to the Otay River occur under the alternatives. For Pond 23, flow over the levees into the river was determined for Existing Conditions and the alternatives. These changes in flood elevations are attributed to the redistribution of flows through salt ponds.

5.3 FLOOD IMPACTS

Flood impacts of the proposed alternatives focused on the differences in the maximum flood elevations from Existing Conditions. The differences, as shown in Figure 5.11, were calculated as the maximum flood elevation for the alternative less the maximum flood elevation for Existing Conditions. In the figure, the white areas indicate no change in maximum water elevation from Existing Conditions. Positive values indicate higher flood elevations for the alternative compared with Existing Conditions, while negative values indicate lower flood elevations. Yellow areas indicate higher flood elevations under the proposed alternatives compared with

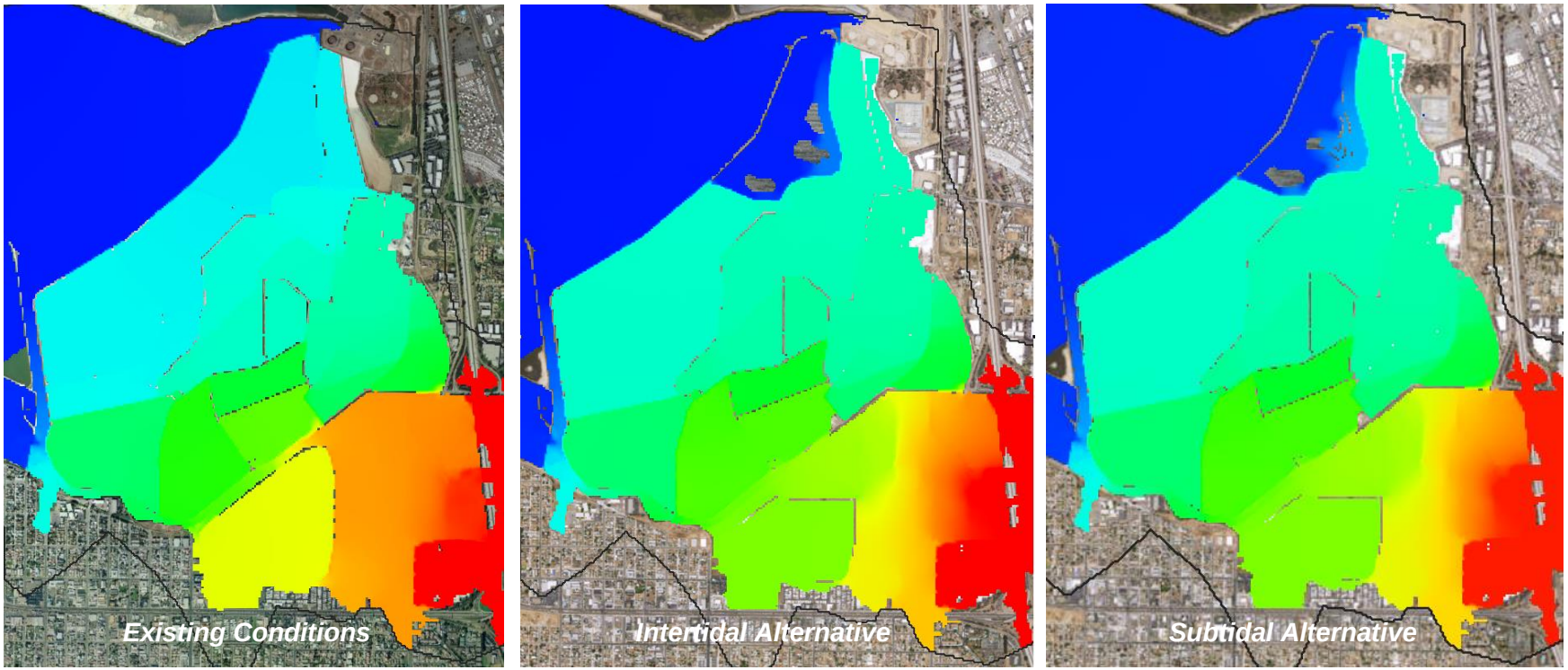


Figure 5.10 Comparisons of 100-Year Flood Maximum Water Elevations

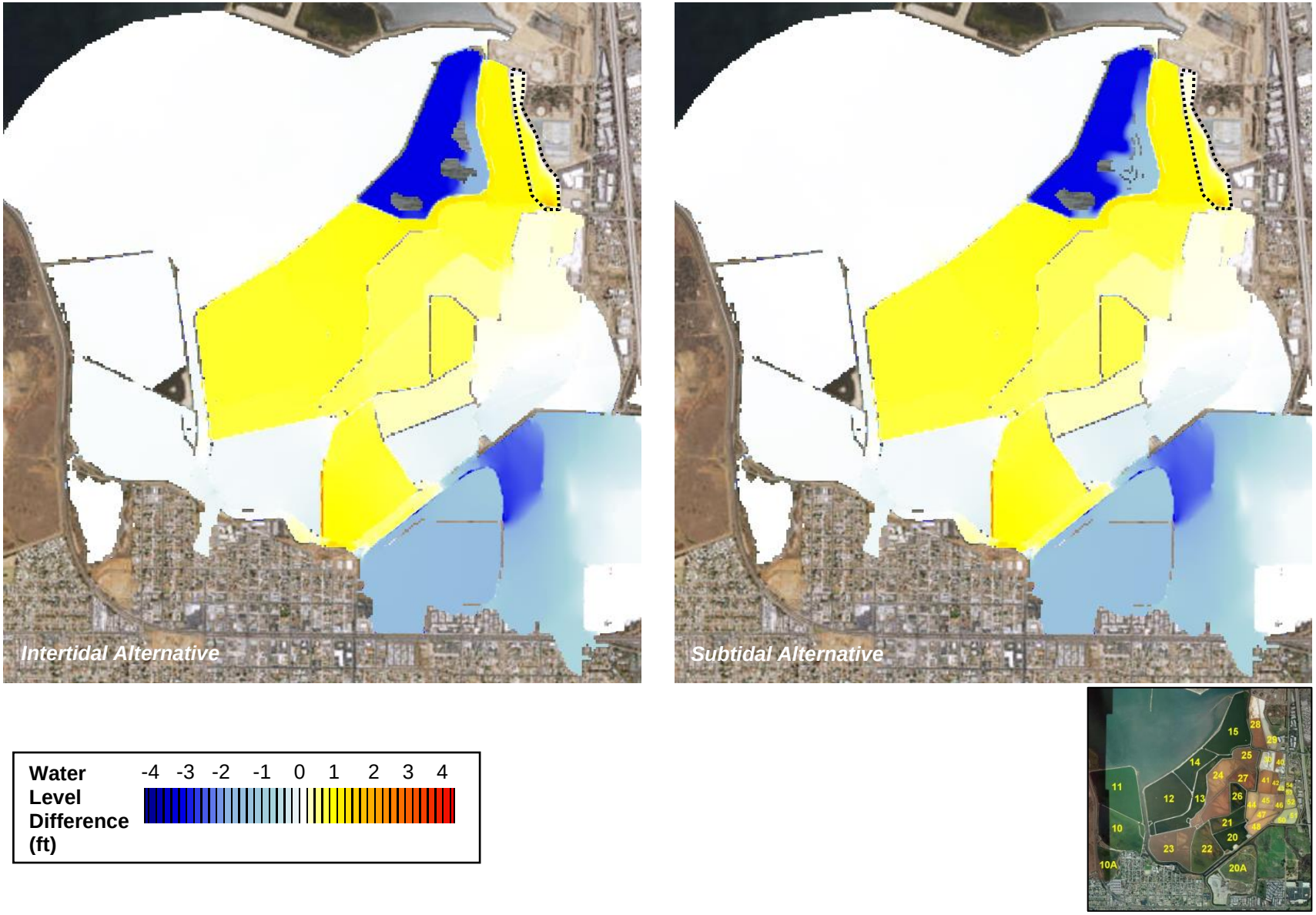


Figure 5.11 100-Year Flood Impacts – Change in Maximum Water Elevations when Compared with Existing Conditions

Existing Conditions. The highest increases in flood elevations are found in Ponds 12 – 14 and 28. Increases in flood elevations are also estimated for the bike path along Pond 22. The yellow area in Pond 29 (outlined in dotted lines) is an area flooding occurs under the alternatives but not under Existing Conditions. The water elevation difference for that area is calculated as the difference in water elevation between the alternatives and the ground elevation of the existing condition. In the figure, lighter blue areas indicate reductions in flood elevations, which primarily occur in the floodplain and project areas. Reductions in flood elevations are also observed within Pond 15 as well as the levee between Pond 15 and San Diego Bay. The darker blue indicates areas that are flooded under Existing Conditions, but are less inundated under the alternative such as the ORF, ERC, Pond 15, and the residential area near Palm Avenue.

Comparisons between the Intertidal and Subtidal Alternatives show similar flood impacts in the salt ponds for both alternatives. The Subtidal Alternative results in slightly higher flood elevations for the south end of the bike path along Pond 22.

5.3.1 Salt Ponds 14 and 28

As mentioned previously, the proposed alternatives will result in higher flood elevations compared with Existing Conditions in Ponds 12 to 14, 28, and 29 due to changes in the flow distribution through the salt ponds. The higher levees around Pond 15 under the proposed alternatives also contribute to the higher water elevations by reducing the flood area. The higher water elevations result in higher flows over the Pond 12 and 14 levees into San Diego Bay as well as higher flows into Ponds 28 and 29. Examples of the increase in flood elevations at Ponds 14 and 28 are provided in Figure 5.12. Time series of water elevations during the 100-year flood are shown for Existing Conditions (blue line), Intertidal Alternative (orange line), and Subtidal Alternative (green line). The black-dashed line indicates the average levee elevation so water elevations above this line indicate overtopping of the levee. Water elevations in Pond 14 are compared in the top panel. The elevation of the levee between Pond 14 and San Diego Bay ranges from 7.5 to 9.5 ft, NAVD88, with an average of about 8.5 ft, NAVD88. A portion of the levee is overtopped under Existing Conditions, while essentially the entire length of the levee would be overtopped under the proposed alternatives. For Pond 28 shown in the lower panel, water elevations for Existing Conditions is lower than the levee elevation between Pond 28 and Pond 29, but under the proposed alternatives, flood elevations at Pond 28 would be higher than the levee between Pond 28 and Pond 29. Hence, as discussed earlier, Pond 29 is not flooded under existing alternatives but would be flooded with the proposed alternatives.

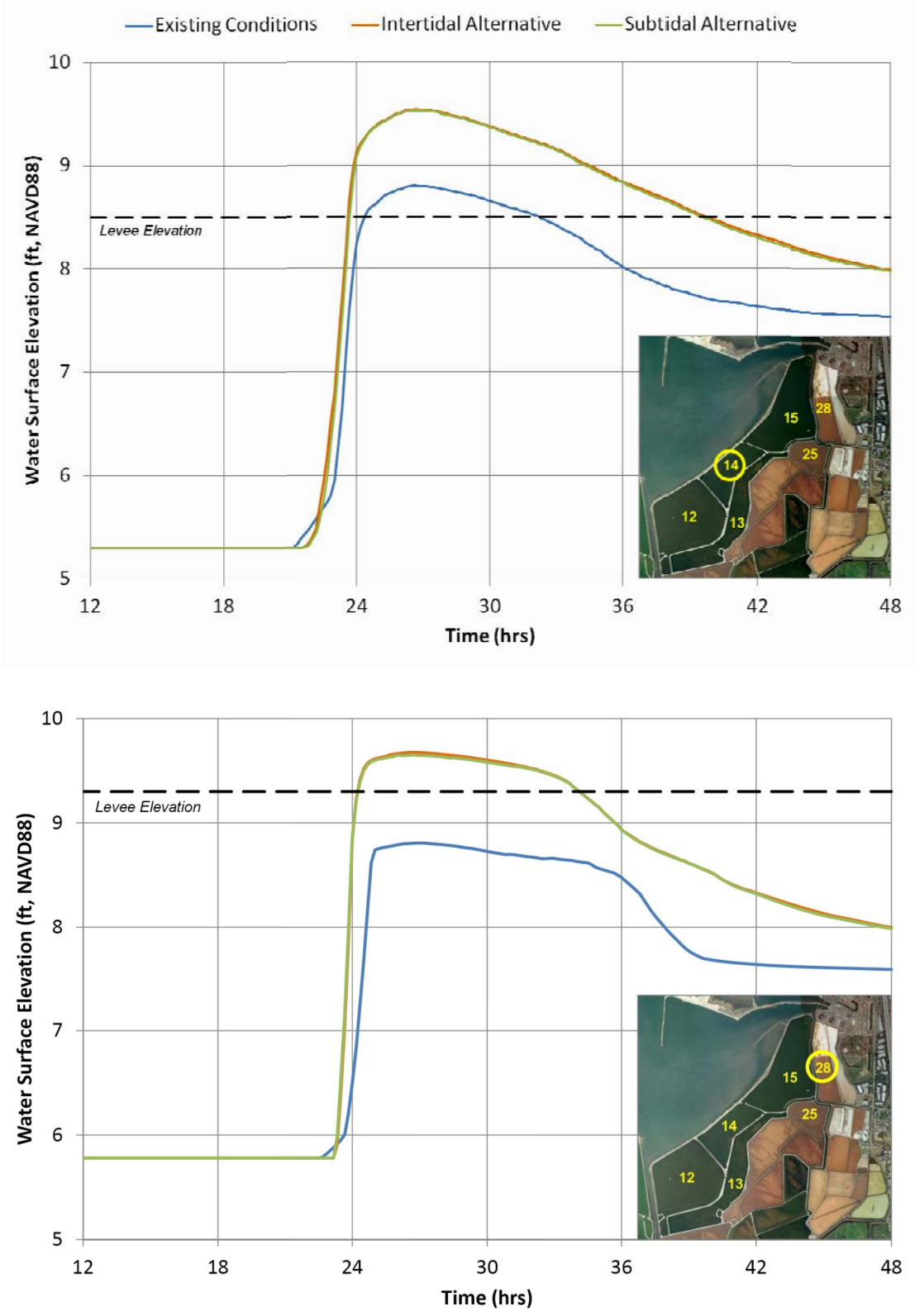
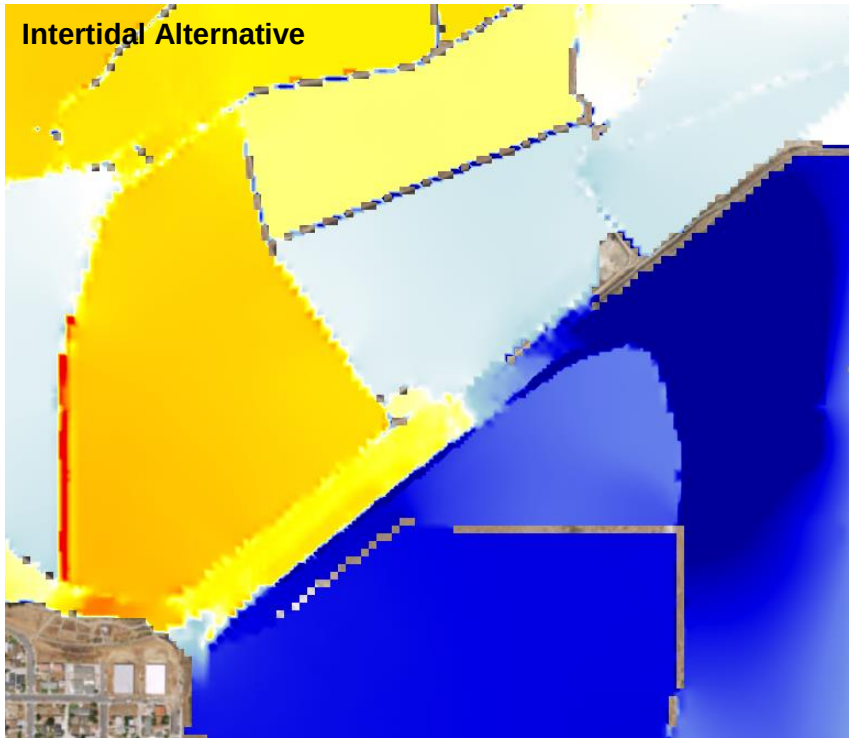


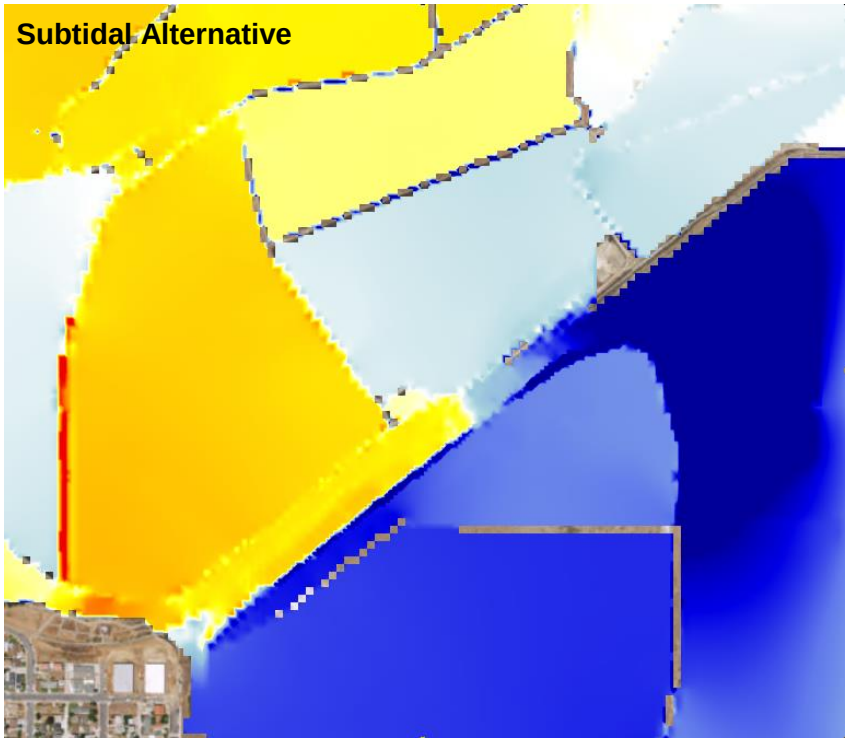
Figure 5.12 100-Year Flood Elevations at Ponds 14 and 28

5.4 BIKE PATH IMPACTS

The 100-year flood modeling described previously showed changes along the bike path in the maximum 100-year flood elevation due to the redistribution of flows under the proposed alternatives. A closer look at the post-restoration changes to the maximum flood elevations along the south end of the bike path is shown in Figure 5.13. The figure shows the differences in maximum flood elevations between the alternatives and the Existing Conditions. In the figure, the yellow area indicates higher flood elevations compared with Existing Conditions, while blue areas indicate lower flood elevations. In general, the 100-year flood elevations would decrease at the center portion of the bike path along Pond 20, but increase at the southern end of the bike path along Pond 22. The higher flood elevations are due to the redistribution of the flood flows. Flood flows that would overtop into Pond 20 under Existing Conditions would be diverted downstream into the wetland area and Pond 22. Although the proposed alternatives would increase flood elevations for the 100-year flood, flood impacts would be reduced for smaller floods events.

Additional flood simulations were conducted to further evaluate potential flooding impact of the bike path due to the proposed alternatives. Flood impacts were evaluated in terms of when flood water levels would exceed the bike path elevation in addition to changes in flood water levels from existing condition during the 100-year flood event. Additional flood modeling was conducted for the 10-, 15-, 25-, and 50-year return period floods to determine the minimum flood size that would result in flooding of the bike path. These additional floods were simulated in the same manner as the 100-year flood with flood hydrographs developed for each return period as discussed previously in Section 4.3.2. It was determined that depending on the location, flooding along the bike path would begin between the 10-year and 15-year flood under existing condition. However, as illustrated in Figure 5.14, with the proposed alternatives, flooding of the bike path would not occur up to the 15-year flood event. In Figure 5.14, water elevations for the 15-year and 100-year floods at three locations along the bike path under existing and with project alternative conditions are compared. The three locations for the comparison of water elevations are shown in the inset at the bottom of the figure. Time series of water elevations for the 15-year flood are shown in the upper three panels and the corresponding water elevations for the 100-year flood are contained in the lower three panels. In the figure, time series for Existing Conditions, Intertidal Alternative, and Subtidal Alternative are indicated by the blue, orange, and green lines, respectively. The black-dashed line is the ground elevation of the bike path at each location. As shown in the figure, at Location 1, flood elevations under the proposed alternatives would be higher than Existing Conditions for both the 15- and 100-year floods. At Location 2, flood elevations would be reduced under proposed conditions for the 15-year flood, whereas, flood elevations would be higher than Existing Conditions for the 100-year flood. At Location 3, both the 15- and 100-year flood elevations for the proposed alternatives would be less than Existing Conditions.





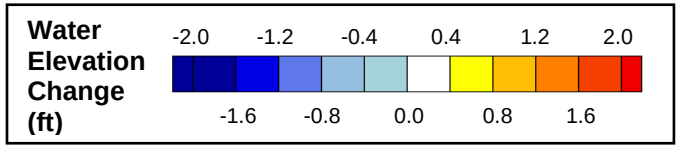




Figure 5.13 100-Year Flood Impacts along Bike Path

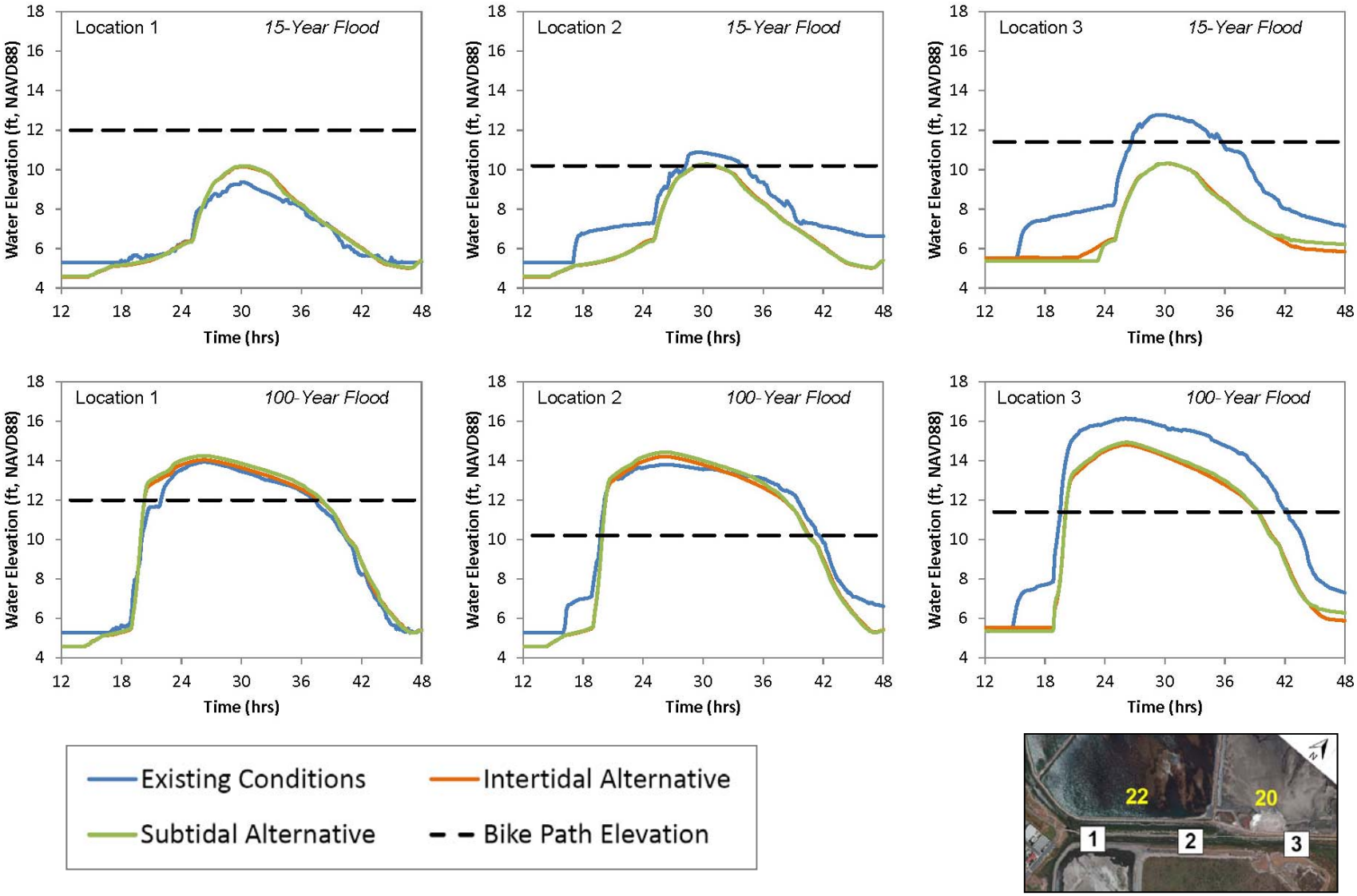


Figure 5.14 15-Year and 100-Year Flood Elevations along Bike Path

Flooding of the bike path occurs when water levels exceed the bike path elevation and overtops the bike path. In Figure 5.14, water elevations above the black-dashed line indicate flooding of the bike path. The bike path would be flooded by a 100-year event under both existing and proposed conditions. However, the proposed alternatives would reduce flooding of the bike path for a 15-year flood event. No flooding occurs for the 15-year flood event at Location 1 under both existing and proposed conditions, but at the other two locations, the proposed alternatives would alleviate flooding of the bike path for the15-year flood event. In summary, the proposed alternatives would not alleviate flooding of the bike path for extreme flood events (e.g., 100-year flood), but would prevent flooding of the bike path for smaller and more frequent flood events (e.g., 15-year flood).

5.5 SUMMARY

Flood modeling was conducted to establish the flow pattern and water elevations during flood events. The flood impact analysis was conducted for the 100-year flood from the Otay River, Poggi Canyon Creek, and Nestor Creek. Flood conditions were simulated for Existing Conditions, Intertidal Alternative, and Subtidal Alternative and then compared with evaluate changes in flow pattern and maximum water elevations. For Existing Conditions, the flood inundates the ORF and then enters the salt ponds from Ponds 51, 20, and 22. The salt ponds are filled from primarily the west and east sides before overtopping the levees into San Diego Bay. Under the alternatives, flood flows are redistributed through the project area and enter the salt ponds through Ponds 51 and 22. A greater amount of flooding occurs from the west side of the salt ponds compared with the east side inundating all the ponds except for Pond 15, which is isolated from flood flows. Higher flood elevations in the northern portion of the salt ponds results in greater flows overtopping into San Diego Bay along Ponds 12 and 14 as well as greater flows into Ponds 28 and 29.

Reductions in flood impacts were determined for the ORF and project areas, Pond 20A, Pond 20, and Pond 15. Along the bike path, the proposed alternatives would reduce flood elevations at the north end of the bike path adjacent to Pond 48. In general, the proposed alternatives would not change flood elevations in tidally influence areas, including the Western Salt Pond Restoration area (formerly Ponds 10A, 10, and 11). Flood impacts of the proposed alternatives were determined for Ponds 12, 13, 14, 28, and 29. Increases in 100-year flood elevations were also found for the south end of the bike path along Pond 22.

Additional flood simulations for flood events with different return periods were conducted to assess flood impacts in terms of flooding of the bike path. The proposed alternatives would not alleviate flooding of the bike path for extreme flood events (e.g., 100-year flood), but would prevent flooding of the bike path for smaller flood events (e.g., 15-year flood).

6. EROSION IMPACT ANALYSIS

6.1 APPROACH

The erosion impact analysis was conducted to identify erosion (scour) associated with the proposed alternatives. In addition to water levels, the flood model TUFLOW provided velocities during flood conditions. The erosion of sediment is dependent primarily on the water velocity and sediment grain size. In general, higher velocities will correspond with greater erosion. Erosion impacts were qualitatively assessed based on change in velocities under the proposed conditions compared with Existing Conditions. Areas with lower velocities than Existing Conditions are expected to have reduced erosion, while areas with higher velocities are expected to have greater erosion. The velocity results for the 100-year flood flow are presented in Section 6.2. Erosion impacts are discussed in Section 6.3, including impacts along the bike path.

6.2 VELOCITY RESULTS

6.2.1 Existing Conditions

The 100-year flood modeling was used to establish flood velocities under Existing Conditions. Results of the flood velocities are represented by the maximum velocity that occurs at any point in time over the 36-hour simulation period. The spatial plot of the maximum velocities over the entire model domain is provided in Figure 6.1. In general, the highest velocities occur along the Otay River channel and levees. Higher velocities, as indicated by the red color, are shown along the entire stretch of the Otay River from the I-5 Bridge to San Diego Bay. These velocities range from about 7 to 10 ft/sec. Similarly, higher velocities are observed along the salt pond levees attributed to the flood flows overtopping the levees. Higher velocities also occur along the levee separating Ponds 14 and 15 with San Diego Bay due to overtopping of the levees.

6.2.2 Intertidal Alternative

The maximum velocities over the entire model domain for the Intertidal Alternative are provided in Figure 6.2, which shows the highest velocities occurring along the river channel and levees. In the upper portion of the Otay River, maximum velocities for the Intertidal Alternative are similar to Existing Conditions indicating the alternative would not cause any erosion impacts upstream of the I-5 Bridge.

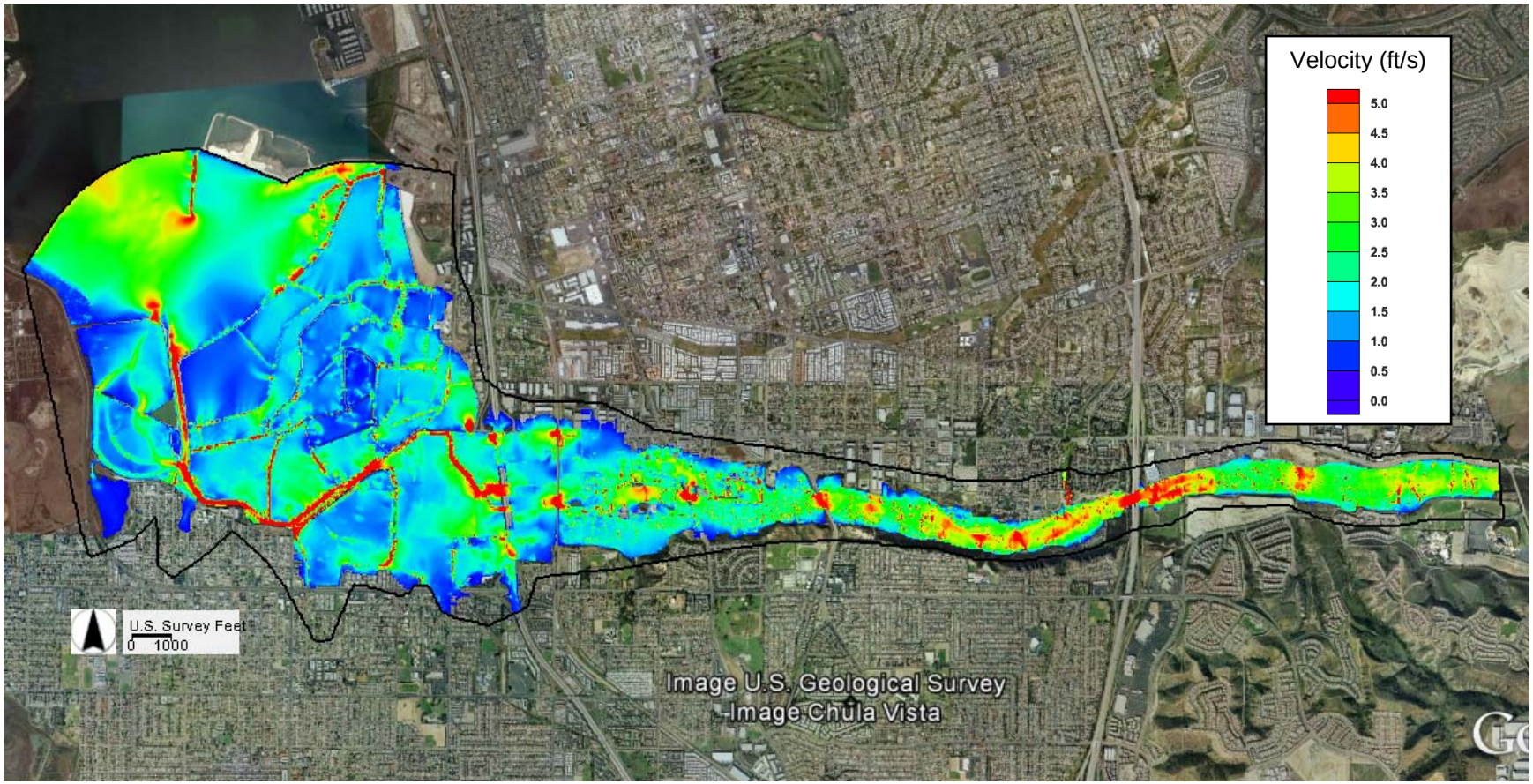


Figure 6.1 100-Year Flood Maximum Velocities for Existing Conditions

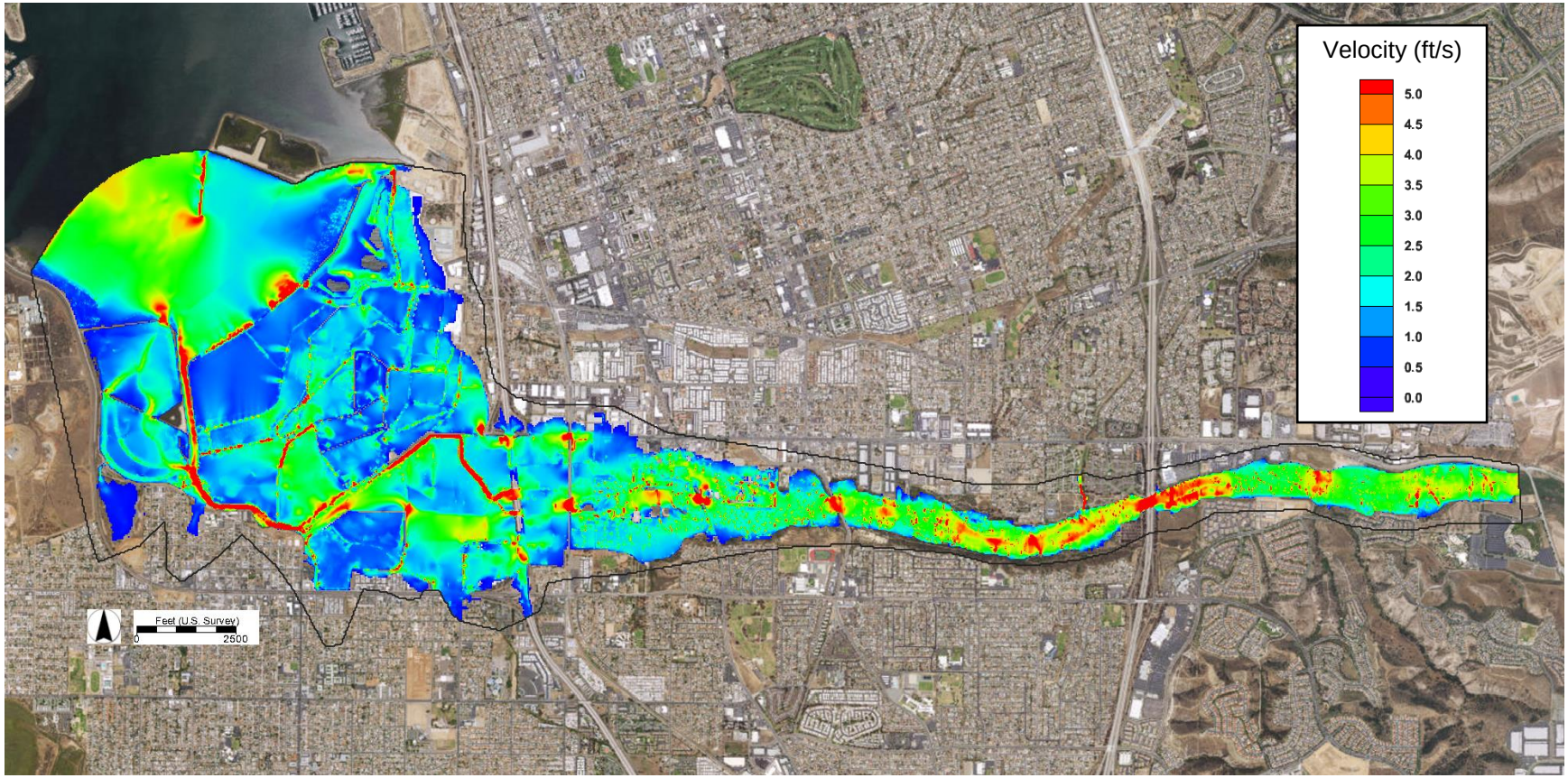


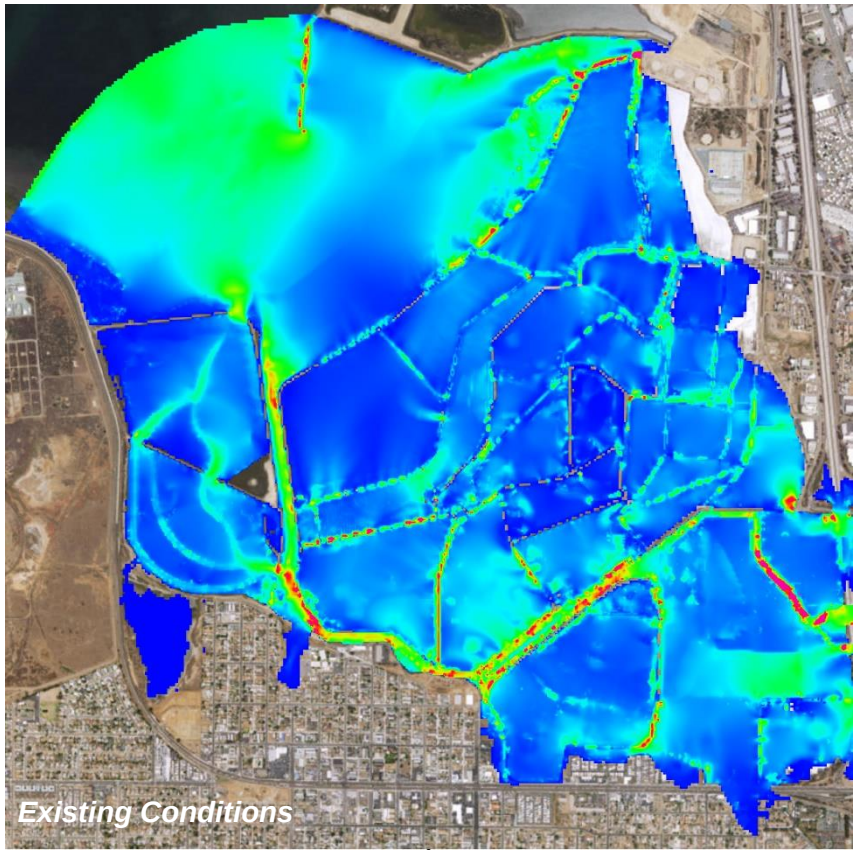
Figure 6.2 100-Year Flood Maximum Velocities for Intertidal Alternative

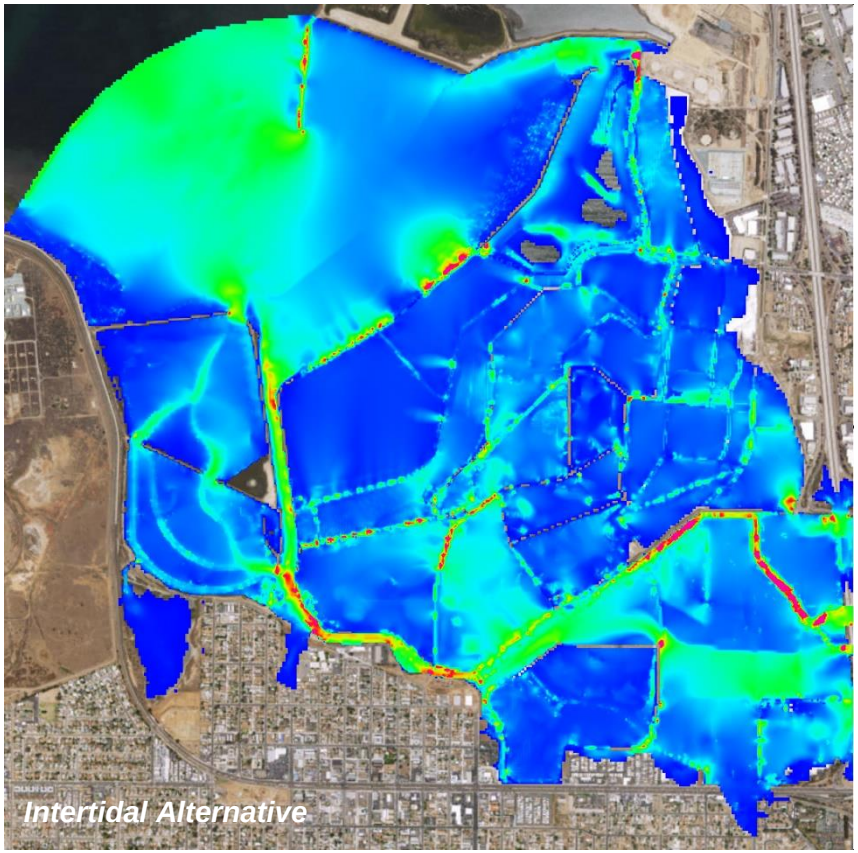
A comparison of maximum flood velocities downstream of the I-5 Bridge for Existing Conditions and Intertidal Alternative is provided in Figure 6.3. In the figure, the color scale has been selected to differentiate the high and low velocities. Flood velocities under the Intertidal Alternative are similar in magnitude to Existing Conditions, but locations of higher and lower velocities differ. As expected, differences in the flood velocities are shown throughout the project area due to the changes in grading. Compared with the Existing Conditions, higher flood velocities are observed in the ORF, while lower velocities are observed in the ERC area. Differences in flood velocities also occur along the bike path adjacent to Ponds 48, 20, and 22, coinciding with differences in flood elevations. Along the pond levees separating the salt ponds and San Diego, differences in flood velocities are apparent. Under Existing Conditions, higher velocities occur along Ponds 14 and 15 due to overtopping of the levees. Under the Intertidal Alternative, lower velocities occur along Pond 15 since with the new tidal inlet, no overtopping occurs from Pond 15. However, higher velocities are shown along Ponds 12 and 14 under the Intertidal Alternative due to additional overtopping resulting from higher flood elevations.

6.2.3 Subtidal Alternative

For the Subtidal Alternative, the maximum velocities during the 100-Year flood are shown in Figure 6.4. Similar to the Intertidal Alternative, the highest velocities occur along the Otay River channel and levees. Above the I-5 Bridge, maximum velocities are similar to Existing Conditions, indicating no erosion impacts.

A comparison of the velocities for the Subtidal Alternative and Existing Conditions in the ORF downstream of the I-5 Bridge is shown in Figure 6.5. Overall, flood velocities under the Subtidal Alternative are similar in magnitude to Existing Conditions, but locations of higher and lower velocities vary. Similar to the Intertidal Alternative, differences in flood velocities are apparent throughout the ORF and project areas due to changes in the grading. Compared with the Existing Conditions, higher flood velocities are observed in the ORF, while lower velocities are observed in the ERC area. Along the bike path, higher velocities occur at the south end of the bike path under Existing Conditions, but higher velocities occur at the north end under the Subtidal Alternative. Differences in flood velocities are also noticeable along the levees adjacent to San Diego Bay. Higher velocities mainly occur along Pond 15 under Existing Conditions, but occur along Ponds 12 and 14 under the Subtidal Alternative.





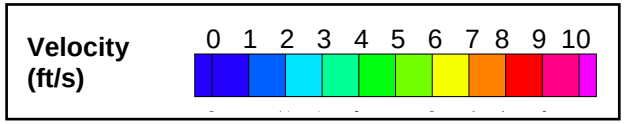




Figure 6.3 Comparison of 100-Year Flood Maximum Velocities for Intertidal Alternative

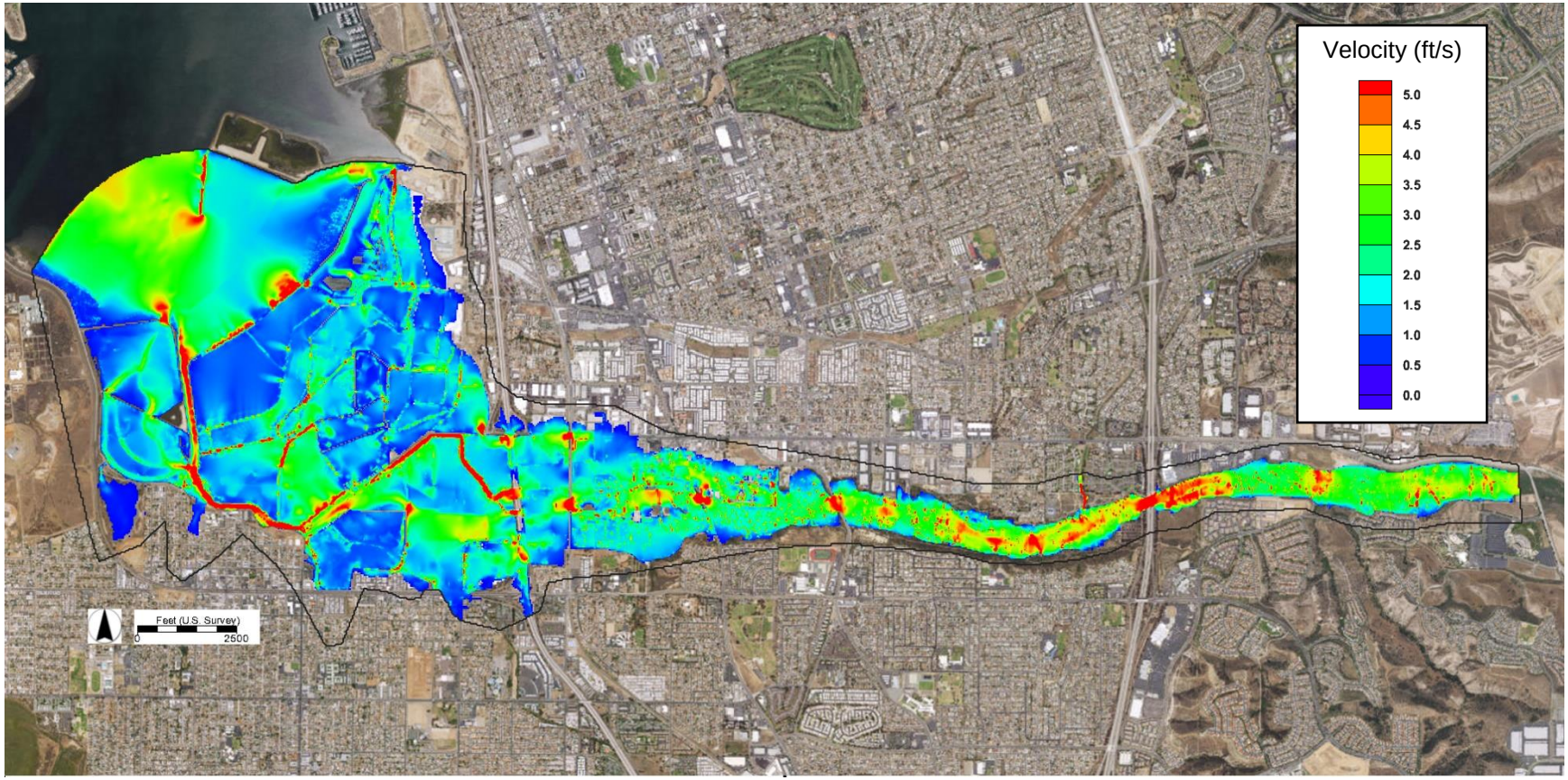


Figure 6.4 100-Year Flood Maximum Velocities for Subtidal Alternative

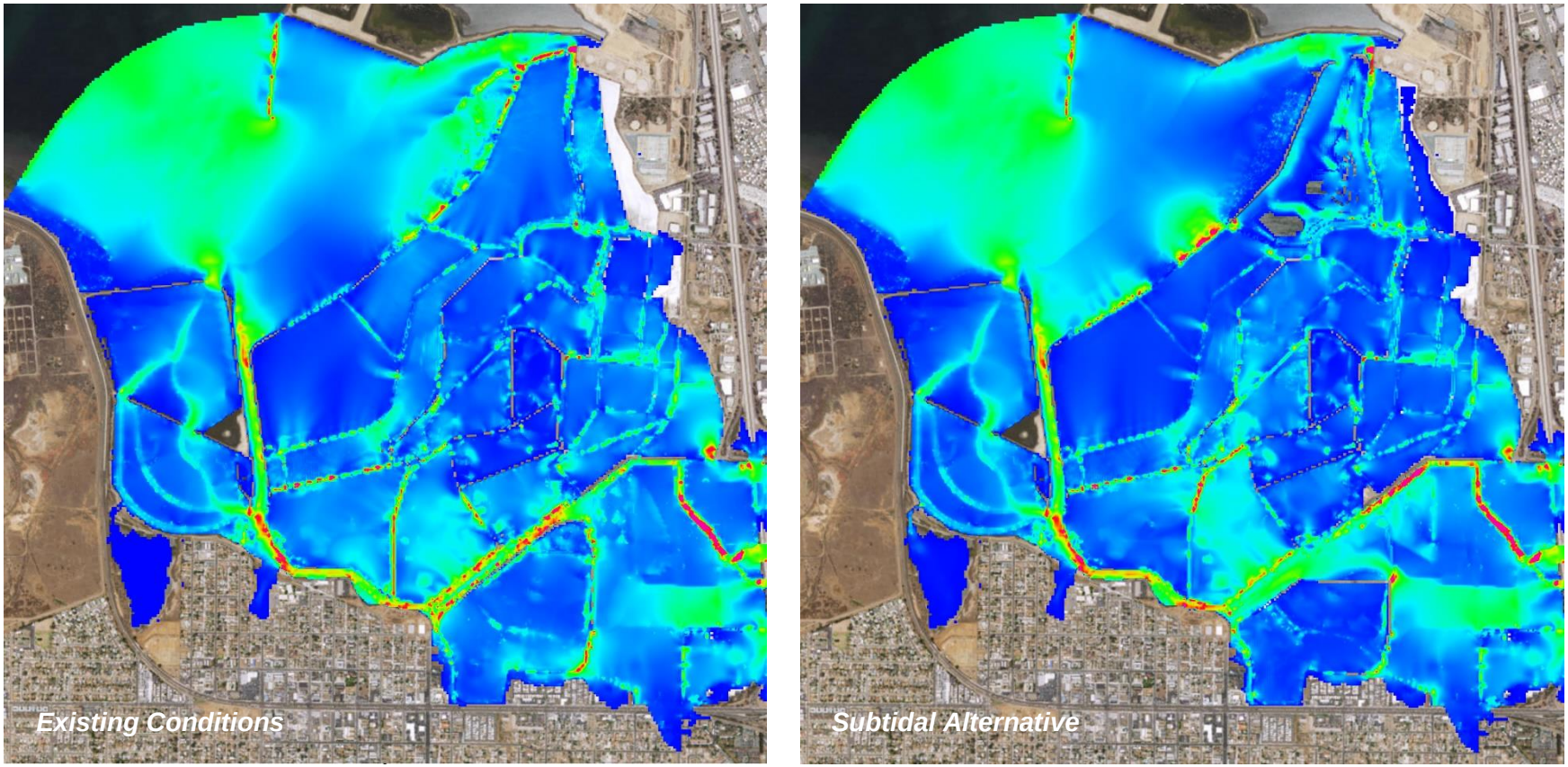


Figure 6.5 Comparison of 100-Year Flood Maximum Velocities for Subtidal Alternative

6.3 EROSION IMPACTS

To evaluate the erosion impacts, differences in the maximum velocity between the proposed alternatives and Existing Conditions were determined to identify areas with changes in erosion conditions, and the results are shown in Figure 6.6. In the figure, positive values indicate an increase in flood velocities, negative values indicate a decrease in flood velocities, and white-colored areas indicate little to no change in the maximum flood velocities compared with Existing Conditions. As shown in the figure, no changes in flood velocities were determined for the Western Salt Pond Restoration Project (formerly Ponds 10A, 10, and 11). In general, the areas with differences in flood velocities correspond to areas with changes in flood elevations. Blue colored areas indicate lower flood velocities for the proposed alternative compared with Existing Conditions resulting in the reduction of potential erosions. Decreases in flood velocities are found for the river channel along the project area, as well as in Ponds 20 and 15. Lower velocities are also generally observed along the east side of the salt ponds, corresponding to lower flows compared with Existing Conditions. The removal of Pond 15 from the flooded area also results in lower velocities along the Pond 15 levee. Areas with higher velocities for the alternatives are shown by yellow and red areas. Increases in velocity occur due to the redistribution of flows, as previously discussed in Section 5.2. The higher velocities indicate greater potential erosion conditions compared with Existing Conditions, and are further discussed below.

6.3.1 Project Area

As expected, changes in velocity were found throughout the project areas. Under the alternatives, the existing levee surrounding Pond 20A would be moved to allow tidal flows into the proposed wetland and also enabling flood flows to pass through the project area. Velocities along the existing levee would decrease, as indicated by the blue area surrounding Pond 20A in Figure 6.6. Based on the flood modeling, the proposed alternatives would decrease flood elevations throughout the ORF and project areas due to the expanded flood area, but increase flood velocities compared with Existing Conditions. A soil characterization study conducted for the ORF Site shows that an area east of Nestor Creek (see Figure 6.7) is contaminated with pesticides (Anchor QEA, 2013). In addition, some of these pesticides occur in the surface and near surface soils across this area. In order to minimize the potential risk of the contamination being disturbed by flood flows during extreme storm events, an exposure reduction cover (ERC) with a 1-foot to 1.5 feet thickness would be placed on the surface of the contamination area for either proposed alternative.

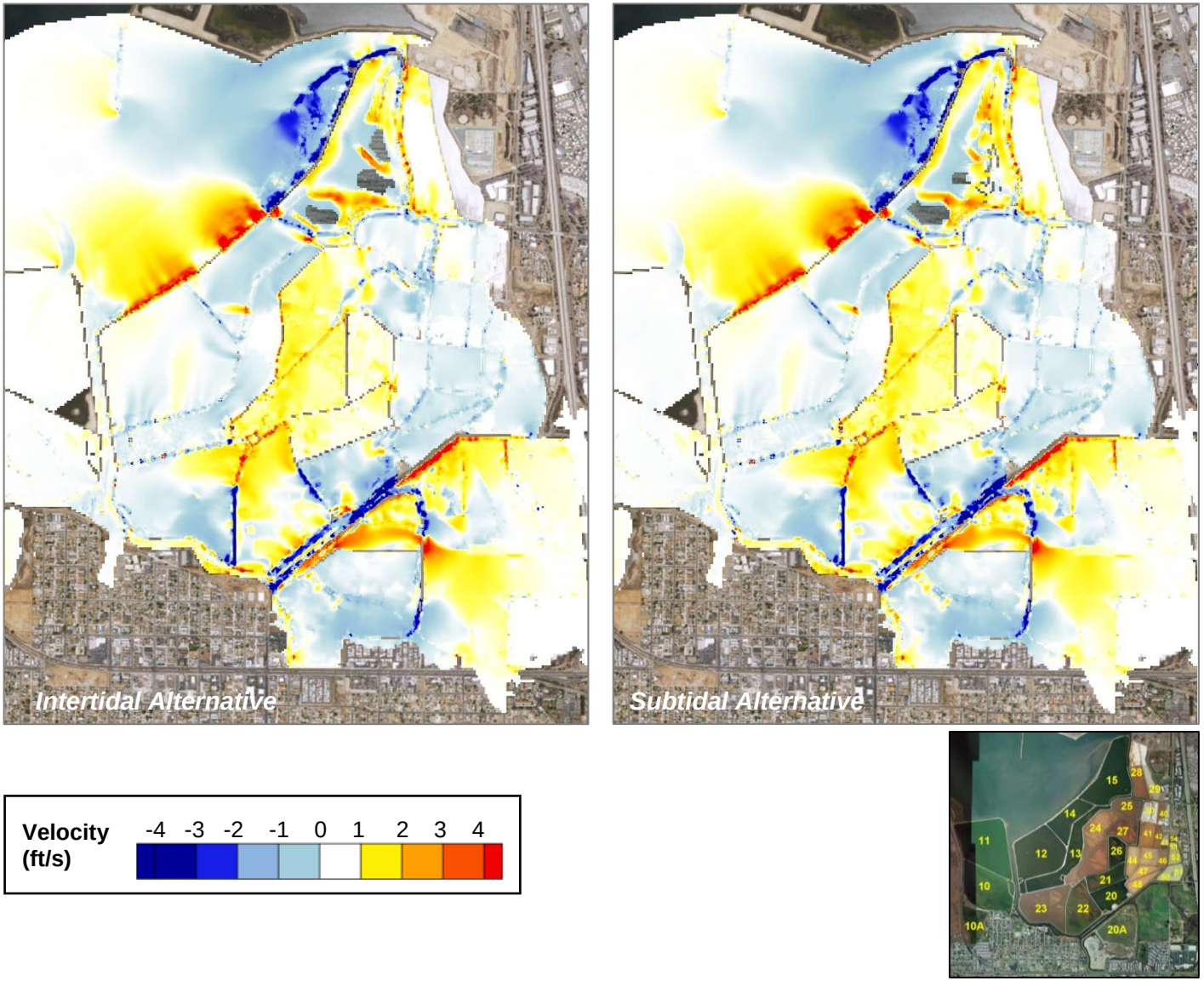


Figure 6.6 100-Year Flood Erosion Impacts based on Maximum Velocities

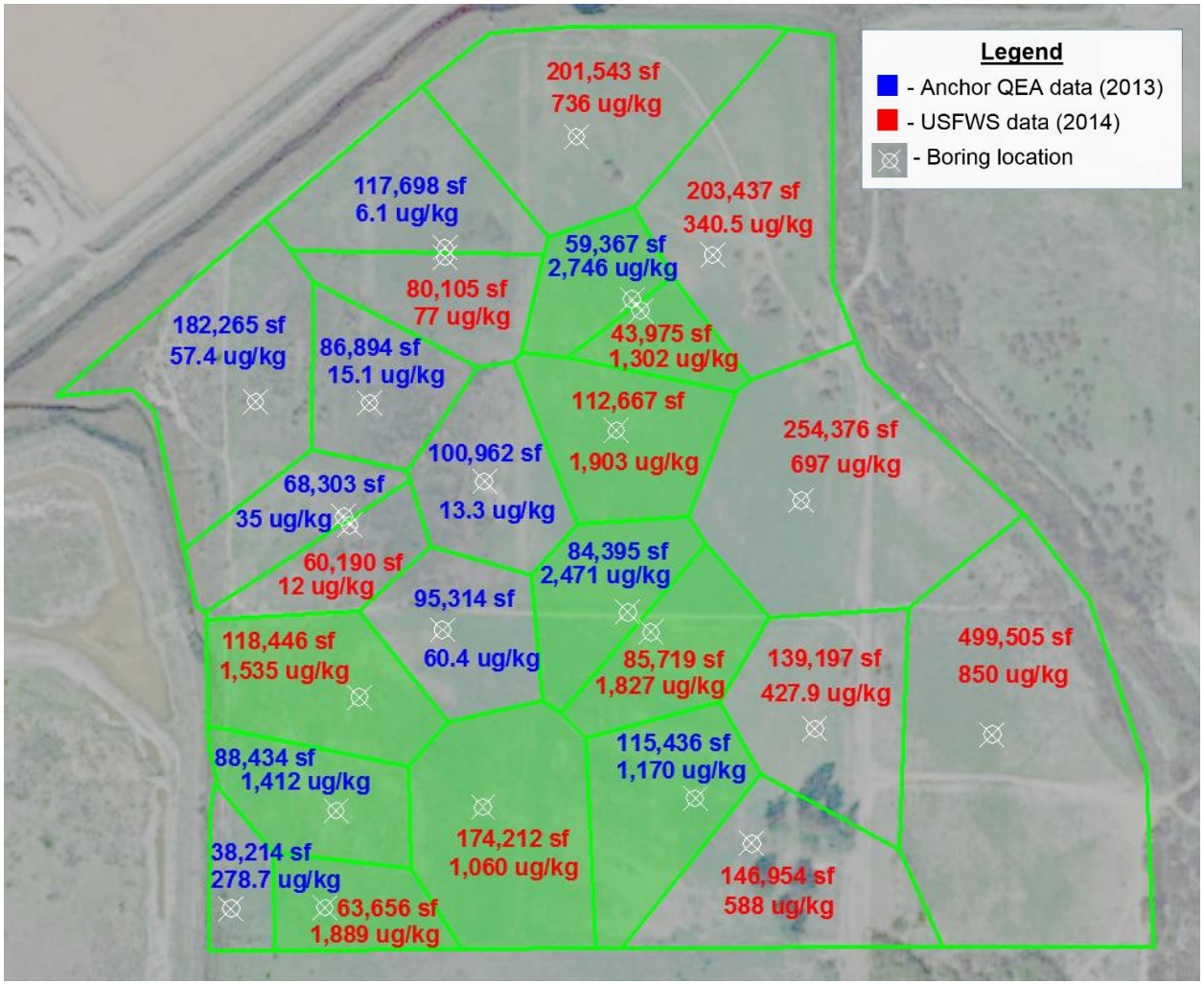


Figure 6.7 Voronoi Diagram for Soils 0 – 1 foot below Ground - Cell Areas and DDT Concentrations

Based on the soil characterization study, the top three feet of the area with pesticide contamination is mainly composed of fine sand to coarse sand. According to the Hjulstrom curve (shown in Figure 6.8), soil composed of fine sand to coarse sand would start to erode when the water velocity reaches and exceeds 0.6 ft/s. To evaluate potential erosion for this area under the 100-year flood, the areas within the ORF Site with maximum flood velocities higher than 0.6 ft/s were identified under Existing Conditions and proposed conditions (Intertidal Alternative and Subtidal Alternative). The areas within the ORF Site with maximum flood velocities higher than 0.6 ft/s under Existing Conditions are shown in Figure 6.9. As shown in the figure, the entire area with contaminated soils would erode under the 100-year flood. Similar plots for areas with maximum flood velocities higher than 0.6 ft/s under the 100-year flood condition for the Subtidal Alternative and Intertidal Alternative are shown in Figure 6.10. As shown in the figure, the maximum flood velocities for the area with contaminated soils are mostly higher than 0.6 ft/s for both the Subtidal and Intertidal alternatives; hence, similar to Existing Conditions, erosion is likely to occur in this area under the 100-year flood condition. Comparing the flood velocities in this area under the Intertidal Alternative and Subtidal Alternative (Figure 6.10) with those under Existing Conditions (Figure 6.9), the maximum flood velocities in most of the area would be similar under proposed conditions (Intertidal Alternative and Subtidal Alternative).

The average times when flood velocities at the ORF site are higher than 0.6 ft/s during a 100-year event under Existing Conditions as well as the Intertidal Alternative and Subtidal Alternative were evaluated to assess the potential erosion impact of the proposed alternatives. The times when the flood velocities are higher than 0.6 ft/s were evaluated for seventeen locations at the ORF site (shown in Figure 6.11) by examining the time series of the velocities at each location. An example velocity time series for Location 56 is shown in Figure 6.12. In the figure, the top panel shows a comparison between the velocities under the Intertidal Alternative and Existing Conditions, while the bottom panel shows a comparison between the velocities under the Subtidal Alternative and Existing Conditions. As shown in the figure, the duration for flood velocities higher than 0.6 ft/s under Existing Condition is approximately 10.3 hours, and the corresponding times for the Intertidal Alternative and Subtidal Alternative are approximately the same at about 13.8 hours. The average times when flood velocities are higher than 0.6 ft/s at the ORF site based on an average across the 17 locations shown in Figure 6.11 is approximately 13.2 hours under Existing Conditions, 11.4 hours under the Intertidal Alternative, and 11.5 hours under the Subtidal Alternative. The results indicate that the proposed alternatives with a proposed ERC layer have the potential to slightly decrease erosion at the ORF site east of Nestor Creek during a 100-year flood event.

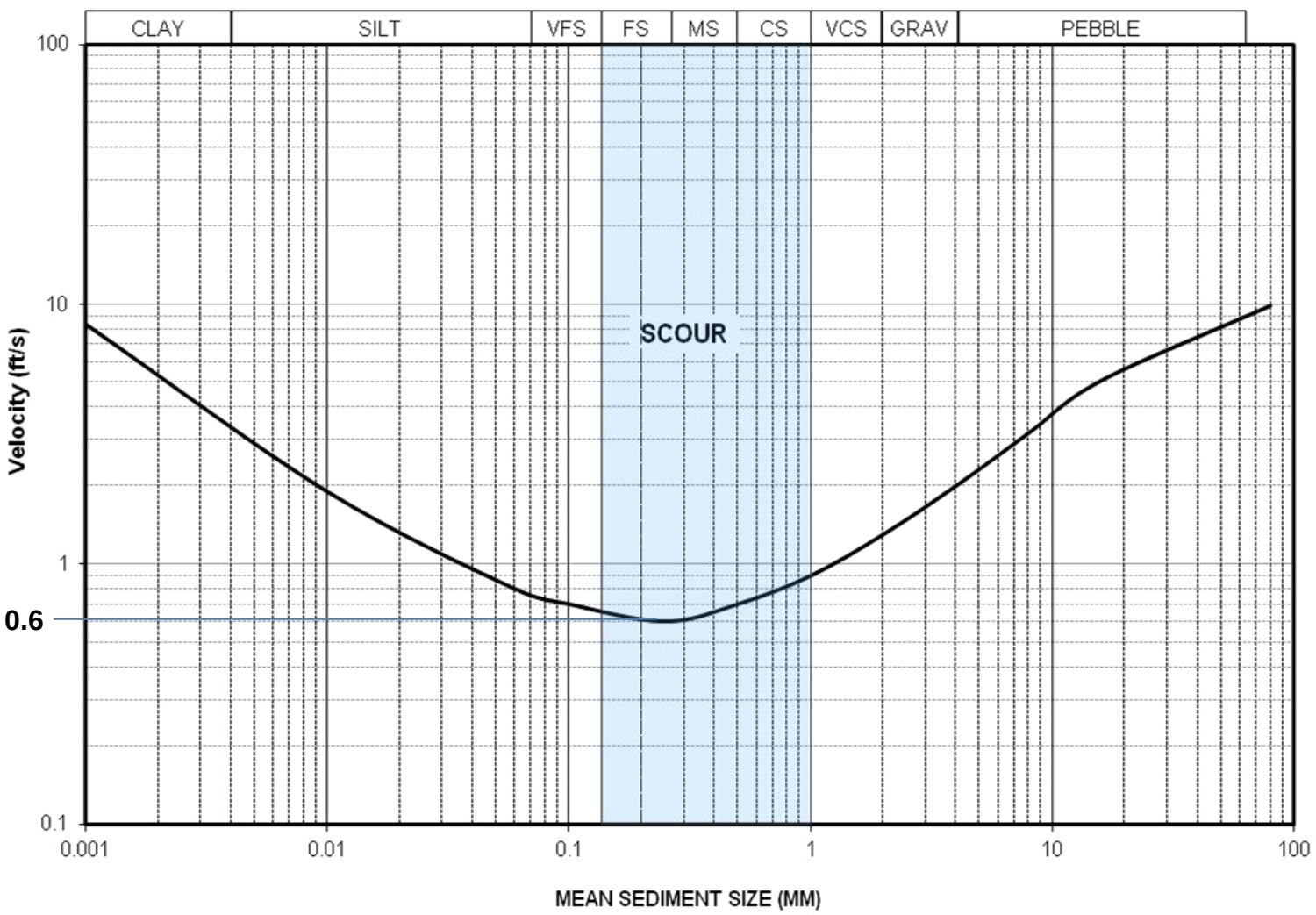


Figure 6.8 Hjulstrom Curve

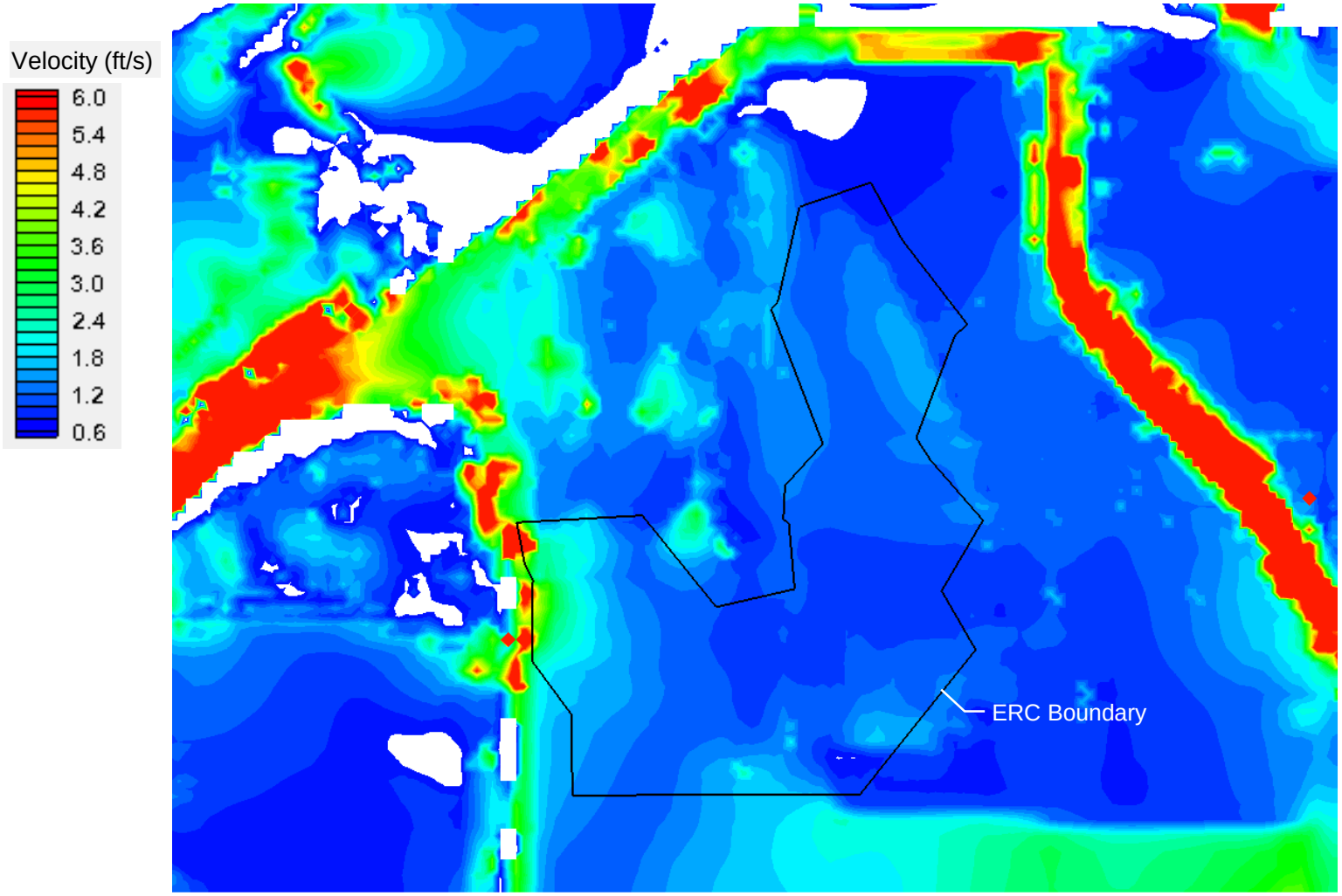
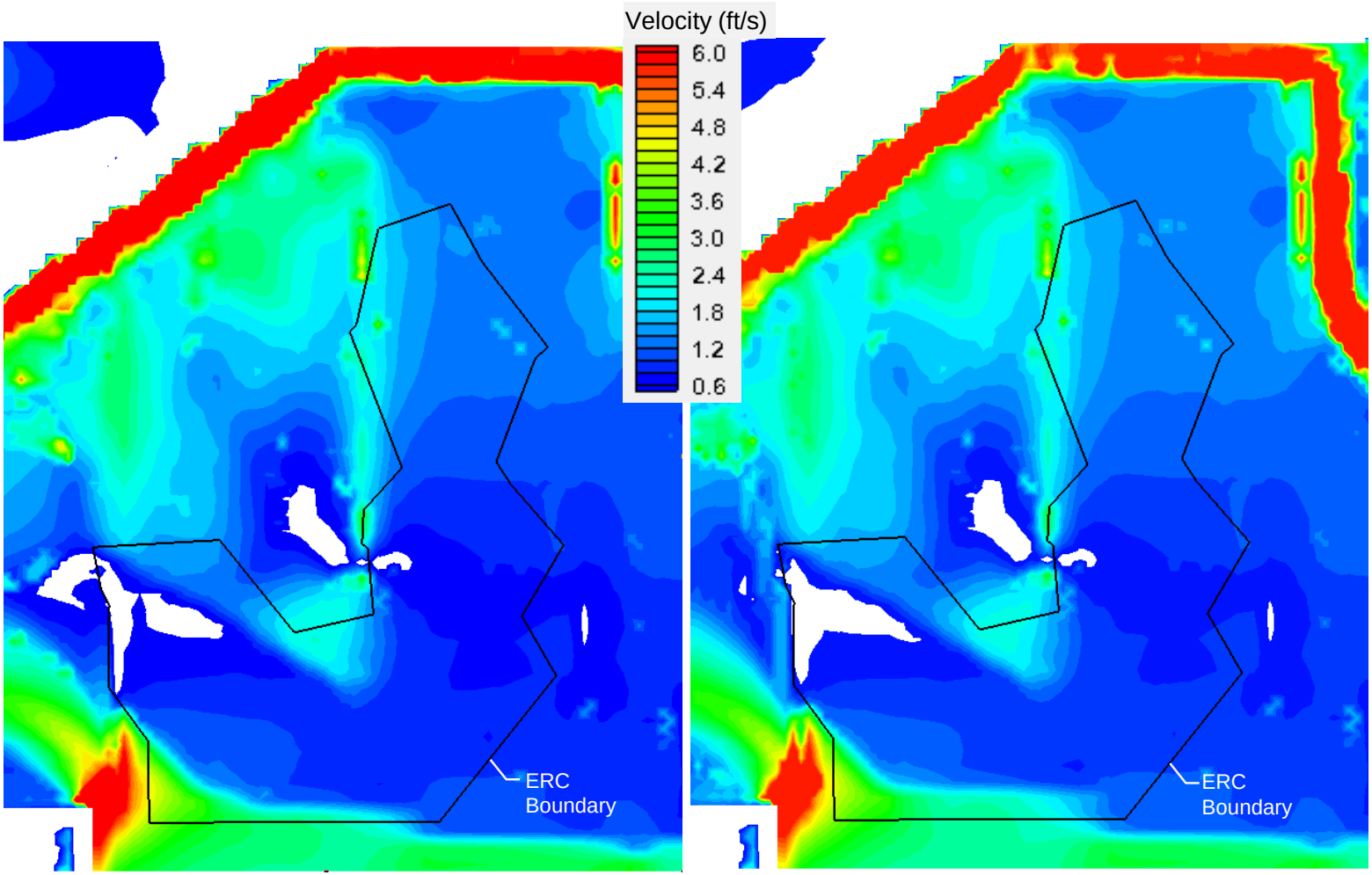


Figure 6.9 Area with 100-Year Flood Maximum Velocity Greater than 0.6 ft/s under Existing Conditions



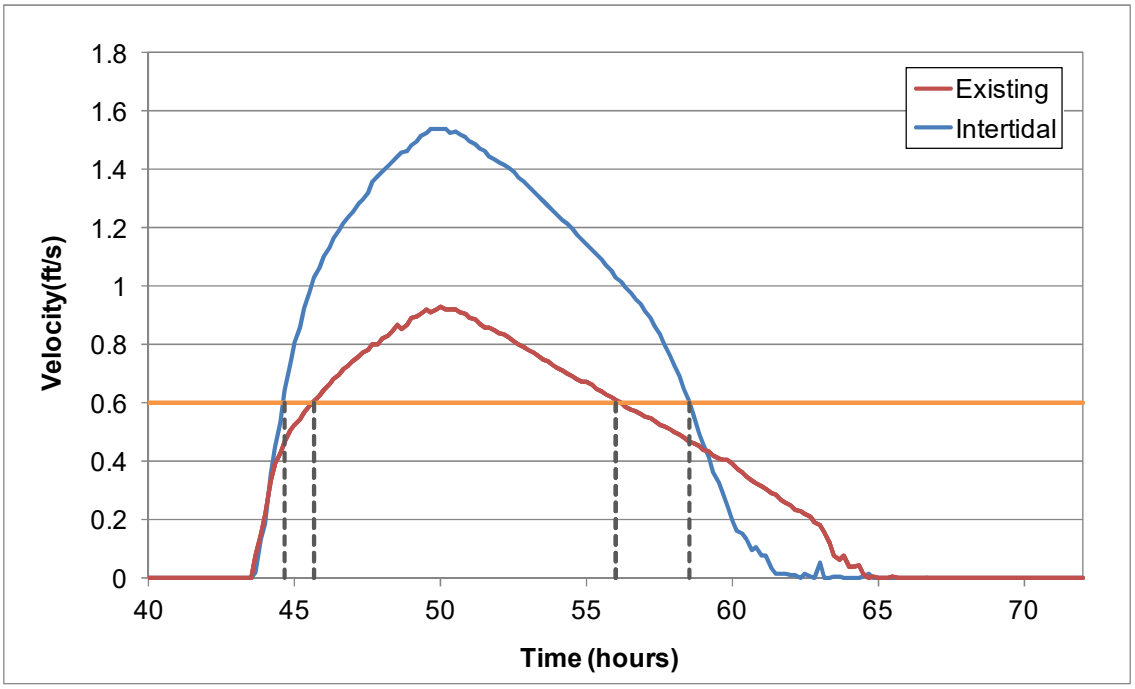
a) Intertidal Alternative

b) Subtidal Alternative

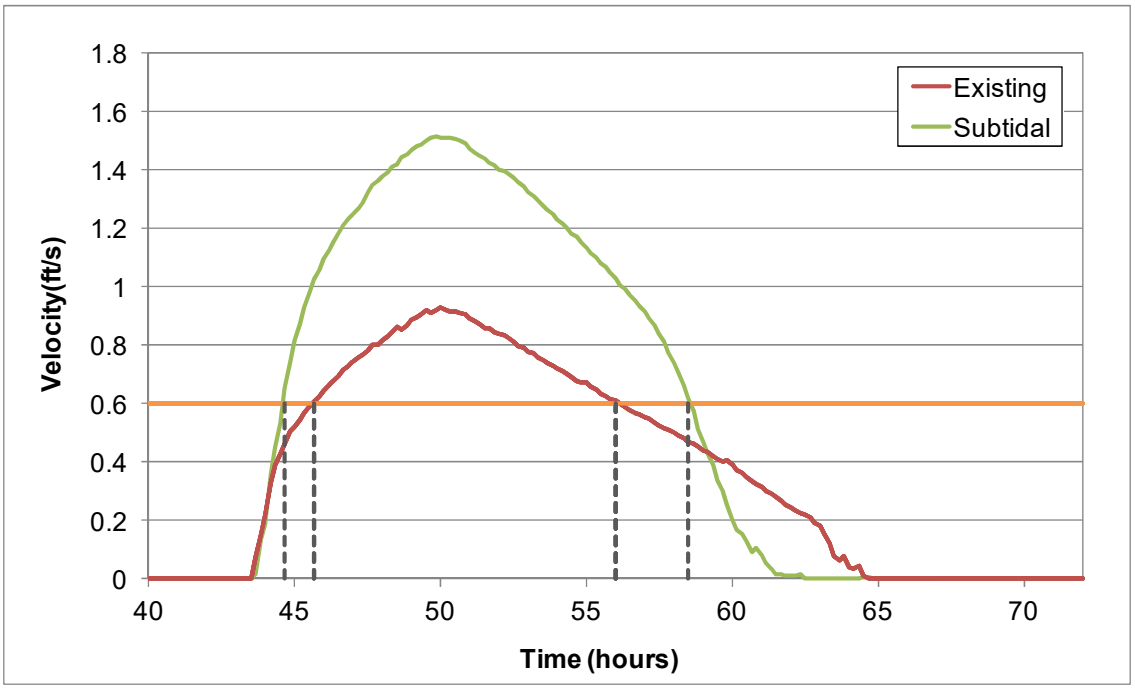
Figure 6.10 Area with 100-Year Flood Maximum Velocity Greater than 0.6 ft/s under Proposed Conditions



Figure 6.11 Locations for Calculating the Time Duration when Flood Velocities are Higher than 0.6 ft/s



a) Existing versus Intertidal



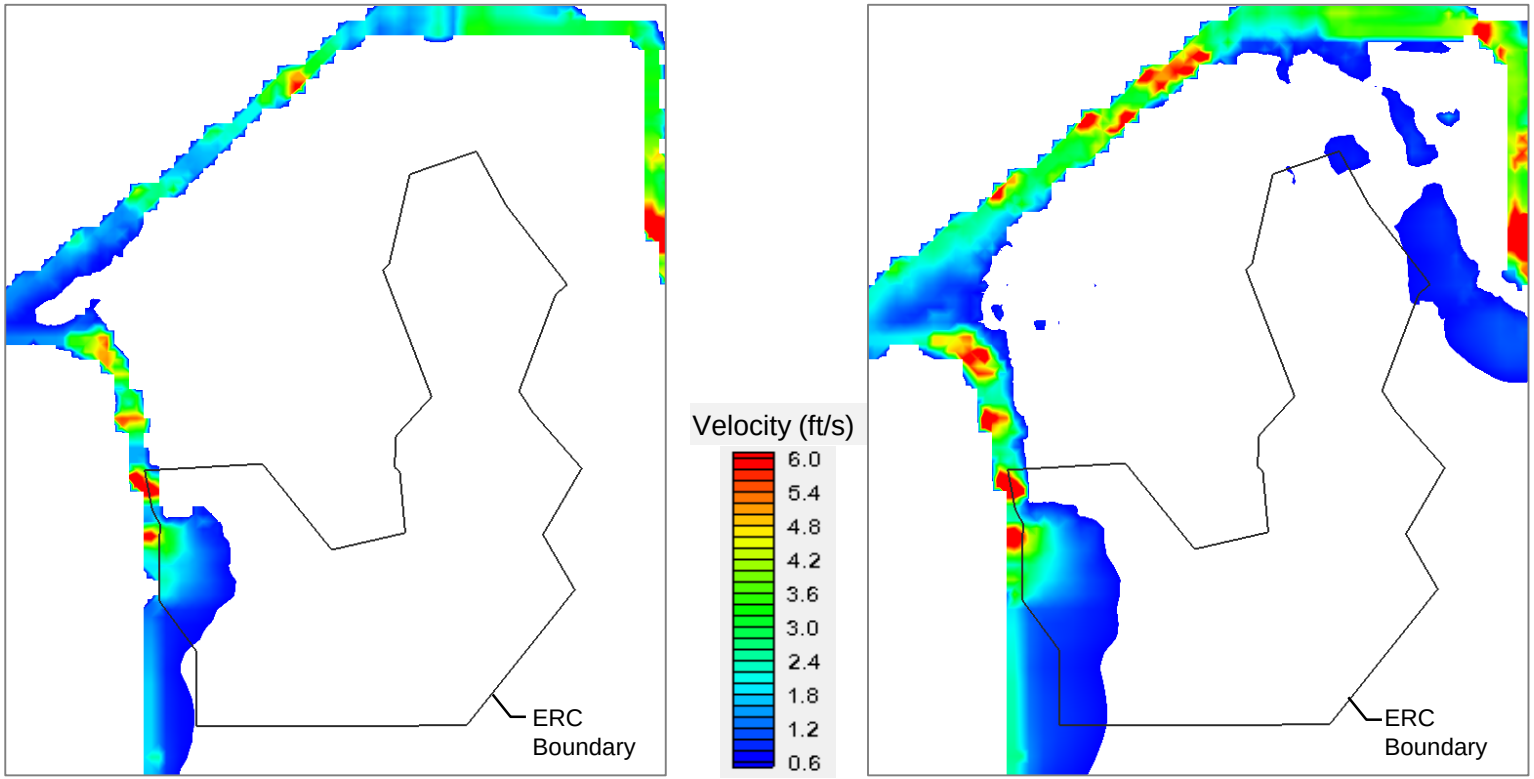
b) Existing versus Subtidal

Figure 6.12 Velocity Time Series at Location 56

While the proposed alternatives may increase erosion at the ORF site during a 100-year flood event, which by definition will occur once in 100 years (*i.e.,* 1% chance of occurring in any given year), the proposed alternatives may result in less erosion at the ORF site during more frequent smaller flood events (*e.g.,* 5-year flood event and 10-year flood event). The 5-year event will occur on the average once every 5 year (*i.e.,* 20% chance of occurring in any given year), while the 10-year flood event will occur on the average once every 10 years (*i.e.,* 10% chance of occurring in any given year). The areas within the ORF site with maximum flood velocities higher than 0.6 ft/s under Existing Conditions during a 5-year flood event and 10-year flood event are shown in Figure 6.13. As shown in the figure, most of the areas at the ORF Site have flood velocities less than 0.6 ft/s (indicated by the white areas) except along the western edge of the ORF site where flood water from Nestor Creek produces velocities higher than 0.6 ft/s. Similar velocity plots for the Intertidal Alternative and Subtidal Alternative are shown in Figures 6.14 and 6.15, respectively. As shown in the figures, with the proposed alternatives, the maximum velocities are less than 0.6 ft/s for almost the entire ORF site during the 5-year flood event and 10-year flood event. The results indicate that the proposed alternatives have the potential to decrease erosion at the ORF site during the more frequent smaller flood events (*e.g.,* 5-year flood event and10-year flood event).

In summary, the proposed Intertidal Alternative and Subtidal Alternative would potentially decrease erosion at the ORF site during the 100-flood event, as well as during the more frequent, smaller flood events (*e.g.,* 5-year flood event and 10-year flood event). The overall potential impact of the proposed alternatives on erosion across the ORF site is likely to be small to negligible across the range of flood events that would be expected to occur within a 100-year period.

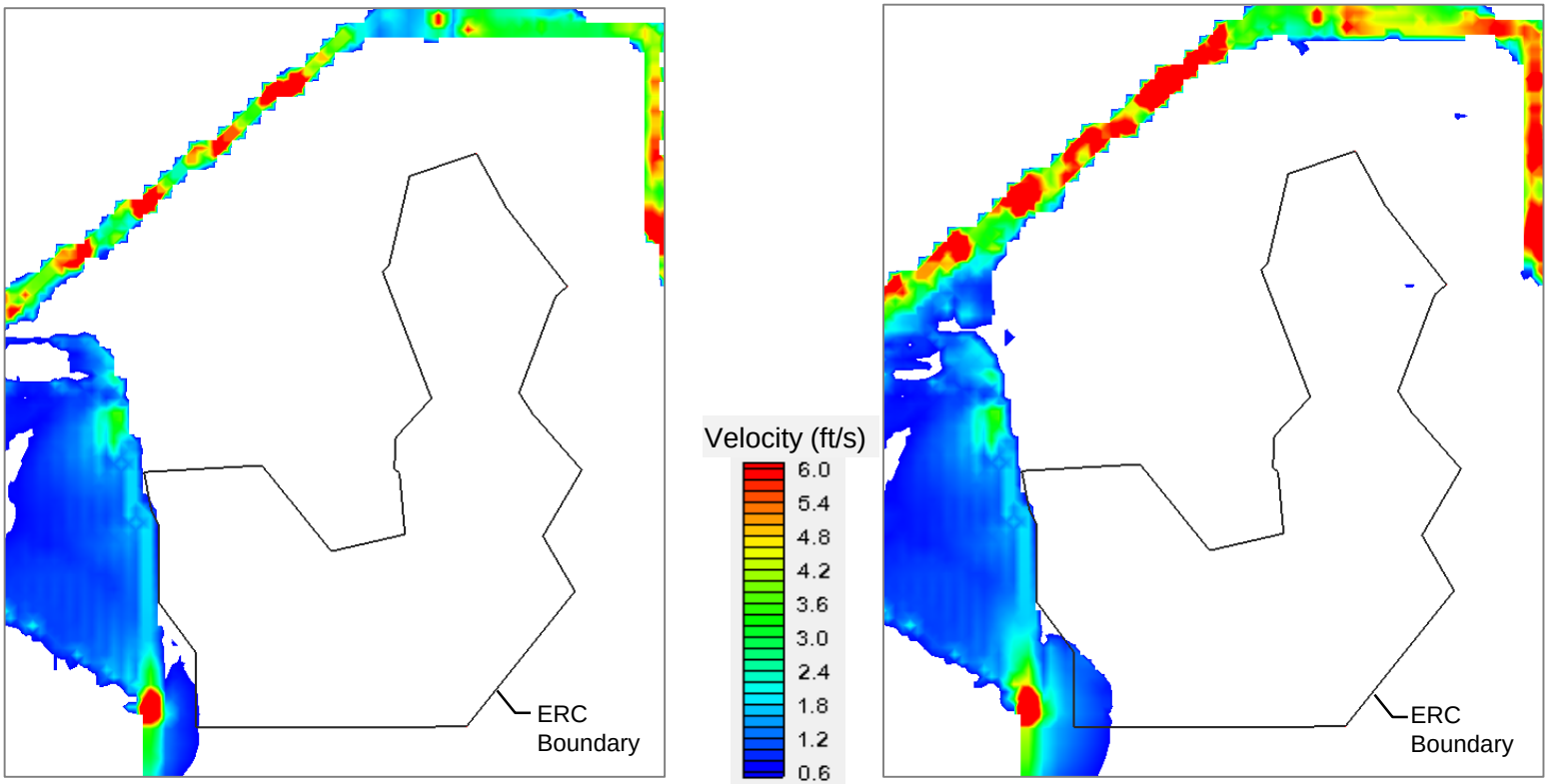
If it is desired to minimize the potential erosion impact of the proposed alternatives across the ORF site during a 100-year flood event, vegetation can be planted at the site to increase friction (*i.e.,* Manning's coefficient) to slow down the flow. In addition to increasing friction, the roots of the vegetation would help bind the soil, making it less erodible (*i.e.,* the flood velocity for initiation of erosion would become higher than 0.6 ft/s). It was determined that if the Manning's coefficient is increased to 0.15 from the existing of 0.05 for the ORF site, the flood velocities for the proposed alternatives would be slowed down to approximately the same as those under Existing Conditions. Figure 6.16 shows the differences in maximum flood velocities between the proposed Intertidal Alternative and Subtidal Alternative with vegetation (*i.e.,* Manning's Coefficient of 0.15) and Existing Conditions. It can be seen from the figure that with the higher Manning's coefficient, the maximum flood velocities with the proposed alternatives are lower than those under Existing Conditions (the blue areas in the figure) for the eastern portion of the ORF site. For the area adjacent to Nestor Creek, the maximum velocities under the proposed alternatives would still be slightly higher (the yellow areas in Figure 6.16) than those under Existing Conditions. In general, the areas with reduced velocities (blue) are slightly larger than the areas with increased velocities (yellow). Hence, the erosion conditions at the ORF site



a) 5-Year Velocity

b) 10-Year Velocity

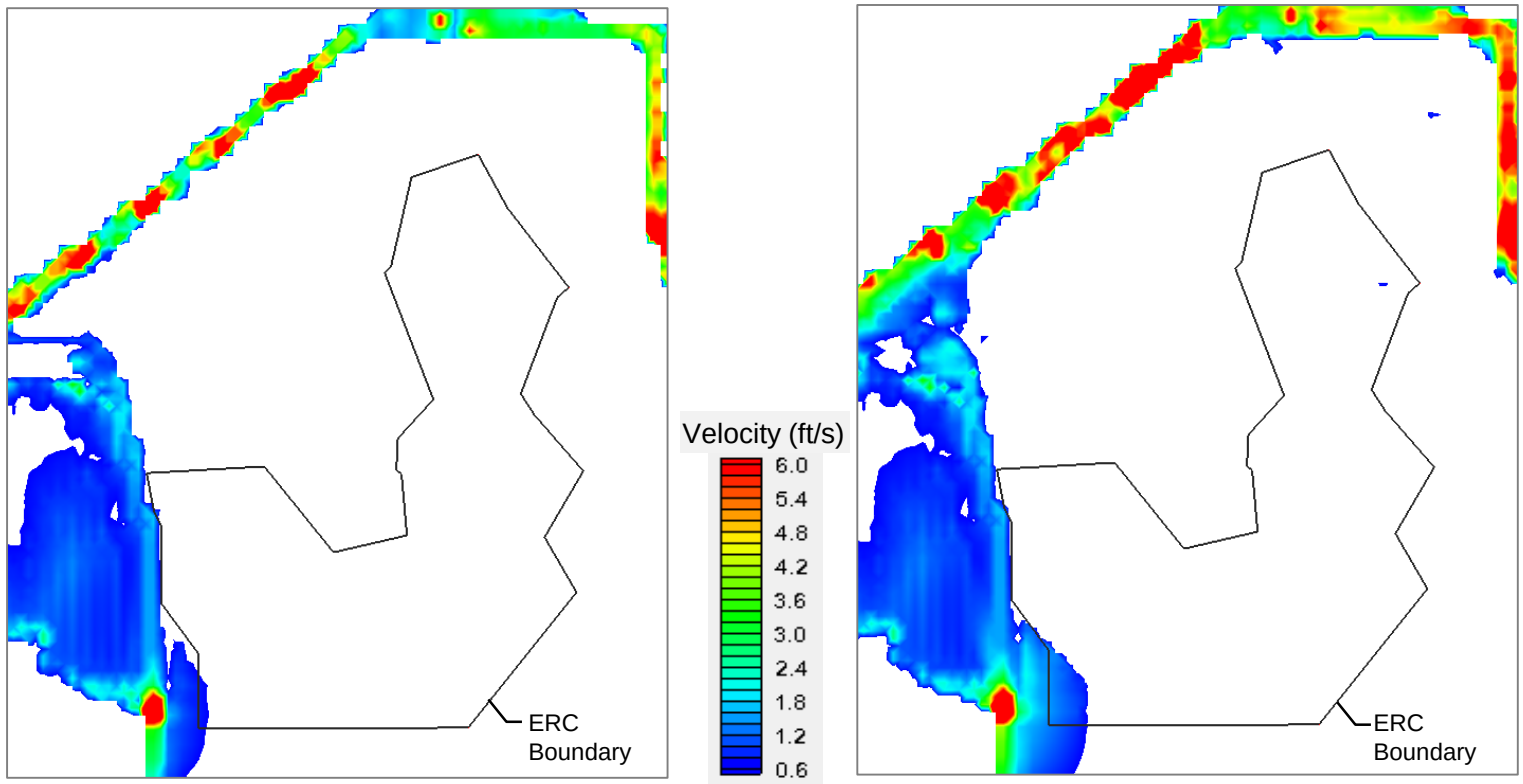
Figure 6.13 Maximum Velocity of ORF Site under Existing Conditions during a 5-year Flood Event and a 10-year Flood Event



a) 5-Year Velocity

b) 10-Year Velocity

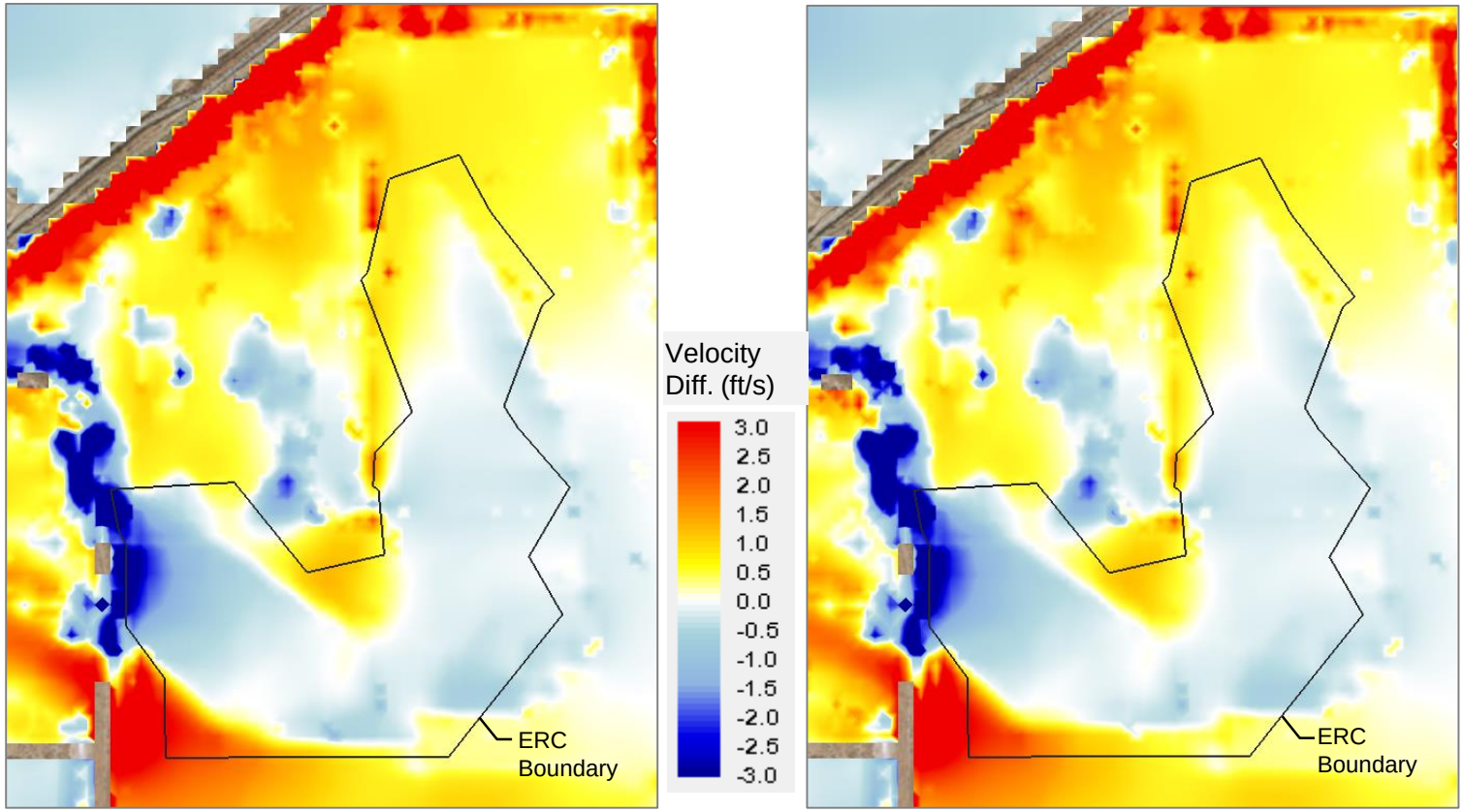
Figure 6.14 Maximum Velocity of ORF Site under Intertidal Alternative Conditions during a 5-year Flood Event and a 10-year Flood Event



a) 5-Year Velocity

b) 10-Year Velocity

Figure 6.15 Maximum Velocity of ORF Site under Subtidal Alternative Conditions during a 5-year Flood Event and a 10-year Flood Event



a) Intertidal Alt. - Existing

b) Subtidal Alt. - Existing

Figure 6.16 Difference in Max Velocity Between Proposed Conditions and Existing Conditions for a 100-Year Flood Event

under the 100-year flood event are likely to be similar between the proposed alternatives with vegetation and Existing Conditions.

Besides the project area, other areas with observable change in velocities include the areas along the bike path, Pond 15, and the levees along Ponds 12 and 14. Changes in velocity at these locations are further described below.

6.3.2 Bike Path

The proposed alternatives would result in changes to the flood velocities in the river channel along the bike path. A closer view of the differences in the maximum velocity along the bike path is provided in Figure 6.17. The northern portion of the bike path along Pond 48 is not flooded (i.e., flows do not overtop the bike path) under Existing or proposed conditions. In this area, higher velocities occur in the river channel along the bike path, while lower velocities occur in the river channel along the center and south portions of the bike path. Water elevations and velocities along the river channel near Pond 48 (Location A) for Existing Conditions, Intertidal Alternative, and Subtidal Alternative are compared in Figure 6.18. In the top panel, water elevations for the Intertidal (orange line) and Subtidal Alternative (green line) are lower compared with Existing Conditions (blue line). The corresponding velocities for the proposed alternatives, shown in the bottom panel, are higher than Existing Conditions due to the reduced water depth. These higher velocities in the river channel are similar in magnitude to velocities that occur at the center and south ends (adjacent to Pond 20 and 22) under Existing Conditions. In general, erosion impacts to the river channel along the north end of the bike path will be similar to erosion conditions currently occurring along the river channel at the south end of the bike path. In other words, the proposed alternatives would essentially shift the higher velocities along the river channel from the south portion of the bike path to the north portion of the bike path. A rock revetment could be placed along the northern portion of the bike path to prevent potential bank erosion caused by the increase in flood velocities associated with the proposed alternatives. Based on the 100-year flood velocities, a one-foot layer of 5-inch (D_{50}) rock would be sufficient to prevent erosion along the bank. A typical cross-section for this revetment and the proposed location are both shown in Figure 6.19.

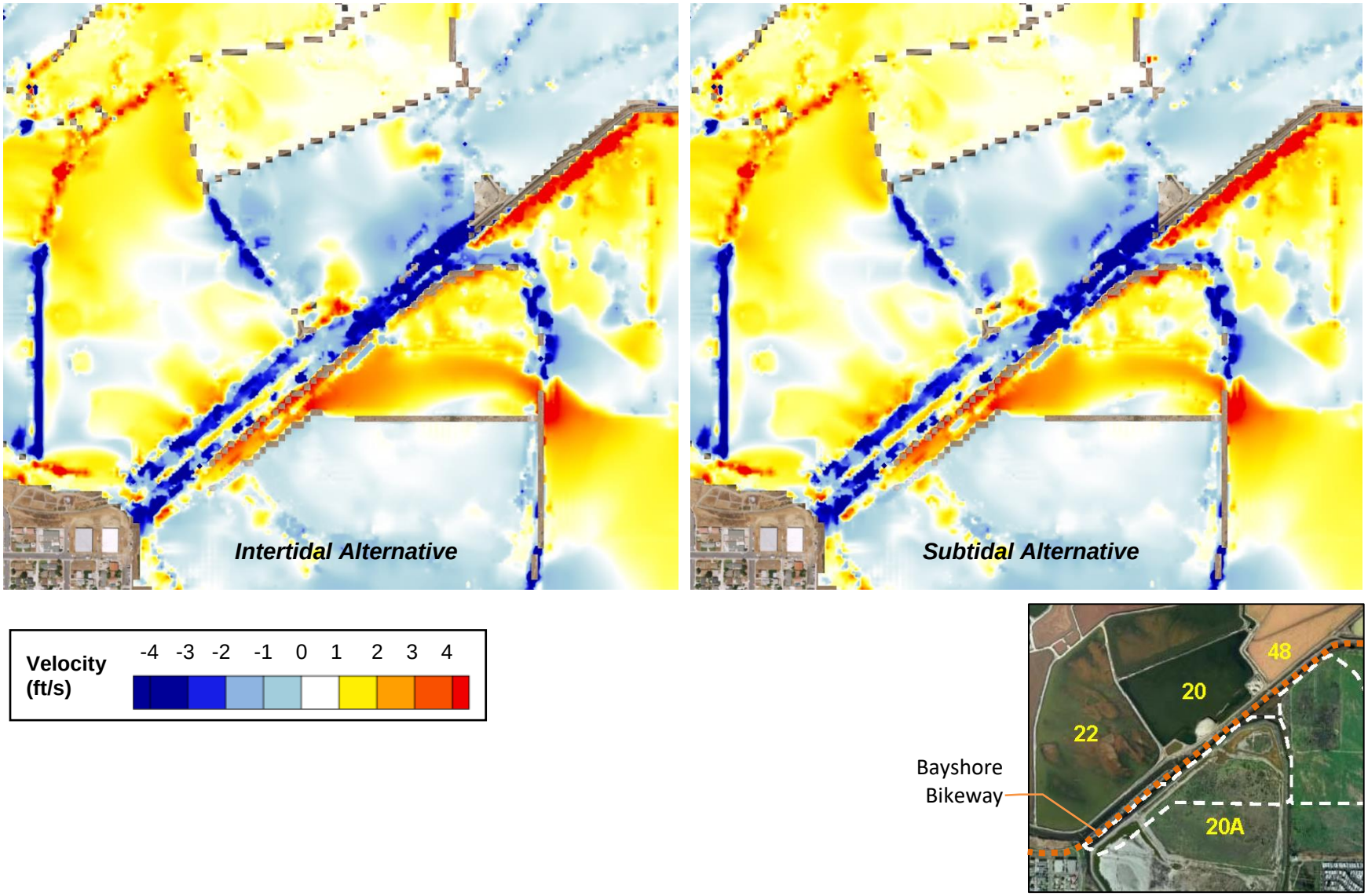


Figure 6.17 100-Year Flood Erosion Impacts along Bike Path

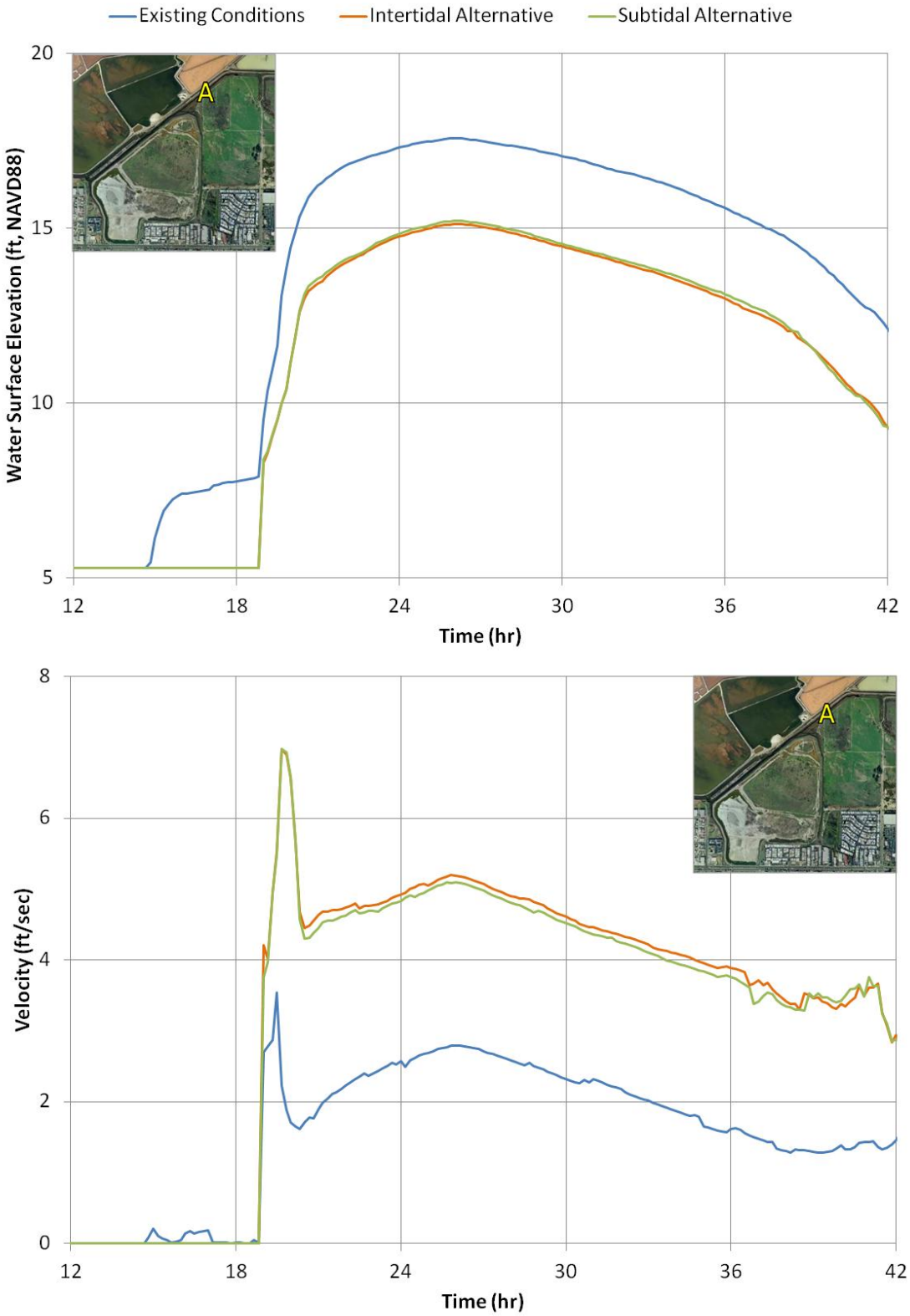
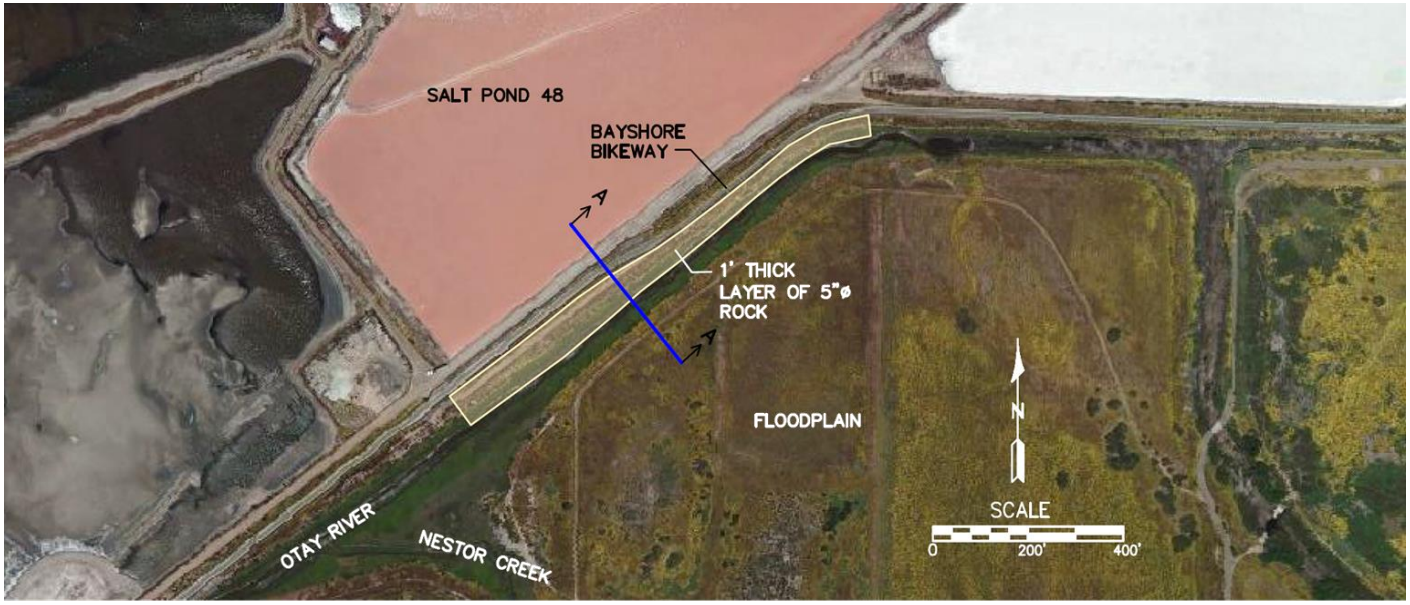
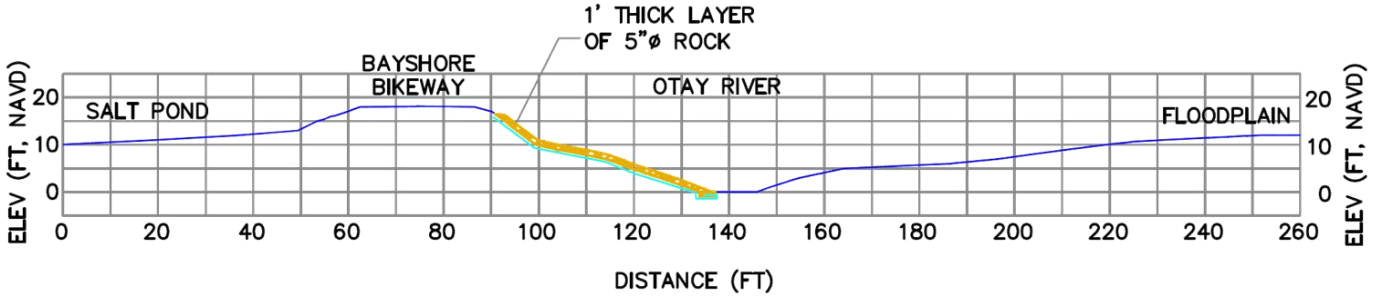


Figure 6.18 100-Year Flood Water Elevation and Velocity Comparisons at Location A



PLAN



SECTION A–A

Figure 6.19 Proposed Revetment Location and Typical Cross-section

Along the central portion of the bike path along Pond 20, the bike path is overtopped into Pond 20 during the 100-year flood. Under the proposed alternatives, both flood elevations and velocities along the river channel and bike path are lower compared with Existing Conditions. Hence, no erosion impacts are anticipated in this stretch of the river channel or bike path.

Along the southern portion of the bike path, lower velocities in the river channel would occur under the proposed alternatives as compared with Existing Conditions. However, higher flood velocities were shown to occur along the bike path and Pond 22 levee. These higher velocities are attributed to the increase in flow over the bike path and levee. Water elevations and velocities of the flows overtopping the bike path (Location B) are compared in Figure 6.20. As shown in the figure, the increase I flow in this area would result in higher water elevations and velocities for both the Intertidal (orange line) and Subtidal Alternatives (green line) as compared with Existing Conditions (blue line).

6.3.3 Ponds 12, 14 and 15

Modifications to Pond 15 under the proposed alternatives would result in changes in velocities surrounding Pond 15, as illustrated in Figure 6.21. Differences in velocities occur along the levee separating the salt ponds and San Diego Bay. Lower velocities are shown along Pond 15 since flood flow no longer overtops the levees at Pond 15. Higher velocities are apparent along the levees of Ponds 12 and 14 due to higher flows overtopping of the levees into San Diego Bay. Under the proposed alternatives, flood elevations in Ponds 12 and 14 are higher due to the redistribution of flows through the salt ponds and diversion of flows around Pond 15, as previously discussed in Section 5.2.4. The higher flood elevations would cause an increase in flows and velocities across the levees into San Diego Bay. The proposed alternatives effectively shift the higher velocities due to flows overtopping the levee from Pond 15 to Ponds 12 and 14. The higher velocities may increase erosion along the levees for Ponds 12 and 14.

The isolation of Pond 15 from flood flows also increases flows into Ponds 28 and 29. Differences in velocities occur along the east side of Pond 15, as shown in Figure 6.21. Decreases in velocity are observed along the Pond 15 levee due to the raising of the levee under the proposed alternatives. Increases in velocity are shown to occur along the channel between Pond 15 and 28. However, the range in velocities occurring along this channel is the same for existing and proposed conditions, as shown previously in Figures 6.3 and 6.5. Erosion impacts along the channel between Ponds 15 and 28 are likely to be localized scour in limited areas of the channel. Increases in flow into Ponds 28 and 29 also result in higher velocities within the ponds, which may result in localized scour where flows overtop the levee.

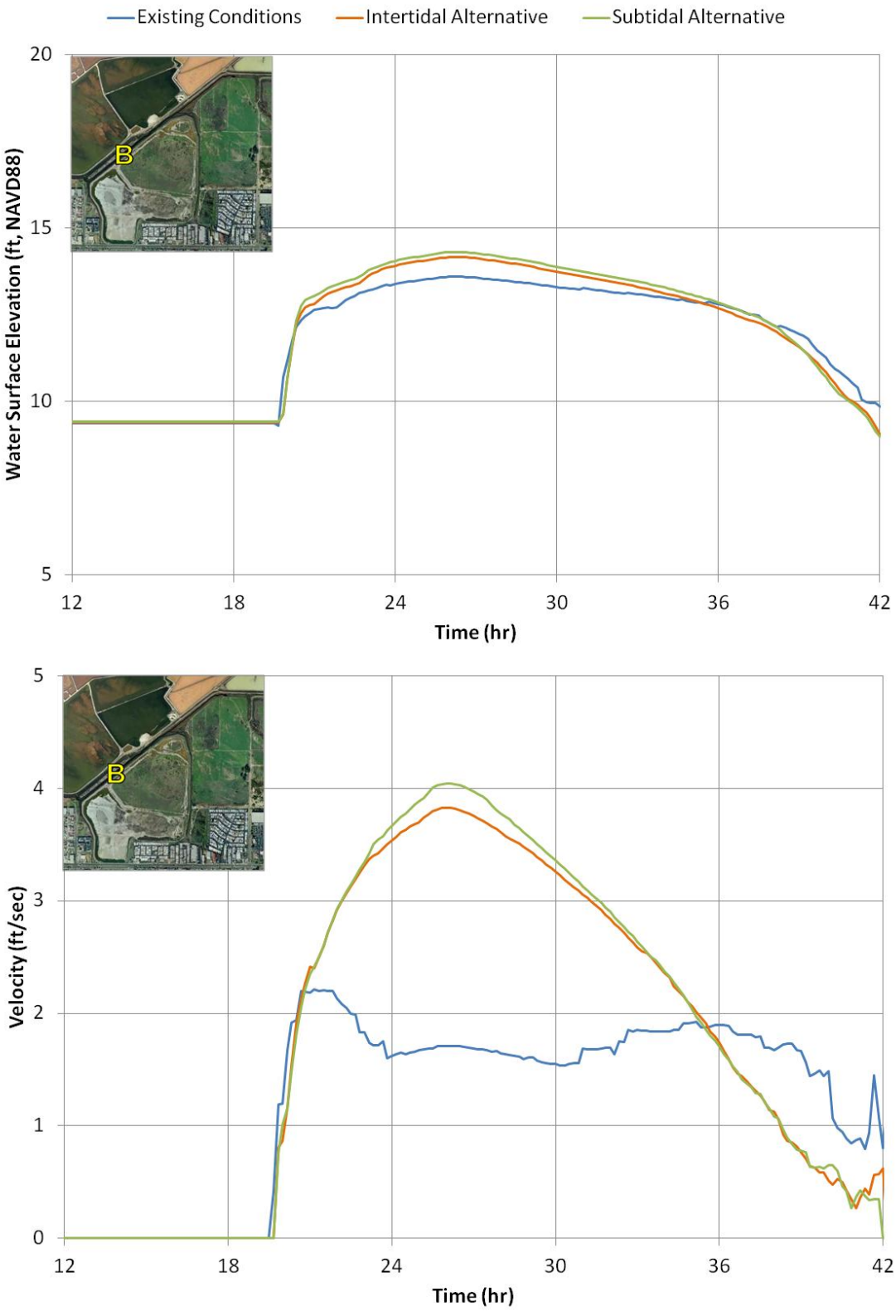


Figure 6.20 100-Year Flood Water Elevation and Velocity Comparisons at Location B

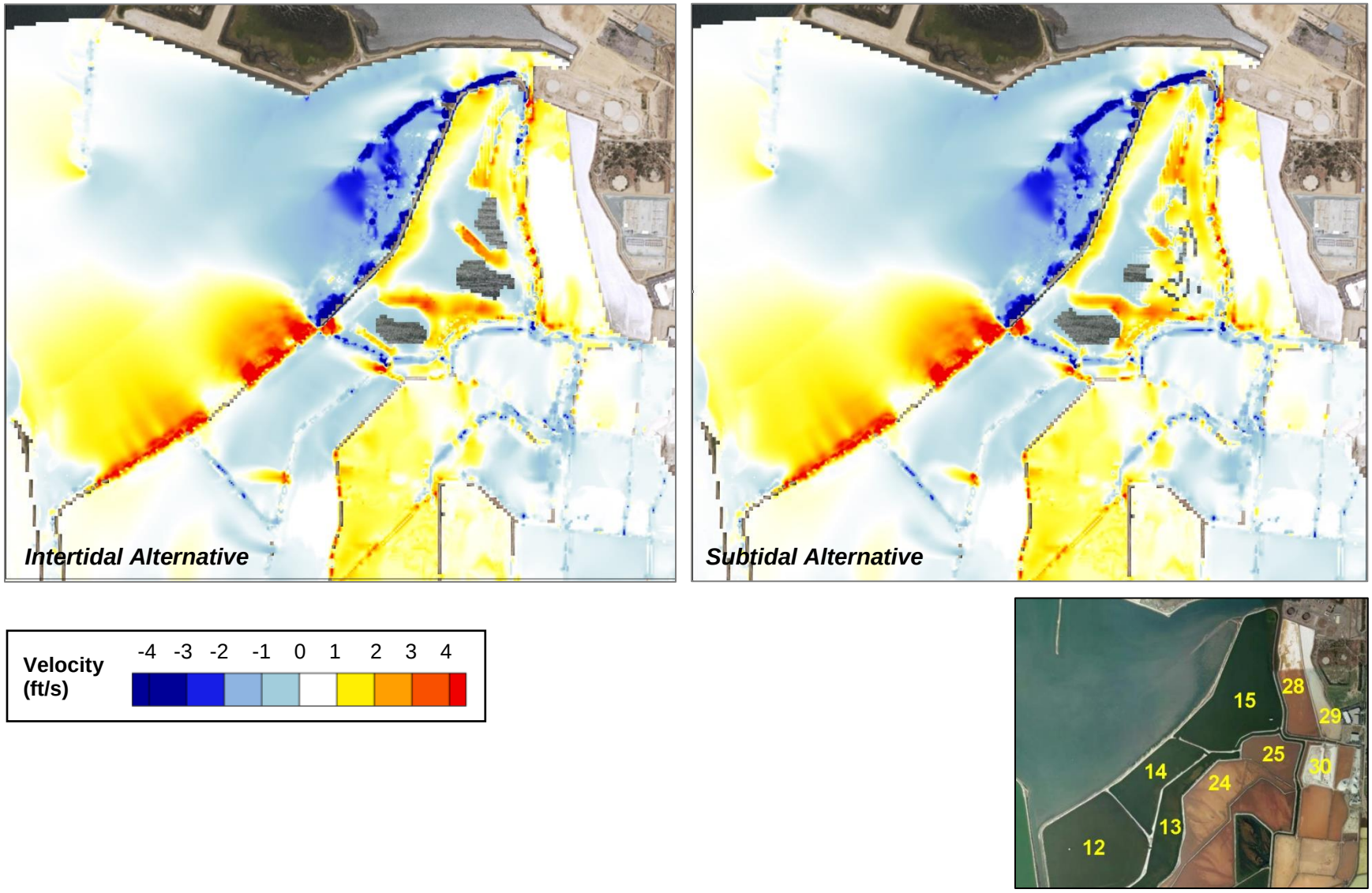


Figure 6.21 100-Year Erosion Impacts near Pond 15

6.4 SUMMARY

Hydrodynamic modeling was conducted to establish flood velocities for Existing Conditions, Intertidal Alternative, and Subtidal Alternative. In general, the highest velocities occur along the river channel, as well as across levees when flow overtopping occurs. Under the proposed alternatives, the velocity distribution in the ORF (ORF) would be altered due to distribution of flood flows through the proposed alternatives. Differences in the maximum flood velocities between proposed alternatives and Existing Conditions were used to characterize and qualitatively evaluate potential erosion impacts. Areas with the same or lower velocities than Existing Conditions are expected to have no erosion impacts, while areas with higher velocities may have erosion impacts.

For most of the ORF, the proposed alternatives will not change flood velocities, including tidally influence areas such as the Western Salt Pond Restoration Project (formerly Ponds 10A, 10, and 11). In general, no erosion impacts are expected within most of the salt ponds. Decreases in erosion impacts were determined for Ponds 20 and Pond 15, as well the central portion of the bike path and river channel adjacent to the proposed wetland. Minor reductions in erosion impacts were determined for several ponds on the eastern side of the salt ponds.

The proposed alternatives divert flood flows through the project area resulting in higher velocities along the northern portion of the bike path. A rock revetment could be placed along this portion of the bike path embankment to mitigate the potential increase in bank erosion. High velocities were also predicted in areas east of Nestor Creek that contain highly contaminated soils. Based on the soil characteristics for the area, the soils are likely to erode under existing conditions during a 100-year flood.

The proposed alternatives will also result in erosion impacts along the levees separating the salt ponds and San Diego Bay. Under the proposed alternatives, Pond 15 would be isolated from the flood area, thereby increasing flood elevations in Ponds 12, 14 and 28. The overtopping of Pond 15 into San Diego Bay under Existing Conditions will be diverted to Ponds 12 and 14. The overtopping of the Pond 12 and 14 levees into San Diego Bay may increase erosion along the levees. Higher velocities that may result in localized scour were also determined along the levee between Ponds 15 and 28.

7. FLUVIAL SEDIMENTATION ANALYSIS

7.1 APPROACH

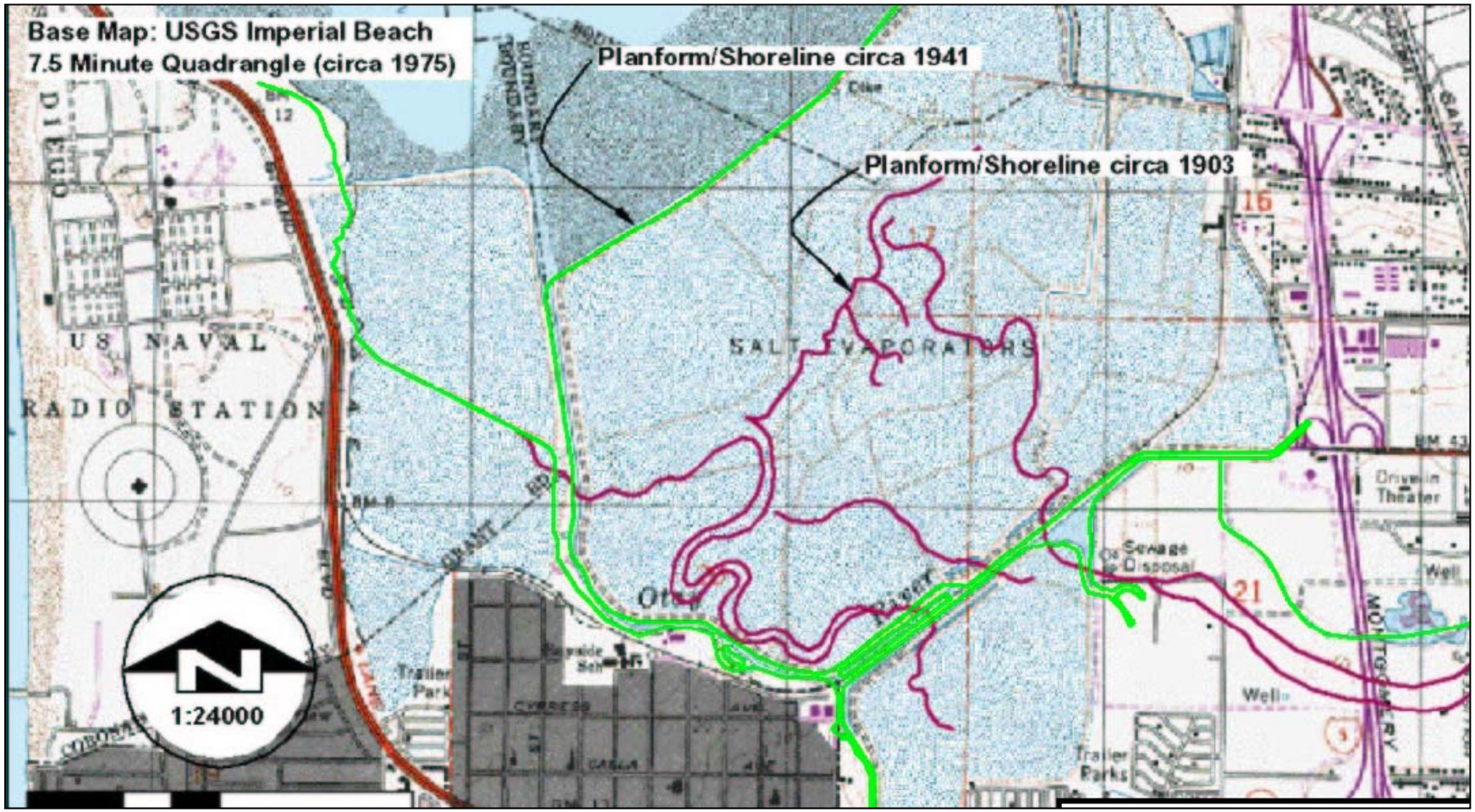
A fluvial sedimentation analysis was conducted to evaluate fluvial sediment delivery from the upstream watershed to the proposed wetlands and the subsequent rate of sedimentation in the proposed wetlands. Sedimentation at the mouth of the Otay River (where the Otay River meets San Diego Bay) associated with coastal processes (*e.g.,* tides, waves) is addressed in a companion study (Jenkins, 2014). The approach for the fluvial sedimentation analysis is summarized below.

1. Estimate the annual sediment loadings from the Otay River Watershed
2. Evaluate the portion of sediment loadings from the Otay River Watershed that will get to the proposed wetland area
3. Estimate the annual sedimentation rate in the wetland based on the portion of the sediment entering the wetland that is likely to settle in the wetland

7.2 SEDIMENT LOADING FROM OTAY RIVER WATERSHED

In the Otay River Watershed, fluvial sediments are transported from the watershed along the Otay River into San Diego Bay. Soils along mountains and canyons are primarily eroded during storm events and washed downstream. A portion of eroded sediment, typically gravels and sands, deposits along the river bed, while finer sediment generally deposits within the river floodplain or delta that forms where the river meets San Diego Bay.

Historically, the downstream end of the Otay River was a typical river delta with multiple pathways to San Diego Bay. This “natural” river configuration was altered by the channelization of the river that has occurred through the construction of dikes and levees for salt ponds and agriculture practices (Aspen 2006 and River Partners 2008). Changes in the river configuration are illustrated in Figure 7.1 based on a comparison of the river in 1903 and 1941. In the figure, the historical delta features are indicated by the magenta lines showing the river planform circa 1903. The river floodplain contained multiple meandering channels leading to San Diego Bay. The channelized river is shown by the green lines based on the river alignment circa 1941. The river pathway has been confined along the edges of the floodplain, which is similar to the current condition of the river. Changes to the lower end of the Otay River are also illustrated by maps of the floodplain area circa 1902, 1930, 1950, and 1978 provided in Figure 7.2. The earlier maps circa 1902 and 1930 show the delta formation along San Diego Bay. The 1950 and 1978 maps show salt ponds and/or agricultural areas in the former river delta.



Source: Aspen 2006

Figure 7.1 Historical Changes to the Otay River

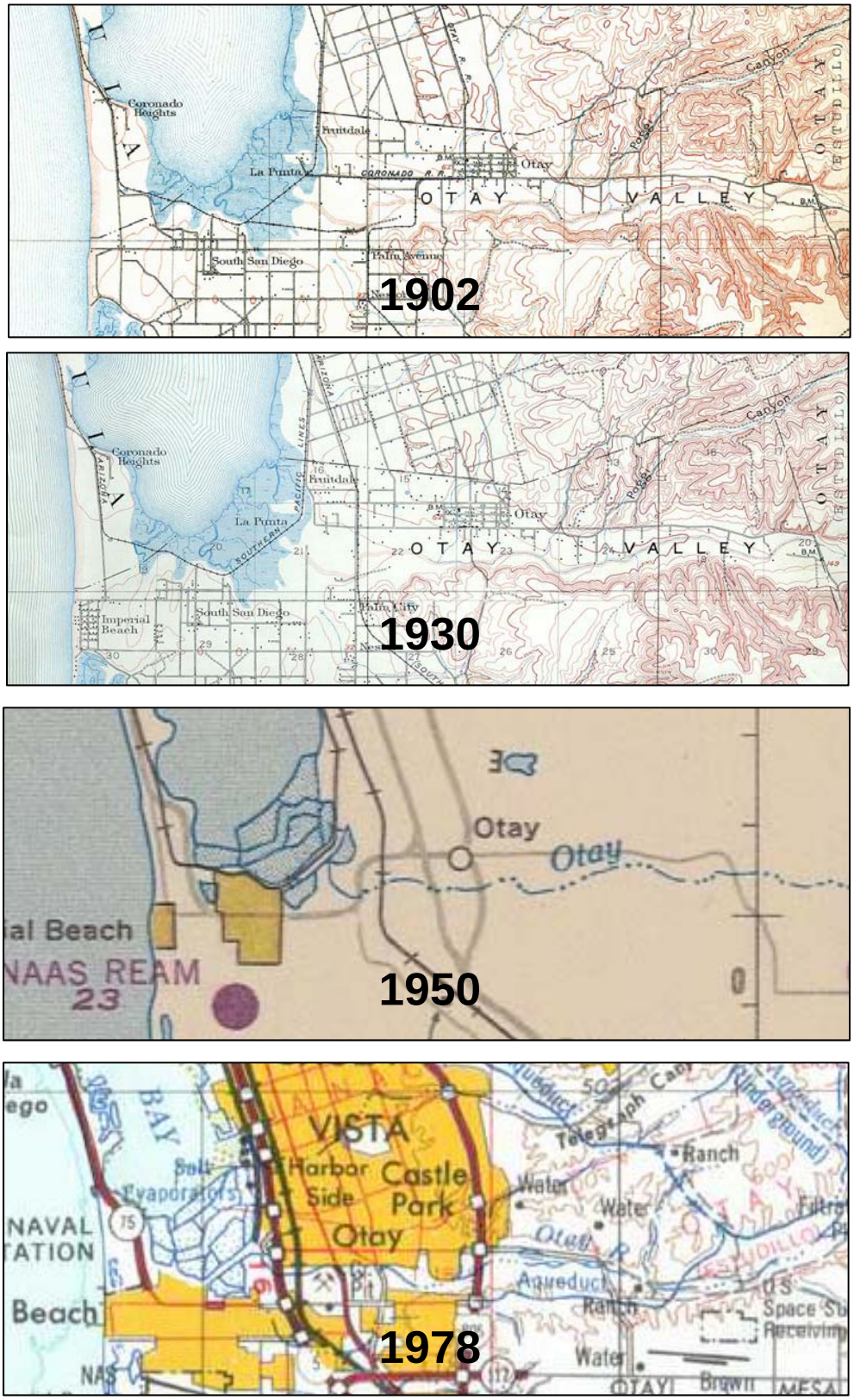


Figure 7.2 Historical Maps of the Otay River near San Diego Bay

Today, essentially all flows and associated sediment from the upper 68% of the watershed are impounded at the Upper and Lower Otay Reservoirs, which are a part of the City of San Diego water supply system. The Upper Otay Reservoir is located at the end of Procter Valley, retaining water and sediment from Proctor Valley Creek. Flows overtopping the upper reservoir are connected to the lower reservoir via a spillway. The Lower Otay Reservoir forms behind Savage Dam, collecting water and sediment from Dulzura Creek, Hollenbeck Canyon, and Jamul Creek. The lower reservoir also receives water from Cottonwood Creek via Morena Dam and Barrett Diversion Dam as well as the Second San Diego Aqueduct.

The Lower Otay Reservoir was originally created in 1897 with water impounded behind a rock-fill structure with a steel core. A series of large storms in January 1916 resulted in failure of the original dam. The catastrophic flood that included loss of life resulted in the destruction of bridges and structures along the canyon and stripping of vegetation and sediment down to bedrock. The flood wave was estimated to be 100-ft high near the dam and 20-ft high in the lower canyon with a peak discharge of 37,400 cfs (USGS 1918), which exceeds the estimated 100-year flood event. The dam was reconstructed between 1917 and 1919 as a gravity-arch dam and renamed Savage Dam, which still stands today.

Savage Dam has reduced sediment delivery by retaining nearly all sediment from the upper watershed resulting in a sediment deficit to the lower river. Sources of fluvial sediments are limited to the 46-mi^2 watershed below the Lower Otay Reservoir. Hence, the sedimentation impact analysis was geographically limited to this region.

Fluvial sediment loading from the Otay River Watershed below the Lower Otay Reservoir was determined from prior studies. Two different methods were analyzed resulting in a range of sediment loadings. The methods were empirically based and account for drainage area and watershed conditions. For Method 1, the sediment loading was determined from estimates for the San Diego River Watershed; and for Method 2, the sediment loading was obtained from a prior watershed loading estimate using a GIS-tool.

7.2.1 Method 1

For Method 1, sediment loading for the Otay River Watershed was estimated by scaling sediment loading estimates for the San Diego River. Given the geographical proximity and similar hydrologic conditions, the sediment loading for the Otay River Watershed was assumed to be proportional to the San Diego River Watershed based on drainage area. The San Diego River is located to the north of Otay River and extends from the Peninsular Ranges to the Pacific Ocean just south of Mission Bay. Similar to the Otay River Watershed, the upper portion of the San Diego River Watershed is controlled by two major reservoirs that cut off flows and sediment to the lower watershed. The San Diego River drainage area covers 432 mi^2 (1,119 km^2), of which 60% is controlled by the El Capitan Dam and San Vicente Dam. The El Capitan Dam was constructed in 1935 and is used by the City of San Diego for municipal uses and

irrigation. The San Vicente Dam was constructed in 1943 and is also used by the City of San Diego for municipal uses.

Sediment loading from the San Diego River was previously estimated by Brownlie and Taylor (1981). Estimates were made using sediment rating curves developed from flow and sediment data collected along the river. As part of the study, annual sediment loads were estimated from 1913 to 1976 for actual and natural conditions, which indicated an average 90% reduction in sediment delivery due to the construction of the El Capitan and San Vicente Dams. Annual sediment loadings for the San Diego River (below the dams) showed a large variability from year to year, thus the average annual loading varied depending on the years selected for the average. In their report, Brownlie and Taylor (1981) provided average sediment loading between two time periods: (i) 1935 and 1956, and (ii) 1943 and 1956. Since the first time period overlaps the implementation of both dams in 1935 and 1943, only the average sediment loading for the second time period is used for this study. For that time period, the estimated average sediment load is1,585 yd^3/yr (1,212 m^3/yr).

Sediment loading for the Otay River Watershed was estimated by scaling the San Diego River sediment loading based on drainage area. A scale factor was calculated as the drainage area of the Otay River below the reservoir to the drainage area of the San Diego River below the reservoir. The resulting estimated sediment loading for the Otay River is 646 yd^3/yr (494 m^3/yr).

7.2.2 Method 2

The second estimate of sediment loadings was obtained from a previous estimate using the Otay Watershed Pollutant Loading (OWPL) Tool (Aspen 2006). The OWPL tool is an Excel spreadsheet setup to estimate annual pollutant loads from the Otay River Watershed and to evaluate best management practices (BMPs). It was developed using PLOAD, a GIS-based tool to calculate runoff volumes and pollutant loads for subwatersheds. The PLOAD calculations employ the EPA Simple Method, an empirical method for estimating pollutant loadings by land use based on drainage area, runoff coefficients, and pollutant event mean concentrations (EMCs). In the OWPL Tool, the Otay River Watershed below the Lower Otay Reservoir is delineated into nine subwatersheds that are individually characterized based on land use and mean annual precipitation. Land uses are used to define runoff coefficients and EMCs based on literature values.

As part of the OWPL tool development, annual loads were estimated for various pollutants including total suspended solids (TSS). The TSS EMCs were obtained from estimates determined by storm water monitoring in Los Angeles County (LACDPW 2000), except for agricultural land use, which was taken from Ackerman and Schiff (2003). Based on the OWPL tool, the annual sediment loading for the Otay River Watershed below the reservoirs was estimated to be 1,360 yd^3/yr (1,040 m^3/yr).

7.2.3 Summary

The estimated sediment loadings based on the above discussed two methods are used to define the likely range of sediment loadings from Otay River Watersheds (i.e., between 646 and 1,360 yd^3/yr). Overall, sediment loadings are relatively small since sediment from the upper portion of the watershed is not transported pass the Lower Otay Reservoir.

7.3 POTENTIAL SEDIMENT DELIVERY FROM OTAY RIVER TO PROPOSED WETLAND

Not all the sediment loadings from the Otay River Watershed will get to the proposed wetland since only portions of the discharge from the Otay River will go through the wetland. In addition depending on the sediment distribution in the sediment loads, some of the larger sediments will deposit along the river bed and only the fine sediments in suspension would be transported with the flow into the proposed wetland.

The total sediment loading generated from the watershed is comprised of eroded sediment of different sizes. Sediment from the Otay River Watershed is generated from areas with roughly half sedimentary and half southern California batholith resulting in a general estimate of sediment composition of 50% fines and 50% sands (Taylor 1981). A portion of the sediment load, primarily sands or gravels, will be primarily deposited within the river bed. Finer sediment material is more likely to stay in suspension and be transported with the river flow. Hence, as a first approximation, it is estimated that only about 50% of the estimated total sediment loadings from the watershed will stay in suspension (i.e., about 323 to 680 yd^3/yr).

Since only a portion of river flow and its associated suspended sediment would flow through the proposed wetland area, the suspended sediment load from the watershed to the proposed wetland area would actually be less than the above estimated 323 to 680 yd^3/yr. During flood events, a portion of the flow overtops the levees along the river and does not flow through the wetland. Based on TUFLOW model results, only about 15, 45 and 60 percent of the flood flow for the 25-, 50- and 100-year flood events will pass through the proposed wetland area. Since sediment loads in general are associated with flood events, based on the model results for the 25-, 50- and 100-year event, it is likely only about 50% of the estimated suspended sediment loads of 323 to 680 yd^3/yr would go through the proposed wetland area (i.e., the annual sediment load to the wetland would be in the range of 160 to 340 yd^3/yr).

7.4 POTENTIAL SEDIMENTATION RATE AT THE PROPOSED WETLAND

It is unlikely that all the suspended sediments passing through the proposed wetland will settle to the bed, but a conservative estimate of the sedimentation rate in the wetland is to assume all the suspended sediment would uniformly deposited over the proposed wetland area (29.62

acres). With this conservative assumption and the estimated annual suspended sediment load of 160 to 340 yd^3/yr, the estimated sedimentation rate in the proposed wetland area would be between 0.04 to 0.08 in/yr (1 to 2 mm/yr). If we assume only about half of the suspended sediment that passes through the proposed wetland would actually settle and stay in the wetland, the average annual sedimentation rate in the wetland would be of the order of 0.02 to 0.04 in/yr (0.5 to 1 mm/yr).

8. EFFECT OF SEA LEVEL RISE

8.1 OVERVIEW

On October 14, 2013, the California Coastal Commission (CCC) released the Draft Sea-Level Rise Policy Guidance for public comment (CCC, 2013). The draft guidance document was prepared by CCC staff to provide a theoretical framework for assessment of sea-level rise in Local Coastal Programs and Coastal Development Permits. The draft guidance policies recognize the science on sea-level rise is constantly evolving, but at the time of the report's publication, the best available science on sea-level rise in California is the 2012 *National Research Council (NRC) Report, Sea-Level Rise for the Coasts of California, Oregon and Washington: Past, Present and Future* (NRC, 2012). The NRC-recommended sea-level rise projections for Southern California (south of Cape Mendocino) are summarized in Table 8.1.

Table 8.1 Potential Sea Level Rise Ranges Using Year 2000 as the Baseline for Southern California (NRC Report 2012)

YEAR	RANGE OF SEA LEVEL RISE (INCHES)
2030	1.6 – 12
2050	5 – 24
2100	16.5 – 66

For this study, the potential effect of sea level rise (SLR) was evaluated for Year 2050 and 2100 using the upper bound of the projected SLR shown in Table 8.1 (i.e., 24 inches for Year 2050 and 66 inches for Year 2100). It was assumed that the tidal characteristics would remain the same in the future, such that SLR effectively raises the PMP tide described in Section 4.3.1 uniformly by 24 inches and 66 inches in Year 2050 and Year 2100, respectively. The resulting PMP tides used as downstream boundary condition for flood modeling for Year 2050 and Year 2100 are shown in Figure 8.1. In the figure, the timing for the arrival of the 100-year flood from Otay River, Poggi Canyon Creek, and Nestor Creek at the upstream boundaries relative to the downstream PMP tides are also shown.

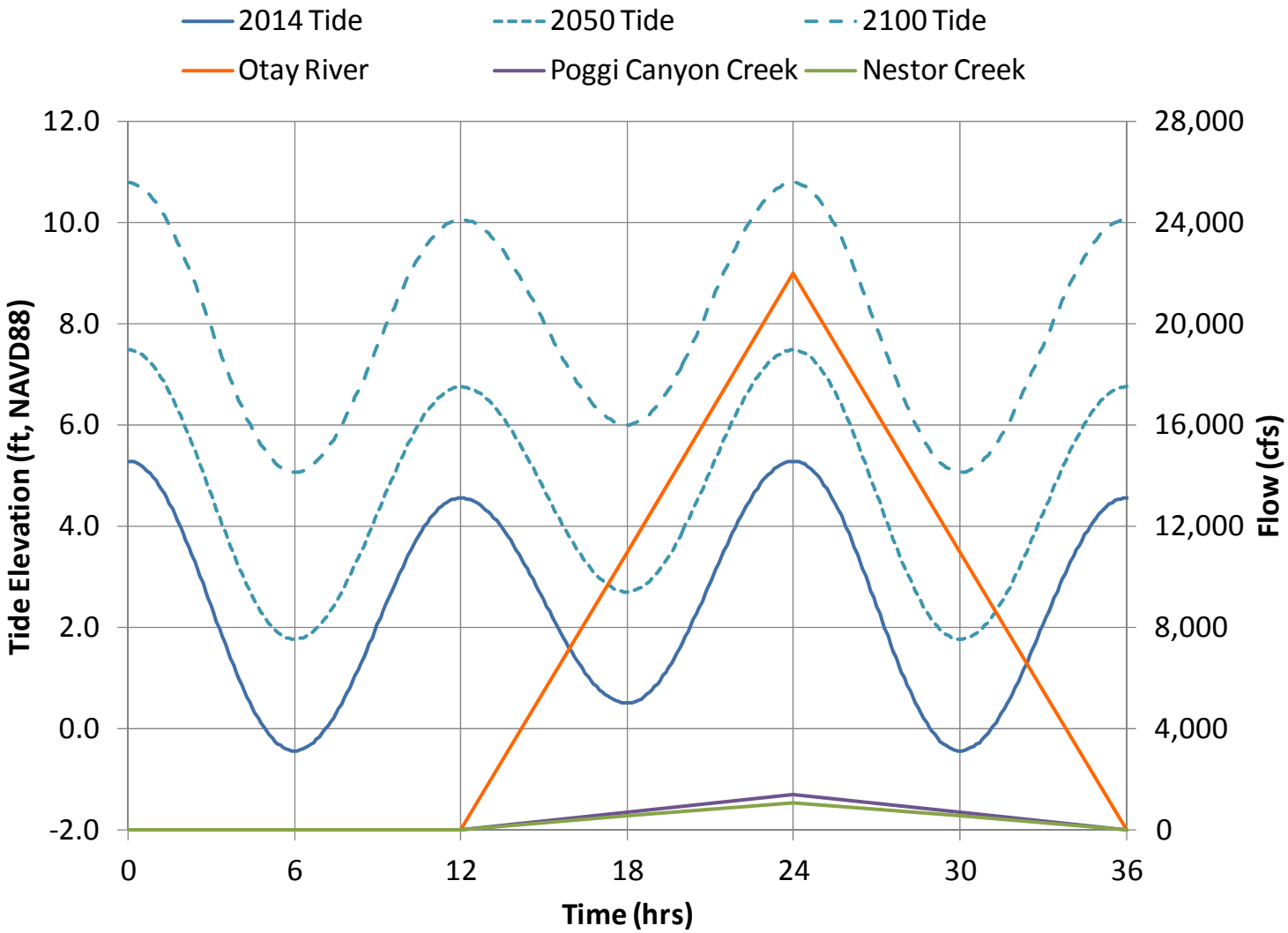


Figure 8.1 Parametric Mean Periodic Tides in Years 2050 and 2100 and 100-Year Flood Hydrographs

8.2 FLOOD MODELING RESULTS

8.2.1 Existing Conditions

The spatial plots of maximum water elevations for the entire model domain for current, year 2050 and 2100 sea levels under Existing Conditions are shown in Figure 8.2. As shown in the figure, there is no noticeable difference in the extent and flood elevations upstream of I-5 Bridge for Year 2050 and 2100 compared with current sea level condition and minor difference in the ORF. To better illustrate the difference in flood elevations for areas in the ORF, the maximum water elevations for the ORF are shown in Figure 8.3 with a different color scale that allows a better comparison for this area. As shown in the figure, the only difference in the maximum water elevations in the ORF between Year 2050 and current condition is at the restored Salt Ponds 10 and 11 which are connected to San Diego Bay. With only a 2-ft rise in SLR for Year 2050, the maximum tide water levels are still lower than the levees of the salt ponds; hence there is no change in the flood water elevations during the 100-year flood. However, for Year 2100 with a 5.5 ft rise in SLR, the tide elevations will be higher than the salt pond levees; hence the salt pond will be inundated as illustrated in Figure 8.3.

8.2.2 Flood Impact with Proposed Conditions (Intertidal and Subtidal Alternatives)

The spatial plots of maximum water elevations for the entire model domain for Existing Conditions and with proposed alternatives with Year 2050 SLR are compared in Figure 8.4. With the color scale that can show water elevations for the entire domain, there is no noticeable difference in the extent and flood elevations for the Existing Conditions and proposed alternatives. To better illustrate any potential impact of the proposed alternative to flood levels in the ORF, the maximum water elevations downstream of the I-5 Bridge are compared in Figure 8.5 with a color scale that can show smaller differences. Similar to the results shown in Figure 5.10 for current sea level, the proposed alternatives would result in slightly lower maximum flood water elevations near the proposed wetland areas compared with Existing Conditions. In Year 2050, with a 2-ft SLR, there is still no flooding at Pond 29 under Existing Conditions. However, as expected, since Pond 29 would be flooded under the proposed alternatives with current sea level, there would be increased flooding in Pond 29 in Year 2050.

Similar comparisons of maximum water elevations for Existing Conditions and under proposed alternatives for Year 2100 with 5.5-ft SLR are shown in Figures 8.6 and 8.7. The impacts of the proposed alternatives in 2100 would still be confined to areas near the proposed wetland location. However, with a 5.5-ft SLR in Year 2100, Pond 29 would be inundated even under Existing Conditions.

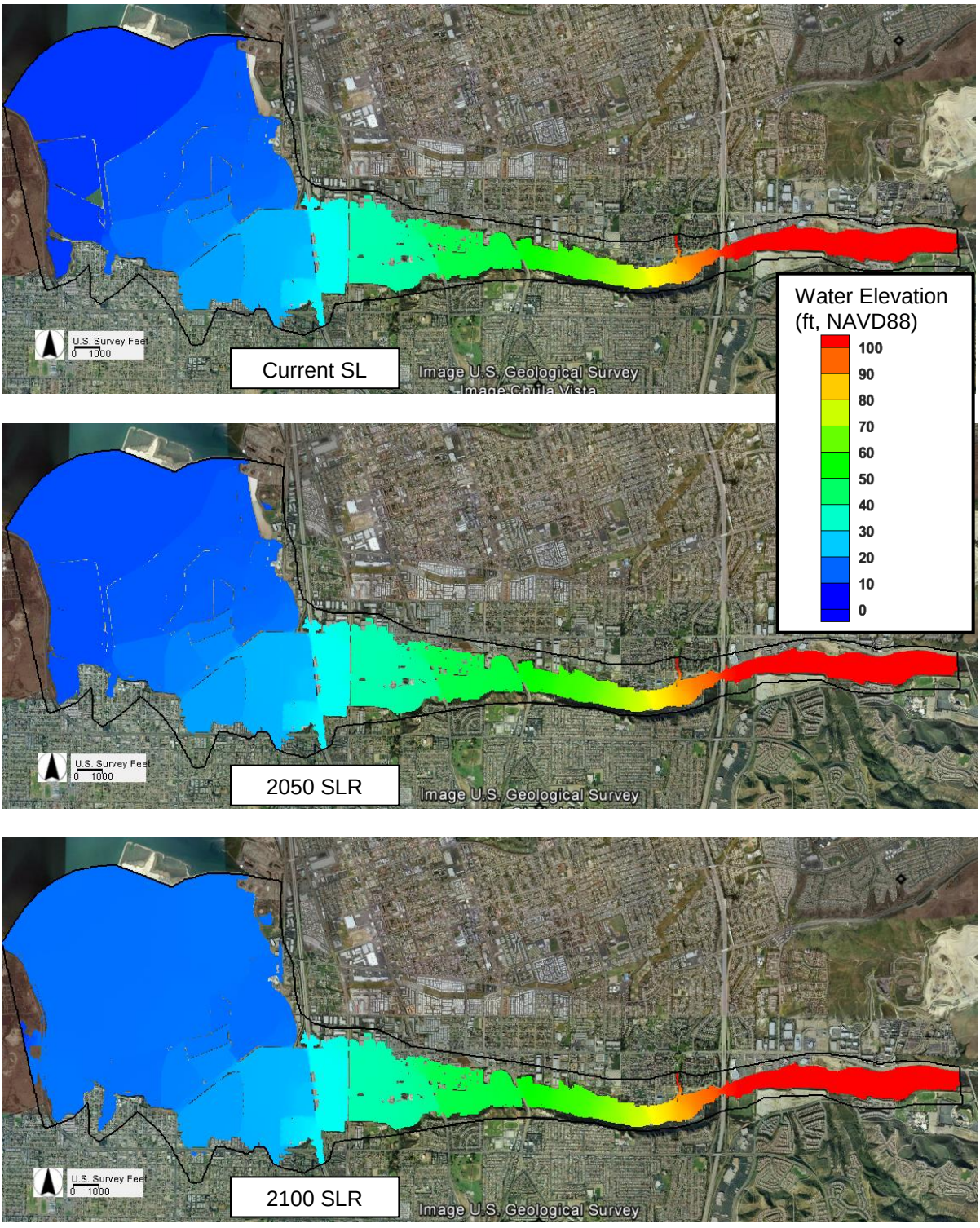


Figure 8.2 100-Year Flood Maximum Water Elevations under Existing Conditions for Current Sea Level, 2050 and 2100 SLR Scenarios

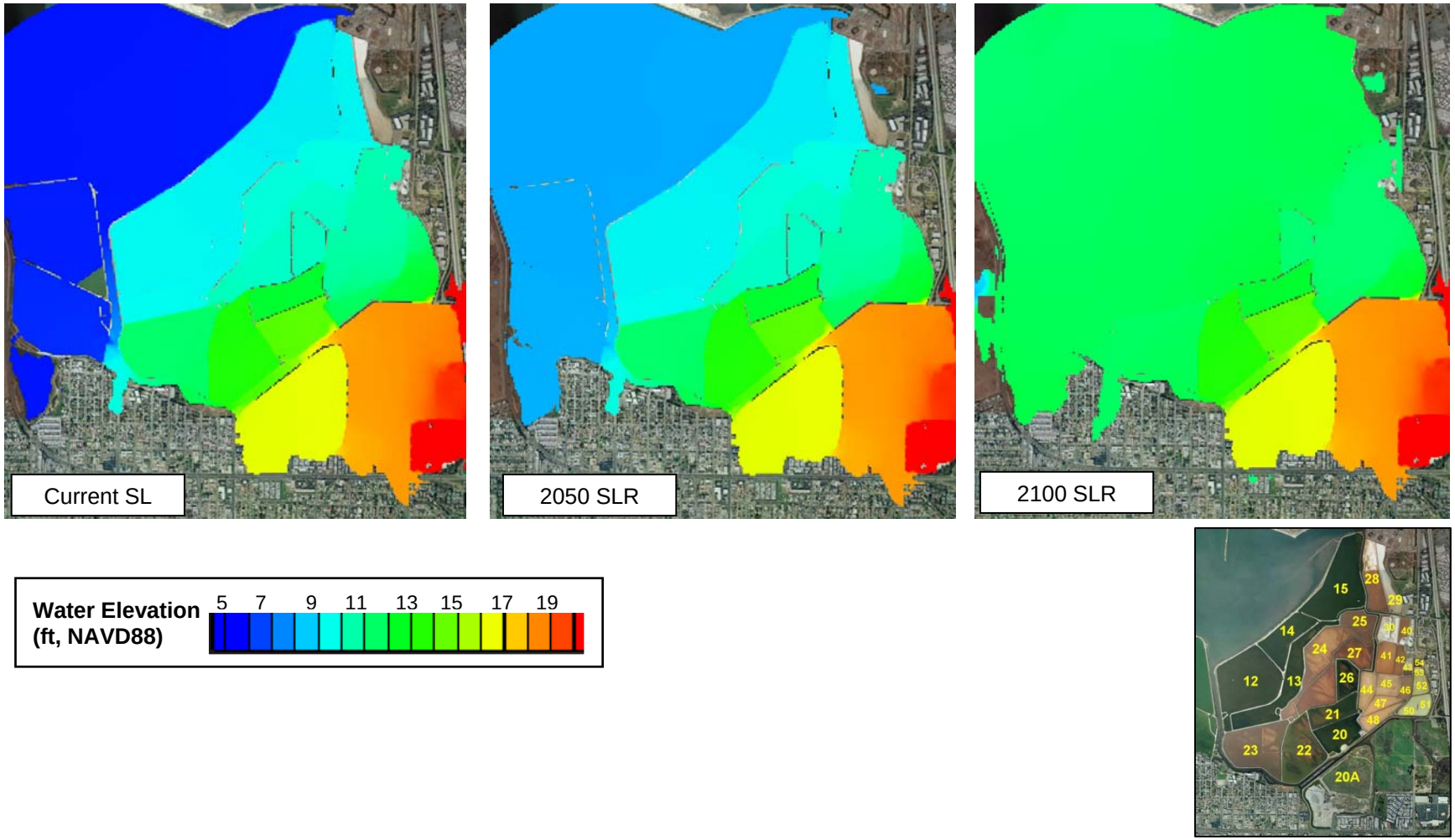


Figure 8.3 100-Year Flood Maximum Water Elevations in Floodplain under Existing Conditions for Current Sea Level, 2050 and 2100 SLR Scenarios

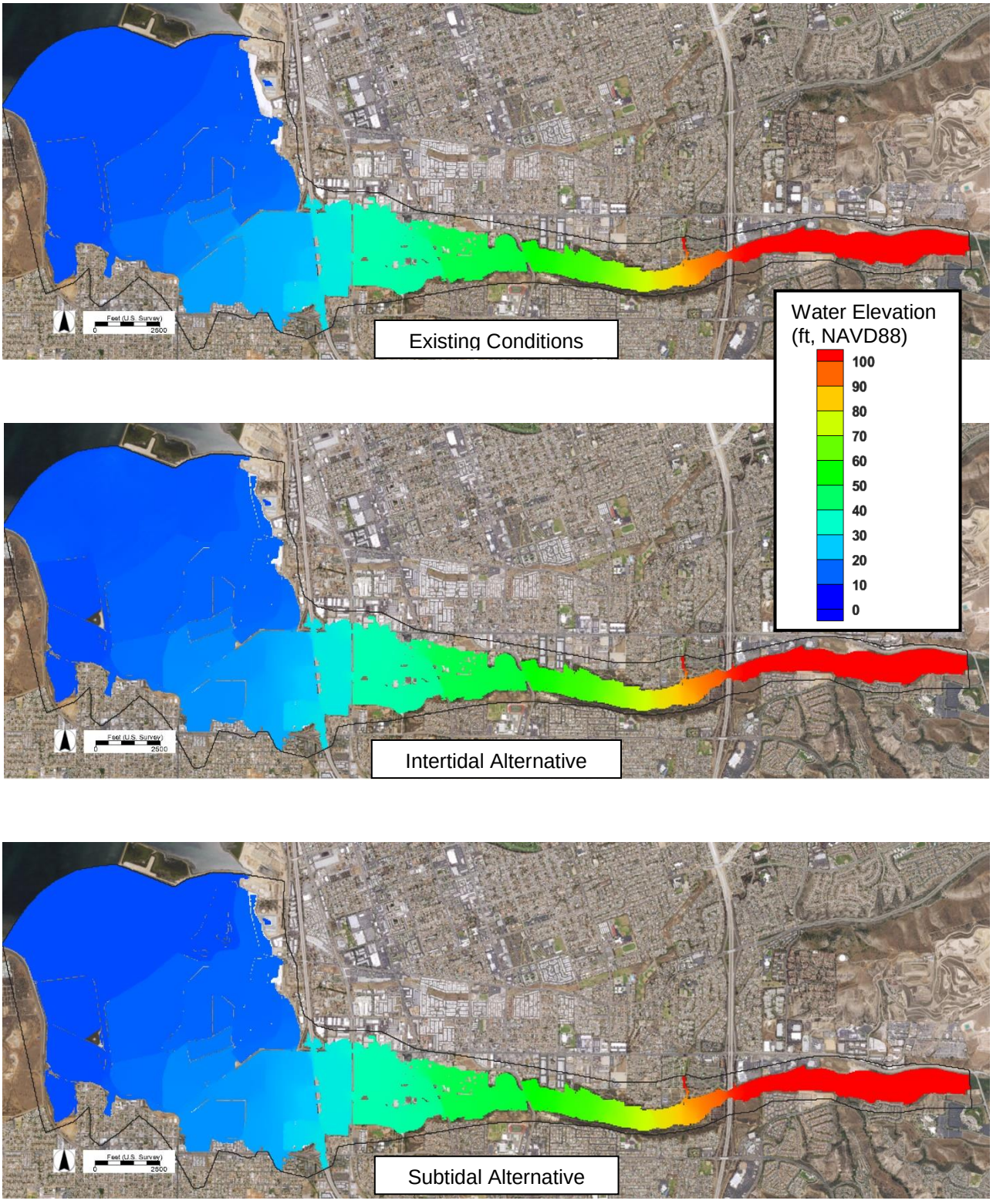


Figure 8.4 100-Year Flood Maximum Water Elevations under Existing and Proposed Conditions for 2050 SLR Scenario

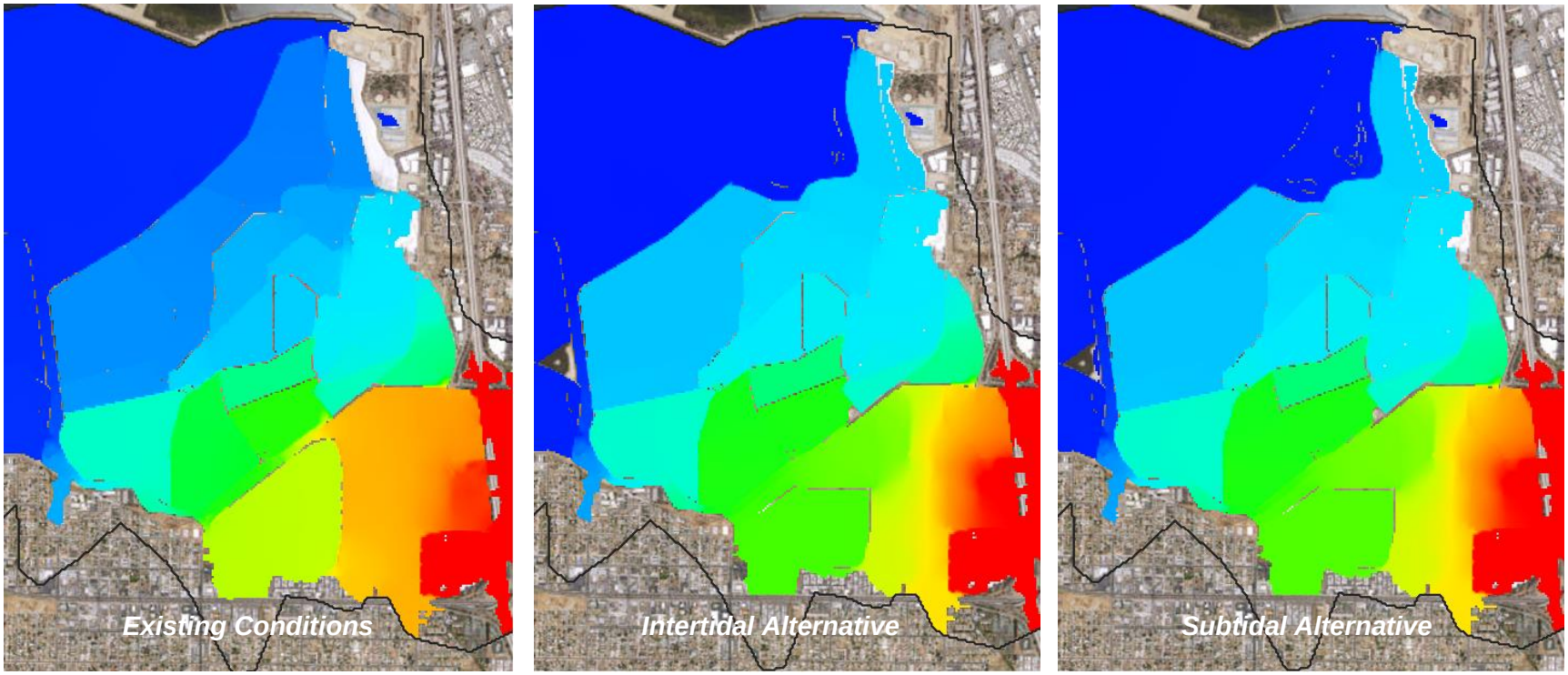


Figure 8.5 Comparison of 100-Year Flood Maximum Water Elevations in Floodplain under 2050 SLR Scenario

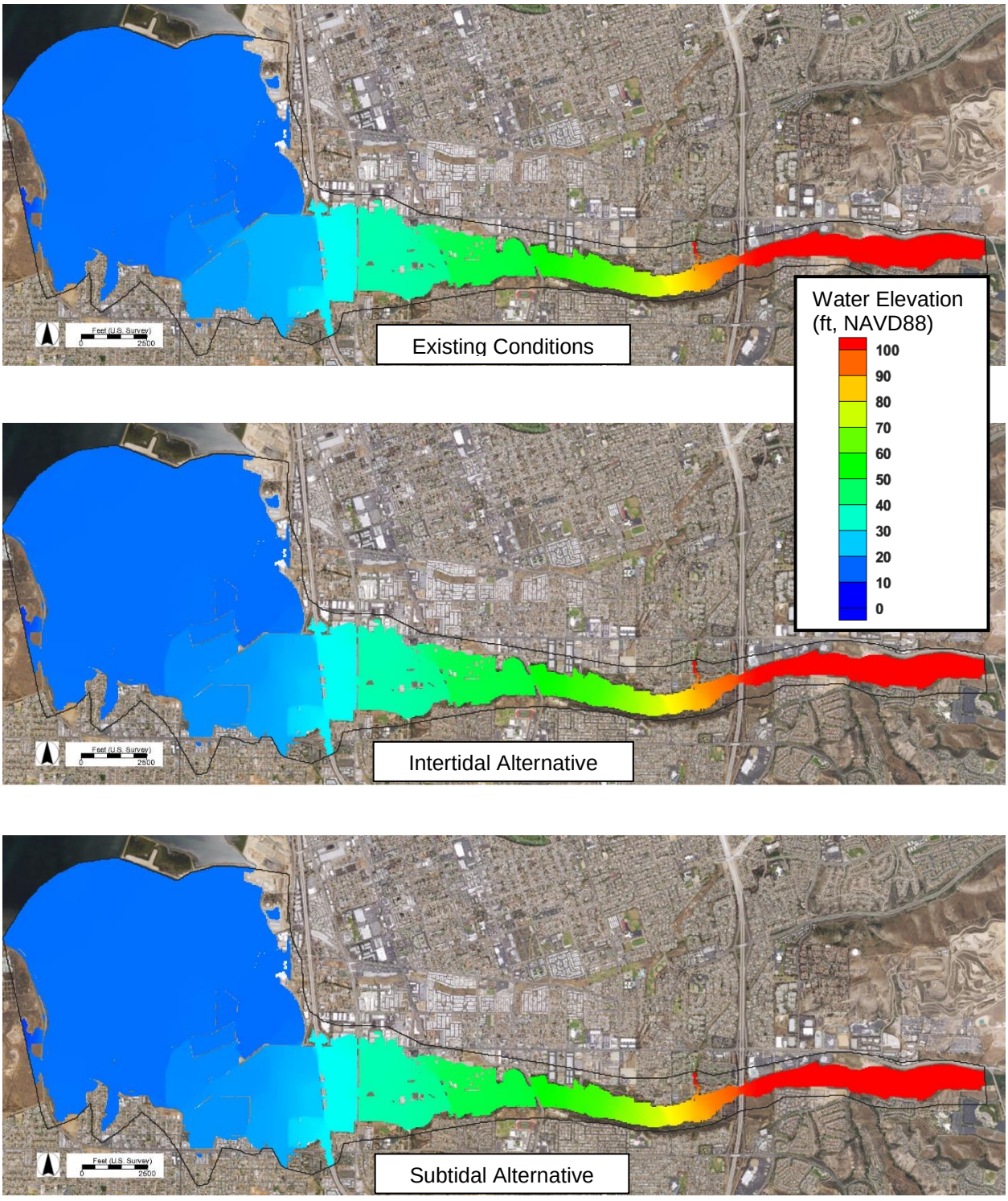


Figure 8.6 100-Year Flood Maximum Water Elevations under Existing and Proposed Conditions for 2100 SLR Scenario

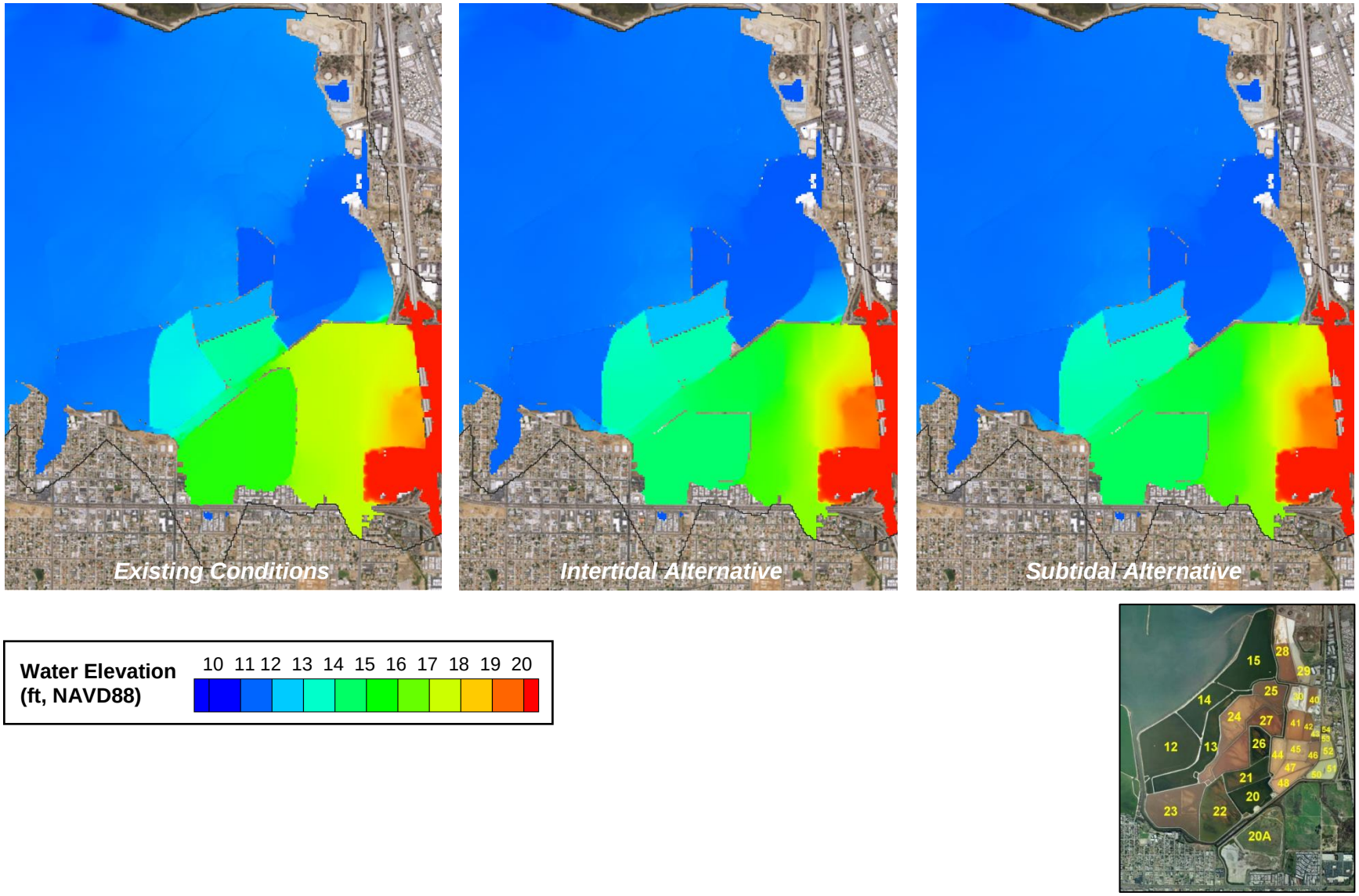


Figure 8.7 Comparison of 100-Year Flood Maximum Water Elevations in Floodplain under 2100 SLR Scenario

9. CONCLUSIONS AND RECOMMENDATIONS

1. Flood impacts of the ORERP are localized and mainly in the vicinity and downstream of the project area (e.g., along the bike paths and in the salt ponds). The ORERP would not have any flood impact to areas upstream of the I-5 Bridge.

2. Along the bike path, for the 100-year flood event, the ORERP would reduce flood elevations at the north end of the bike path adjacent to Pond 48, but increase flood elevations for the south end of the bike path along Pond 22. However, the ORERP would reduce the frequency of flooding along the bike path for smaller flood events. Under existing conditions, flooding would occur along the bike path for flood events with return period of between 10 and 15 years. With the ORERP, flooding along the bike path would not occur up to the 15-year return period flood event.

3. During a 100-year flood event, the ORERP would cause an increase in flood elevations at Ponds 12, 13, 14, and 28 compared with Existing Conditions. The increase in flood elevations in Pond 28 would cause overtopping of the levee between Ponds 28 and 29, resulting in flooding of Pond 29, which would not be flooded under Existing Conditions.

4. For most of the ORF, the ORERP would not change flood velocities, including tidally influence areas such as the Western Salt Pond Restoration Project (formerly Ponds 10A, 10, and 11). In general, no erosion impacts are expected within most of the salt ponds. Decreases in erosion would be expected for Ponds 20 and Pond 15, as well the central portion of the bike path and river channel adjacent to the proposed wetland.

5. The ORERP would cause higher flows and velocities along the southern portion of the bike path, and the levees separated Ponds 12 and 14 from San Diego Bay. The increase in flood velocities may increase local scour in those areas. Additional hydraulic analyses are recommended as part of the final design of the ORERP to determine whether scour would be a problem. If it is determined that scour would be a problem for those areas, proper scour protection measures would be developed for those areas as part of the final design.

6. The potential sedimentation rate at the proposed wetland areas was estimated to be low, of the order of 0.02 to 0.04 in/yr (0.5 to 1 mm/yr). This sedimentation rate is likely to be offset by future sea level rise (i.e., sea level rise would likely be greater than the future sedimentation).

7. Under Existing Conditions, the effects of sea level rise (SLR) on flood elevations during a 100-year flood event would be confined to the tidally influenced salt pond areas. In Year

2050, with a projection of 2 ft SLR, only Ponds 10A, 10, and 11 (which were recently restored to have tidal connection with San Diego Bay) would have an increase in flood elevations during a 100-year flood compared with current sea level. In Year 2100, with a projected 5.5 ft SLR, the salt ponds would be inundated.

10. REFERENCES

Ackerman, D. and K.C. Schiff 2003. Modeling Stormwater Mass Emissions to the Southern Bight. Southern California Coastal Water Research Project Biennial Report 2001-2002. May 2003.

Anchor QEA, L.P. Sampling and Analysis Report – Otay River Estuary Restoration Soil Characterization Program. Prepared for Poseidon Water, LLC. March 2013.

Aspen 2006. Otay River Watershed Management Plan Draft Final. Prepared for Otay River Watershed Management Plan Joint Exercise of Powers Agreement Public Agencies (City of Chula Vista, City of Imperial Beach, City of San Diego, County of San Diego, San Diego Unified Port District). Prepared by Aspen Environmental Group. May 2006.

Brownlie and Taylor 1981. Sediment Management for Southern California Mountains, Coastal Plains and Shoreline: Part C Coastal Sediment Delivery by Major Rivers in Southern California. William R. Brownlie and Brent D. Taylor. Environmental Quality Laboratory, California Institute of Technology. EQL Report No. 17-C. February 1981.

DUI 2001. Sweetwater Marsh and South San Diego Bay Units CCP Topographic Survey. Ducks Unlimited, Inc.

Everest International Consultants, Inc. 2007. *South San Diego Bay Salt Pond Restoration Project – Otay River Floodplain Modeling.* Prepared for the U.S. Fish and Wildlife Service, September 2007.

FEMA 2006. Flood Insurance Study San Diego County, California and Incorporated Areas. Federal Emergency Management Agency.

Dr. Scott A Jenkins Consulting 2014. Tidal Hydraulics Analysis of the Otay River Estuary Restoration Plan. Prepared for Poseidon Water LLC. Prepared by Dr. Scott A Jenkins Consulting. September 23, 2014.

LACDPW 2000. Los Angeles County 1994-2000 Integrated Receiving Water Impacts Report. Los Angeles County Department of Public Works.

NOAA (National Oceanic and Atmospheric Administration). 2007. http://www.ngs.noaa.gov/cgi-bin/ngs_opsd.prl?PID=DC0891&EPOCH=1983-2001. for Station ID 9410170. June 26, 2007. and http://tidesandcurrents.noaa.gov/data_menu.shtml?type =Bench+Mark+Data+Sheets&mstn =9410170

NOAA DEM Database. http://www.csc.noaa.gov/dataviewer/index.html?action=advsearch&qType=in&qFld=ID&qVal=1124

NWS (Nearshore and Wetland Surveys) 2011. AutoCAD file contours information and point file containing spot elevations from survey data measured in 2011.

NWS 2012. AutoCAD file contours information and point file containing spot elevations from survey data measured in 2012.

PWA (Philip Williams & Associates, Ltd). 2003. *Lower Otay River Salt Marsh and Wetland Restoration: Hydrodynamic Modeling Analysis*. Prepared for the United States Fish and Wildlife Service and Ducks Unlimited, Inc. October 1, 2003.

River Partners 2008. Pre-Restoration Plan for the Otay Valley Regional Park. Prepared for The Resources Legacy Fund. Prepared by River Partners. December 1, 2008.

Taylor 1981. Sediment Management for Southern California Mountains, Coastal Plains and Shoreline: Part B Inland Sediment Movements by Natural Processes. Brent D. Taylor. Environmental Quality Laboratory, California Institute of Technology. EQL Report No. 17-B. October 1981.

U.S. Fish and Wildlife Service. 2006. *San Diego Bay National Wildlife Refuge, Sweetwater Marsh and South San Diego Bay Units, Final Comprehensive Plan and Environmental Impact Statement.* Volumes I & II. August 2006.

USGS 1918. Southern California Floods of January, 1916. Department of the Interior, United States Geological Survey. Prepared in Cooperation with the State of California. Water Supply Paper 426. 1918.

APPENDIX A FLUVIAL ANALYSIS AT BAYSIDE PARK, IMPERIAL BEACH

APPENDIX A

FLUVIAL ANALYSIS AT BAYSIDE PARK, IMPERIAL BEACH

A.1. INTRODUCTION

This appendix summarizes the study conducted for the area in the City of Imperial Beach, where preliminary study results indicated that there would be increase in potential flood impacts as a result of the Otay River Estuary Restoration Project (ORERP). This study area is denoted in yellow in Figure A.1. It is referred to as the Bayside Park area in this appendix. This area is located on the southern bank of the Otay River, near the Salt Pond 23, which is located north of the Otay River. A storm drain constructed under the bikeway connects the study area to the Otay River, as depicted in Figure A.2. The fluvial analysis for the Bayside Park area includes the evaluation of several options to alleviate the flood impacts caused by ORERP. Based on this study and the recommendation of the City staff and the project team members, one of the options has been adopted as part of the proposed feature of ORERP.

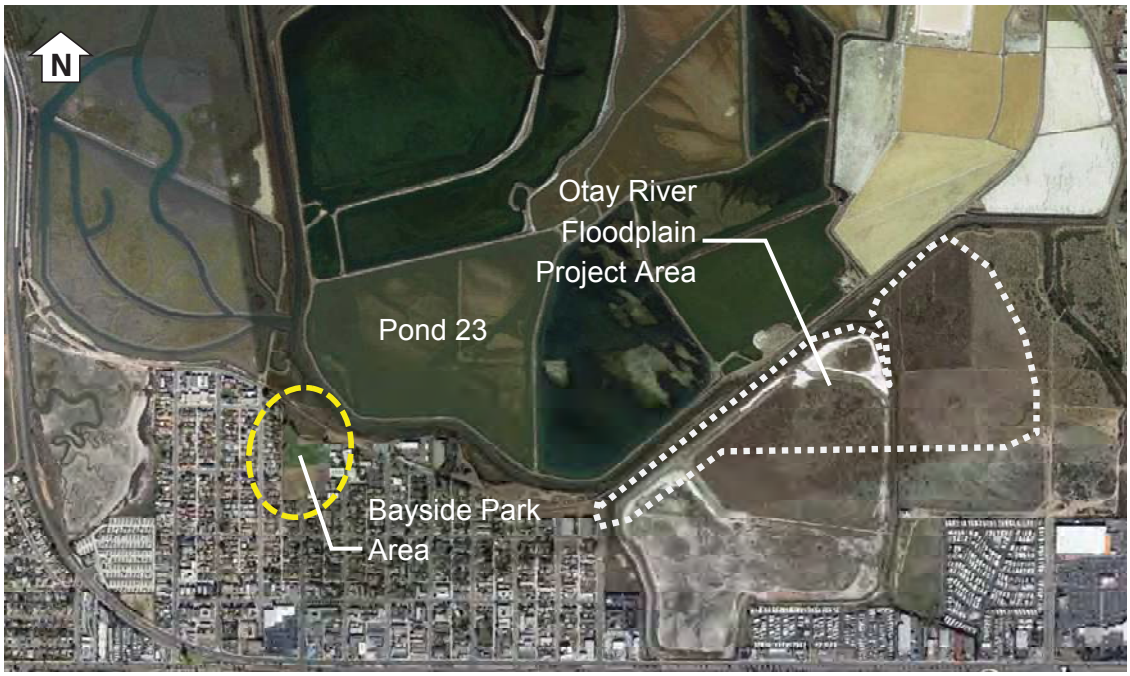


Image: Google Earth Pro

Figure A.1 Bayside Park Study Area



Figure A.2 Photos of Bayside Park Study Area

The fluvial modeling for the Existing Conditions, Intertidal Alternative and Subtidal Alternative are discussed in the main report. The flood impacts of a 100-year storm in the study area were evaluated based on the maximum water elevation results generated from the fluvial model simulations. In all simulations, i.e., the existing conditions and proposed conditions, the results indicate that the area in the vicinity of Bayside Park in the City of Imperial Beach was flooded during a 100-year storm.

The maximum water elevations for the Existing Conditions and for the Subtidal Alternative are presented in Figure A.3 and Figure A.4 respectively. At the location of the Bayside Park area, the maximum water elevation during a 100-year storm under Existing Conditions is 9.2 ft, NAVD88, and that under the Subtidal Alternative is 9.4 ft, NAVD88. The flood elevation result of the Intertidal Alternative is the same as that for Subtidal Alternative at this location. There is an increase of 0.2 ft in flood elevation under the proposed ORERP project conditions.

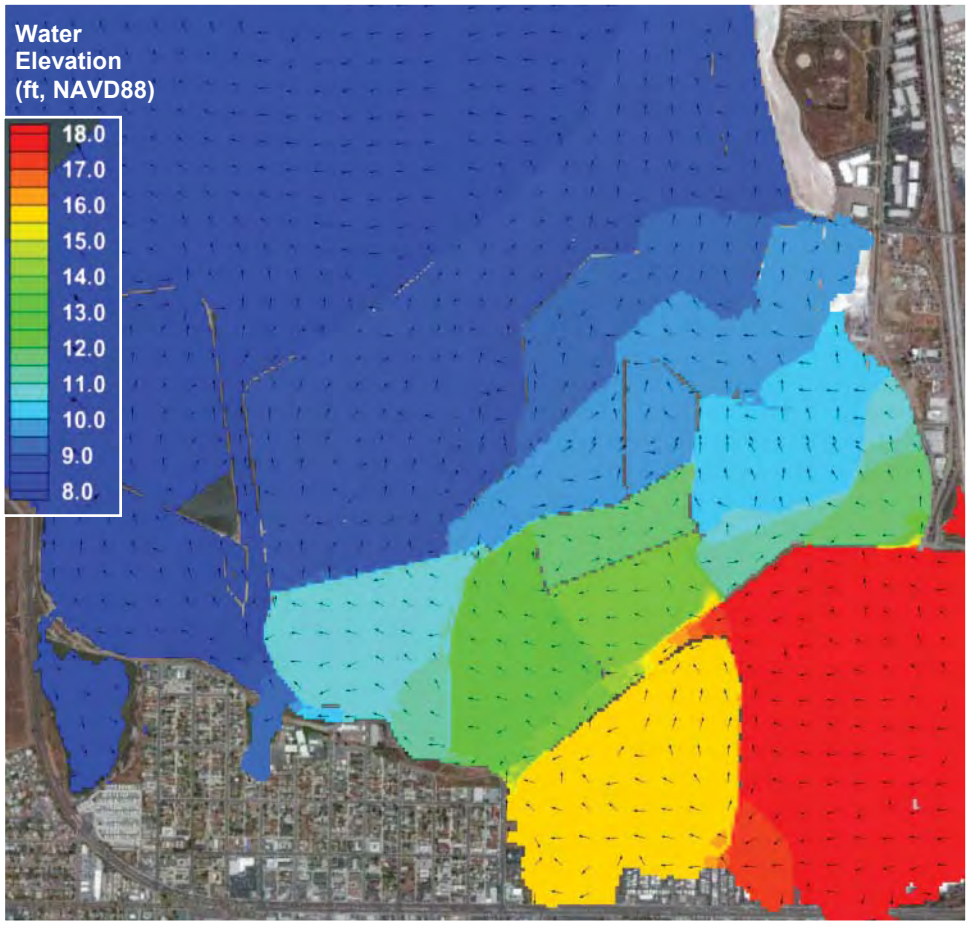


Figure A.3 100-Year Flood Water Elevations for Existing Conditions

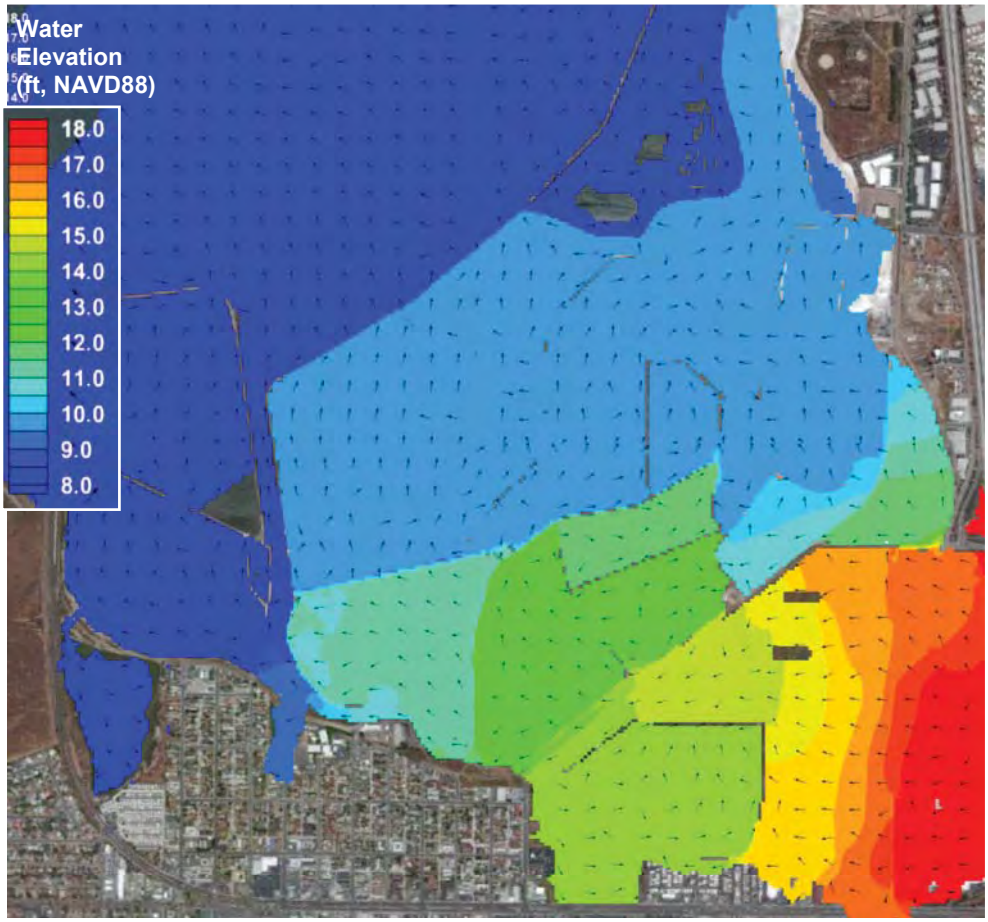


Figure A.4 100-Year Flood Water Elevations for Subtidal Alternative

A.2. FLOOD IMPACT REDUCTION EVALUATION

Several options were evaluated as potential ways to reduce the increased flood impact in the Bayside Park area. The three options that were evaluated with TUFLOW models are outlined below.

Option 1 – Lower Pond 48 Levee by 4 Feet

Option 1 involves the lowering of the top of the levee on the southern border of Pond 48 (south side of bikeway) from approximately 18 ft, NAVD88 to 14 ft, NAVD88 for a length of 800 feet. The goal of Option 1 is to divert flood flow towards Pond 48 from Otay River such that the flood flow reaching the Bayside Park area would be reduced. Approximately 4,500 CY of material would be removed in this modification. Figure A.5 shows the schematic of the levee modification of Option 1.



Figure A.5 Option 1

Option 2 – Raise Ponds 22 and 23 Levee by 2 Feet

Option 2 involves the raising of the top of the levee between Ponds 22 and 23 by two feet, from an elevation of approximately 11 ft to 13 ft NAVD88 for a length of 1,400 ft. The goal of Option 2 is to divert flood flow away from Pond 23 and Bayside Park neighborhood and towards the northern salt ponds. Approximately 11,500 CY of fill material will be brought in for this modification. Figure A.6 shows the schematic of the levee modification for Option 2.



Figure A.6 Options 2 and 3

Option 3 – Raise Ponds 22 and 23 Levee by 1 Foot

Option 3 is similar to Option 2, the difference is that the levee elevation is increased by one foot instead of two feet. Under Option 3, the top of the levee between Ponds 22 and 23 would be raised from an elevation of approximately 11 ft to 12 ft NAVD88 for a length of 1,400 ft. The goal of Option 3 is to divert the flood flow away from Pond 23 and Bayside Park neighborhood. The diverted flow is expected to be less in Option 3 than in Option 2. Approximately 6,500 CY of fill material will be brought in for this modification. Figure A.6 shows the schematic of the levee modification for Option 3.

A.3. FLUVIAL MODELING AND RESULTS

The three options were evaluated using the TUFLOW model grids set up for the ORERP Project. A model simulation for the 100-year storm event was conducted for each of the three options for the Subtidal and Intertidal Alternatives respectively. The water elevations at the Bayside Park area were extracted from the model results and are listed in the following

table. The maximum water elevations along the Otay River were plotted and shown in Figure A.7 and A.8 for the Subtidal and Intertidal Alternative respectively. It can be seen that the maximum water elevations in the Bayside Park area is reduced for all the proposed options. Among the three options, Option 2, in which the levee between Ponds 22 and 23 are raised by 2 feet, provides the most flood reduction in the Bayside Park area.

Table A.1 100-Year Flood Maximum Elevations in Bayside Park

SCENARIO	MAXIMUM WATER ELEVATION (FT, NAVD88)
Existing Conditions	9.2
Proposed Conditions *	9.4
Option 1 *	**9.2**
Option 2 *	**9.1**
Option 3 *	**9.2**

** Same results for both Subtidal Alternative and Intertidal Alternative*

A.4. SUMMARY

The results of the analysis were presented to the City of Imperial Beach and other project team members. Based on these results, Option 2 has been selected to be included as one of the proposed features for the Subtidal and Intertidal Alternatives. Option 2 eliminates the project flood impact and reduces the flood elevation of a 100-year storm to 9.1 ft, NAVD88, which is slightly lower than the existing flood elevation of 9.2 ft, NAVD88.

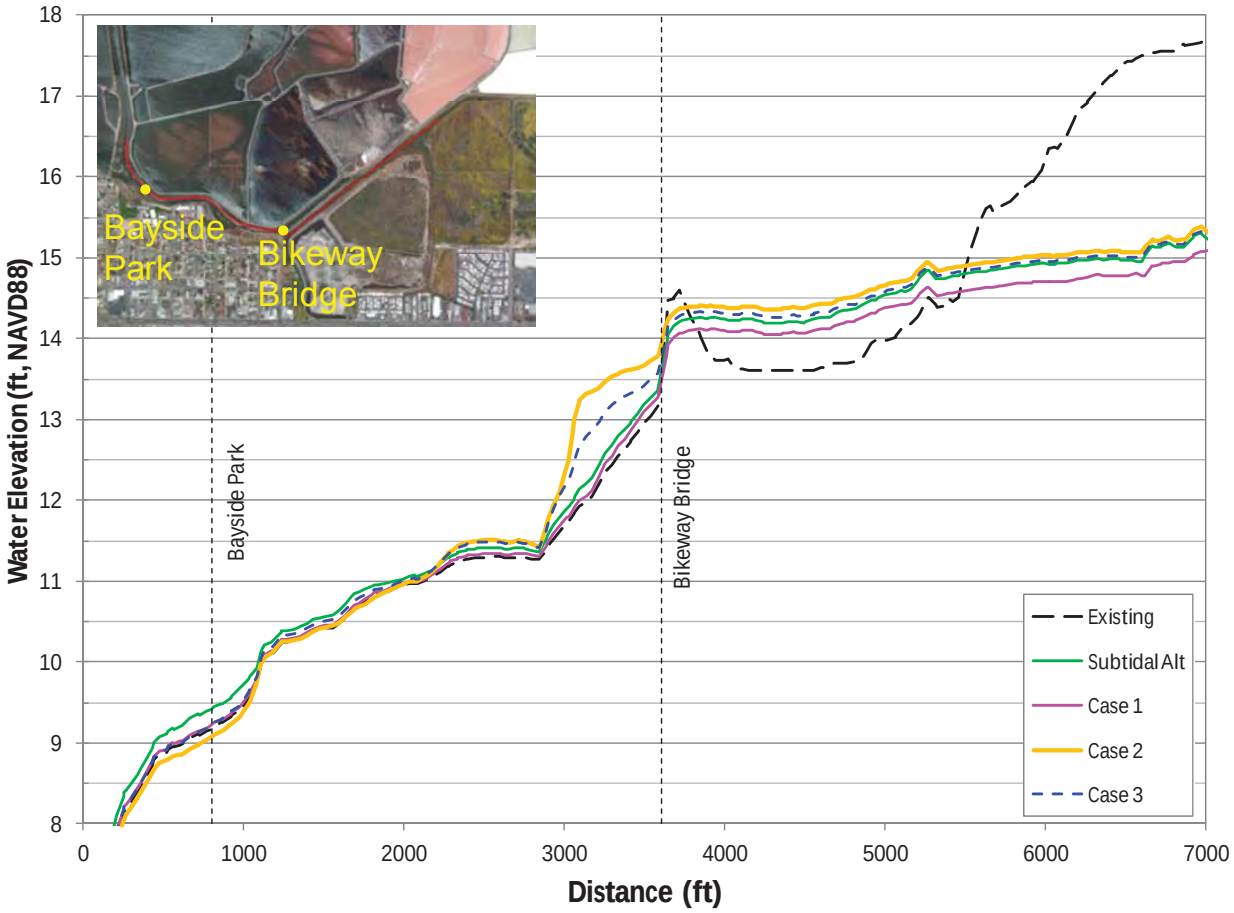


Figure A.7. Subtidal Alternative Maximum Water Elevation Profiles

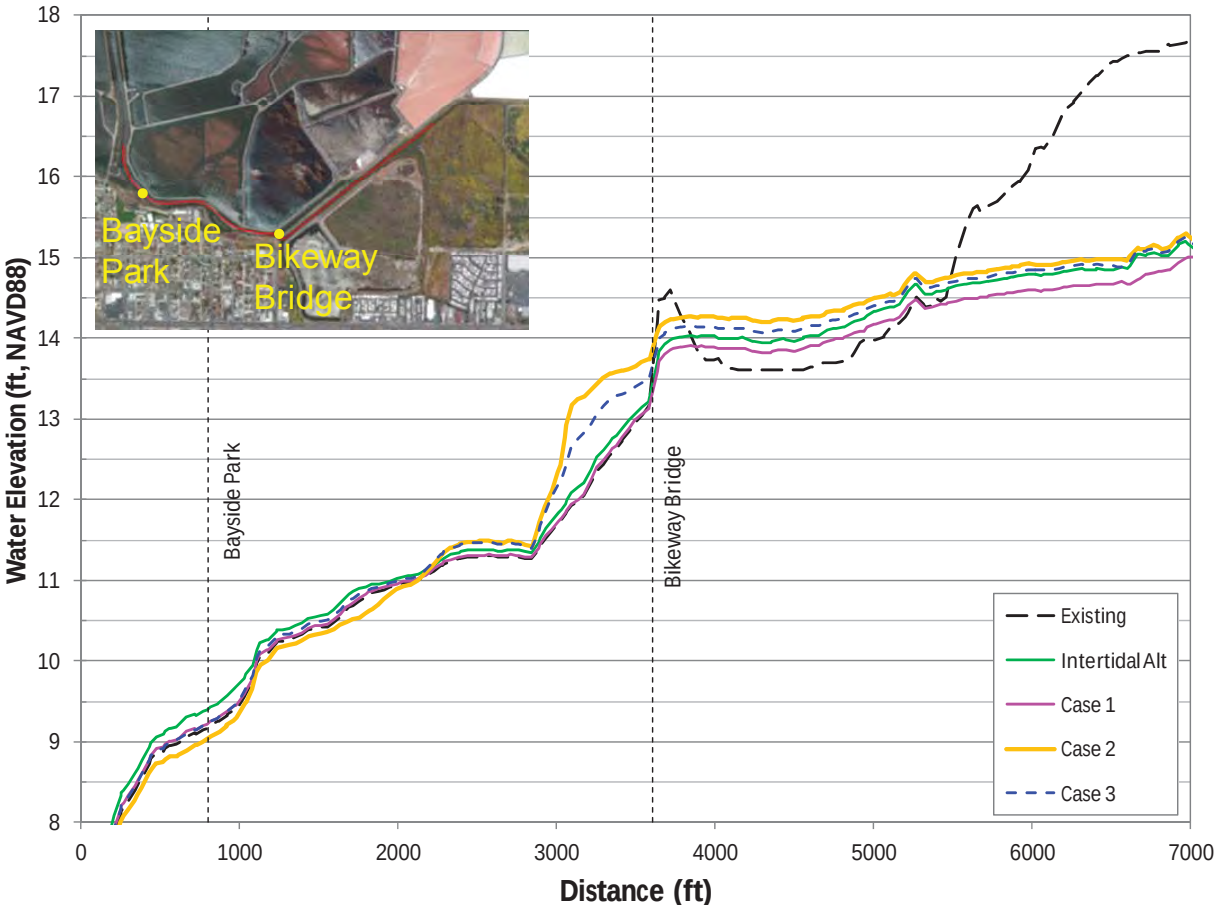


Figure A.8. Intertidal Alternative Maximum Water Elevation Profiles

APPENDIX B EROSION PROTECTION FOR THE SOUTH BAYSHORE BIKEWAY BRIDGE

APPENDIX B

EROSION PROTECTION FOR THE SOUTH BAYSHORE BIKEWAY BRIDGE

B.1. INTRODUCTION

The TUFLOW model results indicate velocities at the south abutment and channel bed at the South Bayshore Bikeway Bridge (bridge) during the 100-year flood event could be high enough to cause erosion along the slopes of the south abutment and channel bed under the bridge. This appendix provides a summary of a conceptual design to provide scour protection for the south abutment and the channel of the bridge.

B.2. ABUTMENT PROTECTION

The conceptual design considers the use of rock riprap to protect the south abutment and adjacent bank area of the bridge from scour. The protection design is based on 100-year flood conditions under the Subtidal Alternative, for which TUFLOW model results shows higher velocities along the south abutment of the bridge compared to the velocities under the Intertidal Alternative.

Riprap Size

The conceptual design follows the guidelines of the Hydraulic Engineering Circular No. 23 (HEC-23) published by the Federal Highway Administration (FHWA 2009). Followed the guidelines for HEC-23, an Isbash equation was used to estimate the riprap size for erosion protection at the south abutment of the bridge

$$\frac{D_{50}}{y} = \frac{K}{(S_s-1)}\frac{V^2}{gy} \qquad \text{(1a—for Froude number, Fr ≤ 0.80)}$$

$$\frac{D_{50}}{y} = \frac{K}{(S_s-1)}\left[\frac{V^2}{gy}\right]^{0.14} \qquad \text{(1b—for Fr > 0.80)}$$

where:

D_{50} = Median rock diameter, ft
V = Average velocity at the abutment, ft/s
S_s = Specific gravity of rock riprap

g = Gravitational acceleration, 32.2 ft/s^2
y = Depth of flow at the abutment, ft
K = Abutment shape coefficient; value depends on whether or not Fr is greater than 0.80, and whether the abutment is of a spill-through or vertical wall shape
Fr = Froude Number based on the velocity and depth adjacent to and upstream of the abutment = V/(gy)$^{1/2}$ where V is the velocity

Parameters used with Equation 1a and 1b are summarized in Table B.1.

Table B.1 Abutment Protection Design Parameters

PARAMETER	SELECTED VALUE	SOURCE/ BASIS FOR SELECTED VALUE
V	8.0 ft/s	TUFLOW model results near the south abutment
S_s	2.65	Average riprap specific weight cited within various literature sources (165 lb/ft^3), and average freshwater density (62.4 lb/ft^3)
y	5.5 ft	TUFLOW model results near the south abutment
Fr	0.60	Calculated from TUFLOW model results
K (Fr ≤ 0.80)	0.89	Eq. 14.1 of HEC-23 for a spill-through abutment
K (Fr > 0.80)	0.61	Eq. 14.2 of HEC-23 for a spill-through abutment

Since the riprap size depends on velocity and water depth, the TUFLOW time series results were examined at multiple locations near the south abutment of the bridge to look for a combined velocity and water depth that may result in the largest rock size for scour protection. The estimated rock size (D_{50}) for scour protection under the 100-year flood is one foot, i.e., Class III riprap.

Riprap Extent

Following the HEC-23 guidance, the riprap apron should extend from the toe of the abutment into the bridge waterway by approximately 25 feet. The downstream riprap coverage should extend back from the abutment by approximately 25 feet as well. The abutment slope should be protected two feet above the expected high water elevation for the design flood, which is higher than low chord of the bridge. Hence, the vertical extent of the abutment riprap is up to the low chord of the bridge.

Riprap Layer Thickness

Following the HEC-23 criteria, assuming the riprap will be placed underwater, the riprap layer thickness should be greater than or equal to the larger of 1.5*D_{100} and 2.25*D_{50}. Given a D_{50} of 1 foot (Class III riprap), maximum allowable D_{100} is 2 ft (based on Table 4.1 of HEC-23). Hence, a riprap thickness of 3 ft is used for the conceptual design.

B.3. CHANNEL BED PROTECTION

Rock riprap will also be used to protect the channel bed from scour. Like the abutment protection design, the channel bed protection design is based on 100-year flood conditions under the Subtidal Alternative.

Riprap Size

Channel bed riprap size was estimated based on fluvial conditions using a design equation in the Hydraulic Engineering Circular No. 11 (HEC-11) published by the Federal Highway Administration (FHWA 1989).

$$D_{50} = 0.001 \frac{C\,(V_a{}^3)}{(d_{avg}{}^{0.5} K_1{}^{1.5})} \qquad (2)$$

where:

D_{50} = Median riprap particle size
C = Correction factor, C_{sg}*C_{sf}
C_{sg} = Correction factor for the specific gravity (S_s) of the rock riprap, $\frac{2.12}{(S_s-1)^{1.5}}$
C_{sf} = Correction factor for the stability factor (SF) to be applied, $\left(\frac{SF}{1.2}\right)^{1.5}$
V_a = Average velocity in the main channel, ft/s
d_{avg} = Average flow depth in the main flow channel, ft
K_1 = Side slope correction factor, $\left[1 - (\frac{sin^2\theta}{sin^2\varphi})\right]^{0.5}$
θ = Bank angle with the horizontal
φ = Riprap material's angle of repose

Parameters used with Equation 2 are summarized in Table B.2 below.

Table B.2 Channel Bed Protection Design Parameters

PARAMETER	SELECTED VALUE	SOURCE/ BASIS FOR SELECTED VALUE
S_s	2.65	Average riprap specific weight cited within various literature sources (165 lb/ft^3), and average freshwater density (62.4 lb/ft^3)
SF	1.7	Guidelines for the selection of stability factors, included as Table 1 in HEC-11
V_a	8.0 ft/s	TUFLOW model results under the bridge
d_{avg}	4.6 ft	TUFLOW model results under the bridge
θ	14.8°	Average bank slope at typical channel cross section
φ	40°	Average value cited within various literature sources

Since riprap size depends on velocity and water depth, the TUFLOW time series results were examined at multiple locations near the bridge to look for velocity and water depth sets that may result in larger rock size. The average maximum velocity under the bridge and corresponding average water depth values were selected. A conservative stability factor (SF) of 1.7 was selected to account for the effects of the sharp channel bend at the bridge. As such, the estimated rock size for 100-year flood conditions under the Subtidal Alternative is a D_{50} of 0.5 feet.

B.4. RECOMMENDED PROTECTION DESIGN

The estimated abutment riprap diameter (D_{50}) is 1 foot, which is twice that of the estimated riprap diameter of 0.5 feet for the channel bed. Since the abutment riprap needs to be extended 25 ft into the channel, it is easier for construction to extend it all across the channel bed instead of having part of the channel protection using the smaller 0.5 ft riprap size. Usage of a uniform riprap diameter and layer thickness for the overall abutment and channel bed protection is recommended for practical construction purposes. Since the underlying soils are fine-grained, a geotextile filter and granular filter should be placed in between the riprap and the soil surface. The recommended conceptual design for the overall revetment protection, including riprap extent, is presented in Figure B.1.

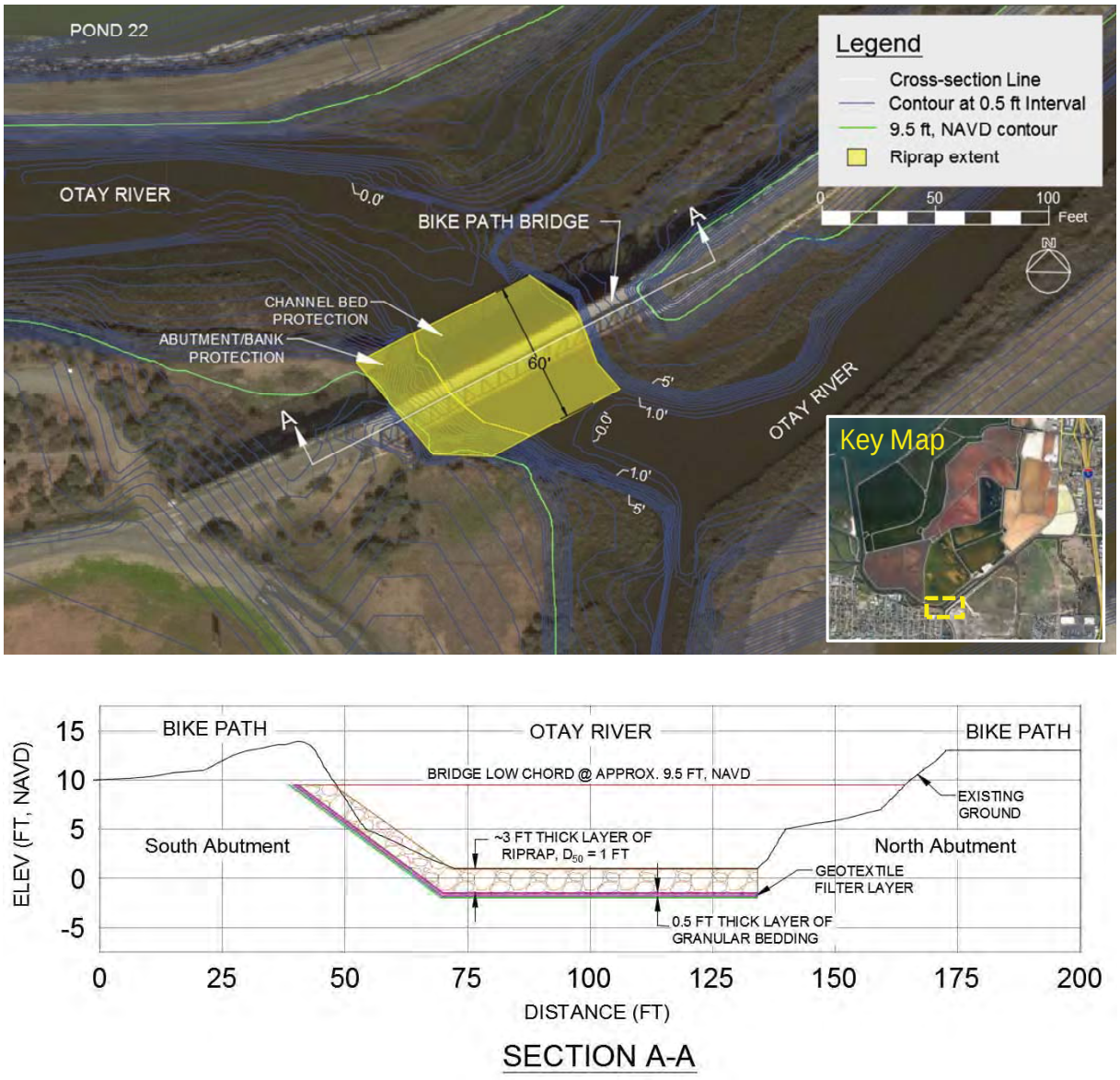


Figure B.1 Conceptual Design for Revetment Protection at the South Bayshore Bikeway Bridge (Do Not Use for Construction)

B.5. REFERENCES

FHWA 1989. Hydraulic Engineering Circular No. 11 (HEC-11). Design of Riprap Revetment. Publication No. FHWA-IP-89-016. Federal Highway Administration, U.S. Department of Transportation. March 1989.

FHWA 2009. Hydraulic Engineering Circular No. 23 (HEC-23). Bridge Scour and Stream Instability Countermeasures, Third Edition. Publication No. FHWA-NHI-09-112. Federal Highway Administration, U.S. Department of Transportation. September 2009.

APPENDIX I

DDT Analysis

Sensitivity Analysis of Potential DDT Deposition in the Otay River Estuary Restoration Plan (ORERP) Post-100 Year and 50-Year Floods

by:

Scott Jenkins, Ph. D[1]., Ying Poon, D.Sc.[2], Catherine Zeeman, Ph.D[3], and Carol Roberts[3]

Submitted to:
Poseidon Water LLC
5780 Fleet Street, Suite 140
Carlsbad, CA 92008

First Draft: 2 April 2015; Final Draft 26 August 2015; Final 28 October 2015

ABSTRACT: This analysis focuses on an assessment of potential impacts on the ORERP from erosion of soils containing DDT by the 100 yr. flood, with additional analysis of the 50-year flood impacts. Scour potential associated with the 100-year flood on the ORERP have been evaluated in a companion study (Everest 2014). The present analysis evaluates the effects associated with erosion of soils containing DDT from the floodplain under the 100-year flood event that may release DDT to downstream portions of the project. Because the duration of the 100-yr flood is only 24 hours, it was assumed that tidal exchange will quickly re-establish flow dominance post-flood; and that the transport and settling dynamics of potentially contaminated silts and clays will be driven and limited by the tidal hydraulics and tidal residence times.

A sensitivity analysis was developed based on a parameter sweep of the amounts of soils containing DDT that might be eroded by the 100-year flood. Sediment coring data indicates that the depth of erosion in the area of soils containing DDT might vary between 1 ft. and 3 ft.; and the concentrations of DDT in the eroded soils could vary between 790 µg/kg and 310 µg/kg, depending on the depth of erosion. These eroded soils containing DDT could mix with as much as 438,000 cubic yards (cy) of "clean" (*i.e.,* assumed to be free of DDT) fine-grained sediments from the Otay River watershed below the Savage Dam; but that estimate was based on a surrogate watershed (Buena Vista Creek) for which more complete sediment yield data was available. Based on the uncertainties of applying that surrogate analysis to the Otay River watershed, it is sensible to consider the sensitivity of the final outcome to omitting consideration of that flux of what is believed to be "clean" sediments from upstream sources by eliminating the dilution effects that blending with clean fines exerts on DDT concentrations during the post-flood deposition. From this assessment of the possible sediment erosion input assumptions, a sensitivity analysis **is provided** for the post 100-year flood DDT deposition that is based on

1. Michael Baker International
2. Everest International
3. Environmental Contaminants Division, Carlsbad Fish and Wildlife Office

erosion fluxes from three erosion depths (1 ft., 2 ft. and 3 ft.) in the floodplain that are each combined with two possible fluxes of "clean" fines (0 cy and 438,000 cy) from the watershed below the Savage Dam. In addition, the biological risk assessment of these six possible deposition scenarios also considers bioturbation exposures occurring post-flood within the top 20 mm, 40 mm and top 80 mm of the muddy sediments in the tidal basins of the ORERP. This range of parameters yields a sensitivity analysis with 18 possible outcomes including worst-case scenarios.

It was found that the post 100-year flood will result in the deposition of less than 1 mm to as much as 8 mm of partially consolidated mud in the tidal basins of either restoration alternative that will have an average dry bulk DDT concentration of 42 μ g/kg to 790 μ g/kg, depending on the particular scenario. The DDT concentrations in the muds deposited in the ORERP can range as high as 310 μ g/kg to 790 μ g/kg, but the deposition thicknesses of these scenarios reduce to only fractions of a millimeter once these muds become consolidated. Using a depth-proportional exposure approach, and assuming all exposure occurs within the top 20 mm under worst-case, we calculated that the DDT concentration experienced by the benthic biota would range from approximately 13 μ g/kg to 29 μ g/kg initially, and would decrease with compaction and consolidation to a final 20 mm-based dry bulk concentration of 4.2 μ g/kg to 7.9 μ g/kg. The controlling variable in worst-case exposure determination is the total mass of DDT in the post-flood sediment deposition, which is maximized by the scenarios in which the largest volumes of DDT-contaminated sediments that were eroded, (*i.e.*, the 3ft. erosion depth scenarios) in the absence of mixing with additional sediments from upstream sources. Worst case exposures were found to be relatively insensitive to the dilution provided by sediments from upstream sources, while the mixing depth of bioturbation has a much stronger influence. DDT concentrations experienced by the benthic biota under worst-case are reduced 2 to 4 fold when bioturbation extends over the top 40 mm or top 80 mm of the muddy sediments in the tidal basins of the ORERP. The depth of bioturbation will be determined by the species that ultimately colonize the tidal basins, but we would not expect that to be less then approximately 20 mm.

Upon advice from the California Coastal Commission Science Advisory Panel, the above analysis was repeated for the 50-yr flood, to assure the most extreme potential DDT exposure outcomes have been modeled. The DDT deposition results for the 50-yr flood were found to be within the range of those for the 100-yr flood. The DDT concentrations in the muds deposited in the ORERP post 50-year flood can range as high as 111 μ g/kg to 790 μ g/kg, and again, deposition thicknesses of these scenarios reduce to only fractions of a millimeter once these muds become consolidated. Using a depth-proportional exposure approach within the top 20 mm under worst-case, we calculated that the DDT concentration experienced by the benthic biota would range from approximately 12 μ g/kg to 26 μ g/kg initially after the 50-year flood, and would decrease with compaction and consolidation to a final 20 mm-based dry bulk concentration of 4.0 μ g/kg to 7.1 μ g/kg.

Relative to impacts on the benthic organisms as the prey base, the maximum short-term DDT concentrations in the post-flood deposition fall between the ER-L and ER-M values. Thus, we would expect that impacts on benthic organisms could occur occasionally during the short-term. Given the likelihood of effects combined with the short-term nature of this condition,

population level impacts are expected to be limited in nature and extent. Once these post-flood muddy deposits have compacted and consolidated, the DDT concentrations in the top 20 mm of muddy sediment are very close to the ER-L, and even lower for the top 40 mm and top 80 mm of sediment; so that negative effects are expected to be rare. This condition is not likely to have a measurable effect on the prey base for aquatic-dependent species.

In regards to the aquatic-dependent birds' exposures to DDT in prey , comparison of the 20 mm-based DDT concentrations to screening levels indicates that these concentrations fall within the range of highest and lowest NOAELs. Given the species known to be the most sensitive are pelicans and cormorants, (which are very closely related, and our target species are not members of groups believed to be particularly sensitive), impacts on aquatic-dependent birds are unlikely to result from the anticipated deposition of sediments in the ORERP following either a 100-year or 50-year flood event.

Upon advice from the California Coastal Commission Science Advisory Panel, the above analysis was repeated for the 100-yr flood in the absence of the ORERP (*i.e.*, No Project Alternative). Those results are given in APPENDIX-B. The DDT deposition results in Ponds 10 & 11 of the No Project Alternative were found to be within the range of those for the ORERP tidal basins post 100-yr flood, so that the above conclusions on potential flood-induced DDT impacts to the existing wetlands ecology are upheld; and it can be concluded that the ORERP does not increase the risk of exposure of wetland ecology to DDT, a risk that exists with or without the project.

Sensitivity Analysis of Potential DDT Deposition in the Otay River Estuary Restoration Plan (ORERP) Post-100 Year Flood

Scott A. Jenkins, Ph. D., Ying Poon, D.Sc., Catherine Zeeman, Ph.D., and Carol Roberts

1.0) Introduction:

In this study we estimate rates of fine-grained sediment deposition in the tidal basins of the ORERP *Intertidal and Subtidal Alternatives* for a model problem in which the wash load source is defined by the sediment yield of the Otay River during the 100 year flood. Because of the nearby Savage Dam, the sediment yield is assumed to be derived from scour and erosion of the Otay River floodplain, downstream from the dam. Scour impacts from the 100 year flood on the ORERP have been evaluated in a companion study Everest, (2014). The primary concern of the present analysis is that a portion of the floodplain that could be scoured and eroded by the 100 year flood has surficial layers of soil comprised of a high percentage of silts and clays that contain various concentrations of DDT; and that some of those fine-grained sediments might re-settle in the tidal basins of the ORERP post-flood. Because the duration of the 100-yr flood is only 24 hours, we assume that tidal exchange will quickly re-establish flow dominance post-flood; and that the transport and settling dynamics of potentially contaminated silts and clays will be driven and limited by the tidal hydraulics and tidal residence times detailed in Sections 4 and 5.

This study is a multi-disciplinary effort of four scientists. The study begins with a soil characterization and erosion analysis of the 100 year flood in Sections 2 and 3, respectively, which was conducted by Ying Poon, D.Sc. of Everest International. Section 2 provides the essential sediment flux initial conditions for a post-flood suspended sediment tidal transport and deposition analysis in Sections 4 and 5 that was performed by Scott Jenkins, Ph.D. of Michael Baker International. The post flood deposition thicknesses and DDT concentrations in the tidal basins that were calculated in Sections 5 were throughput to a biological impact assessment presented in Section 6 that was conducted by Catherine Zeeman, Ph.D. and Carol Roberts of the Environmental Contaminants Division, Carlsbad Fish and Wildlife Office. Deposition results for the 50-year flood appear in APPENDIX-B and were found to remain within the range of variability of scenarios for the 100-year flood.

2.0) Erosion Analysis for the 100-Year Flood in the Otay River Basin:

Everest International Consultants (Everest) conducted an analysis on the potential for the DDT containing soils in the Otay River Floodplain (ORF) to be eroded and transported to the proposed wetland during a 100-year flood event. The analysis was based on numerical simulations conducted with the two-dimensional hydrodynamic model – TUFLOW, which simulated the velocities over the ORF during a 100-year flood event. The analysis was also based on soil property data from the soil sampled in the ORF to evaluate the potential for soil erosion. Details of the TUFLOW model setup can be found in Everest (2014).

The 100-year flood hydrographs for the Otay River, Poggi Canyon Creek and Nestor Creek are shown in Figure 1. The total flow volume during a 100-year flood for the Otay River is 35,200,000 cubic yards (cy), or 26,911,315 cubic meters (m^3). The corresponding flow volumes for Poggi Canyon Creek and Nestor Creek are respectively 2,240,000 cy (1,712,254 m^3) and 1,748,800 cy (1,337,003 m^3), so that the combined flow through the floodplain is $\overline{Q}$ = 39,188,800 cy (29,960,856 m^3), or 24,290 acre ft. The flow for the Otay River is an order of magnitude higher than those for Poggi Canyon Creek and Nestor Creek. The percent of Nestor flow that would pass through the wetland was not analyzed, but since Nestor Creek directly flows into the proposed wetland area, it was assumed that all of the Nestor Creek flow would enter the wetland. Figures 2 & 3 give the distributions of maximum stream flow velocities for the 100-year flood velocity throughout the Otay River floodplain and adjacent pond complexes for the ORERP Intertidal and Subtidal Alternatives, respectively.

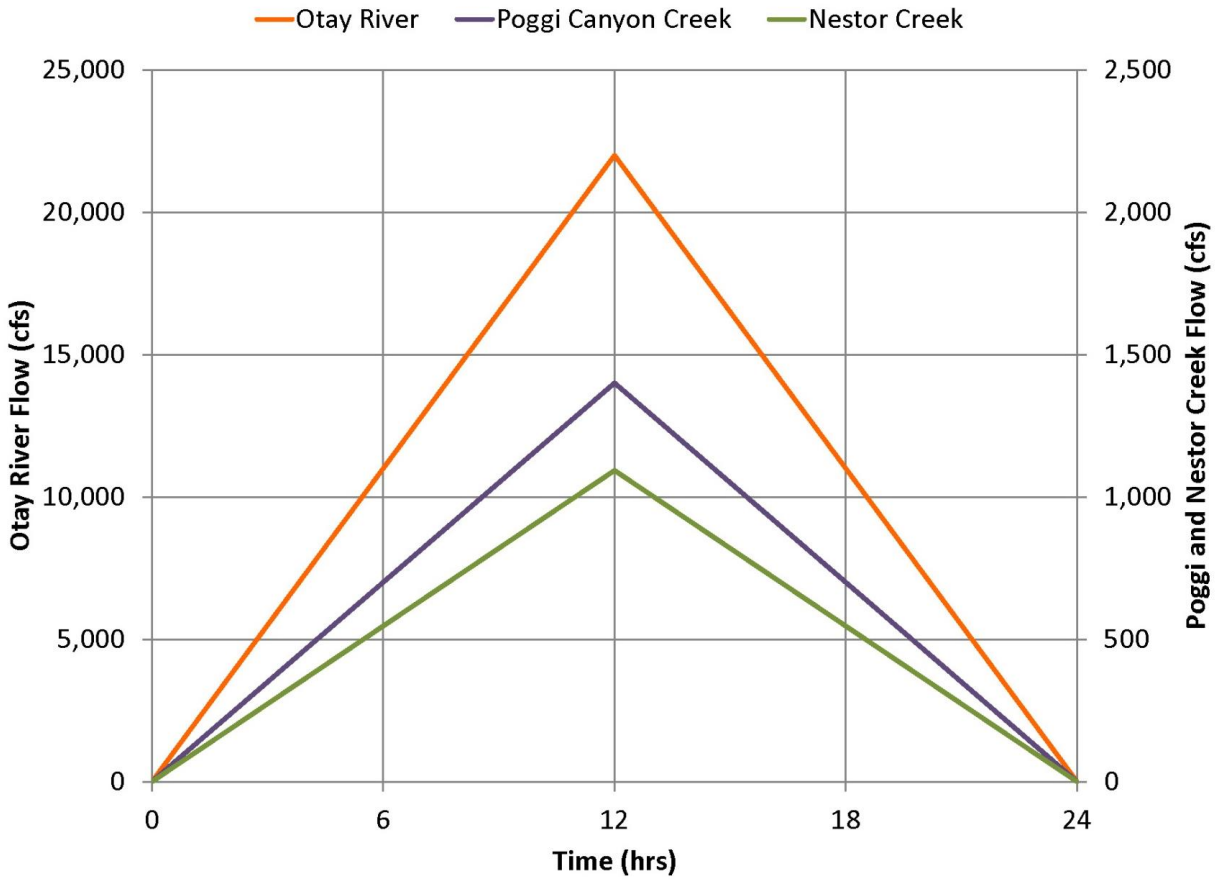


Figure 1. The 100-Year Return Period Flood Hydrographs**.**

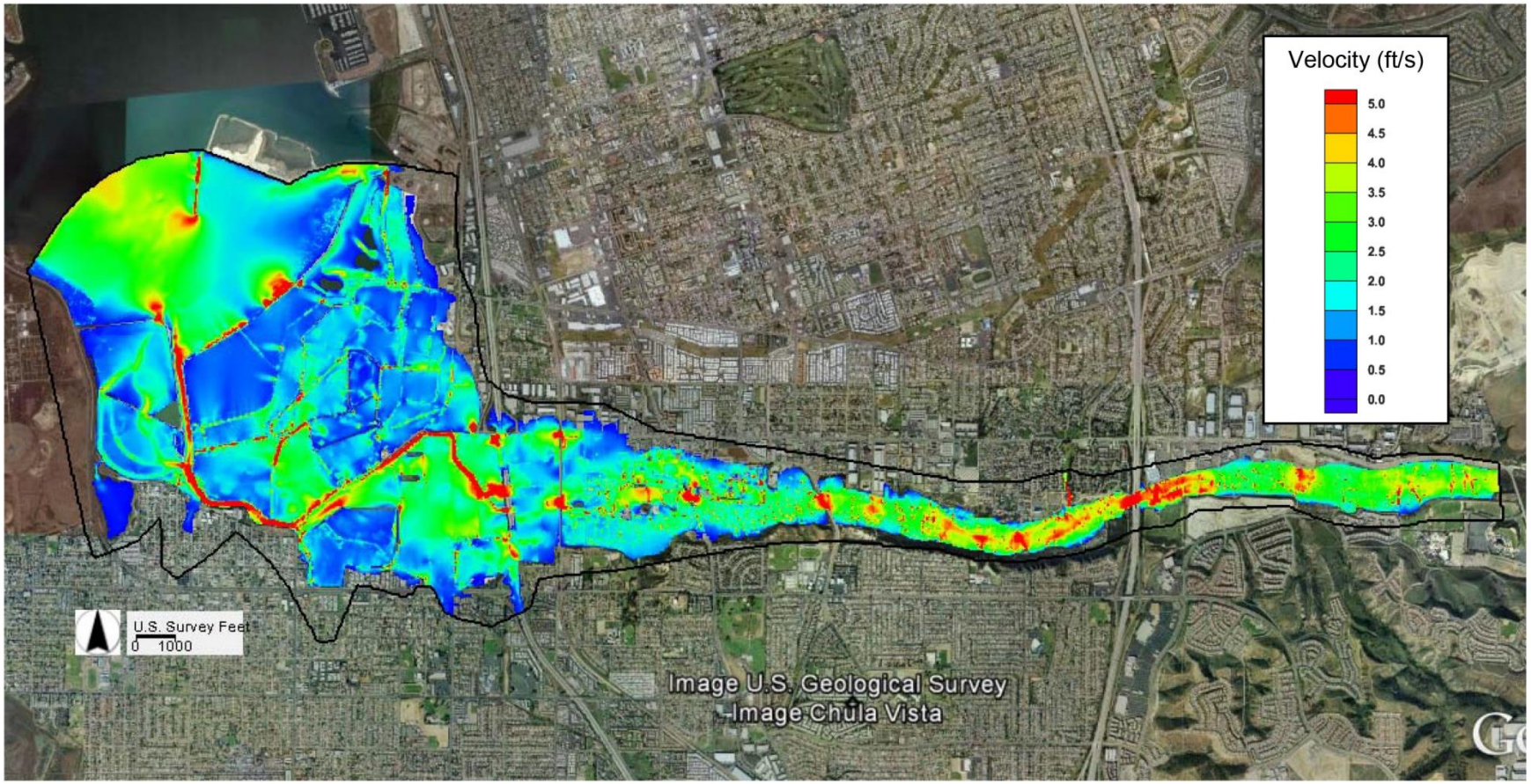


Figure 2: Distribution of maximum stream flow velocities for the 100-year flood in the lower Otay River flood plain with the fully implemented Intertidal Alternative, (after Everest, 2014)

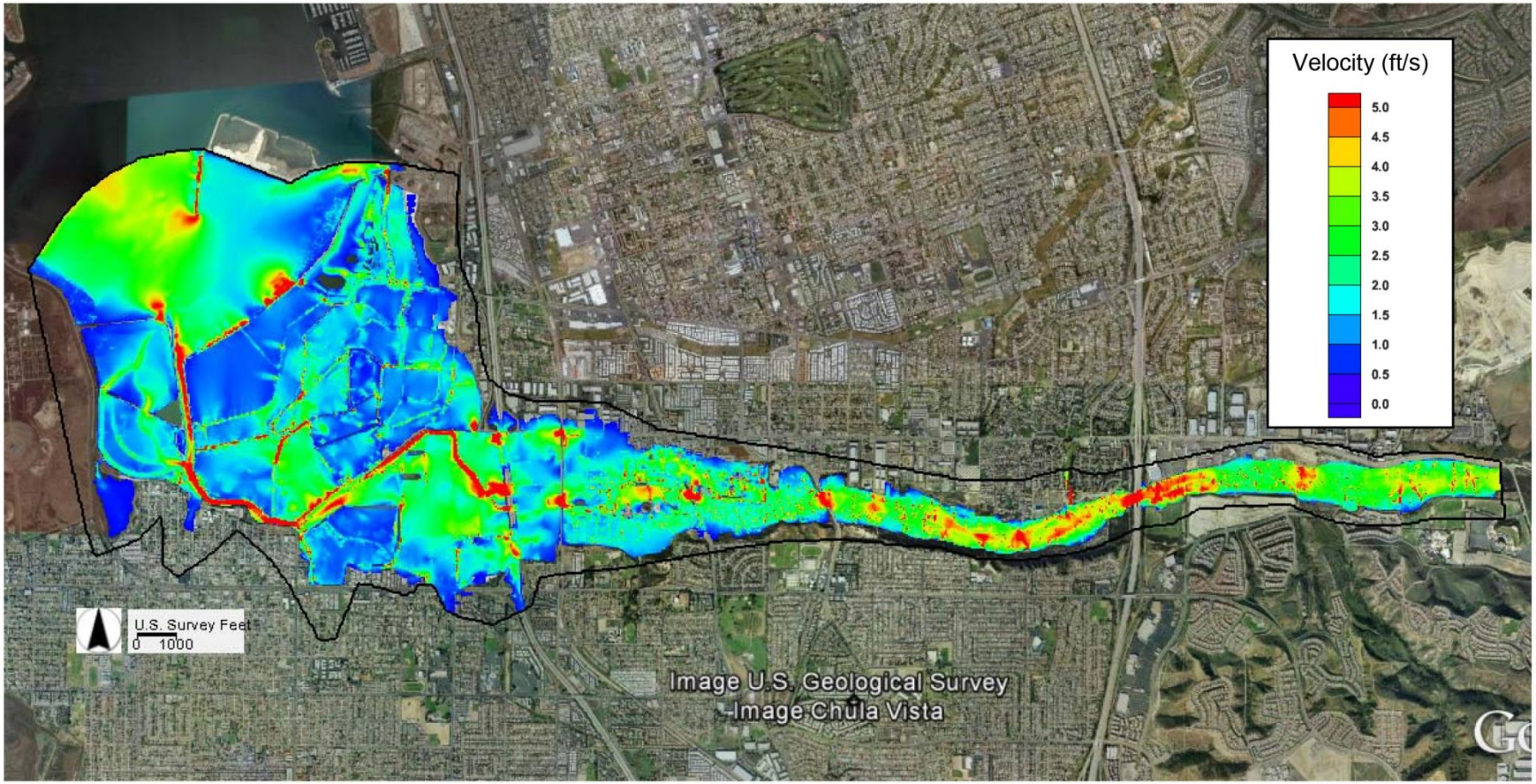


Figure 3: Distribution of maximum stream flow velocities for the 100-year flood in the lower Otay River flood plain with the fully implemented Subtidal Alternative, (after Everest, 2014).

Data were not available for the sediment discharge from the Otay River Watershed during a 100-year flood event; hence, it was estimated based on sediment discharge from the Buena Vista Creek (BV) Watershed for which sediment discharge during a 100-year study was available. In an earlier fluvial hydraulic and sediment transport study, Everest (2008) estimated that the sediment discharge during a 100-year flood event for the BV Watershed would be about 603,000 cy. Characteristics of the Otay River Watershed and BV Watershed are compared in Table 1. The area for the BV Watershed is approximately 19 square miles, while the Otay River Watershed (portion below the dam) is about 46 square miles with the entire Otay Watershed covering 143 square miles. Compared with the BV Watershed, the Otay River Watershed (below dam) is less urbanized with more open space land use, potentially more susceptible to soil erosion during a flood event. Nevertheless, simply based on scaling by the watershed size, sediment discharge from the Otay River Watershed is about 1,460,000 cy during a 100-year event. Based on Taylor (1981), about 50% of the sediment delivered from the Otay River Watershed is fine grain size ($d < 0.065$ mm), and the other 50% is sand. Hence, the fine portion is about 730,000 cy. It is estimated that during a 100-year flood, approximately 60% of the fine grain sediment discharge, i.e. 438,000 cy (334,880 m^3) would pass through the proposed wetland.

Table 1: Comparison between Otay River and Buena Vista Creek Watersheds

COMPARISON	OTAY RIVER	BUENA VISTA CREEK
Watershed Area	46 mi^2 *	19 mi^2
Urban Land Uses	39.1%	75.2%
Agricultural Land Uses	0.6%	22.4%
Open Space Land Uses	60.3%	2.4%

**Watershed area below dam*

2.1) Soil Erosion from Otay River Floodplain: The potential for soil erosion from the ORF during a 100-year flood event is evaluated based on the flood velocities and soil properties. In general, silt and clay are less susceptible to erosion while sand is relatively easier to be eroded. Based on the sediment characterization study conducted by Anchor QEA (2013), the top three feet of sediment consists of fine to coarse sand (i.e., easy to be eroded), and below three feet, based on data for samples taken between 3 to 5 ft below ground, sediments are cohesive, consisting mainly of silt and clay (less susceptible to erosion). As illustrated by the Hjulstrom Curve shown in Figure 4, sediments consisting mainly of fine sand to coarse sand (the blue shaded area in Figure 4) are likely to be scoured (eroded) when the flood flow velocity is higher than approximately 0.6 ft/sec. The TUFLOW model simulated maximum flood velocities over

the ORF area during a 100-year flood event is shown in Figure 5. The color scale of the figure is selected such that the lowest velocity shown is 0.6 ft/sec (threshold for scouring). As can be seen in the figure, the maximum flood velocities over the entire ORF are higher than 0.6 ft/sec; hence likely to be eroded based on the Hjulstrom curve. In addition, based on the TUFLOW model results, (Figures 2 & 3) the bed shear stress over the ORF ranges from about 0.2 N/m^2 to 0.9 N/m^2 during a 100-year flood event. Based on empirical data relating sediment erosion to bed shear stress, these bed shear stresses are high enough to result in sediment erosion (Roberts et al, 1998).

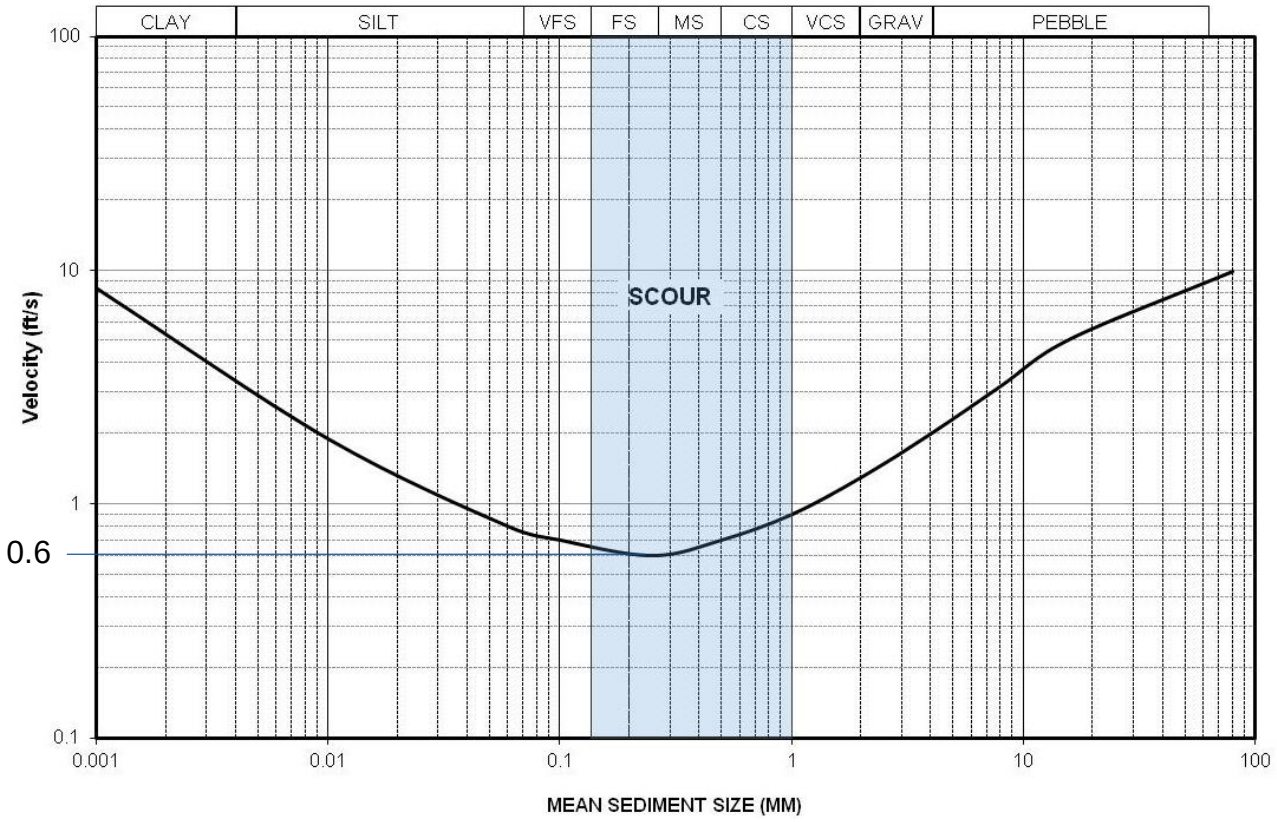


Figure 4. Hjulstrom Curve

Not all the sediment being eroded from the ORF would be transported and delivered to the proposed wetland. Sediment being eroded may simply move along the bed from one location to another, or remain suspended in the water column (portion that are likely to be transported). Some of the suspended sediment may be re-deposited in another area (not entering the wetland). In lieu of conducting a sediment transport modeling study, it is not easy to quantify the amount of eroded soil from the ORF that would be transported to the proposed wetland. Hence, for this study, three erosion scenarios for erosion depths of 1 ft, 2 ft, and 3 ft over the entire ORF were considered for the evaluation of potential transport and deposition of DDT contaminated soils from the ORF to the proposed wetland. The volume of eroded soil, percent fines (d < than 0.065 mm), and volume of fines for these three scenarios are summarized in Table 2.

Table 2: Volume and Properties of Eroded Soils of ORF

EROSION DEPTH (ft.)	VOLUME OF ERODED SOIL (cy)	PERCENT FINES	VOLUME OF FINES (cy)
1	114,890	21.1%	24,260
2	229,780	33.2%	76,350
3	344,700	37.2%	128,300

2.2) DDT Concentrations of the Eroded Soils: Two soil sampling and analysis datasets were utilized to evaluate the DDT concentrations of the ORF soils under the three erosion scenarios described above. The two datasets include data from an earlier Anchor QEA study (2013) along with newer data from a U.S. Fish and Wildlife Service study (Zeeman 2014). The two datasets consist of data for different sampling locations and boring depths. The Anchor data consist of 11 borings over the ORF, with DDT concentrations for depth layers of 0 to 1, 1 to 3, and 3 to 5 feet below ground. Soil data from the U.S. Fish and Wildlife Service consists of 14 sampling locations, and data were collected from the top 0.5 feet below ground.

Based on discussion with the project team, it was decided to assume that the DDT concentrations for the U.S. Fish and Wildlife samples would apply to the top one foot of soils; hence can be combined with the Anchor data for the top 1 ft to evaluate the DDT concentrations for the top 1 ft. of soil over the ORF. From these data, the DDT concentrations of the ORF were estimated using Voronoi diagrams, in which each cell area is partitioned based on the sampling locations. Figure 6 shows the resulting Voronoi diagram for the top 1 ft of the soil over the ORF

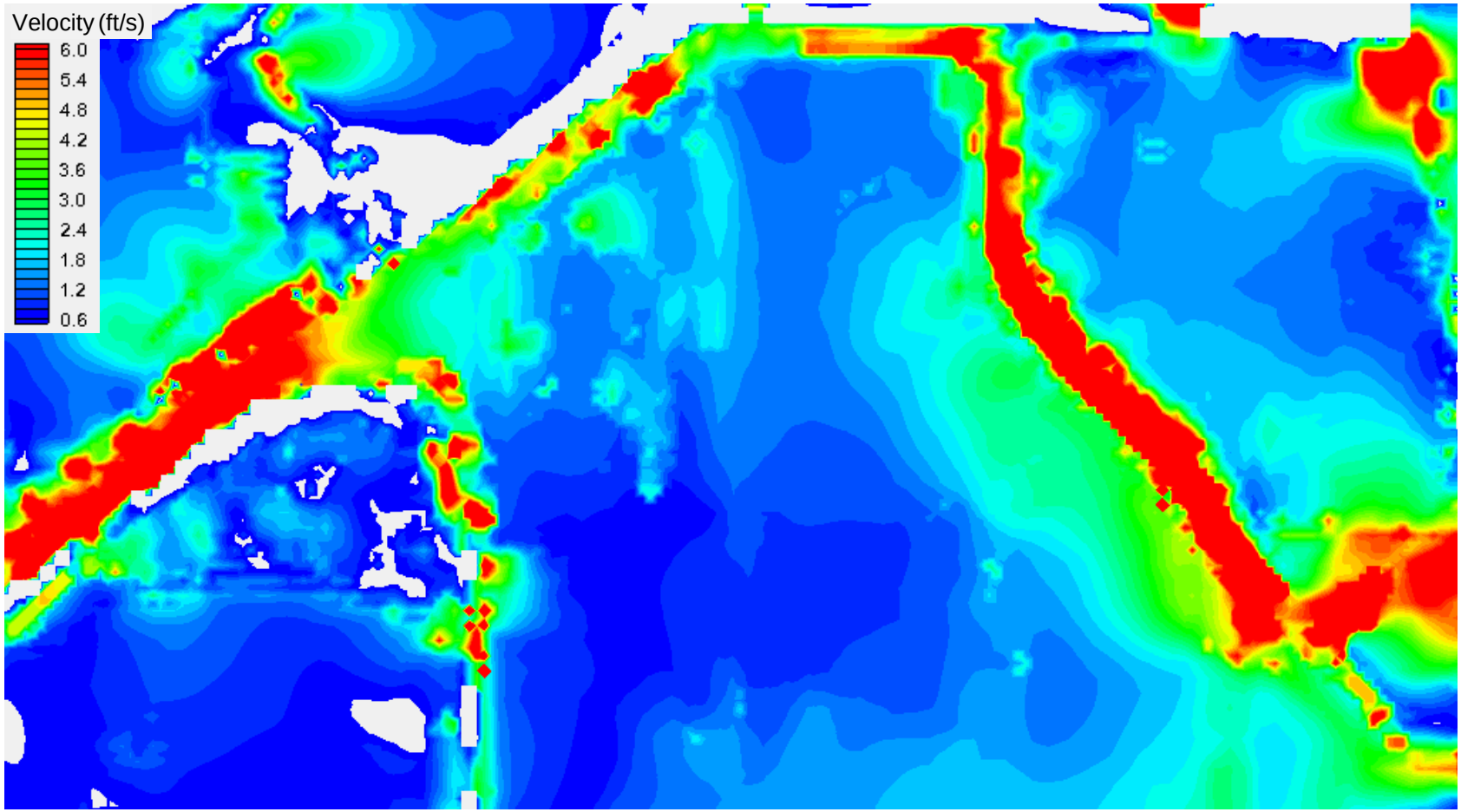


Figure 5. Maximum Velocity during a 100-year Flood under Existing Conditions. Note: white color indicates maximum velocity less than 0.6 ft/s

using both datasets (a total of 25 locations—11 from Anchor QEA and 14 from the U.S. Fish and Wildlife Service). The numbers shown in the figure are the Voronoi cell size in square feet and associated DDT concentrations in µg/kg. Similar Voronoi diagram for soil layer from 1 to 3 feet below ground is provided in Figure 7. This diagram is developed using only the Anchor QEA data. The number of cells in Figure 7 is fewer than those shown in Figure 6 since there are only 11 relevant boring locations for this layer. From these Voronoi diagrams, the average DDT concentration (weighted by soil volume) under the three erosion scenarios over the ORF were calculated and summarized in Table 3.

Table 3: Average DDT Concentrations for Three Erosion Scenarios

EROSION DEPTH (ft.)	AVERAGE DDT CONCENTRATION (µg/kg)
1	790
2	430
3	310

3.0) Specifying the Sensitivity Analysis for the Post 100-Year Flood DDT Deposition

The sensitivity analysis is based on a parameter sweep of the amounts of DDT containing sediments that might be eroded by the 100-year flood; and Section 2.2 has provided coring analysis that indicates the concentration of DDT in the eroded fine sediments could vary between 790 µg/kg to 310 µg/kg, depending on the depth of erosion. Section 2.0 indicates that these eroded contaminated sediments could mix with as much as 438,000 cy of fines (assumed to be uncontaminated) from the upper watershed below the Savage Dam. This estimate was based on a surrogate watershed (Buena Vista Creek) for which more complete sediment yield data was available. Based on the uncertainties of applying that surrogate analysis to the Otay River watershed, it is sensible to consider the sensitivity of the final outcome to omitting the flux of supposedly "clean" sediments from upstream sources altogether. In the absence of any new information revealing additional upstream sources of DDT, that omission will eliminate the dilution effects that blending with "clean" fines exerts on DDT concentrations during the post-flood deposition. From this assessment of the possible sediment erosion input assumptions, a sensitivity analysis **is posed** for the post 100-year flood DDT deposition that is based on erosion fluxes from three possible erosion depths (1 ft, 2 ft, and 3 ft) in the DDT contaminated area of the floodplain that are each combined with two possible fluxes of clean fines (0 cy and 438,000 cy) from the watershed below the Savage Dam; yielding a sensitivity analysis comprised of 6 separate deposition scenarios. The ensembles of input parameters for this sensitivity analysis are summarized in Table 4.

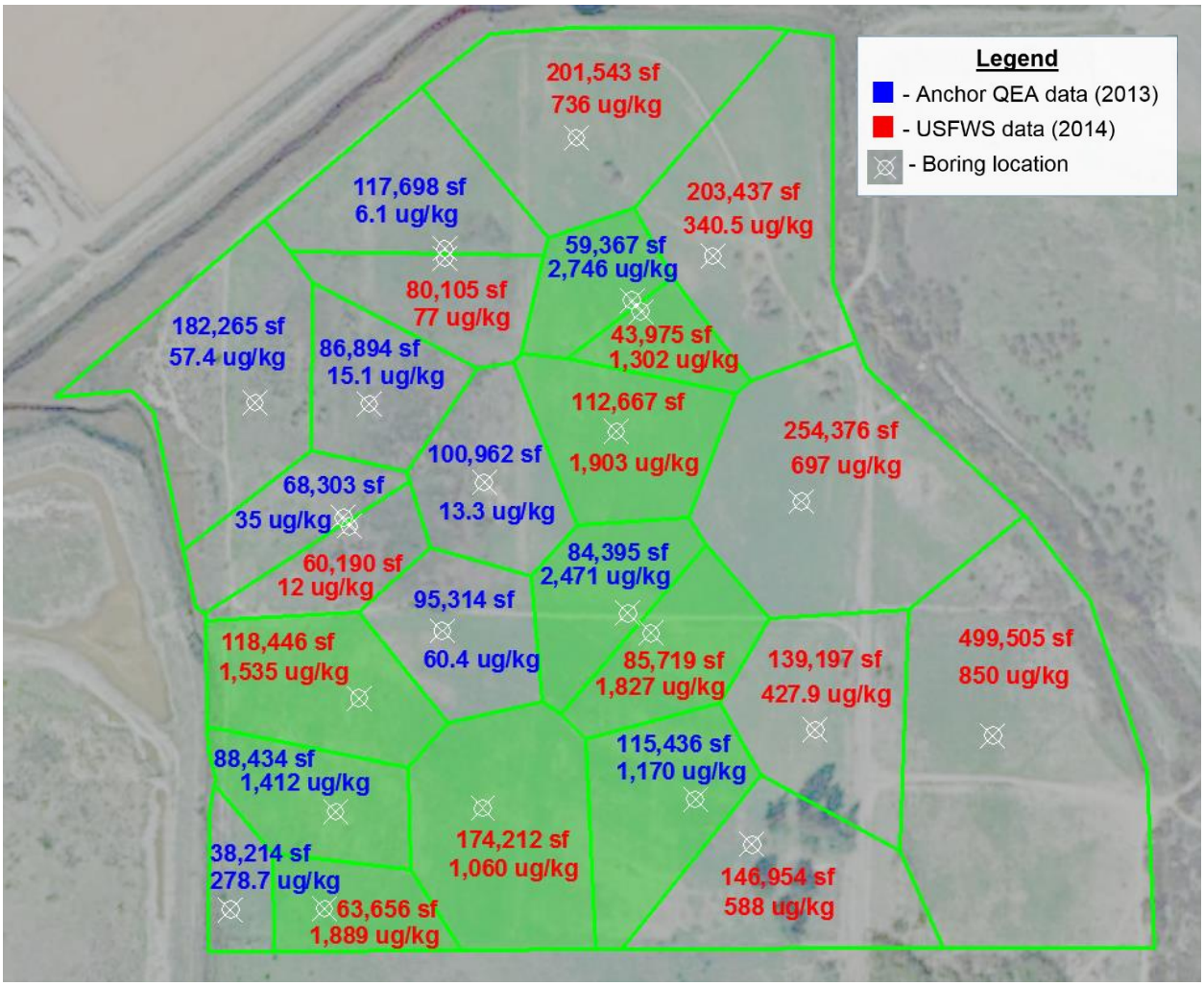


Figure 6. Voronoi Diagram for Soils 0 ft. to 1 ft. below ground surface - Cell Areas and DDT Concentrations

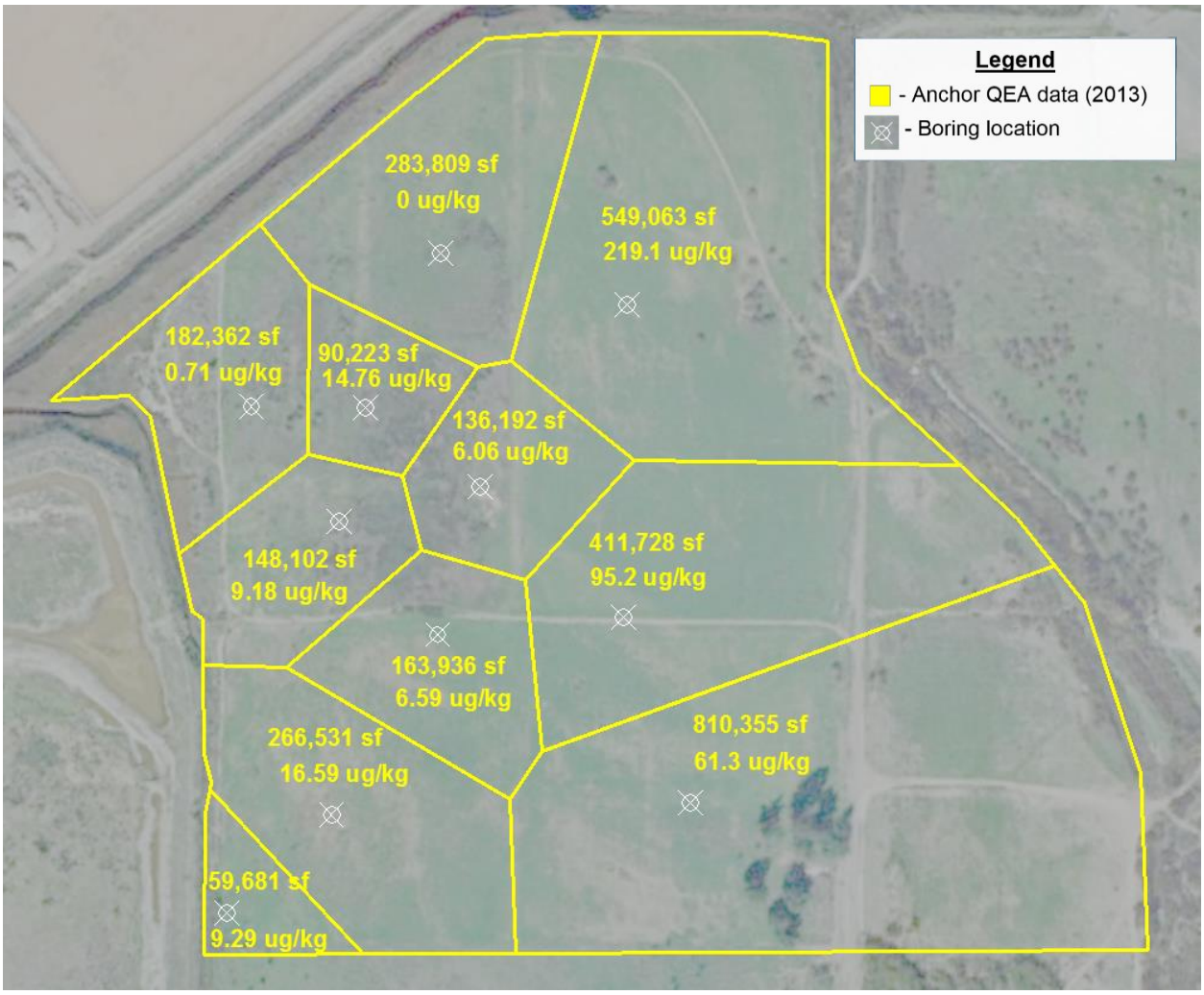


Figure 7. Voronoi Diagram for Soils 1 ft - 3 ft below ground surface - Cell Areas and DDT Concentrations

The suspended sediment concentrations in Table 4 are based on a dry bulk density for eroded soil of 2700 lb per cy, or 1.225 metric tons per cy; where a metric ton is 1000 kg. This conversion factor is applied to the sum of the volume of eroded DDT- bearing fines (column_2) and the volume of eroded fines from the upper Otay watershed (column_4) to obtain the total flux of suspended fine grained sediment in tons/day during the 24-hour flood period of the 100-year flood (cf. Figure 1). The sand and gravel sized fractions eroded from the floodplain by the 100-year flood are assumed to be transported as bed load. The suspended sediment flux component (column_2 + column_4) is divided by the flow volume of $\overline{Q}$ = 29,960,856 m^3 during the 24-hour flood period to give the average suspended sediment concentration in column_6 upon conversion of metric tons to grams and cubic meters to liters.

Table 4: Input Parameters for Sensitivity Analysis of Post 100-Year Flood DDT Deposition

Scenario	Volume of Eroded DDT-Bearing Fines	Average DDT Conc. in DDT-Bearing Fines	Volume of Eroded Upper Watershed Fines	Flood Flow Volume	Suspended Sediment Conc.
Erode top 3 ft. of Contaminated Area + Upper Watershed*	128,300 cubic yards	310 μ g/kg	438,000 cubic yards	24,290 acre ft	23.15 g/l.
Erode top 1 ft. of Contaminated Area + Upper Watershed	24,260 cubic yards	790 μ g/kg	438,000 cubic yards	24,290 acre ft	18.90 g/l
Erode top 2 ft. of Contaminated Area + Upper Watershed	76,350 cubic yards	430 μ g/kg	438,000 cubic yards	24,290 acre ft	21.03 g/l
Erode top 3 ft. of Contaminated Area Only*	128,300 cubic yards	310 μ g/kg	0 cubic yards	24,290 acre ft	5.25 g/l
Erode top 1 ft. of Contaminated Area Only*	24,260 cubic yards	790 μ g/kg	0 cubic yards	24,290 acre ft	0.99 g/l
Erode top 2 ft. of Contaminated Area Only*	76,350 cubic yards	430 μ g/kg	0 cubic yards	24,290 acre ft	3.12 g/l

4.0) Suspended Sediment Transport and Deposition:

Because DDT is hydrophobic, it can only be adsorbed and transported by the silt and clay fractions of floodplain soils eroded by the 100 year flood. These fine-grained fractions are transported as suspended load (commonly referred to as wash load), and capable of becoming re-distributed into the tidal basins of the restoration project; while the remaining coarser erodible fractions (primarily sands and gravels) are transported as bedload and remain confined to the streambeds of the Otay River, Poggi Canyon Creek and Nestor Creek, (Everest, 2014). For this reason, we focus on the tidally influenced suspended sediment transport dynamics of fine-grained silts and clays in the post-flood period.

While the duration of the 100 year flood is relatively brief (24 hr), the transport, redistribution and settling of the washload sediments can linger on for days, even weeks under the influence of tidal exchange. Typically in calm water, silt particles will require 4.3 hr. to settle to the bottom in 1 meter of water depth, while clay-sized particles can take as long as 18 days. The residence time of water in South San Diego Bay can be as long as 40 days (Largier, 1995); consequently, washload discharged into South San Diego Bay from the 100-year flood can potentially recirculate back into the tidal basins of the restoration project for many tide cycles before the fine-grained washload sediments completely settle out of the South Bay water mass.

From Anchor (2013), the average grain size of the silts and clays that make up the 37.2% of the sediments found in the top three feet of erodible sediments in the black outlined area of Figures 6 & 7 is only 25 microns ($\overline{d}_{fines} \cong 0.025$ mm). The settling velocity is only w_s = 0.030 cm/sec based upon 25 micron median aggregate size of silts and clays (Figure 8). Because of these very low settling rates, (*Stokes settling regime*), subsequent deposition of the silts and clays that contain DDT will be a slow process, which will extend for many tide cycles depending on the local water depth. In posing the problem of tidal flushing of these fine-grained sediments from the tidal basins of the restoration project, we shall neglect any hydrodynamic effect on the tidal hydraulics due to the river flow. This assumption is supported by the short duration of the flood hydrograph relative to the duration of settling and deposition processes. By this assumption, we are basically saying that the hydrodynamics are dominated by the fluvial processes during the first 24 hours, since the flow volume of the 100-year flood is 56 times larger than the combined tidal prisms of the restoration project tidal basins. Thereafter, tidal processes ensue; so that fluvial and tidal processes occur sequentially without interaction. In addition, we shall assume that the sediment yield of the 100-year flood is uniformly dispersed at the end of the flood period, with an initial suspended sediment concentration $\overline{C}_0$ given by column_6 in Table 4 that is uniform throughout the floodplain and adjacent South San Diego Bay as far north as the nodal points at the Chula Vista Wildlife Reserve (Figures 2 & 3). This initial uniform suspended concentration is subsequently modified by the action of tidal advection and diffusion and by gravity-induced settling that we shall represent by the following form of the sediment continuity equation:

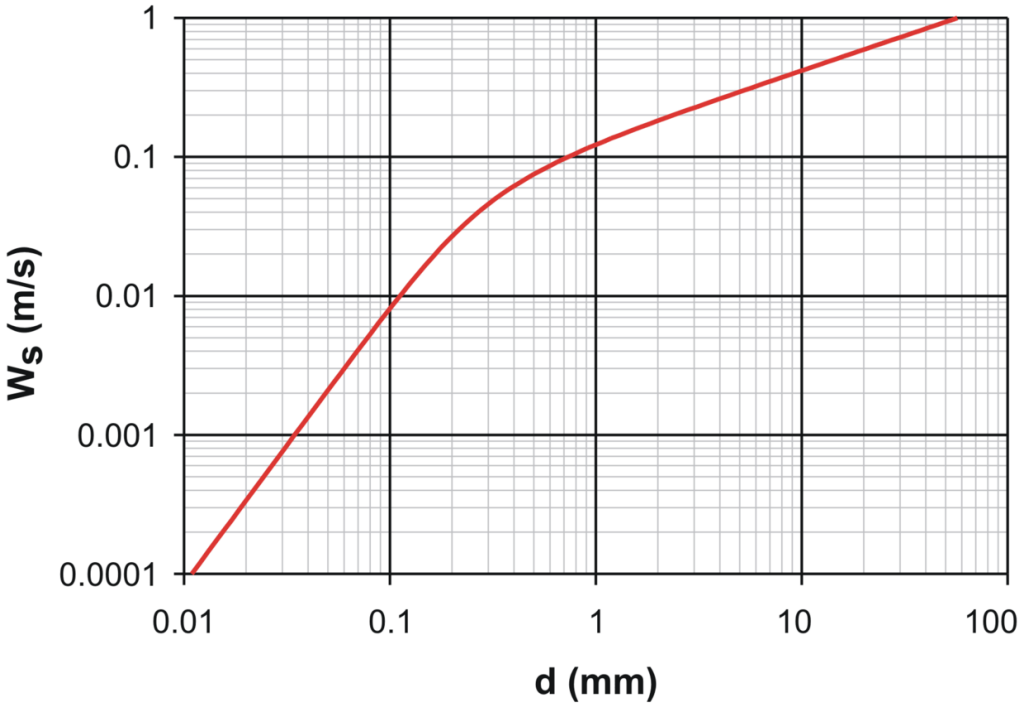


Figure 8: Settling velocity of quartz grains as a function of median grain size.

$$\frac{\partial}{\partial t} c H + \frac{\partial}{\partial x} J_x + \frac{\partial}{\partial y} J_y = \varepsilon_m \left(\frac{\partial^2 c}{\partial x^2} + \frac{\partial^2 c}{\partial y^2} \right) - Sc \qquad (1)$$

where $c = c(x, y, t)$ is the local suspended sediment concentration; S is the settling (sink) coefficient, $S \sim f(w_0)$; w_s is the settling velocity of the sediment that is independent of (x, y, t) and is a single valued function of grain size only according to Figure 8; the water depth at any finite element node is $H = \eta + h$; h is the local bottom elevation in NAVD 88; η is the tidal amplitude in NAVD 88; ε_m is the mass diffusivity, and J_x , J_y are local sediment flux components due to the local depth averaged tidal velocities, $(\bar{u}, \bar{v})$:

$$J_x = c \int_{-h}^{\eta} \bar{u} dz \qquad (2)$$

$$J_y = c \int_{-h}^{\eta} \bar{v} dz$$

Equation (1) is forced by the solutions for the water surface elevations, η , and tidal

velocities, $(\bar{u},\bar{v})$ generated by the TIDE_FEM finite element tidal hydraulics model applied to the grading designs of the Intertidal and Subtidal Alternatives for the ORERP. These TIDE_FEM tidal hydraulics solutions are documented in Jenkins and Wasyl (2014).

The term Sc in Equation (1) represents a sink for suspended sediment, often referred to as the deposition flux, $D(x,y,t)$, that is the net of settling and re-suspension:

$$Sc = D(x,y,t) = c(x,y,t)\,w_s - \frac{\alpha\left[\tau(x,y,t)-\tau_c\right]}{\tau_c} \qquad (3)$$

Where the term $c\,w_s$ is the downward-directed settling flux, while the upward flux of sediment re-suspended by bottom shear stress is $E(x,y,t)=\alpha(\tau-\tau_c)/\tau_c$. Here, α is an empirical coefficient, α = 2.356 X 10^{-4} g/cm^2/sec after Mehta (1981); τ_c = 0.5 dynes/cm^2 is the cohesive yield stress for unconsolidated mud after Mehta, et al. (1982); and $\tau=(\tau_x^2+\tau_y^2)^{1/2}$ is the tidally induced bottom shear stress from the that is quasi-linearized by Chezy-based friction using Manning's roughness factor, n_o:

$$\tau_x = -\frac{g}{\rho H^2 C_z^{\,2}}\,q_x\left(q_x^{\,2}+q_y^{\,2}\right)^{1/2}$$
$$\tau_y = -\frac{g}{\rho H^2 C_z^{\,2}}\,q_y\left(q_x^{\,2}+q_y^{\,2}\right)^{1/2} \qquad (4)$$

$$q_x = \rho\int_{-h}^{\eta}\bar{u}\,dz \quad ; \quad q_y = \rho\int_{-h}^{\eta}\bar{v}\,dz$$

Here, C_z is the Chezy coefficient calculated as:

$$C_z = \frac{1.49}{n_0}H^{1/6} \qquad (5)$$

By Equations (1) – (5), the post flood deposition processes of settling and re-suspension are posed as a time-dependent, two-dimensional boundary value problem in which the forcing is provided by the depth averaged tidal velocities, $(\bar{u},\bar{v})$ resolved by the TIDE_FEM tidal hydraulics model detailed in Sections 2 and 3 of Jenkins and Wasyl, (2014). Boundary conditions and initial conditions on Equation (1) are imposed at the land-water and open water boundaries and open-water boundaries and nodes. Flux quantities normal to these boundary contours are denoted with "n" subscripts and tangential fluxes are given "s" subscripts. At any point along a boundary contour, the normal and tangential suspended sediment fluxes are:

$$J_n = \int_{-h}^{\eta} cu_n dz = \alpha_{nx} J_x + \alpha_{ny} J_y$$

$$J_s = \int_{-h}^{\eta} cu_s dz = -\alpha_{nx} J_x + \alpha_{ny} J_y \qquad (6)$$

$$\alpha_{nx} = \cos(n, x)$$

$$\alpha_{ny} = \cos(n, y)$$

On land-boundary contours, the suspended sediment flux components are prescribed as:

$$J_n = J_s = 0 \qquad \text{on land-water boundaries} \qquad (7)$$

On the open-water boundaries and nodes of the computational mesh, an initial post-flood condition is imposed requiring that the suspended sediment concentration is a constant, $\overline{C}_0$, given by the eroded area values from column_6 in Table 4, or $c = \overline{C}_0$ in Equation (6) at $t = 24$ hr.

Equation (1) is solved over the same finite element mesh as the ORERP tidal hydraulics simulations using the Galerkin weighted residual method detailed in Gallagher,(1981), Weiyan (1992). By this approach, the sediment continuity equation (1) reduces to a simple oscillator equation forced by the collection of algebraic terms which is easily integrated over time. The time integration scheme used over each time step of the post-flood tidal forcing period is based upon the *trapezoidal rule*. This scheme was chosen because it is known to be unconditionally stable, and in tidal propagation problems has not been known to introduce spurious phase differences or damping. It replaces time derivatives between two successive times, $\Delta t = t_{n+1} - t_n$, with a truncated Taylor series.

Solutions to Equation (1) for the post-flood suspended sediment concentration $c = c(x, y, t)$ are combined with solutions for the tidally induced bottom shear stress, $\tau(x, y, t)$, from the TIDE_FEM model to compute the deposition flux, $D(x, y, t)$ using Equation (3). As these solutions continue forward in time post-flood, $D(x, y, t) \to 0$ as the suspended sediments progressively fall out of suspension and $c(x, y, t) \to 0$. The deposition flux is integrated over this post-flood deposition period to compute the deposition thickness, but initially this deposition represents unconsolidated of fluid mud. With this initial deposition to consolidate and compact from an initial fluid-mud layer whose bulk concentration is C_f; to some partially consolidated mud layer whose bulk density is C_s, after Krone (1978), Mehta (1989). The deposition thickness at time $t = j\Delta t$ for any given nodal point is calculated [Krone, 1962]:

$$\Delta Z(x,y,t) = \int_0^{j\Delta t} \frac{D(x,y,t) - K_s C_s\, g}{1 - C_f / C_s}\, dt \qquad (8)$$

where K_s = 4 x 10^{-13} sec is the sedimentation coefficient after the work of Fujita (1962). The fluid mud layer bulk concentration shall be set at C_f = 100g/l and the partially consolidated mud concentration shall be set at a rather low value of C_s = 200 g/l to allow for the effects of bioturbation. These are conservative values which will tend to overestimate deposition thickness. The mass diffusivity shall be set at ε_m = 4.9 cm^2/sec based upon work conducted in tidal basins in the San Francisco Bay Estuary, Jenkins and Wasyl (1980, 1983, and 1990).

5.0) Post-Flood Tidal Deposition Simulations for the 100-Year Flood:

The TIDE_FEM model was run for 276 hours immediately following the 100-year flood using tidal forcing with Δt = 2 sec time step intervals at the mouth of the Otay River, derived from a spectral correction applied to the NOAA tide gage #941-0170 located at the Navy Pier, as detailed in Section 3.4 of Jenkins and Wasyl (2014). The post-flood tidal deposition simulations were run on the same finite element grid using the TIDE_FEM outputs for depth averaged tidal velocities, $(\bar{u},\bar{v})$, tidally induced bottom shear stress $\tau(x,y,t)$, and local water surface elevations, η as forcing functions to Equation (1).

Initial conditions post flood were a uniform dispersion throughout the model grid of a suspension of silt and clay sized sediment characterized by a 20 micron median grain size with a settling rate of w_s = 0.030 cm/sec to account for some degree of flocculation. The initial conditions were specified as a uniform suspended sediment concentration, $\overline{C}_0$, and companion DDT concentration for each scenario of the sensitivity analysis according column_6 and column_3 respectively in Table 4. The finite element model grid included the lower Otay River channel beginning at the presently contaminated area shown in Figures 6 & 7; the tidal basins of the restoration with all of the salt pond complexes; and extended out into south San Diego Bay as far as the Chula Vista Wildlife Reserve as shown in Figures 2 & 3. Boundary conditions on this grid consisted of no normal fluxes of suspended sediment through the land-water boundaries, and continuity of normal and tangential fluxes of suspended sediment across the open water boundaries where a constant suspended sediment concentration $c = \overline{C}_0$ from column_6 in Table 4 prevailed at time t = 24 hr at the start of the deposition simulation. For each time step, the TIDE_FEM model solves equations (3) and (8) for deposition flux and deposition thickness at each finite element node in the grid mesh. The deposition of partially consolidated mud in the tidal basins of the restoration was characterized by averaging deposition flux and deposition thickness at 6 (ea.) nodes distributed across the Floodplain Tidal Basin and 9 (ea.) nodes distributed across the Pond 15 Tidal Basin of the Intertidal and Subtidal Alternatives.

Figure 9 gives the time evolution of the post-flood deposition flux and deposition thickness for the first scenario (row_2 of Table 4) in the Floodplain Tidal Basin of the Intertidal and Subtidal Alternatives; and Figure 10 gives results for those same quantities in the Pond 15 Tidal Basin of the Intertidal and Subtidal Alternatives. This scenario is based on maximum flood-induced erosion depths of 3 ft. in the contaminated area adjacent the Floodplain Tidal Basin mixed with 438,000 cubic yards of fine-grained sediments from upstream erosion of the portion of the watershed below the Savage Dam. Results are similar for both tidal basins and restoration alternatives with dry bulk DDT concentrations of 70.2 μ g/kg everywhere in the post-flood deposition, because the initial post-flood suspended sediment concentration is the same in all areas in and around the restoration as a consequence of the 100 year flood over topping and flowing through these areas with its washload (cf. Figures 2 & 3). The general depositional features are that deposition flux peaks within one diurnal tide cycle after cessation of the flood in both basins of both restoration alternatives, with an initial deceleration in flux during the first semidiurnal ebb tide. After the first post-flood diurnal tidal cycle, the deposition flux declines as progressive settling depletes the suspended sediment concentration, and tidal residence times in the tidal basins limits the amount of time for settling and deposition to occur. Meanwhile, deposition thickness, which results from the cumulative sum of deposition flux over time, rapidly builds during the peak deposition flux period, and then gradually approaches a constant limit for partially consolidated mud at 200 g/l bulk density as the deposition flux vanishes after 120 to 150 hours post-flood. The minor differences in deposition flux and deposition thickness among tidal basins and restoration alternatives in Figures 9 & 10 is due to differences in residence times and grading elevations (i.e. water depth).

The Floodplain Tidal Basin, which has the shortest residence time (2 days for the Intertidal Alternative and 2.5 days for the Subtidal Alternative), has the lowest peak deposition flux (16.5 – 18.3 ton/acre/day) and the shortest deposition period (~120 hours); and accumulates only 3.3 to 3.4 mm of partially consolidated mud after 276 hours post-flood (Figure 9). Because of the sub-tidal channel graded into the Floodplain Tidal Basin design for the Subtidal Alternative, the residence time and consequently the deposition fluxes and thickness are slightly greater than for the Intertidal Alternative.

On the other hand, tidal residence times are nearly a day longer for the Pond 15 Tidal Basin of both alternatives (where residence times are 3.0-3.2 days), and consequently deposition fluxes and thickness are notably greater in Figure 10 than for the Floodplain Tidal Basin in Figure 9. In Pond 15, the deposition flux peaks at 18.9-19.9 ton/acre/day, and the deposition period is longer, about 150 hours post-flood. Consequently the deposition thickness is nearly double in Pond 15, with 7.6 to 8.0 mm of partially consolidated mud laid down after 276 hours post-flood. Because more dredge fill from the Floodplain Tidal Basin construction is deposited in Pond 15 of the Subtidal Alternative, its storage volume and residence times are less than for the Intertidal Alternative, whence the deposition fluxes and thickness are slightly less for the Subtidal Alternative in Figure 10 than for the Intertidal Alternative.

The initial post 100-year flood accumulations of partially consolidated mud computed in Figures 9 & 10 will, over time, dewater and compact under its own immersed weight. If

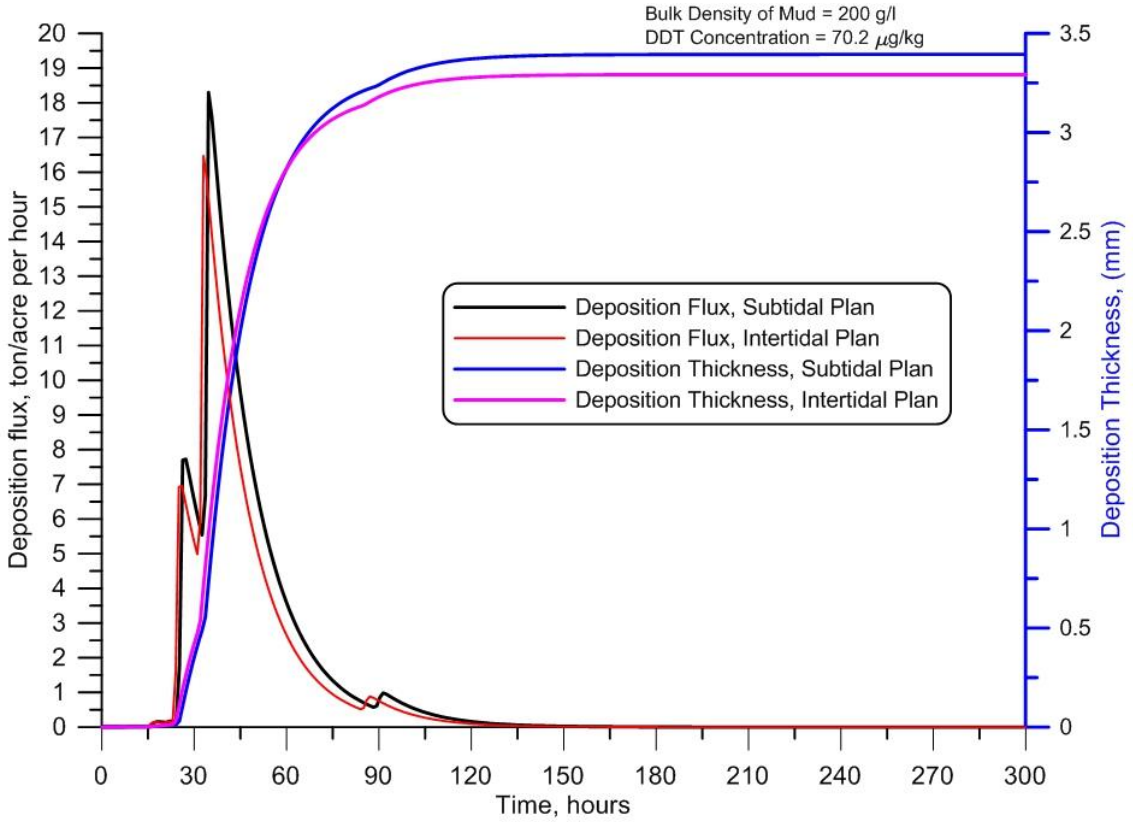


Figure 9. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Otay River Floodplain Tidal Basin following the 100-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 128,300 cubic yards of contaminated fines and 438,000 cubic yards of clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

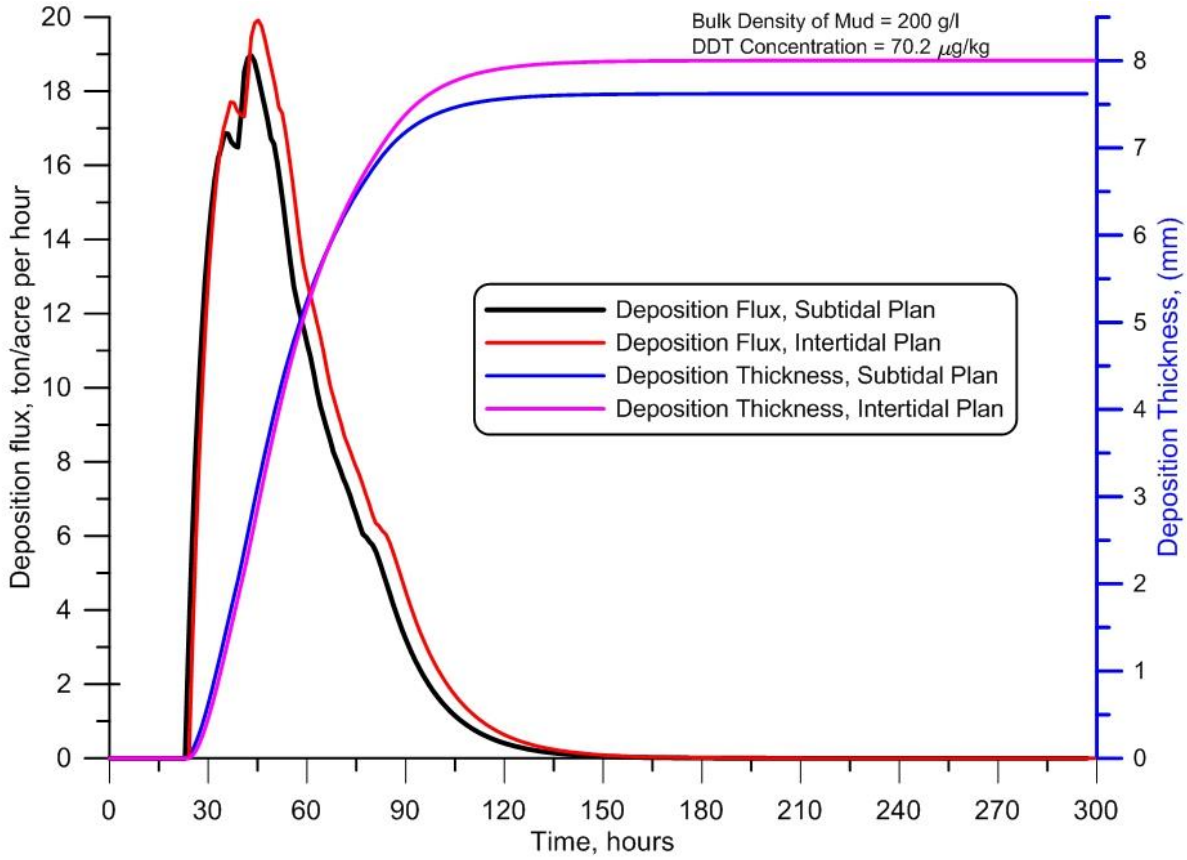


Figure 10. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Pond-15 Tidal Basin following the 100-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 128,300 cubic yards of contaminated fines and 438,000 cubic yards of clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

we assume that the 3mm to 7mm of initial deposition would consolidate and compact to a maximum saturated density for fully consolidated mud, 1200 g/l, then the 100-year flood deposition for the first scenario in Table 4 (row_2) would eventually become a layer of consolidated mud only 0.5 mm to 1.2 mm thick; or:

$$\text{Floodplain Basin: } 3.3\,mm\ @\ 200g/l \ \Rightarrow\ \left\{\frac{dewatering}{consolidation}\right\} \ \Rightarrow\ 0.55\,mm @ 1{,}200g/l$$

$$\text{Pond 15 Basin: } 8\,mm\ @\ 200g/l \ \Rightarrow\ \left\{\frac{dewatering}{consolidation}\right\} \ \Rightarrow\ 1.4\,mm @ 1{,}200g/l$$

Consolidation only involves a reduction in the water content of the post-flood deposition, and therefore does not alter the DDT dry bulk concentration, which remains 70.2 μ g/kg once the muds have consolidated to a density of 1,200 g/l. The amount of time required for this degree of consolidation is uncertain, but experience with dredge material disposal ponds at Mare Island, CA and Charleston, SC [Jenkins, 1980; Jenkins et al., 1981; Jenkins and Skelly, 1983] suggests that consolidation to 600 g/l could occur within three months while full consolidation to saturation could take several years.

Next, consider how such results may be affected if we assume no erosion of soils occurs in the portion of the watershed upstream of the floodplain and below the Savage Dam. This scenario is specified by the fifth row in Table 4 and is based on maximum erosion depths of 3 ft. in the contaminated area only; and is considered *worst-case.* Here, runoff from the 100 year flood consists of a uniform suspended load of silts and clays with concentration of $\overline{C}$ = 5.25 g/l. Figure 11 gives the time evolution post-flood for deposition flux and deposition thickness in the Floodplain Tidal Basin of the Intertidal and Subtidal Alternatives; and Figure 12 gives results for those same quantities in the Pond 15 Tidal Basin of the Intertidal and Subtidal Alternatives. Again, results are similar for both tidal basins and restoration, but the dry bulk concentration of DDT in the post-flood deposition has increased to 310 μ g/kg, while the deposition thicknesses are greatly diminished. Again, the Floodplain Tidal Basin, with the shortest residence time (Figure 11), has the lowest peak deposition flux (3.7 – 4.1 ton/acre/day) and the shortest deposition period (~120 hours); and accumulates only 0.75 to 0.77 mm of partially consolidated mud after 276 hours post-flood. Deposition fluxes and thickness are slightly greater for the Floodplain Subtidal Alternative than for the Intertidal Alternative, due to its deeper sub-tidal channel and longer residence time. With tidal residence times being nearly a day longer for the Pond 15 Tidal Basin of both alternatives, deposition fluxes and thickness are notably greater in Figure 12 than for the Floodplain Tidal Basin in Figure 11. In Pond 15, the deposition flux peaks at 4.3 - 4.5 ton/acre/day, and the deposition period is longer, about 150 hours post-flood. Consequently the deposition thickness is nearly double in Pond 15, with 1.7 to 1.8 mm of partially consolidated mud laid down after 276 hours post-flood. Because more dredge fill is deposited in Pond 15 under the Subtidal Alternative, its storage volume and residence times are less than for the Intertidal Alternative, whence the deposition fluxes and thickness are slightly less in Figure 12 for the Subtidal Alternative. After dewatering and compaction to a density of 1200 g/l, the post-flood deposition for this worst case eventually become a layer of consolidated mud on the order of

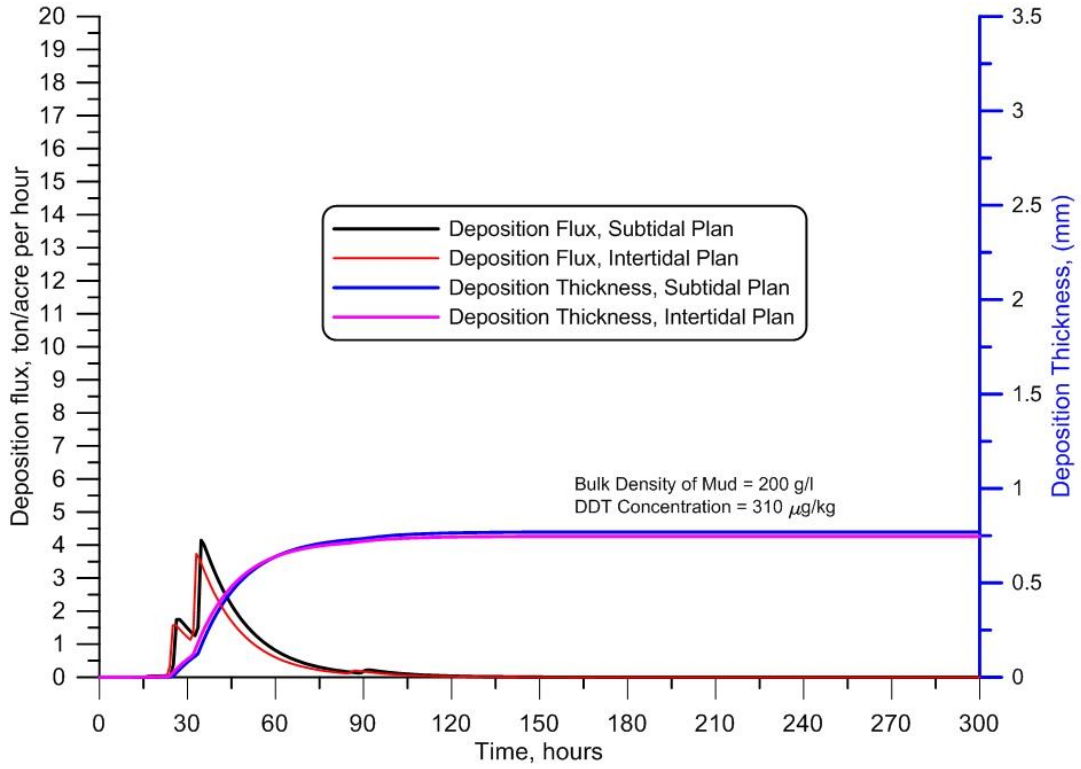


Figure 11. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Otay River Floodplain Tidal Basin following the 100-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 128,300 cubic yards of contaminated fines and no additional clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration

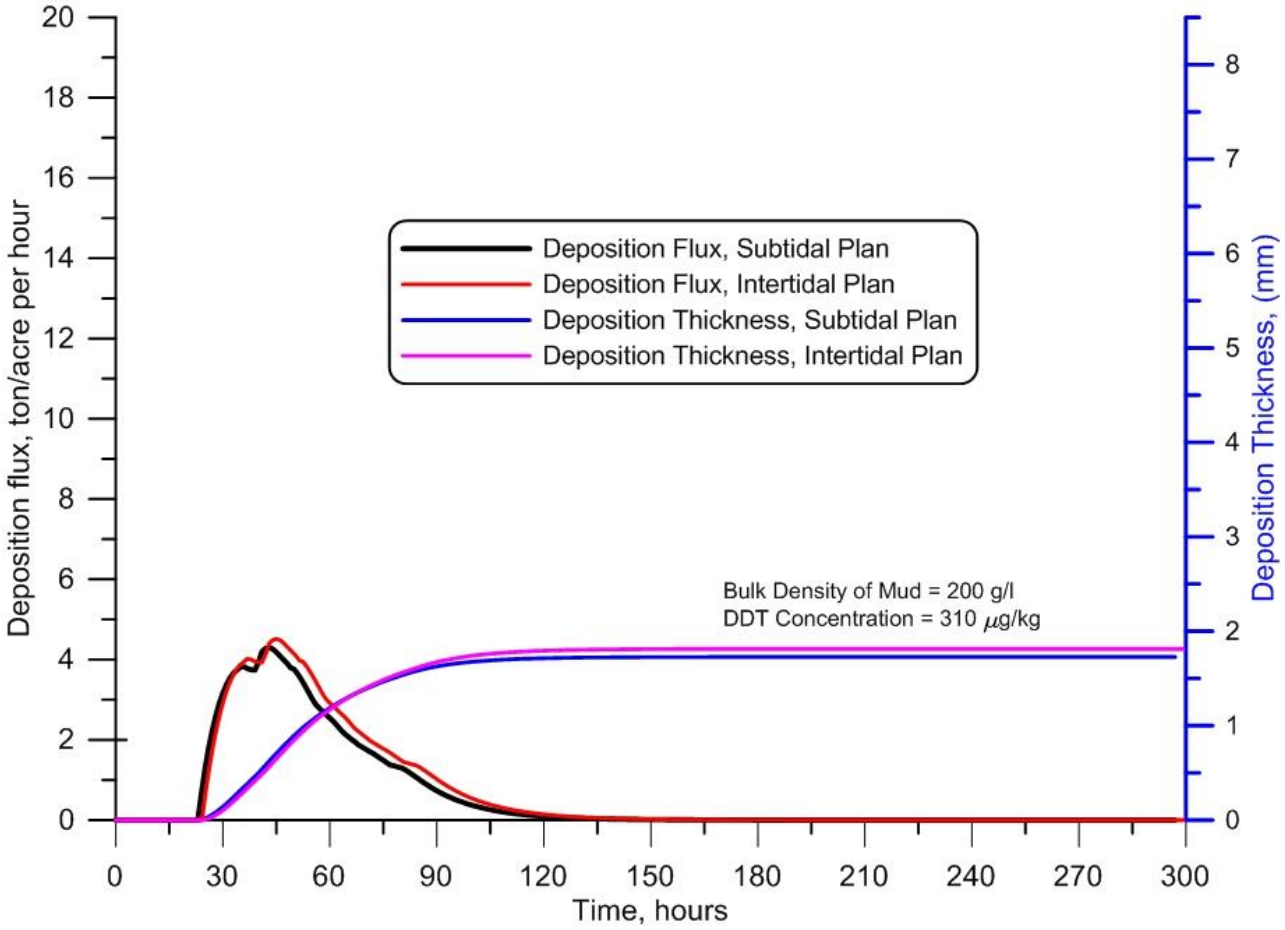


Figure 12. Sensitivity analysis of deposition of fine-grained sediment (mud) in Pond-15 Tidal Basin following the 100-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 128,300 cubic yards of contaminated fines and no additional clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration

only 0.2 mm to 0.4 mm thick; or:

Floodplain Basin: $0.75\,mm\ @\ 200g/l \ \Rightarrow\ \left\{\frac{dewatering}{consolidation}\right\} \ \Rightarrow\ 0.17\,mm @ 1{,}200g/l$

Pond 15 Basin: $1.8\,mm\ @\ 200g/l \ \Rightarrow\ \left\{\frac{dewatering}{consolidation}\right\} \ \Rightarrow\ 0.41\,mm @ 1{,}200g/l$

Again, dewatering and consolidation does not alter the dry bulk DDT concentrations in the post-flood muddy deposits, which will remain at 310 μ g/kg even if these muds consolidate to full saturation.

Plots of the deposition flux and deposition thickness time series for the other scenarios of the sensitivity analysis are found in APPENDIX-A. The complete ensemble of deposition scenarios from this sensitivity analysis are summarized in Table 5 below. Entries in the last three rows are based on the assumption of no erodible fine-grained sediments anywhere else in the Otay River watershed outside of the contaminated area adjacent the ORERP Floodplain Tidal Basin. While the DDT concentrations in the muds deposited under these scenarios of no upstream sources can range as high as 310 μ g/kg to 790 μ g/kg, the deposition thicknesses reduce to only fractions of a millimeter once these muds become consolidated (cf. column_8, Table 5). To assess the potential biological impacts of these simulation results, a risk assessment analysis based on screening levels of keystone wetland species is presented in Section 6 below.

6) Post-Flood Tidal Deposition Simulations for the 50-Year Flood:

6.1 Input Assumptions: The 50-year flood hydrographs for the Otay River, Poggi Canyon Creek and Nestor Creek are triangular with 24-hour durations, similar to those shown in Figure 1 for the 100-year flood, but involving significantly less flow volumes. The total flow volume during a 50-year flood for the Otay River is 19,200,000 cubic yards (cy), or 14,679,545 cubic meters (m^3). The corresponding flow volumes for Poggi Canyon Creek and Nestor Creek are respectively 1,488,000 cy (1,137,664 m^3) and 1,584,000 cy (1,211,062 m^3), so that the combined flow through the floodplain is $\overline{Q}$ = 22,272,000 cy (17,028,272 m^3), or 13,805 acre ft. The flow for the Otay River is an order of magnitude higher than those for Poggi Canyon Creek and Nestor Creek. It was estimated that during the 50-year flood, only about 60% of the Otay and Poggi flow would pass through the proposed wetland restoration areas, while the remainder would flow through the adjacent salt ponds and into South San Diego Bay. The percent of Nestor flow that would pass through the wetland was not analyzed, but since Nestor Creek directly flows into the proposed wetland area, it was assumed that all of the Nestor Creek flow would enter the wetland. Based on these flow volumes and the sediment stratigraphy revealed by the borings taken by Anchor 201, it was estimated that the 50-year flood would erode the top 1 ft of soil over the entire ORF. The eroded volume of soil in the ORF due to the 50-year flood was estimated to be 114,900 cy (87,848 m^3), of which 21.1% (24,260 cy or 18,545 m^3) are DDT bearing fin grained sediments. The average dry bulk DDT concentration in these fine grained sediments is 790 µg/kg.

Scenario	Volume of Eroded DDT-Bearing Fines	Average DDT Conc. in DDT-Bearing Fines	Volume of Eroded Upper Watershed Fines	Flood Flow Volume	Suspended Sediment Conc.	Initial Post-Flood Deposition Thickness (200 g/l Mud)	Final Post-Flood Deposition Thickness (1,200 g/l Mud)	DDT Conc. in Post-Flood Mud Deposition (dry bulk)
Erode top 3 ft. of Contaminated Area + Upper Watershed*	128,300 cubic yards	310 μ g/kg	438,000 cubic yards	24,290 acre ft	23.15 g/l.	3.3 mm to 8.0 mm	0.5 mm to 1.4 mm	70.2 μ g/kg
Erode top 1 ft. of Contaminated Area + Upper Watershed	24,260 cubic yards	790 μ g/kg	438,000 cubic yards	24,290 acre ft	18.90 g/l	2.7 mm to 6.5 mm	0.4 mm to 1.1 mm	41.5 μ g/kg
Erode top 2 ft. of Contaminated Area + Upper Watershed	76,350 cubic yards	430 μ g/kg	438,000 cubic yards	24,290 acre ft	21.03 g/l	3.0 mm to 7.3 mm	0.45 mm to 1.3 mm	63.8 μ g/kg
Erode top 3 ft. of Contaminated Area Only**	128,300 cubic yards	310 μ g/kg	0 cubic yards	24,290 acre ft	5.25 g/l	0.75 mm to 1.8 mm	0.17 mm to 0.41 mm	310 μ g/kg
Erode top 1 ft. of Contaminated Area Only	24,260 cubic yards	790 μ g/kg	0 cubic yards	24,290 acre ft	0.99 g/l	0.14 mm to 0.34 mm	0.02 mm to 0.06 mm	790 μ g/kg
Erode top 2 ft. of Contaminated Area Only	76,350 cubic yards	430 μ g/kg	0 cubic yards	24,290 acre ft	3.12 g/l	0.44 mm to 1.1 mm	0.07 mm to 0.12 mm	430 μ g/kg

Table 5: Matrix of Sensitivity Analysis of Potential DDT Deposition in the ORERP post-100 year flood.

The 50-year flood will cause additional soil erosion from the watershed below the Savage Dam. Based on scaling by the watershed size relative to the Buena Vista watershed, it was estimated that sediment discharge from the Otay River watershed below Savage Dam during the 50-yr flood is about 501,000 cy of which 50% is fine, or 250,500 cy. Because only 60% of flow from the upper Otay River watershed would pass through ORF, the eroded contaminated sediments from the ORF could mix with as much as 150,300 cy (114,913 m^3) of fines not known to contain DDT from the upper watershed below the Savage Dam.

From this assessment of possible sediment erosion input assumptions, we pose a sensitivity analysis for the post 50-Year flood DDT deposition that is based on erosion fluxes from one possible erosion depth (1 ft.) in the DDT contaminated area of the floodplain that is each combined with two possible fluxes of clean fines (0 cy and 150,300 cy) from the upper watershed below the Savage Dam; yielding a sensitivity analysis comprised of two separate deposition scenarios. The ensembles of input parameters for this sensitivity analysis are summarized in Table 6.

Table 6: Input Parameters for Sensitivity Analysis of Post 50-Year Flood DDT Deposition

Scenario	Volume of Eroded DDT-Bearing Fines	DDT Conc. in DDT-Bearing Fines	Volume of Eroded Upper Watershed Fines	Flood Flow Volume	Suspended Sediment Conc.
Erode top 1 ft. of Contaminated Area + Upper Watershed	24,260 cubic yards	790 μ g/kg	150,300 cubic yards	13,805 acre ft	12.60 g/l
Erode top 1 ft. of Contaminated Area Only*	24,260 cubic yards	790 μ g/kg	0 cubic yards	13,805 acre ft	1.8 g/l

The suspended sediment concentrations in Table 6 are based on a dry bulk density for eroded soil of 2700 lb per cy, or 1.225 metric tons per cy; where a metric ton is 1000 kg. This conversion factor is applied to the sum of the volume of eroded DDT- bearing fines (column_2) and the volume of eroded fines from the upper Otay watershed (column_4) to obtain the total flux of suspended fine grained sediment in tons/day during the 24 hour flood period of the 50-year flood. The sand and gravel sized fractions eroded from the floodplain by the 50 year flood are assumed to be transported as bed load. The suspended sediment flux component (column_2 + column_4) is divided by the flow volume of $\overline{Q}$ = 17,028,272 m^3 during the 24 hour flood period to give the average suspended sediment concentration in column_6 upon conversion of metric tons to grams and cubic meters to liters.

6.2 Deposition Results: Plots of the deposition flux and deposition thicknesses in the ORERP tidal basins for the 50-year flood scenarios are found in Figures 13 through Figure 16. The complete ensemble of 50-year flood deposition scenarios from this sensitivity analysis are summarized in Table 7 below. With initial dilution from mixing with the clean sediments from upstream sources, DDT concentrations post-50 year flood in the tidal basins of the ORERP are on the order of 110 μ g/kg. This concentration is higher than the companion result for the 100-year flood in row_1, column_9, Table 5. This is due to the fact that the 50-year flood causes proportional less erosion in the upper water shed of the Otay River than the 100 year flood. Entries in the last row of Table 7 are based on the assumption of no erodible fine-grained sediments anywhere else in the Otay River watershed outside of the contaminated area adjacent the ORERP Floodplain Tidal Basin and represent *worst case* for the 50-year flood. While the DDT concentrations in the muds deposited under worst case scenarios of no upstream sources can range as high as 790 μ g/kg, the deposition thicknesses are initially only 0.62 mm to 0.26 mm reduce to only fractions of a millimeter (0.06 mm to 0.14 mm) once these muds become consolidated (cf. column_8, Table 7). However, the DDT deposition results for 50-yr were found to be within the range of those for the 100-yr flood, so that the conclusions put forth previously in Section 6 on potential flood-induced DDT impacts to the ORERP wetlands ecology are upheld.

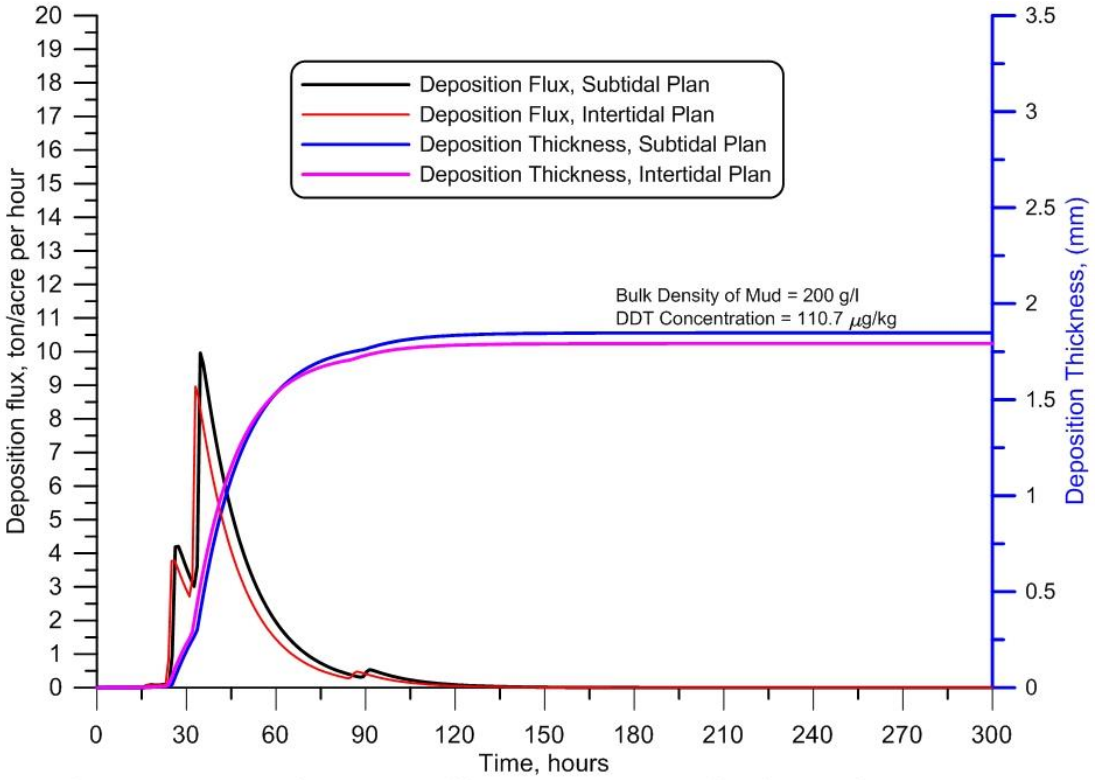


Figure 13. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Otay River Floodplain Tidal Basin following the 50-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 24,500 cubic yards of contaminated fines from erosion of the top 1 ft. and 150,300 cubic yards of clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

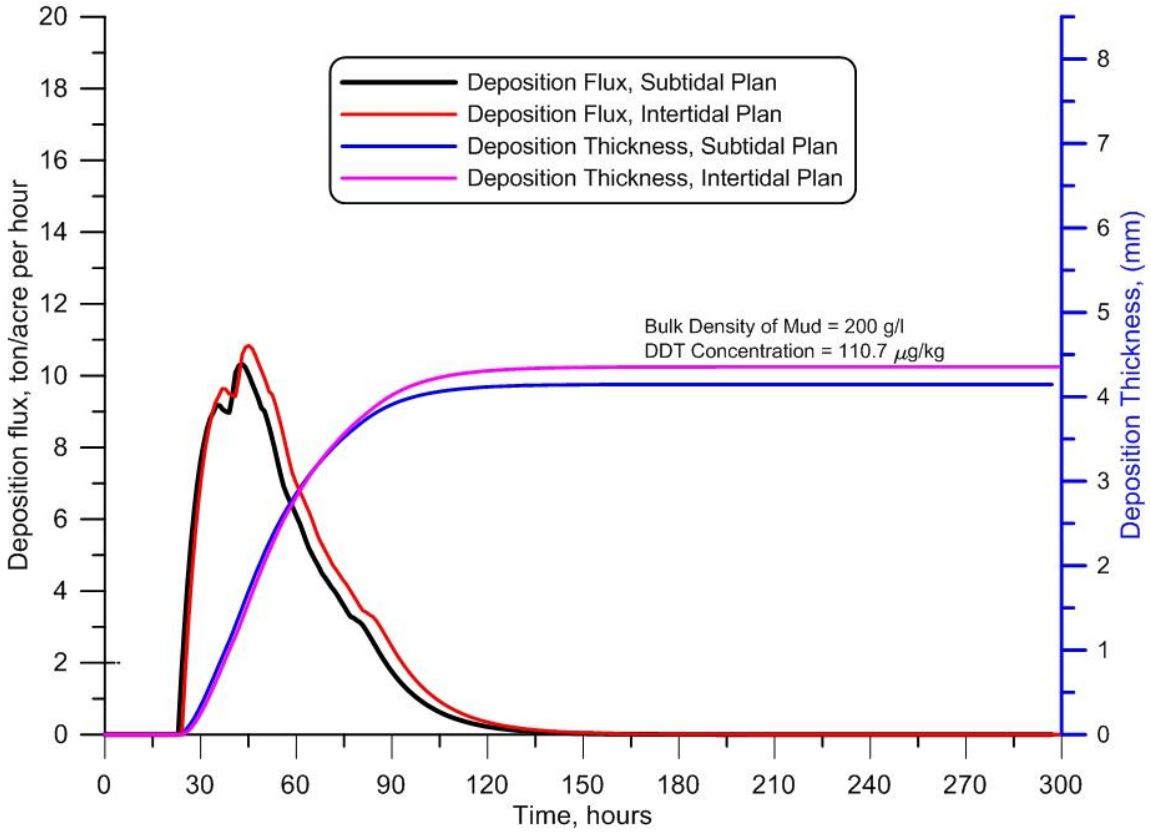


Figure 14. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Pond-15 Tidal Basin following the 50-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 24,500 cubic yards of contaminated fines from erosion of the top 1 ft. and 150,300 cubic yards of clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

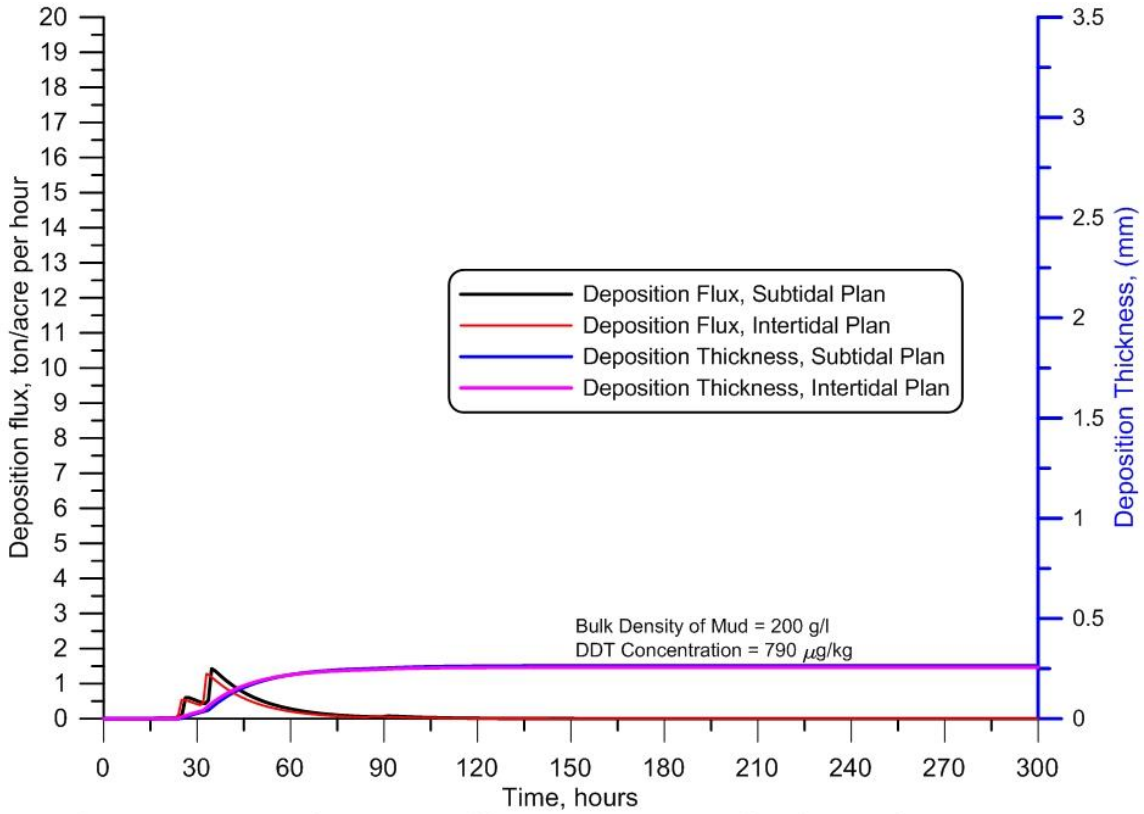


Figure 15. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Otay River Floodplain Tidal Basin following the 50-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 24,260 cubic yards of contaminated fines from erosion of the top 1 ft. and no additional clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

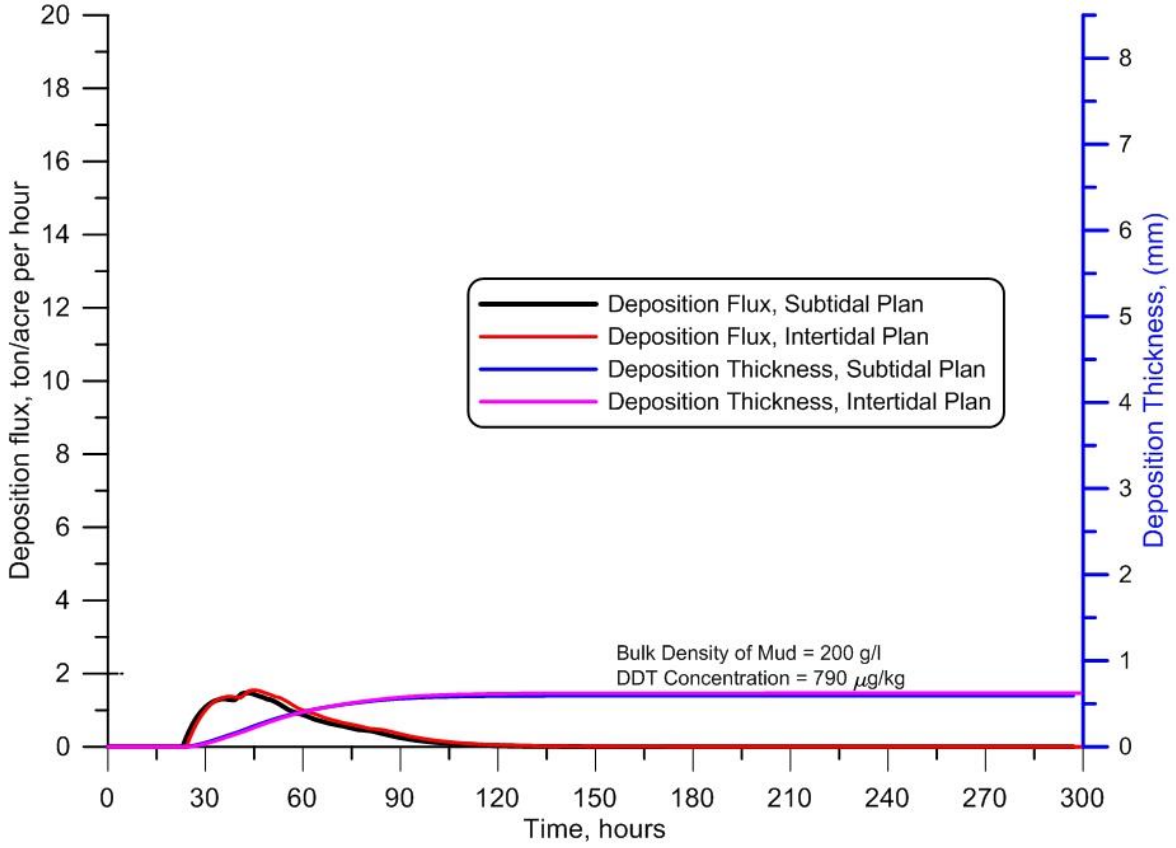


Figure 16. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Pond-15 Tidal Basin following the 50-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 24,500 cubic yards of contaminated fines from erosion of the top 1 ft. and no additional clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

Scenario	Volume of Eroded DDT-Bearing Fines	Average DDT Conc. in DDT-Bearing Fines	Volume of Eroded Upper Watershed Fines	Flood Flow Volume	Suspended Sediment Conc.	Initial Post-Flood Deposition Thickness (200 g/l Mud)	Final Post-Flood Deposition Thickness (1,200 g/l Mud)	DDT Conc. in Post-Flood Mud Deposition (dry bulk)
Erode top 1 ft. of Contaminated Area + Upper Watershed	24,260 cubic yards	790 μ g/kg	150,300 cubic yards	13,805 acre ft	12.60 g/l	1.8 mm to 4.3 mm	0.30 mm to 0.72 mm	110.7 μ g/kg
Erode top 1 ft. of Contaminated Area Only	24,260 cubic yards	790 μ g/kg	0 cubic yards	13,805 acre ft	1.8 g/l	0.26 mm to 0.62 mm	0.06 mm to 0.14 mm	790 μ g/kg

Table 7: Matrix of Sensitivity Analysis of Potential DDT Deposition in the ORERP post-50 year flood.

*Entries in RED are based on the assumption of NO erodible fine-grained sediments anywhere else in the Otay River watershed below Savage Dam outside of the contaminated area adjacent the ORERP Floodplain Tidal Basin., and represent *Worst-Case* for the 50-year flood

7.0) Biological Implications of the Post-Flood Deposition Simulations

The approach used for this analysis was to focus on critical and applicable information. The focus was on sensitive and potentially most exposed species, and data that would be applicable to the specific area (i.e., salt marshes in San Diego Bay). A risk assessment approach was used to identify wildlife risk-based screening levels for DDT in salt marsh sediment. A screening level approach was used, in that estimates were based on most exposed and/or sensitive species, and conservative assumptions used when there was uncertainty. This analysis entails the identification of no-effects based screening levels (doses and dietary concentrations) for birds, and factors that can be used to relate DDT concentrations in the bird's diet (specifically marsh invertebrates and forage fish) to concentrations in sediment. The availability of applicable data is greatest for effect levels in birds, while data on biota/sediment relationships are limited, especially for forage fish. Consequently, while it is possible to identify conservative dietary screening levels for avian receptors, whether factors used to relate DDT concentrations in biota to DDT concentrations in sediment are particularly conservative is not possible to tell at this time. In other words, this is not necessarily a worst case relative to this element of the analysis.

7.1 Screening Levels For DDT and Metabolites In Salt Marsh Sediment Relative to Proposed ORERP Activities: DDT in environmental media usually occurs as a mixture of parent compound (p,p'-DDT), and impurities and metabolites (i.e., o,p'-DDT, o,p'-DDD, o,p'-DDE, p,p'-DDD and p,p'-DDE). The metabolite, p,p'-DDE is the most persistent and the dominant of the six isomers (forms) in biological samples and in environmental media where there have been no recent DDT applications. The p,p'-DDE isomer is also the one associated with the most sensitive adverse effects in avian species. Consequently, some studies focus on p,p'-DDE only, while others consider the sum of the six isomers (total DDT). Data from studies on p,p'-DDE were considered in the development of the sediment screening levels. However, because of concerns about ongoing conversion of DDT to DDE, and because isomers other than p,p'-DDE are associated with adverse effects, sediment screening levels are used for comparison with total DDTs even though they are derived based on data for the most sensitive effects that are associated with p,p'-DDE.

Sediment-borne DDT and its metabolites (especially p,p'-DDE) can be toxic to directly exposed benthic organisms, and to indirectly exposed aquatic-dependent wildlife. Sediment-borne DDT and metabolites are known to enter and accumulate in the tissues of aquatic food web organisms. Through bioaccumulation and biomagnification (with trophic transfer), concentrations of DDT and metabolites can reach levels in tissues of aquatic food chain organisms that are unsafe for wildlife that rely on the aquatic biota for food. Sediment screening levels for DDT and metabolites must consider; 1) potential for toxicity to benthic invertebrates, and 2) potential for uptake and food chain transfer and therefore adverse effects via dietary exposure among aquatic-dependent wildlife.

The focus of this exercise is on avian species because marsh habitats on San Diego Bay NWR: 1) are specifically managed for federally listed species (birds and one plant) and

migratory birds[1], and 2) do not support mammalian or reptile species of concern nor other species that (based on feeding habits) are likely to experience significant exposure to sediment-borne DDT. Avian species that are present during the nesting season are of particular concern because DDT (specifically p,p'-DDE) impairs eggshell production by adult females (thin shells) and, because it is readily transferred to eggs, may adversely affect developing embryos. Eggshell thinning is a well-documented effect in many species of birds, and it may be one of the most sensitive of sub-lethal effects leading to population-level impairments. Sensitivity to the thinning effects of p.p'-DDE varies among species. Species that are less sensitive to eggshell thinning may be at risk of endocrine disrupting effects of o,p'-DDT on developing embryos (e.g., developmental feminization) (Fry and Toone 1981). It is assumed that screening levels based on the toxicity of p,p-DDE but applied to total DDTs will protect against adverse effects associated with any of the isomers.

7.2: Wildlife Receptors: Two species of birds were considered as representatives of potentially most exposed aquatic-dependent wildlife to DDT in marsh sediments: One is the light-footed Ridgeway's rail (*Rallus obsoletus longirostrus* or LFRR; formerly light-footed clapper rail), and the other is the snowy egret (*Egretta thula*).

1. The LFRR is a federally endangered bird that is a year-round resident of salt marshes of coastal southern California, including at the San Diego Bay NWR. LFRR forage for food in vegetated marsh and tidal creek channels by gleaning and probing for benthic organisms. Their primary foods are snails and crabs, but they are opportunistic and will eat bivalves, shrimps, worms and fish (Zembal and Fancher 1988). LFRR exposure to sediment-borne DDT is almost completely via diet, but there may be some exposure via incidental ingestion of sediment while foraging as well. The LFRR is larger than two other rallid species with similar feeding habitats that might occur in the restored salt marsh (i.e. the Sora and the Virginia rail), but only infrequently and generally not during the nesting season (SDSU San Diego Bird Atlas). However, it is the same size or smaller, therefore has equal or greater nutritional needs, than most species with similar feeding habits that commonly forage in San Diego Bay salt marshes (e.g., willet, long-billed curlew and whimbrel). Given the estimated nutritional needs, and year-round residency, the LFRR is considered a reasonably conservative representative of marsh birds that rely on resident mid-trophic level invertebrates for food, and will be exposed to site-specific DDT during the nesting season.

2. The snowy egret is a wading bird that can be found foraging for fish in San Diego Bay marshes while nesting in colonies at nearby locations. The snowy egret mainly eats fish, but may opportunistically consume invertebrates and small terrestrial vertebrates. Because most of their diet is fish, snowy egrets are considered upper trophic level aquatic-dependent predators that may encounter even higher DDT concentrations in their diet than will species such as the LFRR. The snowy egret is one of the smaller wading bird species, which include egrets, herons and bitterns, and as such has proportionally

[1] Note: the highlights are provided to bring the reader's attention to the specific steps in this analysis.

greater nutritional needs than other larger species. Because of its diet, food requirements and foraging habits, snowy egrets are considered a conservative representative of piscivorous birds given they rely on upper trophic level salt marsh biota (fish) for food and are relatively small among wading birds.

7.3 General Approach: A couple approaches were used to derive wildlife risk-based sediment screening levels, determined largely by the kinds of data available for assessing effects thresholds in birds and relating thresholds for eggs and diet to concentrations in sediment. This is provided because each approach will give somewhat different but valid results relative to the question of risk posed by the sediments.

1. Tissue targets for p,p'-DDE and/or total DDTs in avian eggs: recommend 1.5 mg $_{DDT}$/kg wet weight (ww).

Total DDT and p,p'-DDE concentrations in eggs have been related to eggshell thinning and reduced nesting success of numerous avian species. Eggshell thinning appears to be one of the most sensitive of the adverse effects in birds (i.e., occurs at lower dose levels than other adverse effects such as neurotoxicity).

1a) There are species differences in sensitivity, reflected by DDE concentrations associated with eggshells that are 20% thinner than shells collected before DDT was in heavy use (e.g., pre 1940s). This is a convenient benchmark for comparison, but this extent of thinning (15–20%), when it is persistent over several years, is associated with population level impacts in many species. DDE concentrations in eggs associated with 20% shell thinning (as mg /kg ww; from Blus 2011) include:

- 5 - 10 mg $_{DDT}$/kg ww (pelican, condor, prairie falcon, osprey, sparrowhawk, ibis)
- 10 - 20 mg $_{DDT}$/kg ww (loon, great blue heron, peregrine falcon, and merlin)
- >50 mg $_{DDT}$/kg ww (black crowned night heron and bald eagle)

1b) DDE concentrations associated with adverse effects at <20% shell thinning – pelicans (Blus 1984)

- 3.0 mg $_{DDT}$/kg ww is associated with colony collapse (= effect concentration for productivity)
- 2.0 mg $_{DDT}$/kg ww is associated with productivity that is indistinguishable from productivity observed with non-detectable DDE levels in eggs (= potential no effect concentration for productivity). This concentration may affect eggshell thickness, but not to the extent that productivity is affected.

1c) Estimated no effect threshold for eggshell thinning in sensitive species - Using regression equations from Fry (1994) relating p,p'-DDE concentration to percent of pre-DDT eggshell thickness, one can estimate DDE concentration for an eggshell with no thinning (equal to 100% of pre-DDT eggshell thickness). This would be a true no-effect level for pp'-DDE relative to all endpoints, given it applies to the most sensitive

endpoint.

- 1.5 mg $_{DDT}$/kg ww for brown pelican, and 1.2 mg/kg ww for double-crested cormorant.

1d) Data specific to rails and/or snowy egrets.

- 1.0 – 2.0 mg $_{DDT}$/kg ww in CA clapper rail eggs; no effect for shell thinning (Lonzarich et al. 1992)
- 0.45 & 1.02 mg $_{DDT}$/kg ww (means; range 0.197 – 1.78) in light footed clapper rail from Tijuana Slough and Seal Beach NWRs; no effect on shell thinning (Goodbred et al 1996).
- 2.13 mg $_{DDT}$/kg ww (mean; range 0.63-5.60) in light footed clapper rail eggs from Mugu Lagoon; no effect on shell thickness relative to pre-DDT, but shells thinner than for eggs from Seal Beach and Tijuana Slough NWRs (Goodbred et al 1996). Although we have a difference between sites in terms of measured eggshell thickness, this is not likely to have been manifested in adverse effects in productivity given the eggshell measurements were, for the most part, similar to pre-DDT era eggshells.
- 0.41, 0.97 and 1.3 mg $_{DDT}$/kg ww (means; overall range 0.1 – 6.4 mg/kg ww) in clapper rail eggs collected in 1972-73 from 3 Atlantic coast locations. No effect levels for eggshell thickness compared with pre-1947, but there were location-specific variations for both pre- and post- 1947 eggs (Klaas et al 1980).
- 1.05 mg $_{DDT}$/kg ww in single light-footed clapper rail egg; eggshell thickness within range for pre-DDT use, but thinner than eggs collected at the same time and location, but with lower concentrations (~0.45 – 0.70 mg/kg ww; Sutula et al 2005).
- 1.0 – 5.0 mg $_{DDT}$/kg ww in snowy egret egret eggs; no effect on productivity (Henny et al 1985)
- 5.0 – 10 mg $_{DDT}$/kg ww in snowy egret eggs; effect level for productivity (Henny et al 1985)

These species-specific concentrations give us confidence that our proposed target in avian eggs of 1.5 mg DDT/kg ww is appropriately protective for the rail and the egret.

Based on concentrations of DDE/total DDT in eggs, pelicans are among, if not the most sensitive species for eggshell thinning (compared with pre-DDT use) and productivity effects of DDT (primarily DDE). For pelicans, productivity in the field is impacted @ 3.0 mg/kg ww, but DDE-related impacts are not detectable @ 2.0 mg/kg ww, and an estimated no effect level for eggshell thinning is 1.5 mg/kg ww.

For rails, no shell thinning (compared with pre-DDT eggs) has been detected with mean concentrations of 1.02 mg/kg ww (Goodbred et al. 1996), and 1.3 mg/kg ww (Klaas et al. 1980). There is limited information to suggest that subtle thinning (but not different from pre-DDT eggs) may occur with concentrations as low as ~1.0 mg/kg ww. But the effect may be due to population-related variation in shell thickness or statistical artifact. The available data suggest that light-footed Ridgeway's rails are no more sensitive than pelicans to the eggshell thinning and productivity effects of DDT. Data are insufficient

to determine if rails are less sensitive than pelicans. In comparison, data on snowy egrets indicate that they are less sensitive to DDT than pelicans. The recommended screening level is based on no effects in pelicans and as such will be protective of other species as well.

A screening level of 1.5 mg $_{DDT}$/kg egg ww is recommended for total DDT concentration in eggs. This value is based on data for pelicans. It is considered protective of rails and is within the range of no effect levels for snowy egrets.

2. Tissue targets for p,p'-DDE and/or total DDTs in avian diets (mg $_{DDT}$/kg fish or invertebrate ww).

2a) Combining the screening level for eggs (1.5 mg $_{DDT}$/kg egg ww), with egg-to-diet concentration ratios. Wet weight-based ratios were used, consistent with concentrations and ratios reported in the literature.

- Egg/invertebrate ratios in clapper rail studies - rail egg/crab ratios ~25 (Goodbred et al. 1996 & Foehrenrich et al. 1972), and rail egg/snail ratio ~73 (Foehrenrich et al. 1972). Given the target concentration of 1.5 mg/kg in rail eggs, corresponding target concentrations in crabs is 0.06 mg/kg ww and in snails, it would be 0.021 mg/kg ww, or an overall average of 0.03 mg/kg ww, assuming a 50:50 mix.
- Egg/forage fish ratios in studies of piscivorous birds - egg/fish ratios are generally between 20 and 60 (Davis et al 2007). Values of 32 to 45 have been reported for herring gulls on Lake Ontario (Braune and Norstrom 1989), and values between 15 and 32 are indicated by data for California brown pelican (Anderson et al. 1975). In one study by Zeeman et al (2008), the average concentration of total DDT in forage fish from South San Diego Bay was 0.042 mg/kg ww. Corresponding bird egg/fish concentration ratios were 43 using black skimmer and Caspian tern eggs and approximately 10 using elegant and California least tern eggs. If using the geometric mean concentration for all seabird egg samples (1.08 mg $_{DDT}$/kg egg ww), the average ratio is 25. With a target DDT concentration of 1.5 mg $_{DDE}$/kg egg ww, the target DDT concentration in forage fish consumed by egrets (or other piscivorous birds) based on the ratios of 10-43 identified above would be between 0.150 mg/kg ww and 0.034 mg/kg ww, or an overall average (based on the mean of 25) of 0.060 mg $_{DDT}$/kg fish ww.

Ratios used to estimate dietary screening levels from the avian egg screening level, are averages. For rails, geometric mean concentrations for snails and crabs were used. Similarly, for piscivorous birds, geometric mean concentrations of multiple species of forage fish were used. This was done because (1) data are limited, and (2) birds generally consume a variety of species. Also, data from four species of piscivorous birds were combined to produce a geometric mean concentration of DDT in bird eggs. This was done to simplify the analysis (using an average rather than a range), and we deemed it appropriate given we know that the snowy egret is not among the most sensitive species.. The outcome (estimated dietary concentration) is less conservative than what the worst

case value would be, but the difference is less than 2-fold. If you assume the worst case at every step, it is possible to end up with a totally protective, yet totally unrealistic, result. We were trying to strike a balance between these two. Overall, the egg/diet ratios used for estimates in this analysis are: Rail eggs/invertebrates = 50 and piscivorous bird egg/fish = 25.

2b) Reference dose (TRV)-based (combined with food ingestion rates estimated from Nagy 2001)

- TRV @ 0.014 mg/kg-d (a hybrid approach using field data, and therefore some uncertainty about actual concentrations in diet): This TRV is a chronic value for California brown pelican, a species known to be sensitive to these effects (USEPA 1995), adjusted downward by a Lowest Observed Adverse Effect Level (LOAEL) to No Observed Adverse Effect Level (NOAEL) uncertainty factor of 2.0 (based on observed low effect- and estimated no effect concentration in egg for eggshell thinning), combined with an egg/diet concentrations ratio of 32X (from Anderson et al. 1975). Using ingestion rates from Nagy (2001), combined with a TRV of 0.014 mg/kg-d, the estimated dietary screening level for LFRR (concentrations in invertebrates) is 0.027 mg $_{DDT}$/kg ww and the screening level for snowy egret (concentrations in fish) is 0.029 mg $_{DDT}$/kg ww.

- TRV @ 0.227 mg/kg-d (from lab studies with known concentrations in diet): Highest bounded NOAEL lower than the lowest bounded LOAEL for effects on growth, reproduction and survival in multiple avian species including waterfowl and double-crested cormorants (a sensitive species; EPA ECO-SSL). It is equal to or less than bounded and unbounded NOAELs for biochemical effects, pathology, survival and growth in sub-chronically (9 week) exposed double-crested cormorants. Other than cormorants and kestrels, most of the species represented by the TRV are not among the most sensitive (Item 1a above). Consequently, this TRV is considered an upper bound of no effects-based TRVs. This approach is a reasonable one to use in assessing risk more broadly among species, as it is not based on the most sensitive endpoints nor on the most sensitive species. Using ingestion rates from Nagy (2001), combined with a TRV of 0.227 mg/kg-d, the estimated upper bound dietary screening level for LFRR (concentrations in invertebrates) is 0.432 mg $_{DDT}$/kg ww and the screening level for snowy egret (concentrations in fish) is 0.465 mg $_{DDT}$/kg ww.

2c) Literature values: 3.0 mg/kg ww: Concentration in avian diet which could cause adverse impacts (Goodbred et al. 1996)

Table 8: Screening levels for total DDT in marsh bird diets (mg $_{\text{total DDT}}$/kg diet ww)

Approach	Rails – Concentration in invertebrates
Egg SL/invertebrate ratio[+]*	0.030
Dose rate (hybrid)*	0.027
Dose rate (lab based)**	0.432
Approach	**Egrets – Concentration in forage fish**
Egg SL/fish ratio[+]*	0.060
Dose rate (hybrid)*	0.029
Dose rate (lab based)**	0.465

[+] Based on field collections from southern California
* Based on No Observed Adverse Effects Levels in most sensitive species
** Based on No Observed Adverse Effects Levels in a few studies on most sensitive, but primarily in studies on less sensitive species; considered here as an upper bound no observed adverse effect level for avian species that forage in salt marsh habitats.

3. Sediment targets for total DDTs

3a) Benthic community:

ER-L = 0.00158 mg/kg dry weight (dw) and ER-M = 0.0461 mg/kg dw, (Long et al 1995). These two guidelines delineate three concentration ranges: concentrations below the ER-L represent "minimal-effects range" (adverse effects rarely observed), concentrations between the ER-L and ER-M represent a "possible effects range" (adverse effects may occur occasionally), and concentrations equal to or greater than the ER-M represent the "probable effects range" and at which effects to benthic invertebrates would frequently occur. (Note: the effect levels are considered to apply to an “active zone” that is 20 mm deep. These benchmarks would not be applicable to a thin layer such as that associated with our modeled sediment deposition as that thin layer is not biologically meaningful to the species and circumstances evaluated in this compellation.)

3b) Reference concentrations for San Diego Bay, with the term "reference" representing DDT concentrations measured in sediments from San Diego Bay, and not in the immediate vicinity of known contaminated sites

0.001 mg/kg ww, or between 0.0013 and 0.0016 mg/kg dw. These are geometric mean concentrations from the USFWS south San Diego Bay mudflats study (unpublished) and the F&G Street Marsh study (Zeeman et al. 2008a)

3c) Wildlife risk-based sediment screening levels using target concentrations in invertebrates and forage fish, combined with biota/sediment ratios (data are very limited)

Ratios are wet weight-based using geometric mean concentrations. USFWS south San Diego Bay mudflats study (unpublished) California horn snail/sediment = 2.5, fiddler crab/sediment = 6.8, and forage fish/sediment = 27. The ratio for invertebrates in general (fiddler crabs and snails combined) = 4.1. Goodbred et al. (1996) report shore crab/sediment ratios of 1.3 and 2.2, for two southern California salt marshes. (dry weight-based ratios available in Sutula et al. 2005; wet weight-based ratios would be lower than reported). These are the actual relationships derived from the field data collected by the Carlsbad Fish and Wildlife Office.

Overall, the biota/sediment ratios used for estimates in this analysis are: 3.0 for invertebrates /sediment and 27 for forage fish/sediment (all wet weight). The former ratio is another case where we avoided pursuing the worst case scenario into what would be an unrealistic result. We know that rails do eat more than one prey type.

Table 9: Inputs and estimates of wildlife risk-based screening levels for DDT in marsh sediment

Dietary screening levels (mg DDT/kg diet ww)	diet/sediment ratio (ww / ww)	Sediment screening level (mg $_{DDT}$/kg sediment ww)	Sediment screening level (mg $_{DDT}$/kg sediment dw)*
Rails (invertebrates)			
0.030	3	0.010	0.017
0.027	3	0.009	0.015
0.432	3	0.144	0.240
Snowy egrets (fish)			
0.060	27	0.002	0.003
0.029	27	0.001	0.002
0.465	27	0.017	0.028

* wet weight-dry weight conversion based on geometric mean moisture contents for sediment samples from the south San Diego Bay mudflats study (=35) and in F&G street marsh study (=43%);

Table 10: Summary of estimated wildlife risk-based screening levels for DDT in salt marsh sediments, San Diego Bay NWR

Dietary screening levels (mg/kg ww)		Sediment screening levels (ug/kg dw)[#]
Rails - Concentration	Approach	Concentration
0.030	Egg SL/invertebrates ratio*	17
0.027	Dose rate (hybrid)*	15
0.432	Dose rate (lab based)**	240
Egrets - Concentration	Approach	Concentration
0.060	Egg SL/fish ratio*	3
0.029	Dose rate (hybrid)*	2
0.465	Dose rate (lab based)**	28

[#] For comparison: more broadly, surficial sediments in San Diego Bay have concentrations of 1.3-1.6 ug/kg dw, ER-L = 1.58 ug/kg dw, and ER-M = 46.1 ug/kg dw .

* Based on No Observed Adverse Effects Levels in most sensitive species

** Based on No Observed Adverse Effects Levels in a few studies on most sensitive, but primarily in studies on less sensitive species; considered here as an upper bound no observed adverse effect level for avian species that forage in salt marsh habitats.

7.4) Risk Assessment of DDT Deposition in the ORERP for the 100-Year Flood: The results of the first deposition scenario, (cf. row_2 of Table 5; Figures 9 & 10) were used as the starting point for the risk evaluation. This evaluation considers the potential for sediment concentrations of DDTs to impact the benthic organisms and thus the prey base for aquatic dependent wildlife and the potential for bioaccumulation of these compounds to result in impacts on the aquatic-dependent birds that are expected to use the restored areas. In evaluating these concerns, we needed to take into consideration not only the concentration of DDTs in the deposited materials, but how those deposited materials would result in exposure by the benthic organisms. For this element of the evaluation, we calculated exposure concentrations in the context of a vertical sediment layer. We assumed that sediments exposed by the restoration, but before deposition of flood-associated particles, have low levels of DDT equal to what has been observed in sediments from mudflats and marshes of south San Diego Bay (see notes in Table 8 above).

The vertical layer that was used was 20 mm (2 cm), as that thickness is used as the "active layer" for a variety of studies related to evaluation of sediment toxicity, including laboratory bioassays and in-situ mussel data (Long et al. 1995), and was deemed reasonable to represent the potential trophic relationships for the species evaluated here. The model outputs included the estimated depths of deposition of the contaminated materials in addition to the

estimated concentration (70.2 ug/kg dw). In consideration of the range of particle sizes and the locations in which deposition would occur, the model results in Figures 9 & 10 indicated that a 3.3 to 8.0 mm layer of contaminated material would be deposited in restored areas over clean sediments (as based on soil and sediment sampling at depth). Over time, this would become fully consolidated into a layer 0.55 to 1.4 mm thick (Table 5, row-2, column_8). Using a depth-proportional exposure approach, assuming all exposure occurs within the top 20 mm, we calculated that the contamination experience by the benthic biota would range from approximately 13 to 29 ug/kg (dw) initially and would decrease with settlement to a final 20 mm-based concentration of 3.5 to 6.4 ug/kg (dw), see Table 9, row_2, column_10. While this approach does not take into consideration the potential effects of sediment density on the foraging behaviors of benthic organisms (and any resultant changes in exposure), we see this as a reasonable way to incorporate the thickness of the deposited material into our consideration of near-term and long-term potential effects in the restored areas (note that colonizing benthic organisms are not likely to be present in the early stages of settling). Given many benthic species burrow and forage to considerably deeper depths within the sediments, thus averaging the exposure over much thicker layers of clean sediment, we considered this to be a conservative approach.

Results for the 20 mm-based concentrations of the worst-case sediment deposition scenario appear in red font in column_10 of Table 9. The estimated post-flood DDT concentration for this worst case scenario is based on the assumption that DDT- contaminated soils from the former agricultural fields are the only source of sediment settled in restored marsh following a 100-year flood (column_10, row_5 through row_7 in Table 9). These results are considered worst case because higher concentrations could only occur if sediment from other (upstream) sources, and with higher DDT concentrations than those from the former agricultural fields, were added to the mix entering the restored marshes of the ORERP. Given the mixed but predominantly urban land uses in the Lower Otay River watershed (Aspen Environmental Group 2005), suspended fine-grained sediment entering the Otay River floodplain from upstream sources are expected to have lower DDT concentrations than fines from the former agricultural fields (e.g., Mahler et al. 2006). Consequently, the estimated DDT concentration in post-flood sediments under worst the case scenario (i.e., all from the former agricultural fields) forms the upper limit on what may occur in the marsh, and actual concentrations, which include contributions from less contaminated upstream sources, will be lower. Other, lower impact cases for the worst case scenario have also been considered in column_11 and in column_12 of Table 9 where depth-proportional exposure approach of the sensitivity analysis includes bioturbation exposures occurring within the top 40 mm and top 80 mm of the muddy sediments in the tidal basins of the ORERP for comparison. The depth of bioturbation will be determined by the species that ultimately colonize the tidal basins, but we would not expect that to be less then approximately 20 mm, and it could be more than 80 mm.

The final step in this evaluation was comparing our 20 mm, 40 mm and 80 mm-based DDT concentrations to our screening values. Relative to impacts on the benthic organisms as the prey base, the maximum short-term concentrations in Table 11 (initial concentrations) of 13-29 ug_{DDT}/kg dw fall between the ER-L and ER-M values (1.58 ug/kg dw and 46.1 ug/kg dw, respectively). Thus, we would expect that impacts on benthic organisms could occur

occasionally during the short-term. Given the likelihood of effects combined with the short-term nature of this condition, population level impacts are expected to be limited in nature and extent. Once post-flood muddy deposits in the ORERP have compacted and consolidated, the DDT concentrations in the top 20 mm of muddy sediment, at 4.2-7.9 ug_{DDT}/kg dw are very close to the ER-L, and even lower for the top 40 mm and top 80mm of sediment; so that negative effects are expected to be rare. This condition is not likely to have a measurable effect on the prey base for aquatic-dependent species.

In regards to the aquatic-dependent birds' exposures to contaminated prey resulting in impacts, comparison of the 20 mm-based concentrations to our screening levels indicates that these concentrations fall within the range of our highest and lowest NOAELs. Given the species known to be the most sensitive are pelicans and cormorants, which are very closely related, and our target species are not members of groups believed to be particularly sensitive, impacts on aquatic-dependent birds are unlikely to result from the anticipated deposition of DDT-contaminated sediments following a 100-year flood event.

Scenario	Volume of Eroded DDT-Bearing Fines	Average DDT Conc. in DDT-Bearing Fines	Volume of Eroded Clean Fines	Flood Flow Volume	Suspended Sediment Conc.	Initial Post-Flood Deposition Thickness (200 g/l Mud)	Final Post-Flood Deposition Thickness (1,200 g/l Mud)	DDT Conc. in Post-Flood Mud Deposition (dry bulk)	Average DDT Concentration in top 20 mm of Sediment Post-Flood Initial	Average DDT Concentration in top 20 mm of Sediment Post-Flood Final	Average DDT Concentration in top 40 mm of Sediment Post-Flood * Initial	Average DDT Concentration in top 40 mm of Sediment Post-Flood * Final	Average Concentration in top 80 mm of Sediment Post-Flood* Initial	Average Concentration in top 80 mm of Sediment Post-Flood* Final
Erode top 3 ft. of Contaminated Area + Upper Watershed	128,300 cubic yards	310 µg/kg	438,000 cubic yards	24,290 acre ft	23.15 g/l.	3.3 mm to 8.0 mm	0.5 mm to 1.4 mm	70.2 µg/kg	13 – 29 µg/kg	3.5 – 6.4 µg/kg	7.3 – 15 µg/kg	2.5 – 4.0 µg/kg	4.4 – 8.5µg/kg	2.1 – 2.8 µg/kg
Erode top 1 ft. of Contaminated Area + Upper Watershed	24,260 cubic yards	790 µg/kg	438,000 cubic yards	24,290 acre ft	18.90 g/l	2.7 mm to 6.5 mm	0.4 mm to 1.1 mm	41.5 µg/kg	7.0 – 15 µg/kg	2.4 – 3.8 µg/kg	4.3 – 8.1µg/kg	2.0 – 2.7 µg/kg	2.9 – 4.8 µg/kg	1.8 – 2.1 µg/kg
Erode top 2 ft. of Contaminated Area + Upper Watershed	76,350 cubic yards	430 µg/kg	438,000 cubic yards	24,290 acre ft	21.03 g/l	3.0 mm to 7.3 mm	0.45 mm to 1.3 mm	63.8 µg/kg	11 – 24 µg/kg	3.0 – 5.6 µg/kg	6.3 - 13µg/kg	2.3 – 3.6µg/kg	3.9 – 7.3µg/kg	1.9 – 2.6 µg/kg
Erode top 3 ft. of Contaminated Area Only**	128,300 cubic yards	310 µg/kg	0 cubic yards	24,290 acre ft	5.25 g/l	0.75 mm to 1.8 mm	0.17 mm to 0.41 mm	310 µg/kg	13 – 29 µg/kg	4.2 – 7.9 µg/kg	7.4 – 15 µg/kg	2.9 – 4.8 µg/kg	4.5 – 8.5 µg/kg	2.3 – 3.2 µg/kg
Erode top 1 ft. of Contaminated Area Only	24,260 cubic yards	790 µg/kg	0 cubic yards	24,290 acre ft	0.99 g/l	0.14 mm to 0.34 mm	0.02 mm to 0.06 mm	790 µg/kg	7.1 – 15µg/kg	2.4 – 4.0 µg/kg	4.4 – 8.3 µg/kg	2.0 – 2.8 µg/kg	3.0 – 5.0 µg/kg	1.8 – 2.2 µg/kg
Erode top 2 ft. of Contaminated Area Only	76,350 cubic yards	430 µg/kg	0 cubic yards	24,290 acre ft	3.12 g/l	0.44 mm to 1.1 mm	0.07 mm to 0.12 mm	430 µg/kg	11 – 25 µg/kg	3.1 – 4.2 µg/kg	6.3 – 13 µg/kg	2.3 – 2.9 µg/kg	4.0 – 7.5 µg/kg	2.0 – 2.2 µg/kg
Erode top 1 ft. of Contaminated Area + Upper Watershed: 50-year event	24,260 cubic yards	790 µg/kg	150,300 cubic yards	13,805 acre ft.	12.60 g/l	1.8 mm to 4.3 mm	0.30 mm to 0.72 mm	110.7 µg/kg	11 - 25µg/kg	3.3 – 5.5µg/kg	6.5 - 13 µg/kg	2.4 – 3.6µg/kg	4.1 – 7.5 µg/kg	2.0 – 2.6 µg/kg
Erode top 1 ft. of Contaminated Area Only: 50-year event**	24,260 cubic yards	790 µg/kg	0 cubic yards	13,805 acre ft.	1.8 g/l	0.26 mm to 0.62 mm	0.06 mm to 0.14 mm	790 µg/kg	12 – 26 µg/kg	4.0 – 7.1 µg/kg	6.7 - 14µg/kg	2.8 – 4.4µg/kg	4.2 – 7.7µg/kg	2.2 – 3.0µg/kg

Table 11: Matrix of Sensitivity Analysis of Potential DDT Deposition in the ORERP post-100 and post-50 year flood events.

***** Values initially calculated for these columns were calculated incorrectly; these are the revised values (please see comparison below).

**Entries in blue are based on 50-year floods.

8.0) References:

Anderson, D.W., J.R. Jehl, Jr., R.W. Risebrough, L.A. Woods, Jr., L.R. DeWeese and W.G. Edgecomb. 1975. Brown pelicans: Improved reproduction off the southern California Coast. Science 190:806-808.

Anchor 2013. Sampling and Analysis Report, Otay River Estuary Restoration Soil Characterization Program. Final Report Prepared by Anchor QEA for Poseidon Water, LLC, March 2013.

Aspen Environmental Group. 2006. Otay River Watershed Management Plan prepared for the Cities of Chula Vista, Imperial Beach and San Diego, and the County of San Diego and the San Diego Unified Port District. Aspen Environmental Group, Sacramento, CA. 665 pp.

Blus, L.J. 1984. DDE in birds' eggs: comparison of two methods for estimating critical levels. Wilson Bull. 96(2):268-276.

Blus, L.J. 2011. DDT, DDD, and DDE in birds. In "Environmental Contaminants in Biota, Interpreting Tissue Concentrations, Second Edition." W. N. Beyer and J.P. Meador, eds. CRC Press, Boca Raton, Florida. pp. 425-446.

Braune, B.M. and R.J. Norstrom. 1989. Dynamics of organochlorine compounds in herring gulls: III. Tissue distribution and bioaccumulation in lake Ontario gulls. Environ. Toxicol. and Chem. 8:957-968.

Davis, J.A., J.L Grenier, A.R. Melwani, S.N. Bezalel, E.M. Letteney, E.J. Zhang, and M. Odaya. 2007. Bioaccumulation of pollutants in California waters: A review of historic data and assessment of impacts on fishing and aquatic life. Report to California State Water Resources Control Board, Surfance Water Ambient Monitoring Program. San Francisco Estuary Institute, Richmond, California. 210 pp.

Everest 2008. Buena Vista Lagoon Restoration Project - Fluvial Hydraulics, Sediment Transport, and Sedimentation Analysis. Final Report Prepared by Everest International Consultants, Inc. for California State Coastal Conservation, October 2008.

Everest 2014. Otay River Estuary Restoration Project Fluvial Hydraulics Study. Prepared by Everest International Consultants, Inc. for Poseidon Water LLC, October 2014.

Foehrenbach 1972. Chlorinated Pesticides in Estuarine Organisms. Journal (Water Pollution Control Federation), Vol. 44, No. 4 (Apr., 1972), pp. 619-624

Fry, D.M. 1994. Injury of seabirds from DDT and PCB residues in the southern California bight ecosystem.

Fry, D.M. and C.K. Toone. 1981. DDT-induced feminization of gull embryos. Science. 213(4510):922-924.

Fujita, H., 1962, *Mathematical Theory of Sedimentation Analysis,* York, Academic 315 pp.

Gallagher, R. H., 1981, Finite Elements in Fluids, John Wiley & Sons, New York, 290pp.

Goodbred, S.L., D.B. Ledig, and C.A. Roberts. 1996. Organochlorine contamination in eggs, prey and habitat of light-footed clapper rails in three southern California marshes. Final Report. U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office, Carlsbad, California. 42 pp.

Henny, C.J., L.J. Blus and C.S. Hulse. 1985. Trends and effects of organochlorine residues on Oregon and Nevada wading birds, 1979-83. Colonial Waterbirds. 8:117-128

Jenkins, S. A. 1980, "Sedimentation control experiments at Mare Island Naval shipyard," *Proc. Dredging Sedimentation Control,* P. Shelly, ed., Pub. EG&G, Washington, p. 41-56.

Jenkins, S. A., D. L. Inman & W. G. Van Dorn, 1981, "Evaluation of sediment management procedures," *SIO Reference Series* No. 81-22, 212 pp.

Jenkins, S. A., & D. W. Skelly, 1983, "Jet array site suitability study at Charleston Naval Station," *SIO Reference Series* No. 83-20, 146 pp.

Jenkins, S. A. & J. A. Bailard, 1989, "Anti-sedimentation system for harbors," *World Wide Shipping*, v. 52, n. 1, p. 70–75.

Jenkins, S. A. and J. Wasyl, 1990, "Resuspension of estuarial sediments by tethered wings," *Jour. Coastal Res.*, v. 6, no. 4, p. 961-980.

Jenkins, S. A. and J. Wasyl, 2014, "Tidal Hydraulics Analysis of the Otay River Estuary Restoration Plan" submitted to Poseidon Resources Corp., 75pp

Klaas, E.E., H.M. Ohlendorf and E. Cromartie. 1980. Organochlorine residues and shell thicknesses in eggs of clapper rail, common gallinule, purple gallinule and limpkin (Class Aves), Eastern and Southern United States, 1972-74. Pesticide Monit. J. 14:90-94.

Krone, R. B., 1962, *Flume Studies of the Transport of Sediment in Estuarial Shoaling Processes, Final Report,*" Hydraulics Engineering Laboratory and Sanitary Engineering Research Laboratory, University of California, Berkeley.

Krone, R. B., 1978, "Aggregation of suspended particles in estuaries," in *Estuarine Transport, Processes,* B. Kjerfve, (ed.). University of South Carolina Press, Columbia, SC, p. 177-190.

Long, E.R., D.D. MacDonald, S.L. Smith and F.D Calder. 1995. Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuarine sediments. Environ. Manage. 19(1):81-97.

Lonzarich, D.G. T.E. Harvey and J.E. Takekawa. 1992. Trace element and organochlorine concentrations in California clapper rail (*Rallus longirostris obsoletus*) eggs. Arch. Environ. Contam. Toxicol. 23:147-153.

Mahler, B.J., Van Metre, P.C., Wilson, J.T., Guilfoyle, A.L., and Sunvison, M.W., 2006, Concentrations, loads, and yields of particle-associated contaminants in urban creeks, Austin, Texas, 1999–2004: U.S. Geological Survey Scientific Investigations Report 2006–5262, 107 p.

Mehta, A. J., 1989, "On estuarine cohesive sediment suspension behavior, *Jour. Geophys. Res.*, 94, (C10), p. 14303-14,314.

Mehta, A. J., E. J. Hayter, W. R. Parker, R. B. Krone and A. M. Teeter, 1989, "Cohesive sediment transport. I: Process description," *Jour. Hyd. Eng.*, vol. 115, no. 8, p. 1076-1093.

Mehta, A. J., W. H. McAnally, Jr, E. J. Hayter, A. M. Teeter, D. Scholellhamer, S. B. Heltzel and W. P. Carey, 1989, "Cohesive sediment transport. II: Application," *Jour. Hyd. Eng*., vol. 115, no. 8, p. 1094-1112.

Nagy, K.A. 2001. Food requirements of wild animals: predictive equations for free-living mammals, reptiles and birds. Nutrition Abstracts and Reviews, Series B. 71(1):21R-31R.

Roberts, J., R. Jepsen, and W. Lick, 1998. Effects of particle size and bulk density on the erosion of quartz particles. Journal of Hydraulic Engineering, 124:1261-1267.

Sutula, M., S. Bay, G. Santolo and R. Zembal. 2005. "Organochlorine, trace elements and metal contaminants in the food web of the light-footed clapper rail, Upper Newport Bay, California". Southern California Coastal Water Research Project Technical Report #467. Southern California Coastal Water Research Project, Costa Mesa, California. 52 pp.

Taylor 1981. Sediment Management for Southern California Mountains, Coastal Plains and Shoreline: Part B Inland Sediment Movements by Natural Processes. Brent D. Taylor, Environmental Quality Laboratory, California Institute of Technology. EQL Report No. 17-B. October 1981.

USEPA (U.S. Environmental Protection Agency). 1995. Great Lakes Water Quality Initiative criteria documents for the protection of wildlife: DDT, Mercury, 2,3,7,8-TCDD and PCBs. EPA/820/B-95/008. USEPA, Office of Science and Technology. Washington, DC. 90 pp.

Wang, P. F., Cheng, R. T., Richter, K., Gross, E. S., Sutton, D., and Gartner, J. W. (1998). "Modeling Tidal Hydrodynamics of San Diego Bay, California." J. Amer. Water Res. Assoc., 34 (5), 1123-1140.

Weiyan, T., 1992, Shallow Water Hydrodynamics, Water & Power Press, Hong Kong, 434 pp.

Zedler, J. B. & G. W. Cox, 1985, "Characterizing wetland boundaries: a Pacific Coast example," *Wetlands*, 4, p. 43-55.

Zeeman, C. S.K. Taylor, J. Gibson, A. Little and C. Gorbics. 2008. Characterizing exposure and potential impacts of contaminants on seabirds nesting at South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge (Salt Works, San Diego Bay). Final Report. U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office. Carlsbad, California. 53 pp.

Zeeman, C. S.K. Taylor, J. Gibson, A. Little and C. Gorbics. 2008a. F&G Street Marsh Contaminants Investigation. Final Report. U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office. Carlsbad, California. 106 pp.

Zembal, R. and J.M. Fancher. 1988. Foraging behavior and foods of the light-footed clapper rail. The Condor. 90(4): 959-962.

APPENDIX-A: Additional Deposition Flux and Deposition Thickness Simulations Supporting Tables 5 and 11

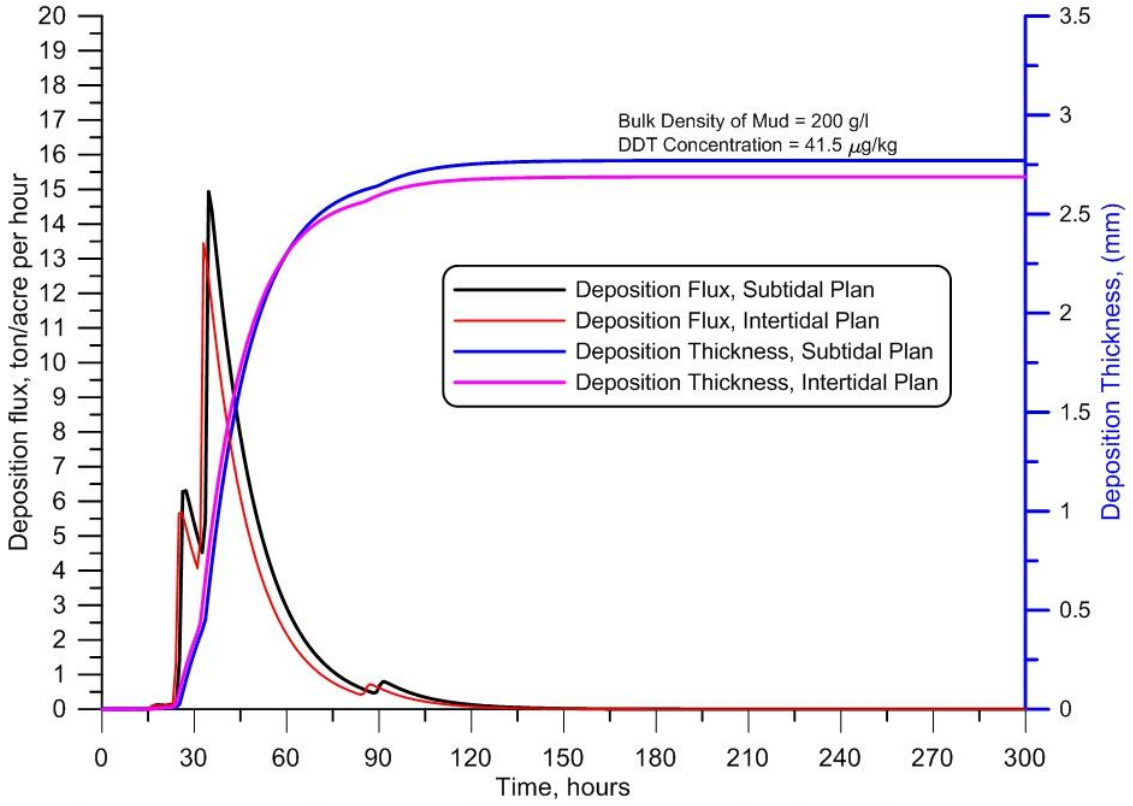


Figure A1. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Otay River Floodplain Tidal Basin following the 100-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 24,260 cubic yards of contaminated fines from erosion of the top 1 ft. and 438,000 cubic yards of clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

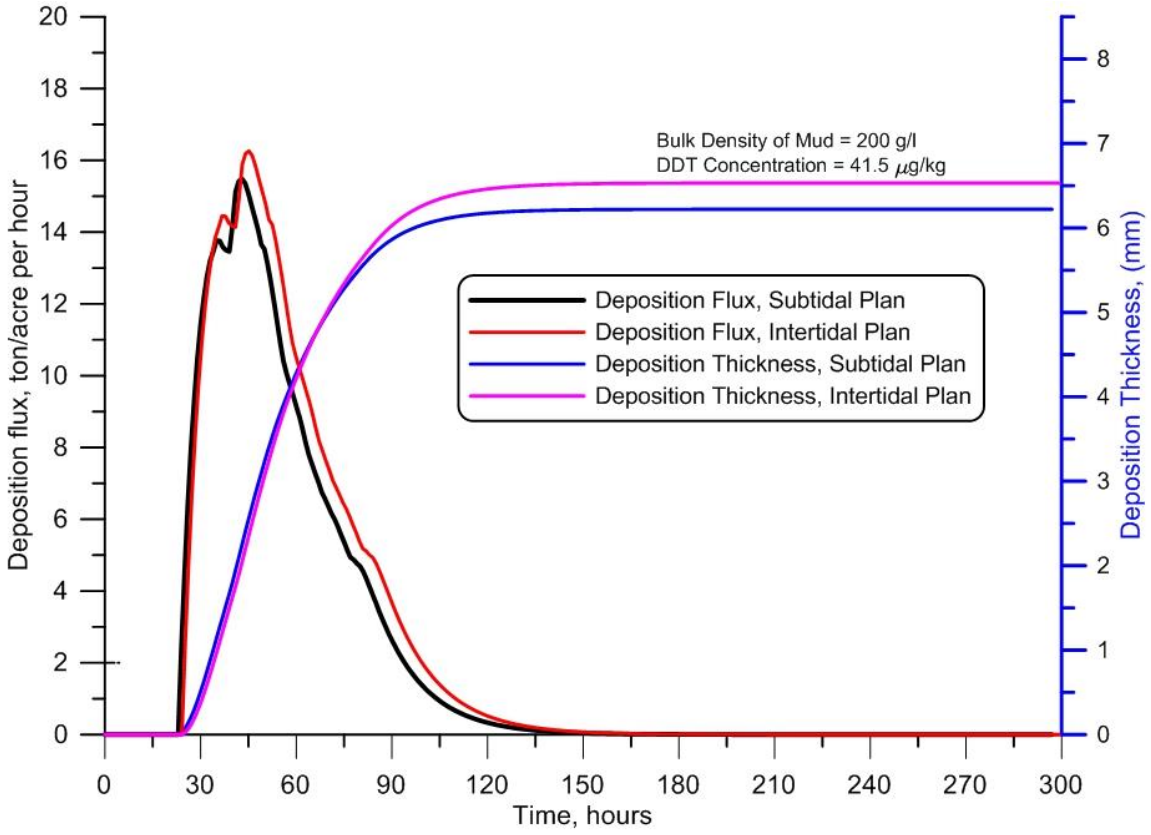


Figure A2. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Pond-15 Tidal Basin following the 100-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 24,260 cubic yards of contaminated fines from erosion of the top 1 ft. and 438,000 cubic yards of clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

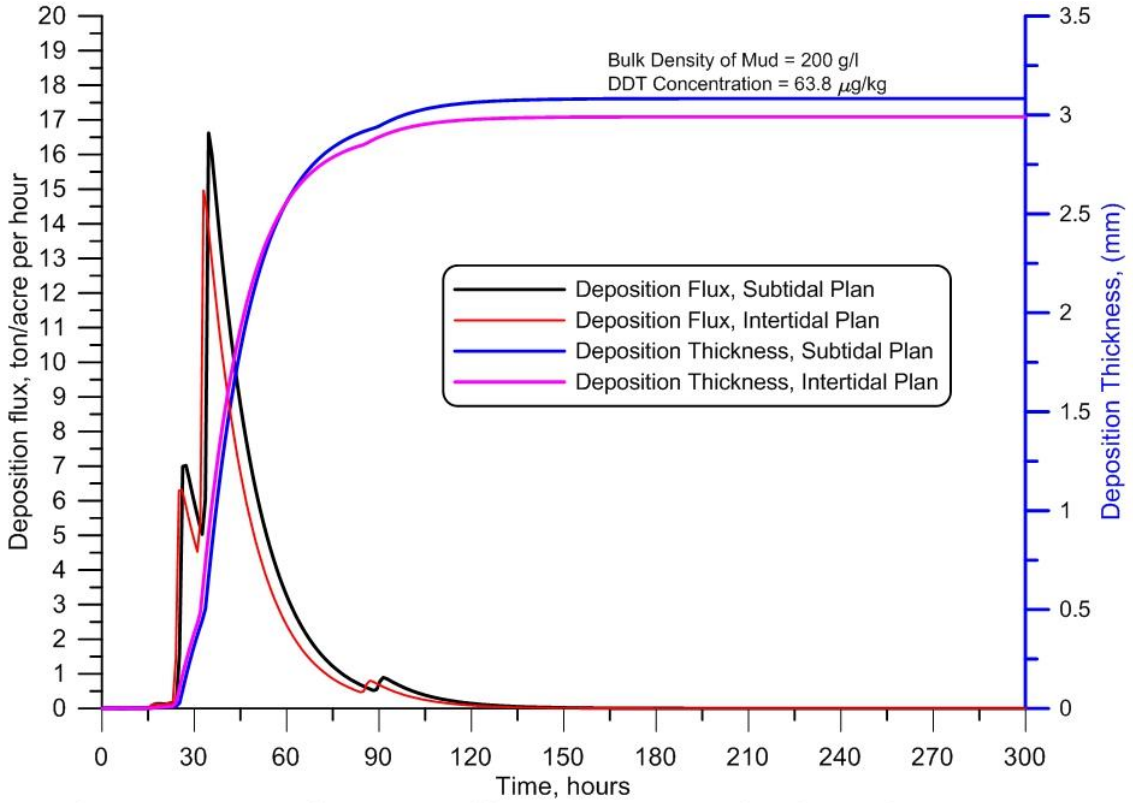


Figure A3. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Otay River Floodplain Tidal Basin following the 100-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 76,350 cubic yards of contaminated fines from erosion of the top 2 ft. and 438,000 cubic yards of clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

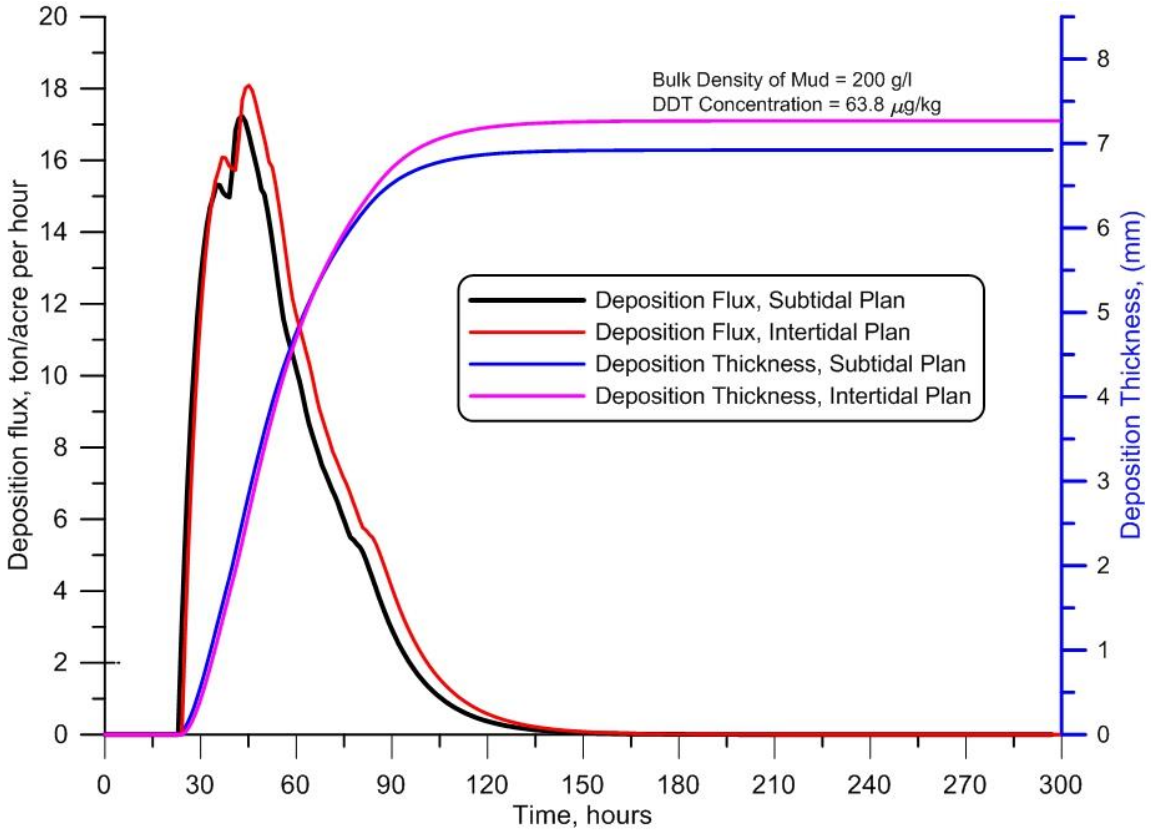


Figure A4. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Pond-15 Tidal Basin following the 100-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 76,350 cubic yards of contaminated fines from erosion of the top 2 ft. and 438,000 cubic yards of clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

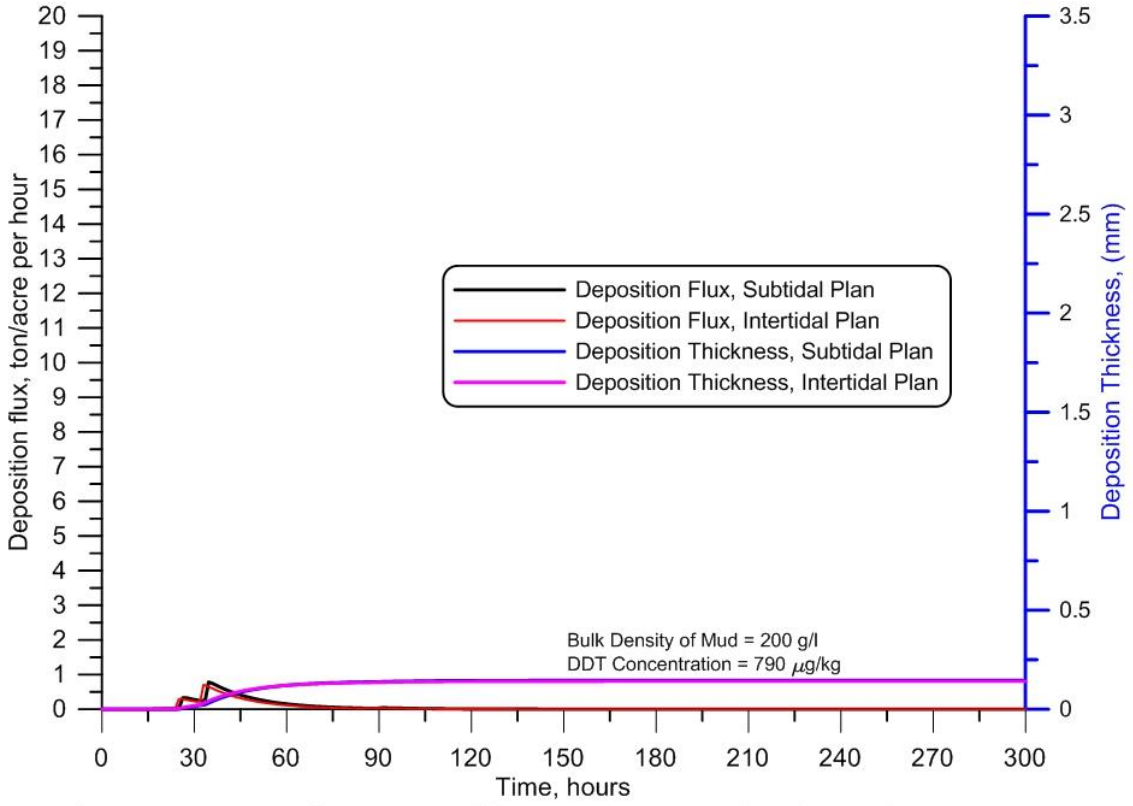


Figure A5. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Otay River Floodplain Tidal Basin following the 100-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 24,260 cubic yards of contaminated fines from erosion of the top 1 ft. and no additional clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

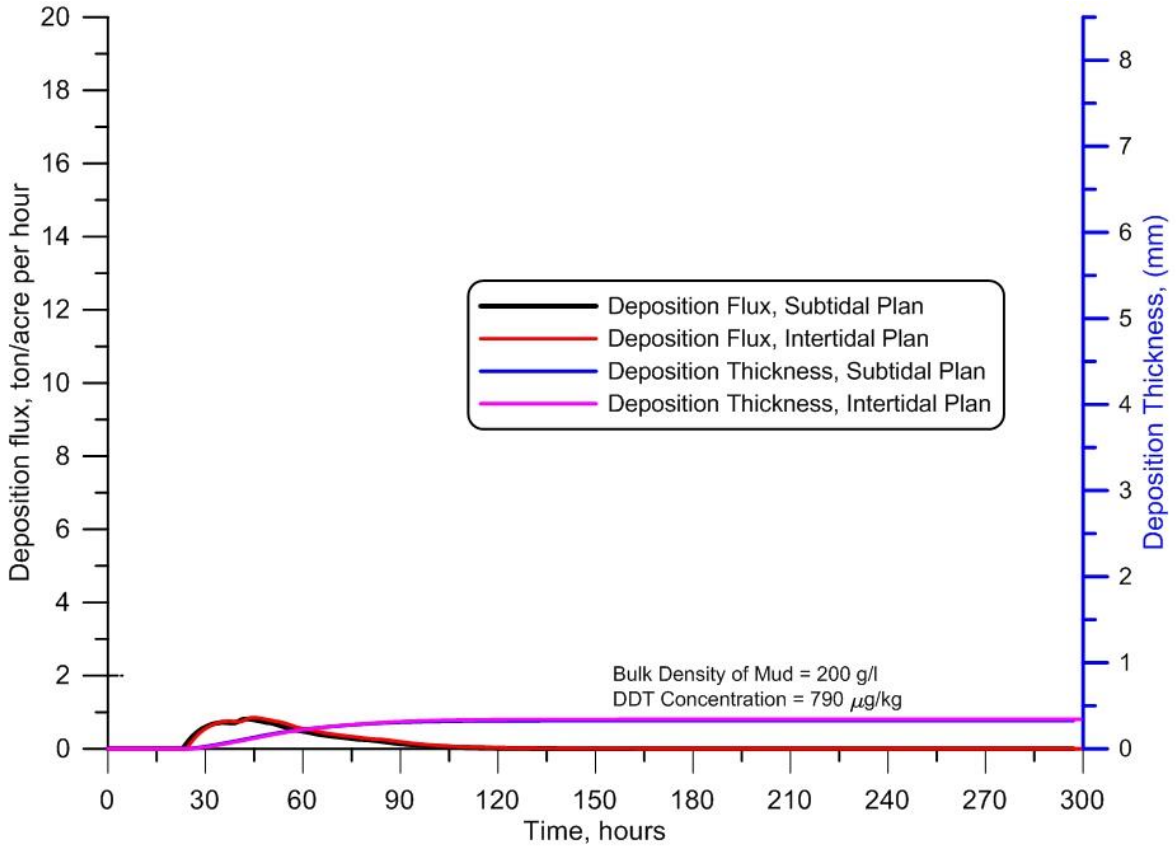


Figure A6. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Pond-15 Tidal Basin following the 100-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 24,260 cubic yards of contaminated fines from erosion of the top 1 ft. and no additional clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

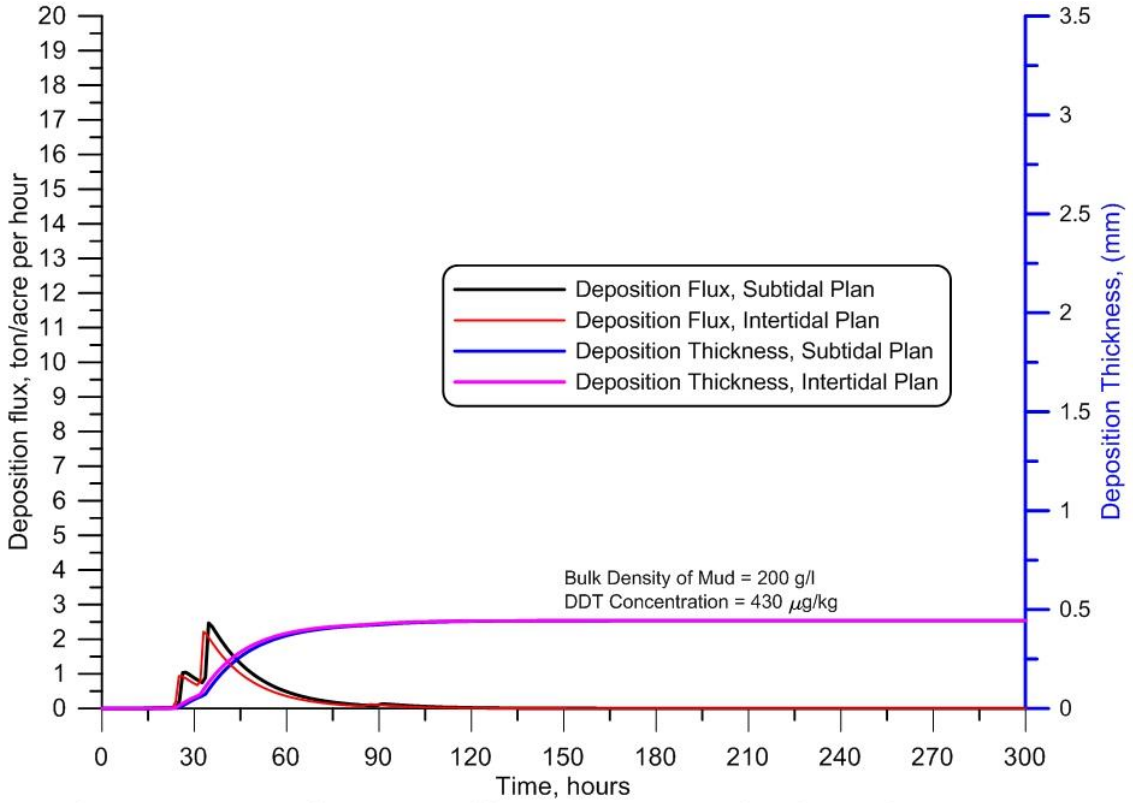


Figure A7. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Otay River Floodplain Tidal Basin following the 100-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 76,350 cubic yards of contaminated fines from erosion of the top 2 ft. and no additional clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

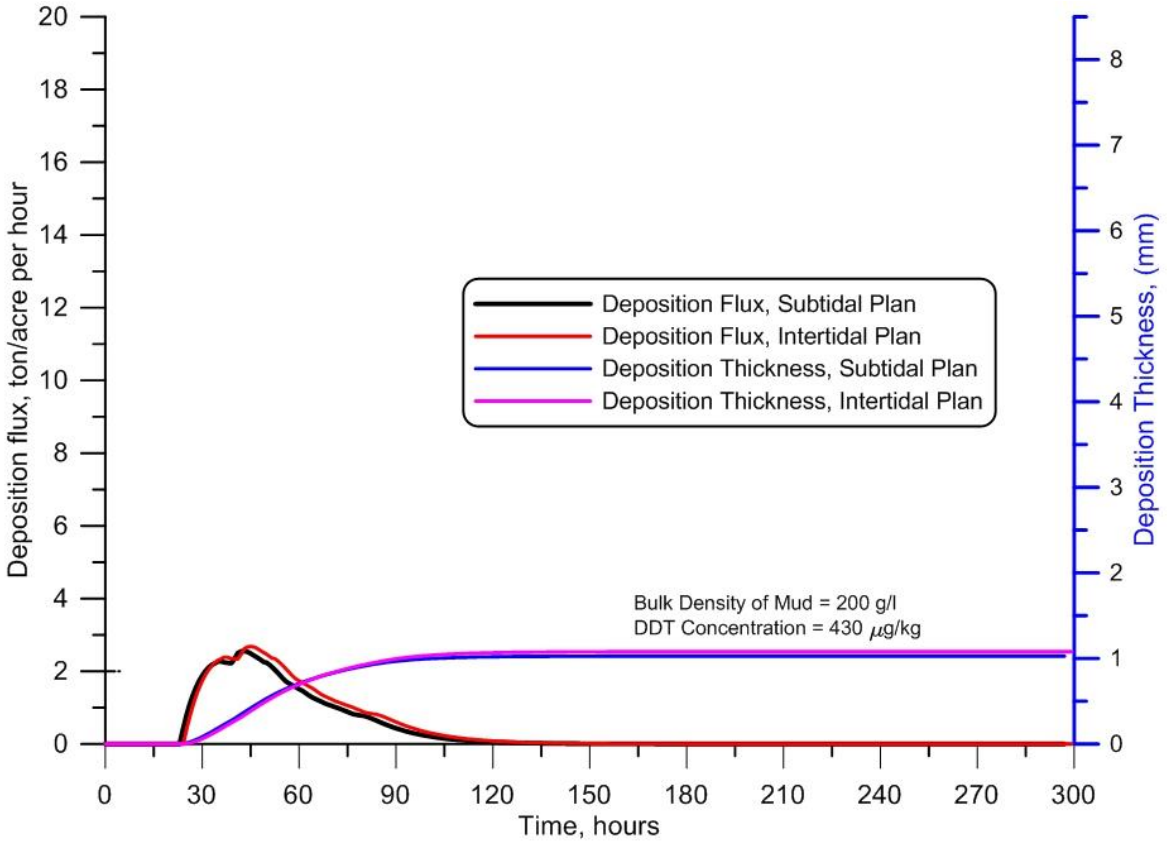


Figure A8. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Pond-15 Tidal Basin following the 100-year flood. Deposition flux (black & red); deposition thickness (blue & magenta). Results for 76,350 cubic yards of contaminated fines from erosion of the top 2 ft. and no additional clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

APPENDIX-B: Additional Deposition Flux and Deposition Thickness Simulations for the *No-Project Alternative* Post 100-Year Flood.

Input Assumptions: The 100-year flood hydrographs for the Otay River, Poggi Canyon Creek and Nestor Creek are unchanged by the presence of the ORERP. The total flow volume during a 100-year flood for the no-project alternative is 35,200,000 cubic yards (cy), or 26,911,315 cubic meters (m^3) for the Otay River. The corresponding flow volumes for Poggi Canyon Creek and Nestor Creek are respectively 2,240,000 cy (1,712,254 m^3) and 1,748,800 cy (1,337,003 m^3), so that the combined flow through the floodplain is $\overline{Q}$ = 39,188,800 cy (29,960,856 m^3), or 24,290 acre ft. Figure B1 give the distribution of maximum stream flow velocities for the 100-year flood in the lower Otay River flood plain and salt pond complex for the no-project alternative, (after Everest, 2014); while Figure B2 gives the velocity distribution for the ORERP Intertidal Alternative and Figure B3 gives the Subtidal Alternative. In each of these figures, the DDT contaminated area is bounded by a yellow polygon in the lower left hand corner.

Comparing the velocities in the DDT contaminated area among Figures B1 – B3, we find the maximum flood velocities for the 100-yr flood are about 0.5 ft/s to 1.0 ft./s greater for the Intertidal and Subtidal Alternatives relative to the no-project alternative. At first impression, this would suggest that the ORERP might cause more soil erosion in the DDT contaminated area than the no-project alternative. However, the sediment stratigraphy in this area indicates this is not the case, as revealed by sediment coring conducted by Anchor QEA (2013). In the DDT contaminated area of the floodplain, the top 3 ft of soils are comprised of 27 % silt and clay ($d < 0.0625$ mm) and 63 % fine sands to coarse sand ($d > 0.0625$ mm). However, from 3 ft to 5 ft below existing grade, 74.1 % of the soils are comprised of silt and clay, and 25.9 % are fine sand to coarse sand. Hence, there is an abrupt transition from more sandy, erodible, material in the top 3 ft, to more cohesive erosion-resistant soil below 3 ft. It was this difference in grain sizes that the original assumption set forth in Section 2.1 was based, whereby the top 3-ft of soil could be completely eroded during a 100-year flood. It is also this abrupt transition in grain sizes at 3 ft below existing grade in the DDT contaminated area that creates a hard enough basement on the depth of erodible soil so that erosion below 3 ft will not occur, with or without the project during a 100-year flood, (given the maximum flood velocities shown in Figures B1 – B3). Therefore we can assume the same amounts of DDT contaminated soils will be eroded from the floodplain for the no-project alternative as for the ORERP alternatives. From that assumption we formulate the model inputs for the post 100-yr floor flood analysis of the no-project alternative as listed in Table B1. The inputs for the no-project alternative are based on erosion fluxes from one possible erosion depth (3 ft.) in the DDT contaminated area of the floodplain, and is combined with two possible fluxes of clean fines (0 cy and 438,000 cy) from the upper watershed below the Savage Dam; yielding a sensitivity analysis comprised of 2 separate deposition scenarios. Thus, the ensemble of input parameters for the no-project sensitivity analysis are comparable to inputs used for the ORERP in Table 4, rows 2 & 5.

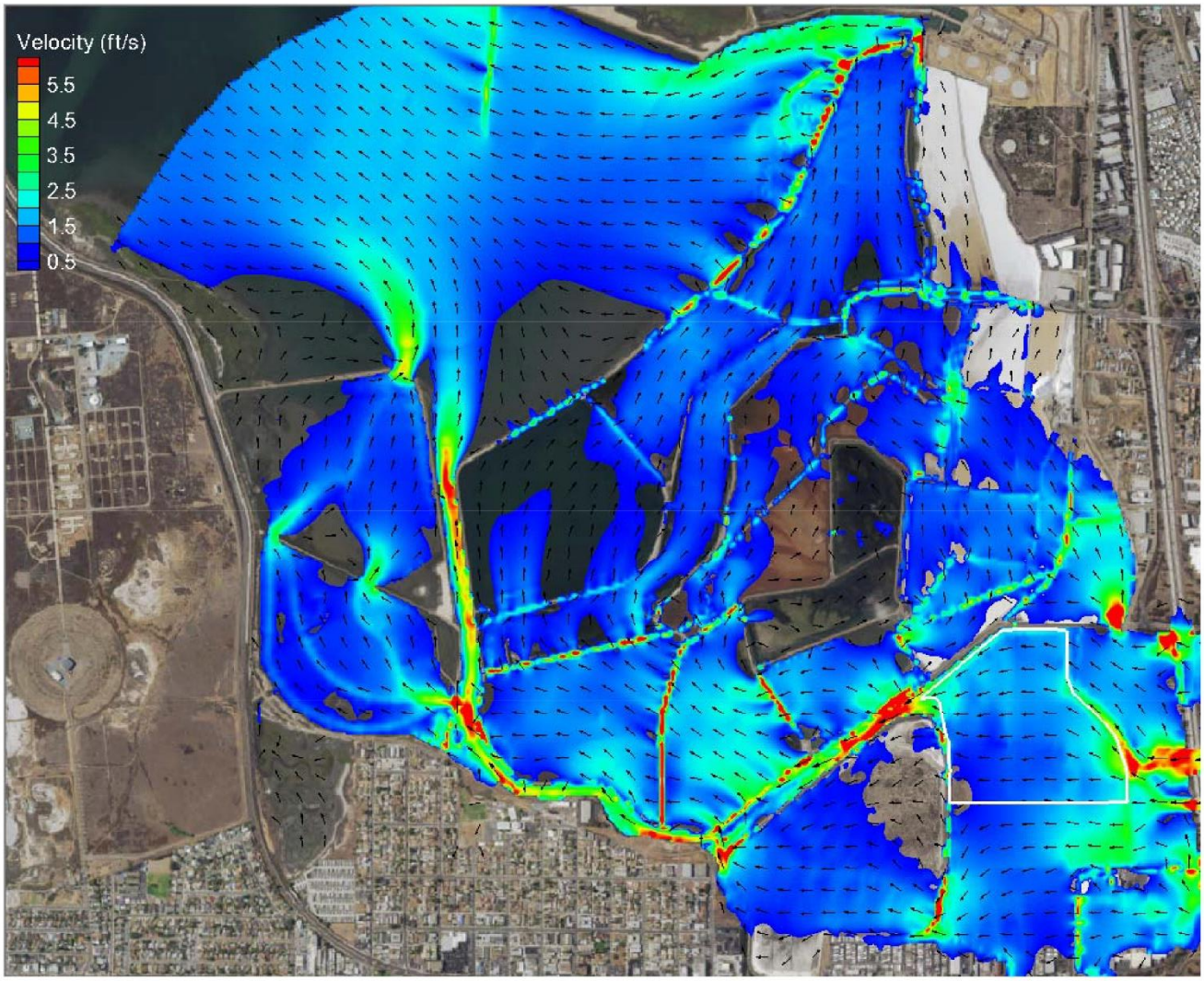


Figure B1: Distribution of maximum stream flow velocities for the 100-year flood in the lower Otay River flood plain and salt pond complex for the no-project alternative, (after Everest, 2014). DDT contaminated area bounded by yellow polygon in the lower right hand corner. Ponds 10 & 11 shown in the lower left corner.

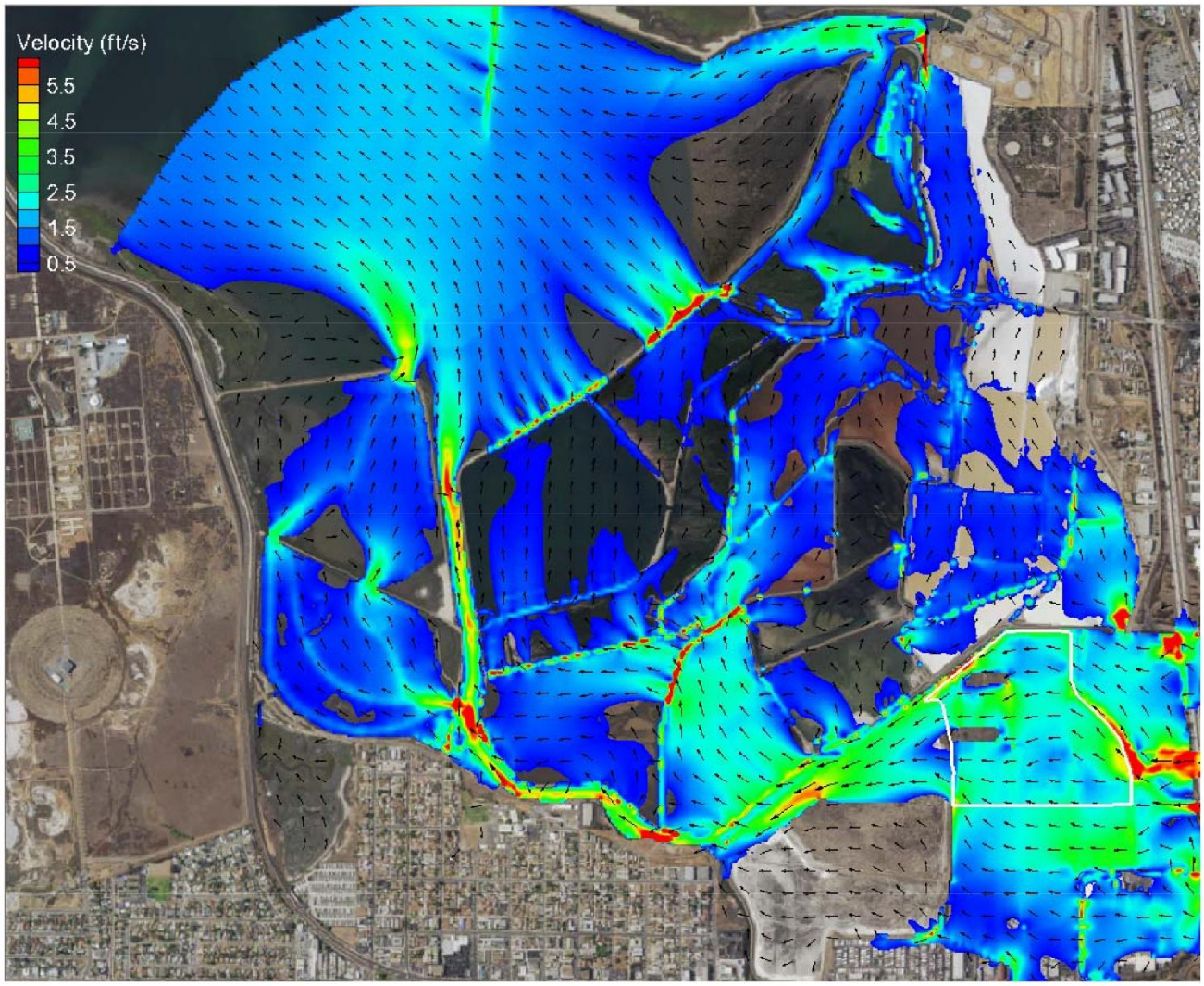


Figure B2: Distribution of maximum stream flow velocities for the 100-year flood in the lower Otay River flood plain and salt pond complex for the fully implemented Intertidal Alternative, (after Everest, 2014). DDT contaminated area bounded by yellow polygon in the lower right hand corner. Ponds 10 & 11 shown in the lower left corner.

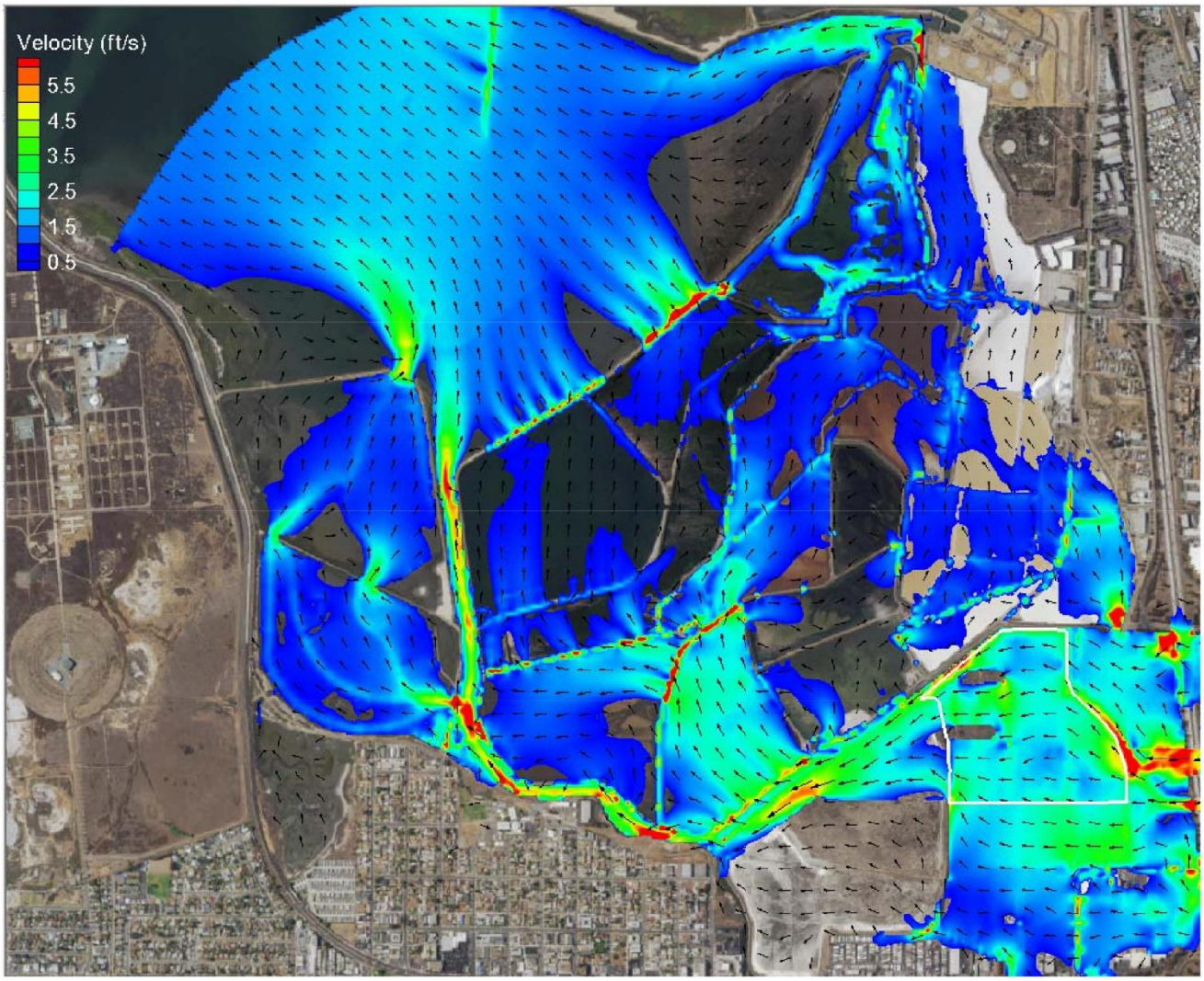


Figure B3: Distribution of maximum stream flow velocities for the 100-year flood in the lower Otay River flood plain and salt pond complex for the fully implemented Subtidal Alternative, (after Everest, 2014). DDT contaminated area bounded by yellow polygon in the lower right hand corner. Ponds 10 & 11 shown in the lower left corner.

Table B1: Input Parameters for Sensitivity Analysis of Post 100-Year Flood DDT Deposition for the No-Project Alternative

Scenario	Volume of Eroded DDT-Bearing Fines	DDT Conc. in DDT-Bearing Fines	Volume of Eroded Upper Watershed Fines	Flood Flow Volume	Suspended Sediment Conc.
Erode top 3 ft. of Contaminated Area + Upper Watershed*	128,300 cubic yards	310 μ g/kg	438,000 cubic yards	24,290 acre ft	23.15 g/l.
Erode top 3 ft. of Contaminated Area Only*	128,300 cubic yards	310 μ g/kg	0 cubic yards	24,290 acre ft	5.25 g/l

The suspended sediment concentrations in Table B-1 are based on a dry bulk density for eroded soil of 2700 lb per cy, or 1.225 metric tons per cy; where a metric ton is 1000 kg. This conversion factor is applied to the sum of the volume of eroded DDT- bearing fines (column_2) and the volume of eroded fines from the upper Otay watershed (column_4) to obtain the total flux of suspended fine grained sediment in tons/day during the 24 hour flood period of the 100-year flood for the no-project alternative. The sand and gravel sized fractions eroded from the floodplain by the 100 year flood (292,000 cy) are assumed to be transported as bed load and remain in the Otay River channel. The suspended sediment flux component (column_2 + column_4) is divided by the flow volume of $\overline{Q}$ = 29,960,856 m^3 during the 24 hour flood period to give the average suspended sediment concentration in column_6 upon conversion of metric tons to grams and cubic meters to liters.

Deposition Results: We use the 2011 bathymetric survey conducted by WRA for modeling post-flood deposition in no-project alternative (Figure B4), and use the deposition results from Ponds 10 and 11 as a proxy for evaluating potential wetlands impacts from the 100-yr flood. In Section 5, it was shown that the deposition thickness in the tidal basins is proportional to the water depths and tidal residence times in those basins, where greater deposition thickness was observed in Pond 15 where water depths are greater and residence times longer than in the Otay River Floodplain Basin of the ORERP, (cf. Figures 9 vs. 10). Figures B4 reveals that water depths in Ponds 10 and 11 are comparable to water depths in the Subtidal Alternative of the ORERP, and the TIDE_FEM solutions indicate that the residence times are also comparable (on the order of 2.5 days). Thus it is not surprising to find that the plots of the deposition flux and deposition thicknesses in the Ponds 10 and 11 in Figures B5 and B6 for the 100-year flood are very similar to those in Figures 9 and 11 for the Subtidal Alternative; although the exact time response (shape) of the two sets of curves are different than for the ORERP simulations.

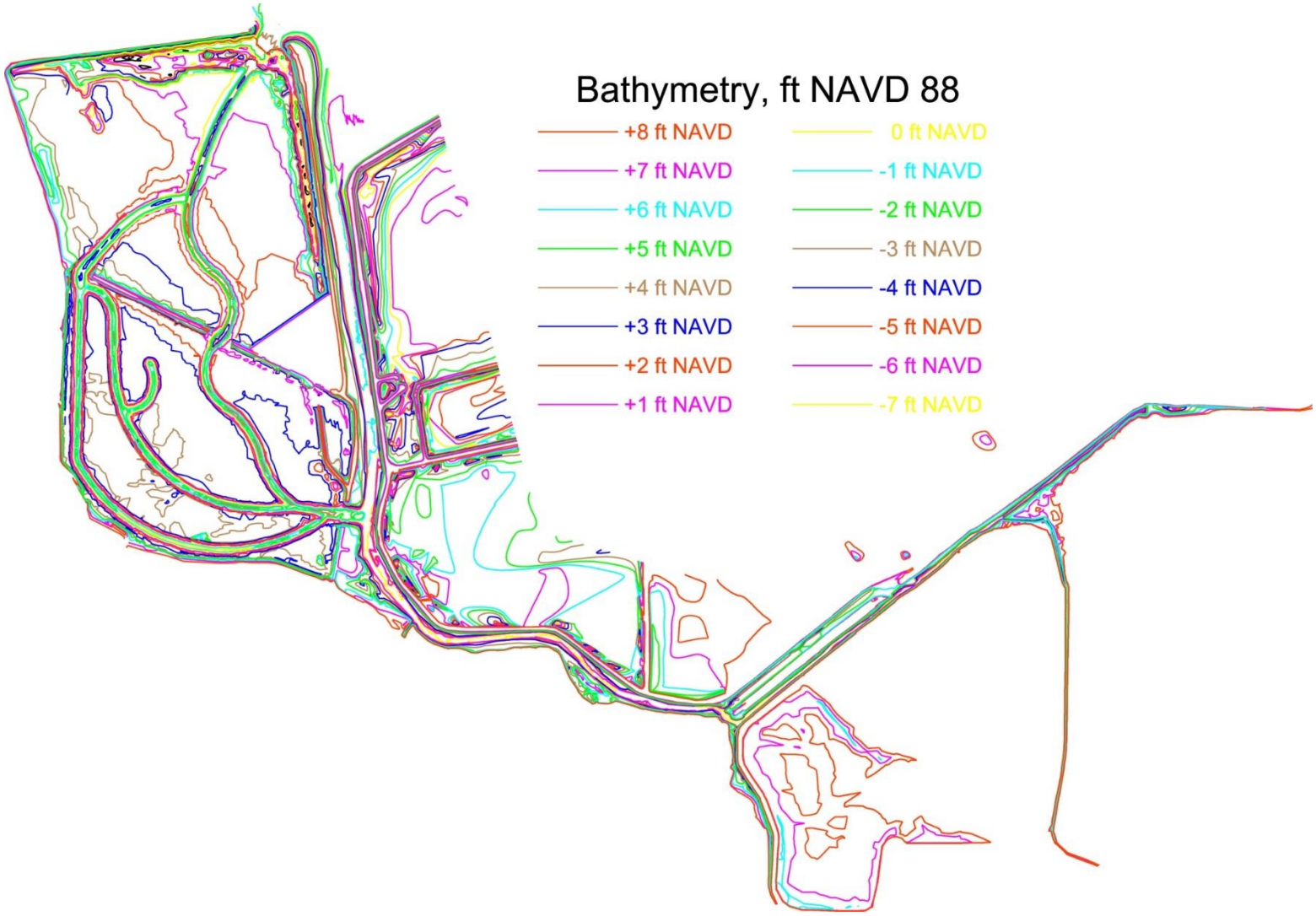


Figure B4: Bathymetry for the *No-Project Alternative* with Ponds 10 & 11 shown on the left hand side (west bank) of the Otay River at the river mouth. Bathymetry shown in ft. NAVD based on bathymetric survey by WRA (2011).

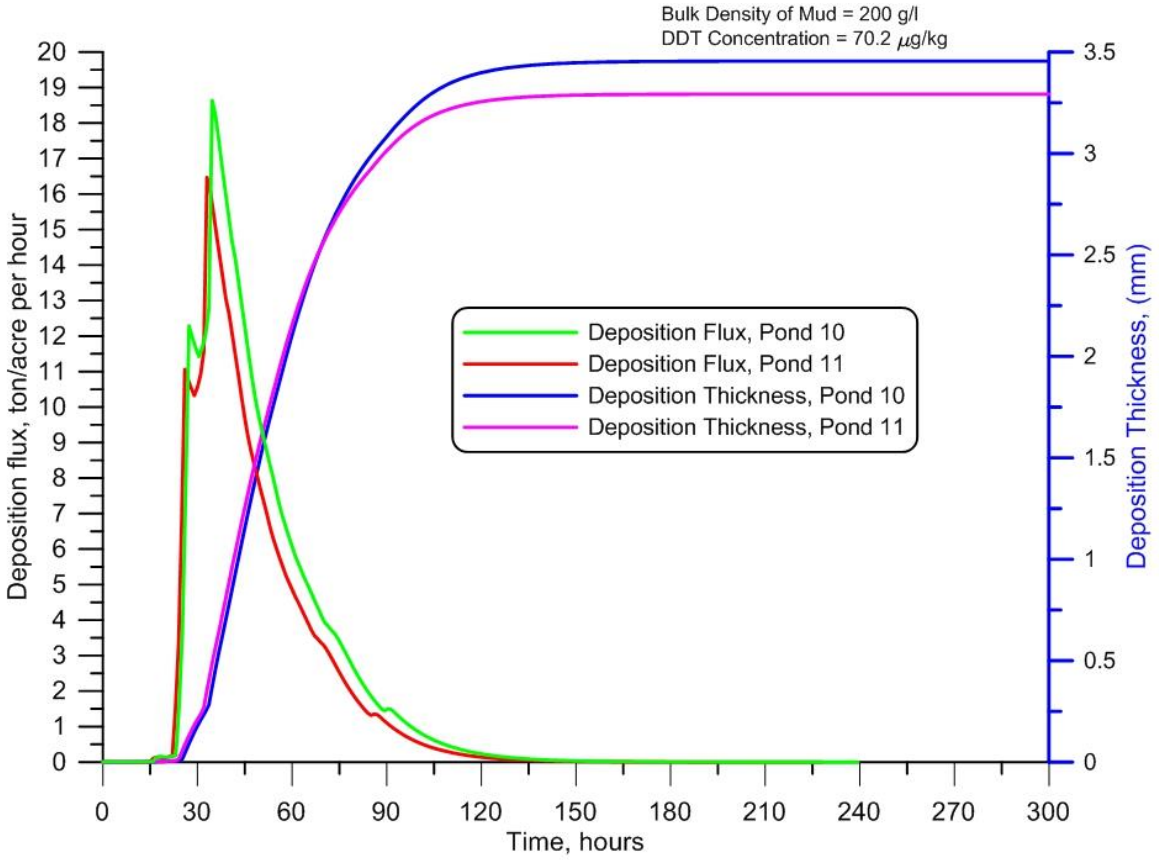


Figure B5. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Ponds 10 and 11 in the Otay River Floodplain (*No-Project Alternative*) following the 100-year flood. Deposition flux (green & red); deposition thickness (blue & magenta). Results for 128,300 cubic yards of contaminated fines and 438,000 cubic yards of clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

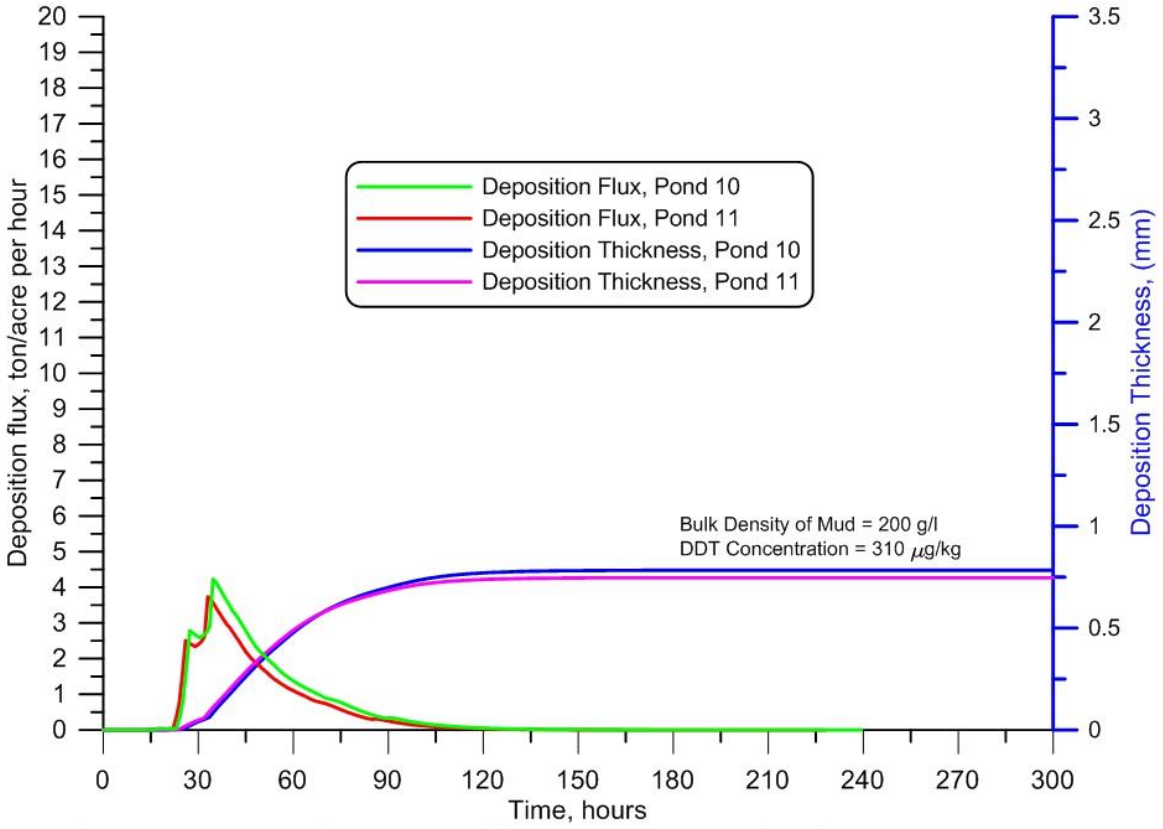


Figure B6. Sensitivity analysis of deposition of fine-grained sediment (mud) in the Ponds 10 and 11 in the Otay River Floodplain (*No-Project Alternative*) following the 100-year flood. Deposition flux (green & red); deposition thickness (blue & magenta). Results for 128,300 cubic yards of contaminated fines and no additional clean sediment from the upper Otay River watershed. DDT given as dry bulk concentration.

Figure B5 gives the time evolution of the post-flood deposition flux and deposition thickness for the first scenario (row_2 of Table B1) in Ponds 10 and 11 of the no-project alternative. This scenario is based on maximum flood-induced erosion depths of 3 ft. in the contaminated area adjacent the Floodplain Tidal Basin mixed with 438,000 cubic yards of fine-grained sediments from upstream erosion of the portion of the watershed below the Savage Dam. Results are similar for both Ponds 10 and 11 showing that accumulations range from 3.4 to 3.7 mm of partially consolidated mud after 276 hours post-flood, with dry bulk DDT concentrations of 70.2 μ g/kg everywhere in the post-flood deposition. The initial post-flood suspended sediment concentration is the same in all areas of the floodplain and salt pond complex because the 100 year flood overtops and flows through these areas with its washload, (cf. Figure B1). The general depositional features are that deposition flux peaks within one diurnal tide cycle after cessation of the flood in both basins of both restoration alternatives, with an initial deceleration in flux during the first semidiurnal ebb tide. After the first post-flood diurnal tidal cycle, the deposition flux declines as progressive settling depletes the suspended sediment concentration, and tidal residence times in the ponds limits the amount of time for settling and deposition to occur. Meanwhile, deposition thickness, which results from the cumulative sum of deposition flux over time, rapidly builds during the peak deposition flux period, and then gradually approaches a constant limit for partially consolidated mud at 200 g/l bulk density as the deposition flux vanishes after 120 to 150 hours post-flood. The minor differences in deposition flux and deposition thickness among the ponds and restoration alternatives are due to differences in residence times as a consequence of proximity of outlets to The Bay and river.

Next, consider in Figure B6 how such results may be affected if we assume no erosion of soils occurs in the portion of the watershed upstream of the floodplain and below the Savage Dam. This scenario is specified by the third row in Table B1 and is based on maximum erosion depths of 3 ft. in the contaminated area only. Here, runoff from the 100 year flood consists of a uniform suspended load of silts and clays with concentration of $\overline{C}$ = 5.25 g/l. Figure B6 gives the time evolution post-flood for deposition flux and deposition thickness in Ponds 10 and 11 of the no-project alternative. Again, results are similar for both ponds, but the dry bulk concentration of DDT in the post-flood deposition has increased to 310 μ g/kg, while the deposition thicknesses are greatly diminished. Ponds 10 & 11 accumulate only 0.74 to 0.78 mm of partially consolidated mud after 276 hours post-flood.

The initial post 100-year flood accumulations of partially consolidated mud computed in Figures B5 & B6 will, over time, dewater and compact under its own immersed weight. The initial deposition will consolidate and compact to a maximum saturated density for fully consolidated mud, 1200 g/l, so that the 100-year flood deposition for the two scenarios in Table B1 would eventually become a very thin layer of consolidated mud on the order of a fraction of a millimeter thick; or:

Deposition with upper watershed sediments:

$$3.4 - 3.7\ mm\ @\ 200 g/l \ \Rightarrow\ \left\{\frac{dewatering}{consolidation}\right\} \ \Rightarrow\ 0.5 - 0.6\ mm @ 1{,}200 g/l$$

Deposition without upper watershed sediments:

$$0.74 - 0.78\ mm\ @\ 200 g/l \quad \Rightarrow \quad \left\{ \frac{dewatering}{consolidation} \right\} \quad \Rightarrow \quad 0.17 - 0.18\ mm @ 1{,}200 g/l$$

Consolidation only involves a reduction in the water content of the post-flood deposition, and therefore does not alter the DDT dry bulk concentration, which remains 70.2 μ g/kg when there is dilution from upper watershed sediments and 310 μ g/kg when there is no deposition of upper watershed sediments. The amount of time required for this degree of consolidation is uncertain, but experience with dredge material disposal ponds at Mare Island, CA and Charleston, SC [Jenkins, 1980; Jenkins et al., 1981; Jenkins and Skelly, 1983] suggests that consolidation to 600 g/l could occur within three months while full consolidation to saturation (1,200 g/l) could take several years.

The DDT deposition results in Ponds 10 and 11 for the 100-yr flood under the no-project alternative are summarized in Table B2 below. These results are found to be within the range of those for the ORERP post 100-yr flood as detailed in Section 5. From that finding, we submit that the conclusions on potential flood-induced DDT impacts to the existing wetlands ecology, as detailed in Section 7 are upheld; and it can be concluded that the ORERP does not increase the risk of exposure of wetland ecology to DDT, (a risk that exists with or without the project).

Scenario	Volume of Eroded DDT-Bearing Fines	Average DDT Conc. in DDT-Bearing Fines	Volume of Eroded Upper Watershed Fines	Flood Flow Volume	Suspended Sediment Conc.	Initial Post-Flood Deposition Thickness (200 g/l Mud)	Final Post-Flood Deposition Thickness (1,200 g/l Mud)	DDT Conc. in Post-Flood Mud Deposition (dry bulk)
Erode top 3 ft. of Contaminated Area + Upper Watershed*	128,300 cubic yards	310 μ g/kg	438,000 cubic yards	24,290 acre ft	23.15 g/l.	3.4 mm to 3.7 mm	0.5 mm to 0.6 mm	70.2 μ g/kg
Erode top 3 ft. of Contaminated Area Only**	128,300 cubic yards	310 μ g/kg	0 cubic yards	24,290 acre ft	5.25 g/l	0.74 mm to 0.78 mm	0.17 mm to 0.18 mm	310 μ g/kg

Table B2: Matrix of Sensitivity Analysis of Potential DDT Deposition in Ponds 10 and 11 for the *No-Project Alternative* post-100 year flood.

APPENDIX J

Biological Technical Report

BIOLOGICAL RESOURCES EXISTING CONDITIONS TECHNICAL REPORT
for the
OTAY RIVER ESTUARY RESTORATION PROJECT
SOUTH BAY UNIT OF THE SAN DIEGO BAY NATIONAL WILDLIFE REFUGE
CITY OF SAN DIEGO, CALIFORNIA

Prepared for:

Poseidon Resources
501 West Broadway, Suite 2020
San Diego, California 92101
Contact: Stan Williams
408.332.5819

Prepared by:

DUDEK
605 Third Street
Encinitas, California 92024
Contact: Anita Hayworth, Ph.D.
760.479.4239

~~**SEPTEMBER 2016**~~**FEBURARY 2018**

Printed on 30% post-consumer recycled material.

TABLE OF CONTENTS

Section **Page No.**

ACRONYMS AND ABBREVIATIONS ..... **V**

SUMMARY OF FINDINGS ..... **VII**

1 INTRODUCTION **1**

2 METHODS AND SURVEY LIMITATIONS **7**

2.1 Literature Review 7

2.2 Field Reconnaissance 7

2.2.1 Resource Mapping 9

2.2.2 Flora 9

2.2.3 Fauna 9

2.2.4 Special-Status/Regulated Biological Resources 10

2.2.5 Jurisdictional Wetlands Delineation 13

3 PHYSICAL CHARACTERISTICS **17**

3.1 Site Description 17

3.1.1 Topography 17

3.1.2 Soils 18

4 RESULTS OF SURVEY **19**

4.1 Botany – Plant Communities and Floral Diversity 19

4.1.1 Otay River Floodplain Site 19

4.1.2 Pond 15 Site 23

4.1.3 Project Features 28

4.1.4 Floral Diversity 36

4.2 Zoology – Wildlife Diversity 36

4.2.1 Otay River Floodplain Site 36

4.2.2 Pond 15 Site 37

4.3 Sensitive Biological Resources 47

4.3.1 Special-Status Plant Species 47

4.3.2 Special-Status Wildlife Species 60

4.3.3 Sensitive Habitats/Regulated Resources 98

4.3.4 Wildlife Corridors and Habitat Linkages 101

4.3.5 Jurisdictional Waters and Wetlands 101

4.4 Regional Resource Planning Context 123

TABLE OF CONTENTS (CONTINUED)

Section **Page No.**

5 ACKNOWLEDGMENTS 125

6 LITERATURE CITED 127

APPENDICES

A Cumulative List of Vascular Plant and Wildlife Species Observed on the Project Site
B Results of the Jurisdictional Wetlands Delineation
C California Gnatcatcher Survey Report
D Focused Survey for Light-Footed Clapper Rail
E CRAM Report

FIGURES

1 Regional Map 3
2 Vicinity Map 5
3 Otay River Floodplain Restoration Site and Project Features Vegetation 21
4 Pond 15 Restoration Site and Project Features Vegetation 25
5 Project Features Vegetation 31
6 Project Features Vegetation 33
7 Nesting Locations as Described in Table 5 45
8 Otay River Floodplain Restoration Site Special-Status Plant Species 61
9 Pond 15 Restoration Site Special-Status Plant Species 63
10 Ponds 22 and 23 Site Special-Status Plant Species 65
11 Otay River Floodplain Restoration Site Special-Status Wildlife Species 67
12 Otay River Floodplain Restoration Site Special-Status Nesting Locations 71
13 Pond 15 Restoration Site Special-Status Nesting Locations 99
14 San Diego Bay 2014 Eelgrass Survey 111
15 Otay River Floodplain Restoration Site and Project Features Jurisdictional Delineation 113
16 Pond 15 Restoration Site and Project Features Jurisdictional Delineation 115
17 Project Features Jurisdictional Delineation 117
18 Project Features Jurisdictional Delineation 119

TABLE OF CONTENTS (CONTINUED)

Page No.

TABLES

1	Schedule for Special-Status Species Surveys	7
2	Vegetation Communities and Land Cover Types for the Otay River Floodplain Site	19
3	Vegetation Communities and Land Cover Types for the Pond 15 Site	24
4	Vegetation Communities and Land Covers within the Project Features	29
5	Results of the 2012-2013 Avian Surveys Conducted for the South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge	38
6a	Locations[1] of Waterbird Nest Sites at the Salt Works Between 2006 – 2011[2]	42
6b	Locations[1] of Waterbird Nest Sites at the Salt Works Between 2012 – 2017[2]	43
7	Special-Status Plant Species Detected or Potentially Occurring on the Project Site	48
8	Special-Status Plant Species Not Detected or with Low or No Potential to Occur on the Project Site	49
9	Special-Status Wildlife Observed or Potentially Occurring on the Otay River Floodplain Site	78
10	Special-Status Wildlife with Low Potential or No Potential to Occur on the Otay River Floodplain Site	85
11	Special-Status Wildlife Documented as Present or Potentially Occurring on the Pond 15 Site	91
12	Special-Status Wildlife with Low Potential or No Potential to Occur on the Pond 15 Site but That Have Been Recorded at the South Bay Salt Works	96
13	Wetland Delineation Sampling Point Summary for All Three Sites	102
14	Wetland Delineation Existing Acreage Summary	105
15	Jurisdictional Waters within Project Features	106

INTENTIONALLY LEFT BLANK

ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
AA	Assessment Area
CDFW	California Department of Fish and Wildlife
CNPS	California Native Plant Society
Commission	California Coastal Commission
Corps	U.S. Army Corps of Engineers
CRAM	California Rapid Assessment Method
CRPR	California Rare Plant Rank
MHPA	Multi-Habitat Planning Area
MSCP	Multiple Species Conservation Program
NWR	National Wildlife Refuge
ppt	parts per thousand
Regional Board	Regional Water Quality Control Board
Service	U.S. Fish and Wildlife Service

INTENTIONALLY LEFT BLANK

SUMMARY OF FINDINGS

The proposed Otay River Estuary Restoration Project (project) site occupies approximately 165.3 acres of the South Bay Unit of the San Diego Bay National Wildlife Refuge (NWR) in the City of San Diego. The site is located north of Palm Avenue, is part of the South Bay Salt Works and also south of the South Bay Salt Works, is west of Interstate 5, and is east of the developed area of Imperial Beach.

Biological surveys of the project site were conducted by Dudek biologists in 2011, 2013, and 2014, with focused surveys conducted in spring and summer 2011. The surveys consisted of vegetation mapping, jurisdictional delineation, and focused surveys for California gnatcatcher (*Polioptila californica californica*), burrowing owl (*Athene cunicularia*), least Bell's vireo (*Vireo bellii pusillus*), Belding's Savannah sparrow (*Passerculus sandwichensis beldingi*), northern harrier (*Circus cyaneus*), light-footed Ridgway's rail (*Rallus obsoletus levipes*), and rare plants. The purpose of this biological resources technical report is to identify existing vegetation and jurisdictional resources, and survey for plant and animal species recognized as sensitive by local, State, and/or Federal wildlife agencies and/or environmental organizations.

Based on species composition and general physiognomy, 15 vegetation communities (or habitat types) and land covers were identified within the project site, inclusive of the Otay River Floodplain Site, the Pond 15 Site, and the project features required for the restoration: bay, beach, disturbed habitat, open water, salt pond levee, southern coastal salt marsh, southern coastal salt marsh–disturbed, brackishwater, former salt pond bottom and borrow area, *Isocoma* scrub, developed land, salt flat, Otay River floodplain restoration, freshwater marsh, and mule fat scrub.

Three special-status plants were observed during the 2011 surveys: California desert-thorn (*Lycium californicum*) (California Rare Plant Rank (CRPR) 4.2), estuary seablite (*Suaeda esteroa*) (CRPR 1B.2), and woolly seablite (*Suaeda taxifolia*) (CRPR 4.2).

Nine special-status wildlife species were detected on site during the 2011 surveys: northern harrier, white-tailed kite (*Elanus leucurus*), elegant tern (*Thalasseus elegans*), western gull-billed tern (*Gelochelidon nilotica vanrossemi*), light-footed Ridgway's rail, burrowing owl, short-eared owl (*Asio flammeus*), Belding's Savannah sparrow, and San Diego black-tailed jackrabbit (*Lepus californicus bennettii*). Nesting of a number of special-status wildlife species was recorded by the San Diego Bay NWR, including Belding's Savannah sparrow, western snowy plover (*Charadrius alexandrinus nivosus*), black skimmer (*Rynchops niger*), Forster's tern (*Sterna forsteri*), California least tern (*Sternula [=Sterna] antillarum browni*), double-crested cormorant (*Phalacrocorax auritus*), Caspian tern (*Hydroprogne caspia*), elegant tern, and western gull-billed tern. Six special-status wildlife species were detected off site to the west or in the Otay

River drainage immediately off site during the 2011 surveys: merlin (*Falco columbarius*), northern harrier, white-tailed kite, Clark's marsh wren (*Cistothorus palustris clarkae*), yellow warbler (*Dendroica petechia brewsteri*), and yellow-breasted chat (*Icteria virens*).

The results of the delineation concluded that there are areas on site that are under the jurisdiction of the U.S. Army Corps of Engineers, Regional Water Quality Control Board, and California Coastal Commission. Although the non-tidal portion of the Otay River channel would have qualified for California Department of Fish and Wildlife jurisdiction, the portion is on Federal land and thus is not subject to Section 1600 et seq. of the California Fish and Game Code. Within the two sites, 97.73 acres of wetlands and waters are under the joint jurisdiction of the U.S. Army Corps of Engineers, Regional Water Quality Control Board, and California Coastal Commission.

1 INTRODUCTION

The Otay River Estuary Restoration Project (project) is a partnership between the U.S. Fish and Wildlife Service (USFWS or Service) and Poseidon Resources (Poseidon) to create, restore, and enhance coastal wetlands to benefit native fish, wildlife, and plant species, and to provide habitat for migratory seabirds and shorebirds and salt marsh–dependent species within the South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge (NWR). The project area (inclusive of the 40.8 acres of project features) is on approximately 165.3 acres located on two non-contiguous sites within the South San Diego Bay Unit of the San Diego Bay NWR (Figures 1 and 2). The first site is an approximately 33.5-acre area of predominantly disturbed uplands within the Otay River floodplain (hereafter referred to as the Otay River Floodplain Site). The second site is an approximately 90.9-acre active solar salt pond (hereafter referred to as the Pond 15 Site). The project also includes all project components required to implement the project.

The project site is located at the south end of San Diego Bay in San Diego County, California. The Otay River Floodplain Site west of Nestor Creek and the Pond 15 Site are located on sovereign land held by the California State Lands Commission for the benefit of the people of the State and leased to the Service for management as a part of the San Diego Bay NWR. The Otay River Floodplain Site east of Nestor Creek is owned by the Service. The Otay River Floodplain Site is situated within the corporate limits of the City of San Diego, and the Pond 15 Site is within the corporate limits of the City of National City. Directly to the south of the Otay River Floodplain Site and to the south and east of the Pond 15 Site are lands included within the City of San Diego. The City of Imperial Beach is located directly southwest of the Otay River Floodplain Site. Specifically, the approximately 33.5-acre Otay River Floodplain Site is located west of Interstate 5 between Main Street to the north and Palm Avenue to the south (Figures 1 and 2). The 90.9-acre Pond 15 Site is located in the northeast portion of the South San Diego Bay Unit of the San Diego Bay NWR, northwest of the intersection of Bay Boulevard and Palomar Street in Chula Vista. The project also includes all project components that are required for implementation of the project. The Otay River Floodplain Site is located within Sections 20 and 21, Township 18 South, Range 2 West on the U.S. Geological Survey 7.5-minute Imperial Beach quadrangle map (1966); longitude 117°5'46.02" W and latitude 32°35'29.95" N (Figure 2). The Pond 15 Site is located within Sections 16, 17, 20, and 21, Township 18 South, Range 2 West on the U.S. Geological Survey 7.5-minute Imperial Beach quadrangle map (1966); longitude 117°6'24"W and latitude 32°36'05"N (Figure 2).

Biological surveys of the project site were conducted by Dudek biologists from February through July 2011 for the Otay River Floodplain Site and in March 2013 for the Pond 15 Site, with focused surveys conducted for the Otay River Floodplain Site in spring and summer 2011. An additional visit was conducted in May 2014 to review existing conditions within the project features.

Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

This report describes the existing biological character of the project site in terms of vegetation, flora, wildlife, wetlands, and wildlife habitats, and analyzes the biological significance of the site with respect to regional biological resources planning and Federal, State, and local laws.

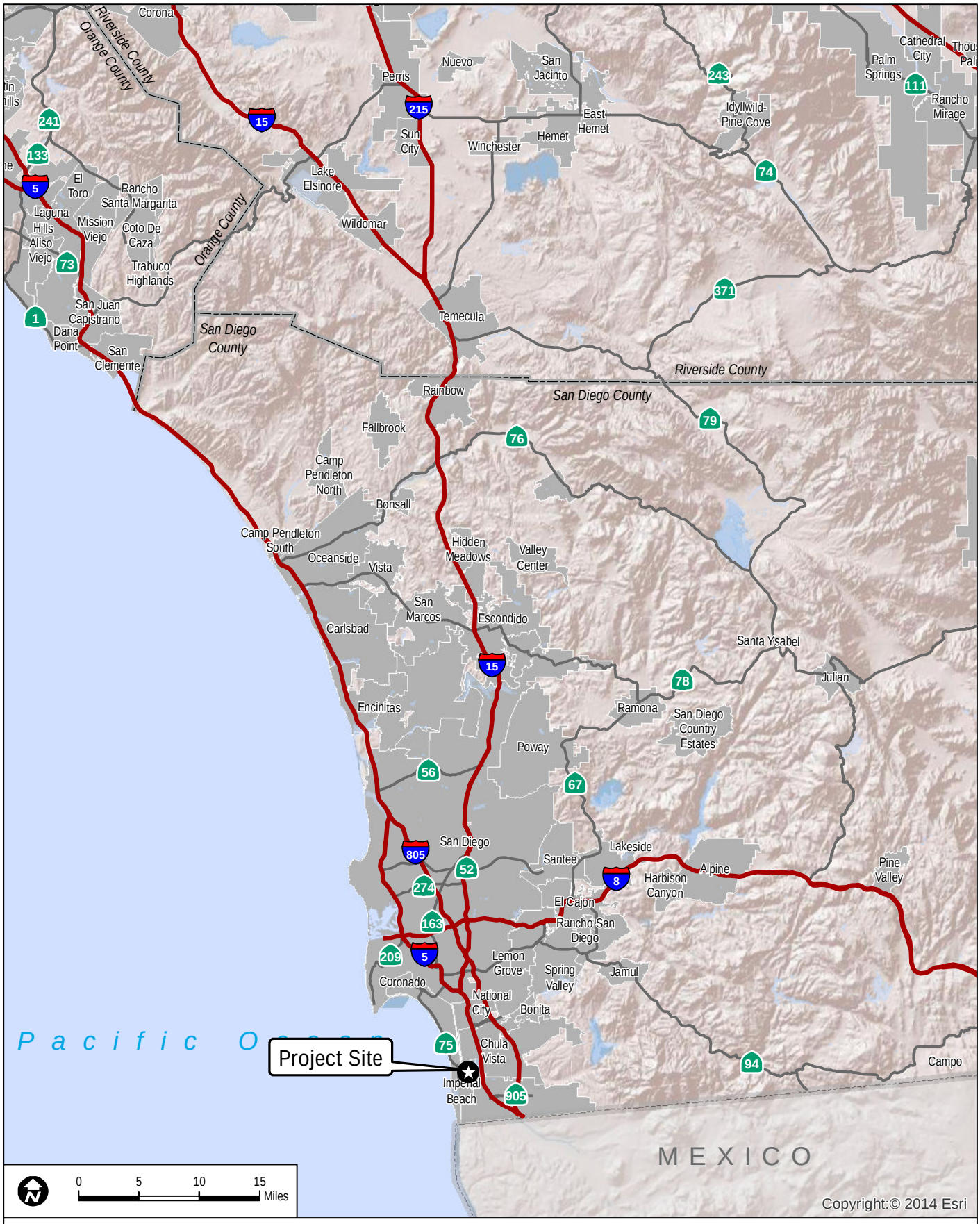


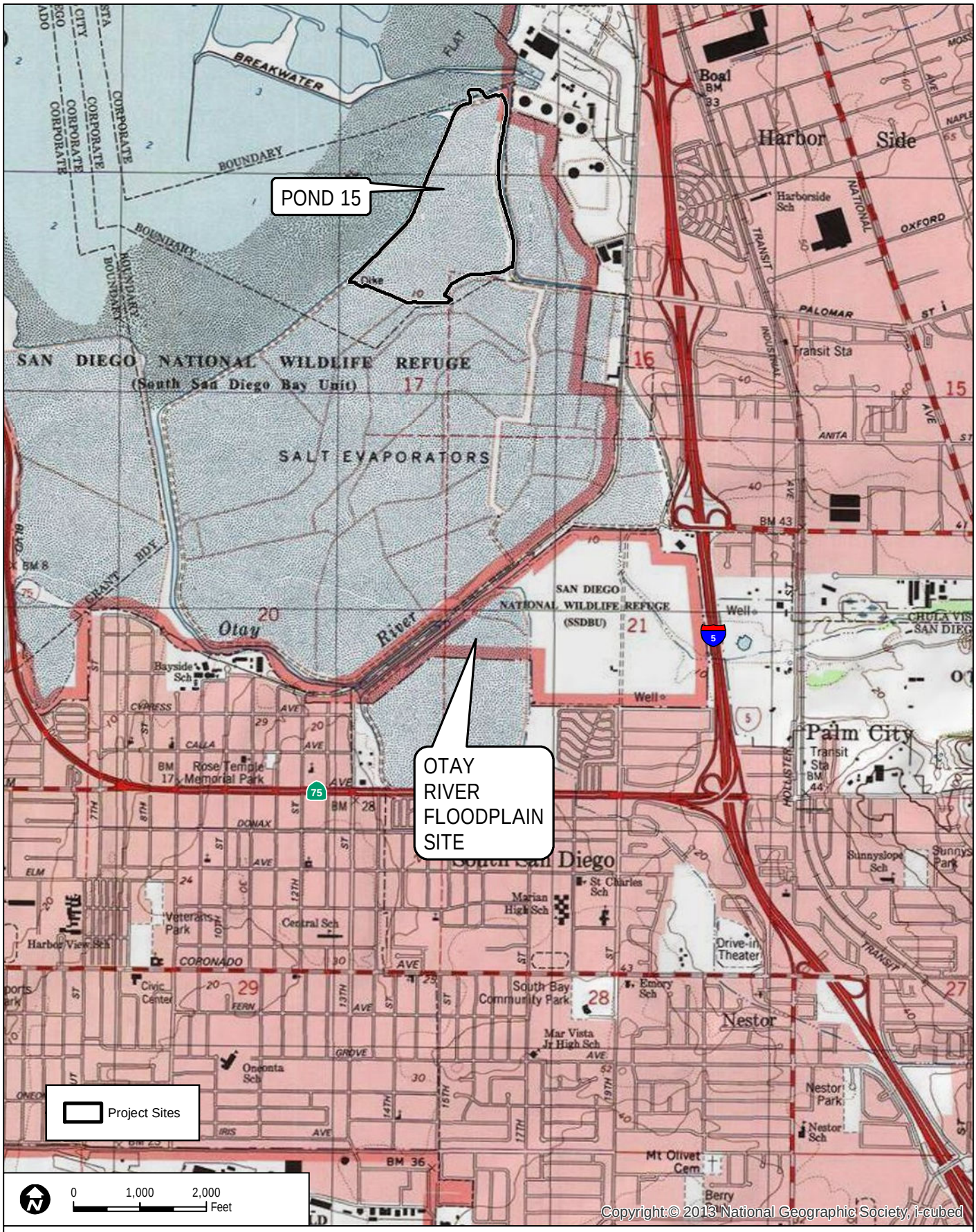
FIGURE 1

Regional Map

DUDEK

Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

INTENTIONALLY LEFT BLANK



SOURCE: USGS 7.5-Minute Series Quadrangle, USA Topographic Maps Service, Imperial Beach Quadrangle.

FIGURE 2

Vicinity Map

DUDEK

Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

INTENTIONALLY LEFT BLANK

2 METHODS AND SURVEY LIMITATIONS

Data regarding biological resources present on the project site were obtained through a review of pertinent literature and through field reconnaissance; both are described in detail below.

2.1 Literature Review

Sensitive biological resources present or potentially present on site were identified through a literature search using the following sources: USFWS (2010), California Department of Fish and Game (CDFG) (2009 and 2011a–c), and the California Native Plant Society's (CNPS) Inventory of Rare and Endangered Vascular Plants (2015). General information regarding wildlife species present in the region was obtained from Unitt (1984, 2004) for birds, Hall (1981) and Ingles (1965) for mammals, Stebbins (2003) for reptiles and amphibians, and Emmel and Emmel (1973) for butterflies.

2.2 Field Reconnaissance

Dudek biologists conducted a number of surveys in 2011, 2013, and 2014. These included vegetation mapping, jurisdictional delineation, and focused surveys for California gnatcatcher (*Polioptila californica californica*), burrowing owl (*Athene cunicularia*), least Bell's vireo (*Vireo bellii pusillus*), Belding's Savannah sparrow (*Passerculus sandwichensis beldingi*), northern harrier (*Circus cyaneus*), light-footed Ridgway's rail (*Rallus obsoletus levipes*), and rare plants. Table 1 lists the dates, conditions, and survey focus for each of the survey visits.

Table 1
Schedule for Special-Status Species Surveys

Date	Hours	Personnel	Focus	Conditions
2/22/2011	0800–1730	A. Thomson, K. Dayton	Wetland delineation and vegetation mapping	Not recorded
2/25/2011	0615–0955	A. Hayworth	Belding's Savannah sparrow	58–63°F; overcast; 3–8 mph wind
3/10/2011	0710–1135	A. Hayworth	Belding's Savannah sparrow	61–69°F; clear; 1–5 mph wind
3/16/2011	0800–1000	A. Hayworth	California gnatcatcher	58°F, clear, 0–1 mph wind
3/24/2011	1015–1520	S. Fraser, K. Shaw	Burrowing owl habitat assessment	62°F, 0–40% cloud cover, 3–4 mph wind
4/4/2011	00730–1230	A. Hayworth	California gnatcatcher; Belding's Savannah sparrow	58–63°F, overcast, 0–1 mph wind

Table 1
Schedule for Special-Status Species Surveys

Date	Hours	Personnel	Focus	Conditions
4/11/2011	0600–1205	A. Hayworth	Least Bell's vireo; Belding's Savannah sparrow; northern harrier	56–60°F; overcast; 0–1 mph wind
4/14/2011	0530–1000	S. Fraser	Burrowing owl	56–62°F; clear; 2–4 mph wind
4/25/2011	0600–1230	A. Hayworth	California gnatcatcher; Belding's Savannah sparrow; least Bell's vireo	58–66°F; overcast to clear; 0–8 mph wind
4/27/2011	0500–1000	S. Fraser	Burrowing owl	58–64°F; clear; 0–1 mph wind
3/27/2011	1650–1815	J. Konecny	light-footed Ridgway's rail	65–61°F; overcast; 7–10 mph wind
4/3/2011	1645–1815	J. Konecny	Light-footed Ridgway's rail	62–59°F; overcast; 5–12 mph wind
4/10/2011	0645–0815	J. Konecny	Light-footed Ridgway's rail	60–63°F; overcast; 5–7 mph wind
4/17/2011	0625–0800	J. Konecny	Light-footed Ridgway's rail	61–63°F; overcast; 5–7 mph wind
4/24/2011	0630–0800	J. Konecny	Light-footed Ridgway's rail	64–65°F; overcast; 7–10 mph wind
5/1/2011	1840–1910	J. Konecny	Light-footed Ridgway's rail	63–60°F; overcast; 9–14 mph wind
5/6/2011	0620–1045	A. Hayworth	Least Bell's vireo; northern harrier	58–59°F; overcast; 1–3 mph wind
5/11/2011	0515–1000	S. Fraser, T. Liddicoat	Burrowing owl	58–68°F; clear; 3–5 mph wind
5/19/2011	0630–0835	A. Hayworth	Least Bell's vireo	61–63°F; overcast; 3–5 mph wind
5/19/2011	0900–1630	A. Thomson, K. Dayton	Rare plant survey	65–70°F; 50% cloud cover; 2–4 mph wind
6/3/2011	0600–1030	A. Hayworth	Least Bell's vireo; northern harrier	68–69°F; clear; 0–5 mph wind
6/22/2011	0900–1045	A. Hayworth	Least Bell's vireo	61–65°F; overcast; 3–5 mph wind
7/18/2011	0700–0910	A. Hayworth, K. Shaw	Least Bell's vireo	58–60°F; overcast; 1–6 mph wind
7/20/2011	0800–1200	S. Fraser	Wetland delineation	Not recorded
7/29/2011	0640–0835	A. Hayworth, K. Shaw	Least Bell's vireo	65–68°F; overcast; 0–1 mph wind
3/13/2013	0800–1700	A. Thomson, K. Dayton	Wetland delineation and vegetation mapping	Not recorded
3/13/2013	830–1200	A.Hayworth	Wildlife survey	60–65°F; clear; 1–5 mph wind
5/29/2014	0800–1500	A. Thomson	Wetland delineation	Not recorded

mph = miles per hour.

2.2.1 Resource Mapping

Vegetation communities were mapped in February 2011 and March 2013 by Andy Thomson and Kathleen Dayton (Table 1). Vegetation communities were mapped in the field directly onto a 100-scale (1 inch = 200 feet) digital orthographic map of the site. These boundaries and locations were digitized by Dudek Geographic Information Systems (GIS) technician Mark McGinnis using ArcGIS software. GIS coverage was created using ArcCAD to calculate acreages of each vegetation type and impacts of the proposed action.

Vegetation communities and land covers used in this report follow the Preliminary Descriptions of the Terrestrial Natural Communities of California (Holland 1986), with modifications to accommodate the lack of conformity of the observed communities to those of Holland (1986). Community classifications were selected based on site factors, descriptions, distribution, and characteristic species present within an area. Information such as dominant species and their associated cover classes, aspect, canopy height, and visible disturbance factors were recorded. For locations of rare or sensitive plant species mapped during the focused surveys, the numbers present were counted or visually estimated.

2.2.2 Flora

All plant species encountered during the field surveys were identified and recorded. Those species that could not be identified immediately were brought into the laboratory for further investigation. A list of plant species observed on site is presented in Appendix A.

Latin and common names for plant species with a California Rare Plant Rank (CRPR) (formerly CNPS List) follow the *California Native Plant Society On-Line Inventory of Rare, Threatened, and Endangered Plants of California* (CNPS 2015). For plant species without a California Rare Plant Rank, Latin names follow the *Jepson Interchange List of Currently Accepted Names of Native and Naturalized Plants of California* (Jepson Flora Project 2015) and common names follow the United States Department of Agriculture (USDA) Natural Resources Conservation Service Plants Database (USDA 2015). Other references used include Rebman and Simpson 2006 and Roberts 1998.

2.2.3 Fauna

Wildlife species detected during the field surveys by sight, calls, tracks, scat, or other signs were recorded. Binoculars (10 x 50 power) were used to aid in the identification of observed wildlife. In addition to species actually detected, expected wildlife use of the site was determined by known habitat preferences of local species and knowledge of their relative distributions in the area. A list of wildlife species observed on the property is presented in Appendix A.

Latin and common names of animals follow Crother (2008) for reptiles and amphibians, American Ornithologists' Union (AOU 2015) for birds, Wilson and Reeder (2005) for mammals, and the North American Butterfly Association (NABA 2001) for butterflies.

2.2.4 Special-Status/Regulated Biological Resources

Special-status biological resources are those defined as follows: (1) species that have been given special recognition by Federal, State, or local conservation agencies and organizations due to limited, declining, or threatened population sizes; (2) species and habitat types recognized by local and regional resource agencies as sensitive; (3) habitat areas or vegetation communities that are unique, are of relatively limited distribution, or are of particular value to wildlife; and (4) wildlife corridors and habitat linkages. Regulated biological resources may or may not be considered special status, but are regulated under Federal, State, and/or local laws.

Surveys for special-status biological resources included rare plant surveys, special-status wildlife species surveys, and wetland delineations, as described below.

Focused Plant Surveys

Dudek performed literature research to determine which special-status plant species have the potential to occur on site. This included a review of CNPS 2015, the California Natural Diversity Database (CDFG 2011c), and USFWS 2010.

Dudek conducted a survey for rare plants that have a moderate to high potential to occur within the project site based on suitable habitat present; all rare plants were recorded if they were observed, regardless of whether they were expected or not. Survey emphasis was placed on determining the presence, or potential for occurrence, of State- and federally listed and CNPS List 1B and 2 species. CNPS List 3 and 4 species were recorded if observed. ~~Survey emphasis was placed on determining the presence, or potential for occurrence, of State- and Federally listed and CNPS List 1B and 2 species. CNPS List 3 and 4 species were recorded if observed.~~ Based on the distribution and results from preliminary research, as well as the blooming period and detectability of the plant species potentially present, it was assumed that one full survey pass would provide the results to support presence or absence of the potential for plant species to occur within the site. Field survey methods conformed to *California Native Plant Society* (*CNPS) Botanical Survey Guidelines* (CNPS 2001); *Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities* (CDFG 2000); and *Guidelines for Conducting and Reporting Botanical Inventories For Federally Listed, Proposed, and Candidate Plants* (USFWS 1996). If special-status species were encountered during the field study, the biologist recorded the center of the polygon in which the

special-status plant was observed as a point using a GPS unit, and estimated the number of individuals present within the polygon. Depending on the species encountered or the number of individuals observed, percent cover was estimated in lieu of the number of individuals.

Focused Wildlife Surveys

Focused wildlife surveys were conducted to address the following special-status species: California gnatcatcher, Belding's Savannah sparrow, least Bell's vireo, light-footed Ridway's rail, northern harrier, and western burrowing owl.

California Gnatcatcher. Surveys were conducted under the authorization of permit TE-781084 (Anita M. Hayworth) according to the schedule provided in Table 1. The survey followed the most current protocol established by the Service, *Coastal California Gnatcatcher* (Polioptila californica californica) *Presence/Absence Survey Protocol, July 28, 1997* (USFWS 1997).

Suitable habitat within the project site was surveyed three times for California gnatcatcher, and included the *Isocoma* scrub and mulefat scrub habitats. Although these habitat types are not typically occupied by California gnatcatcher, the structure of the habitat is potentially suitable and the species is known to periodically forage in mulefat scrub (and *Isocoma* scrub is a subtype of coastal sage scrub). The route selected ensured complete coverage of all suitable habitat within the study area. A topographic map of the site (scale 1 inch = 100 feet) overlain with vegetation polygons was used for the survey. Weather conditions during surveys are provided in Table 1. Binoculars (10×50) were used to aid in detecting and identifying bird species. Taped gnatcatcher vocalizations were played frequently to elicit a response from the species. The tape was played approximately every 50 to 100 feet within suitable habitat. If a California gnatcatcher was detected, playing of the tape ceased to avoid harassment, and the California gnatcatcher location was recorded on the site map.

Burrowing Owl. Dudek biologists conducted a habitat assessment and focused survey for burrowing owl within the project site during the breeding season for burrowing owl. Surveys for burrowing owl followed the California Department of Fish and Wildlife (CDFW) protocol provided in the *Staff Report on Burrowing Owl Mitigation* (CDFG 1995). The surveys were conducted between April 15 and July 15. Survey visits were conducted from 2 hours before sunset to 1 hour after, or from 1 hour before to 4 hours after sunrise. The surveys extended approximately 2 hours beyond the recommended time period because a clear view of the soil surface was available to determine if burrows were present and because temperatures remained low. Four surveys were conducted at no closer than weekly intervals by walking suitable habitat within the survey area. Locations of potential burrows were recorded on a map and notes were recorded of any appropriate evidence indicating that a burrow was occupied (e.g., feathers,

pellets, tracks, and prey remains). Any burrowing owls observed also were recorded and mapped and digitized using ArcGIS.

Light-Footed Ridgway's Rail. Dudek subconsultant John Konecny conducted a focused survey for light-footed Ridgway's rail within the survey area. Light-footed Ridgway's rails have been documented in the vicinity. Six focused survey visits for light-footed Ridgway's rail were conducted 1 week apart following the survey protocol approved by the Service (USFWS 2006a) and the Light-Footed Ridgway's Rail Study Team (CRST 2009). Each survey had a dawn and dusk component. The surveys were conducted between March 27 and May 1. Survey stations were established at approximately 300-foot intervals along the survey area, including all side channels. The surveys were conducted by stopping at all stations and passively listening for light-footed Ridgway's rails during the first 5 minutes. If Ridgway's rails were not detected, a digital vocalization consisting of 30 seconds of light-footed Ridgway's rail calls followed by 30 seconds of silence was played from an iPod with amplified speakers. A response was listened for during a 1-minute period following the recorded vocalizations before proceeding to the next station. Any light-footed Ridgway's rails or other special-status species observed were recorded and mapped. If observed, the data on the light-footed Ridgway's rail's location was digitized using ArcGIS.

Least Bell's Vireo. Dudek conducted a habitat assessment and focused survey for least Bell's vireo within the study area. A recovery permit pursuant to Section 10(a)(1)(A) of the Endangered Species Act of 1973 was not required to conduct presence/absence surveys, provided that the January 19, 2001, survey protocol was followed and vocalization tapes were not used. Eight site visits to areas of suitable habitat were conducted, with 10-day intervals between each visit. Surveys were conducted between April 10 and July 31. Additional visits were conducted up to August 31 and provided information on juvenile use of the habitat and habitat use outside of the typical suitable habitat. Such additional visits were not required. Surveys were conducted between dawn and 11 a.m. by a qualified biologist familiar with least Bell's vireo songs, calls, and plumage. Any least Bell's vireos that were observed were recorded and mapped. If observed, data was digitized using ArcGIS.

Belding's Savannah Sparrow. Dudek conducted focused surveys for Belding's Savannah sparrow within the study area. Surveys for Belding's Savannah sparrow followed the CDFW protocol (CDFG 2001).

The surveys were conducted between February 15 and April 30. Survey visits were conducted from 6 a.m. to 10 a.m., and temperatures were acceptable and sunshine optimal. Five surveys were conducted. Any Belding's Savannah sparrows observed were recorded and mapped. If observed, data was digitized using ArcGIS.

Northern Harrier. Dudek conducted focused surveys for northern harrier within the study area. There is currently no survey protocol for northern harrier. Surveys for northern harrier focused on the detection of breeding of the species, since their numbers increase during the fall and winter due to migration. Surveys were conducted in conjunction with other surveys to be efficient with the surveys required. To detect breeding of the species, surveys were conducted during the peak breeding season, which is generally between April 1 and late July. Although there is no guidance for number of visits required, conducting three visits is prudent, and the visits were made once each in April, May, and June. Surveys were performed in suitable grassland and marshland habitat. Survey methods included walking the suitable areas and observing the behavior of harriers. Nesting is often indicated by observation of a food pass from the male to the female; observation of territorial behavior, since the hunting females often search near the nest locations; and observations of young birds, which would indicate a nest site is near. The biologist conducting the surveys is experienced in the behavior of nesting northern harriers. Any harriers observed were recorded and mapped. If observed, data was digitized using ArcGIS.

2.2.5 Jurisdictional Wetlands Delineation

A formal jurisdictional wetlands delineation was conducted in accordance with the following agencies and regulations: (1) the U.S. Army Corps of Engineers (Corps), pursuant to Section 404 of the Federal Clean Water Act; (2) the Regional Water Quality Control Board (Regional Board), pursuant to Section 401 of the Federal Clean Water Act and the Porter-Cologne Act; (3) CDFW, pursuant to Section 1600 of the California Fish and Game Code; and (4) the California Coastal Commission (Commission). Details of the jurisdictional wetlands delineation are provided in the *Results of a Preliminary Jurisdictional Wetland Delineation for the Otay River Estuary Restoration Project (ORERP), South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge* (Dudek March 10, 2015; Appendix B).

The following data sources were reviewed to assist in the delineation effort:

- National Wetlands Inventory Maps (USFWS 2009)
- National Hydric Soils List
- Natural Resource Conservation Service Web Soil Survey (USDA 2009)
- Historical aerial photographs

The wetlands delineation was performed in accordance with the methods prescribed in the Corps's 1987 Wetland Delineation Manual (ACOE 1987), Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (ACOE 2008), and the Corps/Environmental Protection Agency's Rapanos Guidance (ACOE 1987, 2008; ACOE and

EPA 2007). Other references used for the delineation included Reed 1988, SWANCC 2001, USDA 1994, USGS 2007, and USFWS 2008.

Areas under the jurisdiction of the Regional Board generally coincided with waters of the United States; however, isolated waters may have been under the jurisdiction of the Regional Board as waters of the State as provided by the State Porter-Cologne Act. The Corps/Regional Board wetland delineation consists of the field identification of jurisdictional wetlands using the three parameters described in the Corps Manual: hydric soils, hydrology, and hydrophytic vegetation. A predominance of hydrophytic vegetation, where associated with a stream channel, was used to determine CDFW-regulated riparian areas. Wetlands under the jurisdiction of the Commission were delineated using the Cowardin method of wetlands classification (Cowardin et al. 1979), which defines wetland boundaries by a single parameter (i.e., hydric soils, hydrophytic vegetation, or hydrology). In some instances where isolated surface waters are present, the Regional Board may choose to take jurisdiction over these resources under the State's Porter-Cologne Act.

Otay River Floodplain Site

Dudek biologists Andrew Thomson and Kathleen Dayton performed a formal (routine) wetlands delineation within the Otay River Floodplain Site on February 22, 2011. An additional analysis of the site was conducted by Dudek's Stuart Fraser on July 20, 2011, to confirm lack of ponding in the former salt pond areas in the western portion of the site. The Corps conducted fieldwork in August 2012 to refine Corps jurisdictional areas. All areas identified as being potentially subject to the jurisdiction of the Corps, Regional Board, CDFW, and/or the Commission were field verified and mapped.

Hydrology, vegetation, and soils were assessed at 21 geographically distinct sampling locations (Sampling Points 5–25) (Appendix B) throughout the site to determine the presence or absence of wetland field indicators. The overall area was assessed for evidence of an ordinary high water mark, saturation, permanence of surface water, wetland vegetation, and a nexus to traditional navigable waters. A more detailed description of the methods is described below.

The location of sampling points and the limits of wetlands were collected in the field using a 100-scale (1 inch = 100 feet) aerial photograph, topographic base, and GPS equipment with sub-meter accuracy. ArcGIS software was used to compile the information into a geospatial database.

Pond 15 Site

Dudek biologists Andrew Thomson and Kathleen Dayton performed a formal wetlands delineation within the Pond 15 Site on March 13, 2013. All areas identified as being potentially

subject to the jurisdiction of the Corps, Regional Board, CDFW, and/or the Commission were field verified and mapped.

Hydrology, vegetation, and soils were assessed at 15 geographically distinct sampling locations (Sampling Points 1–15) (Appendix B) throughout the site to determine the presence or absence of wetland field indicators. The overall site was assessed for evidence of an ordinary high water mark, saturation, permanence of surface water, wetland vegetation, and a nexus to traditional navigable waters.

The location of sampling points and the limits of wetlands were collected in the field using a 100-scale (1 inch = 100 feet) aerial photograph, topographic base, and GPS equipment with sub-meter accuracy. ArcGIS software was used to compile the information into a geospatial database.

Project Features

Dudek biologist Andrew Thomson performed a formal wetlands delineation within the project features on May 29, 2014. All areas identified as being potentially subject to the jurisdiction of the Corps, Regional Board, CDFW, and/or the Commission were field verified and mapped.

Hydrology, vegetation, and soils were assessed at seven geographically distinct sampling locations (Sampling Points 1–7) (Appendix B) throughout the access route area to determine the presence or absence of wetland field indicators. The overall area was assessed for evidence of an ordinary high water mark, saturation, permanence of surface water, wetland vegetation, and nexus to a traditional navigable water.

The location of sampling points and the limits of wetlands were collected in the field using a 100-scale (1 inch = 100 feet) aerial photograph, topographic base, and GPS equipment with sub-meter accuracy. Dudek GIS technician Lesley Terry digitized the jurisdictional extents based on the GPS data and data collected directly onto field maps using ArcGIS software.

INTENTIONALLY LEFT BLANK

3 PHYSICAL CHARACTERISTICS

3.1 Site Description

The project site is separated into two non-contiguous areas: the Otay River Floodplain Site and the Pond 15 Site. Both sites will provide wildlife habitat and proximity to the coastline upon completion of the project. The project also includes a number of project features. The lack of significant topographic relief on the Otay River Floodplain Site and Pond 15 Site and surrounding properties allows for broad views across the sites from the neighboring communities of National City, Chula Vista, and Imperial Beach, and the Silver Strand (State Route 75). The project site is surrounded by scenic resources, including San Diego Bay, the Pacific Ocean, and low coastal bluffs and marshlands.

3.1.1 Topography

The approximately 33.5-acre Otay River Floodplain Site is located within the uplands of the Otay River floodplain at the southeastern edge of San Diego Bay, as shown in Figure 2. The relatively flat floodplain gently slopes from southeast to northwest, ranging in elevation from approximately 9.5 to 18.5 feet. The flat elevation of the site and surrounding areas allows for direct views of the adjacent salt ponds and the San Diego Bay to the north. These two features are the most prominent landforms in the general vicinity. The levees that form the salt ponds are visible from around San Diego Bay and much of the developed upland areas that border the San Diego Bay to the south (USFWS 2006b). The San Ysidro Mountain Range and Otay Mountain, which is the highest point in the mountain range, is located more than 12 miles from the project site and is visible on the horizon from the site.

Channelized water flows along the northern boundary of the site through the Otay River and through the center of the site in a north/south direction through Nestor Creek. The western portion of the site contains levees and basins that were constructed as part of the salt ponds system. The eastern portion of the site was formerly used for sewage treatment facilities and agriculture, and is currently dominated by non-native plant species (USFWS 2006b).

The approximately 90.9-acre Pond 15 Site is relatively flat, located directly along the southeastern edge of the San Diego Bay, approximately 1.5 miles west of the Pacific Ocean. The water-filled pond has little to no vegetation due to its high salinity, and often includes periods of very low water levels. The levees and salt ponds, including the Pond 15 Site, are visible throughout the San Diego Bay and much of the developed upland area that borders the south of the San Diego Bay, including the industrially developed sites located east and northeast of the salt ponds.

The prominent visual feature from the Pond 15 Site as viewed from outside the San Diego Bay NWR is the levee barrier system that separates the pond from tidal circulation of the surrounding Bay. Chula Vista Bayfront Park is located approximately 0.5 mile north of the Pond 15 Site. This area also has an uninterrupted view of the Pond 15 Site, with only the waters of the Bay and the access road to the Chula Vista Wildlife Reserve between the two areas. The Pond 15 Site is also visible between 1 to 2 miles across the San Diego Bay from the Bayshore Bikeway and Silver Strand (State Route 75).

3.1.2 Soils

The Otay River Floodplain Site is located at the western terminus of the Otay River within the Otay River floodplain. The floodplain is characterized by soft alluvial/bay deposits under 3 to 5 feet of uncompacted fill soils. The Otay River Floodplain Site is almost entirely composed of Grangeville fine sandy loam at slopes ranging from 0% to 2%. This type of soil is often found in alluvial fans and has a high capacity to transmit water. The soil is considered fertile, with a very high water capacity and a low possibility of erosion. The eastern edge of the site is composed of Visalia gravelly sandy loam ranging from 2% to 5% slope. Visalia gravelly sandy loam is also commonly found in alluvial fans and has a high capacity for transmitting water. However, this soil only contains a moderate available water capacity compared to the soil on the majority of the site. The open space area to the east of the Otay River Floodplain Site contains areas of Riverwash and Tujunga sand, both of which are common in floodplains. These soils have high water-transmitting capabilities and only moderate available water capacity (USDA 2009).

The Pond 15 Site is composed of 140 million gallons of water underlain by Quaternary alluvium. This is silt, sand, clay, and gravel with minor cobbles and boulders generally found in river and stream bottoms, valley fill, floodplains, fans, beach sand, swamps, and sand dune deposits. The Pond 15 Site is within a liquefaction hazard area, or an area with shallow groundwater tables and poorly consolidated granular sediments potentially subject to hazards associated with seismically induced liquefaction, per the City of Chula Vista General Plan Environmental Impact Report Geologic Maps (Figures 5.5-1 and 5.5-2 in the General Plan Environmental Impact Report) (City of Chula Vista 2005).

4 RESULTS OF SURVEY

4.1 Botany – Plant Communities and Floral Diversity

4.1.1 Otay River Floodplain Site

The Otay River Floodplain Site is approximately 33.5 acres, consisting mostly of disturbed and native upland habitat and approximately 6.43 acres of wetland habitat or waters of the United States. Historically, some of the upland areas within the Otay River Floodplain Site supported either freshwater or riparian habitat, but appear to have predominantly been composed of coastal salt marsh habitat (USFWS 2006b). Over time these wetland areas were converted to upland due to channelization of the Otay River, construction of solar salt ponds, and past agricultural activity.

The Otay River Floodplain Site contains five vegetation communities or land covers, as listed in Table 2 and shown in Figure 3, Otay River Floodplain Restoration Site and Project Features Vegetation. Each vegetation community within the project site is described in greater detail below.

Table 2
Vegetation Communities and Land Cover Types for the Otay River Floodplain Site

Vegetation Community/Land Cover Type	Acreage
Isocoma Scrub	11.97
Brackish Water	0.77
Southern Coastal Salt Marsh	1.26
Disturbed Land	8.68
Former Salt Pond Bottom and Borrow Area	10.83
Total	**33.51**

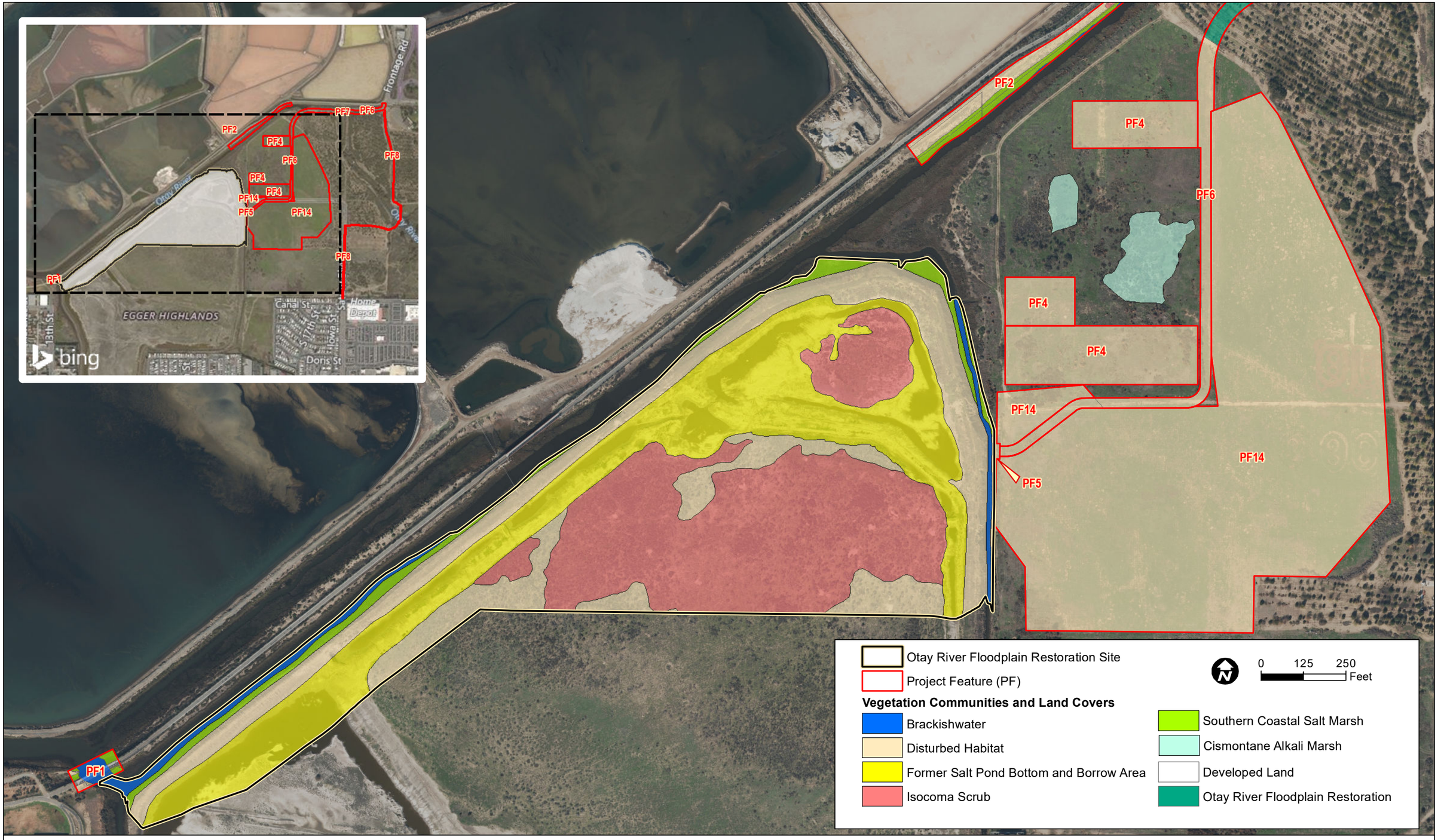
4.1.1.1 Isocoma Scrub; Tier II

Isocoma scrub is dominated by Menzies' goldenbush (*Isocoma menziesii*). The stands of *Isocoma* scrub vegetation on the site, which occur west of Nestor Creek, form a sparse to open shrub layer. The overall height of these shrubs varies from 0 to 3 feet, and overall vegetation shrub cover is approximately 50%. There are a few patches of coastal cholla (*Opuntia prolifera*) within the community, but the community lacks diversity and is predominantly composed of a nearly monotypic stand of Menzies' goldenbush in the shrub layer. The understory is predominantly composed of non-native annual weeds such as stork's bill (*Erodium* spp.), black mustard (*Brassica nigra*), shortpod mustard (*Hirschfeldia incana*), Maltese star-thistle (*Centaurea melitensis*), bromes (*Bromus* spp.), and slender oat (*Avena barbata*).

4.1.1.2 Southern Coastal Salt Marsh; Wetlands

Southern coastal salt marsh typically occurs in bays, lagoons, and estuaries along the coast, and is subject to tidal inundation. Dominant species include alkali seaheath (*Frankenia salina*), seablite (*Suaeda* sp.), and Parish's glasswort (*Arthrocnemum subterminale*) along the drier upper edges of the marshes; Pacific swampfire (*Salicornia pacifica*), dwarf saltwort (*Salicornia bigelovii*), and turtleweed (*Batis maritima*) at middle elevations; and California cordgrass (*Spartina foliosa*) at the lowest elevations.

On site, southern coastal salt marsh generally occurs along the channel of the Otay River that extends along the northern edge of the site, within Nestor Creek, and at the convergence of the Otay River and Nestor Creek. The southern coastal salt marsh on site includes seablite, Pacific swampfire, Parish's glasswort, and California cordgrass.



Document Path: Z:\Projects\jl675801\MAPDOC\MAPS\BioResourcesReport\Fig 3 ORFS Veg Proj Features.mxd

AERIAL SOURCE: SANDAG IMAGERY 2014

DUDEK

FIGURE 3

Otay River Floodplain Restoration Site and Project Features Vegetation

Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

INTENTIONALLY LEFT BLANK

4.1.1.3 Brackish Water; Wetlands

Brackish water refers to tidal channels that are unvegetated, and, thus, do not fit into other wetland habitat categories. The lack of vegetation may be due to the depth of water; scouring effects of floods or regular tidal inundation; or human-caused vegetation removal for flood control, access, sand mining, or other purposes.

The brackish water on site receives water from the ocean with regular tidal inundation, and from freshwater influence from upstream sources. One channel is located along the northern edge of the site (Otay River channel) and a second is oriented north/south through the center of the site (Nestor Creek). Within the project site, both channels are subject to regular tidal inundation.

4.1.1.4 Former Salt Pond Bottom and Borrow Area; Tier IV

The former salt pond bottom and borrow areas consist of a series of low-lying areas that are remnants of former industrial salt evaporation pond construction and operations. The bottom and borrow areas are surrounded by a tall levee that separates them from the adjacent tidal channels. The levee was constructed, in part, using soil excavated from within the basin (borrow area). Because of this area's historical long-term use as an industrial salt evaporation pond, the soil conditions are hypersaline, and the land mapped as former salt pond bottom and borrow area does not support vegetation. The former salt pond bottom and borrow areas are located south and west of the Otay River and Nestor Creek channels. Within this vegetation type, 4.39 acres were determined to be wetlands or non-wetland waters, the remaining 6.44 acres do not meet the definition of wetlands or non-wetland waters.

4.1.1.5 Disturbed Land; Tier IV

Disturbed habitat refers to areas that are not developed but generally lack vegetation, and generally are the result of severe or repeated mechanical perturbation. ~~Disturbed land refers to areas that are not developed but lack vegetation, and generally are the result of severe or repeated mechanical perturbation.~~ The disturbed habitat on site includes an area that was farmed in the past and is periodically mowed by the San Diego Bay NWR to control non-native weeds (specifically crowndaisy [*Glebionis coronaria*]) and for fire management purposes.

4.1.2 Pond 15 Site

The Pond 15 Site consists of approximately 91 acres of disturbed and native upland habitat and approximately 86.27 acres of non-vegetated habitat, including the brines contained in the salt ponds and areas mapped as bay, beach, and disturbed habitat (Figure 4, Pond 15 Restoration Site

and Project Features Vegetation). Prior to diking for salt production, the entire area within the Pond 15 Site was composed of intertidal mudflat.

The Pond 15 Site is part of the South Bay Salt Works operation that currently produces salt for commercial purposes using solar radiation to evaporate water from seawater and concentrate and eventually crystallize the salts through a sequential evaporation technique. The salt evaporation ponds are separated from the adjacent San Diego Bay and tidal channels by levees that surround the ponds. These levees reach a maximum elevation of approximately 8 feet, slightly greater than the highest observed water level (7.71 feet North American Vertical Datum [NAVD 88]). The Pond 15 Site includes the vegetation communities or land covers listed in Table 3 and shown in Figure 4. Each vegetation community within the project site is described in greater detail below.

Table 3
Vegetation Communities and Land Cover Types for the Pond 15 Site

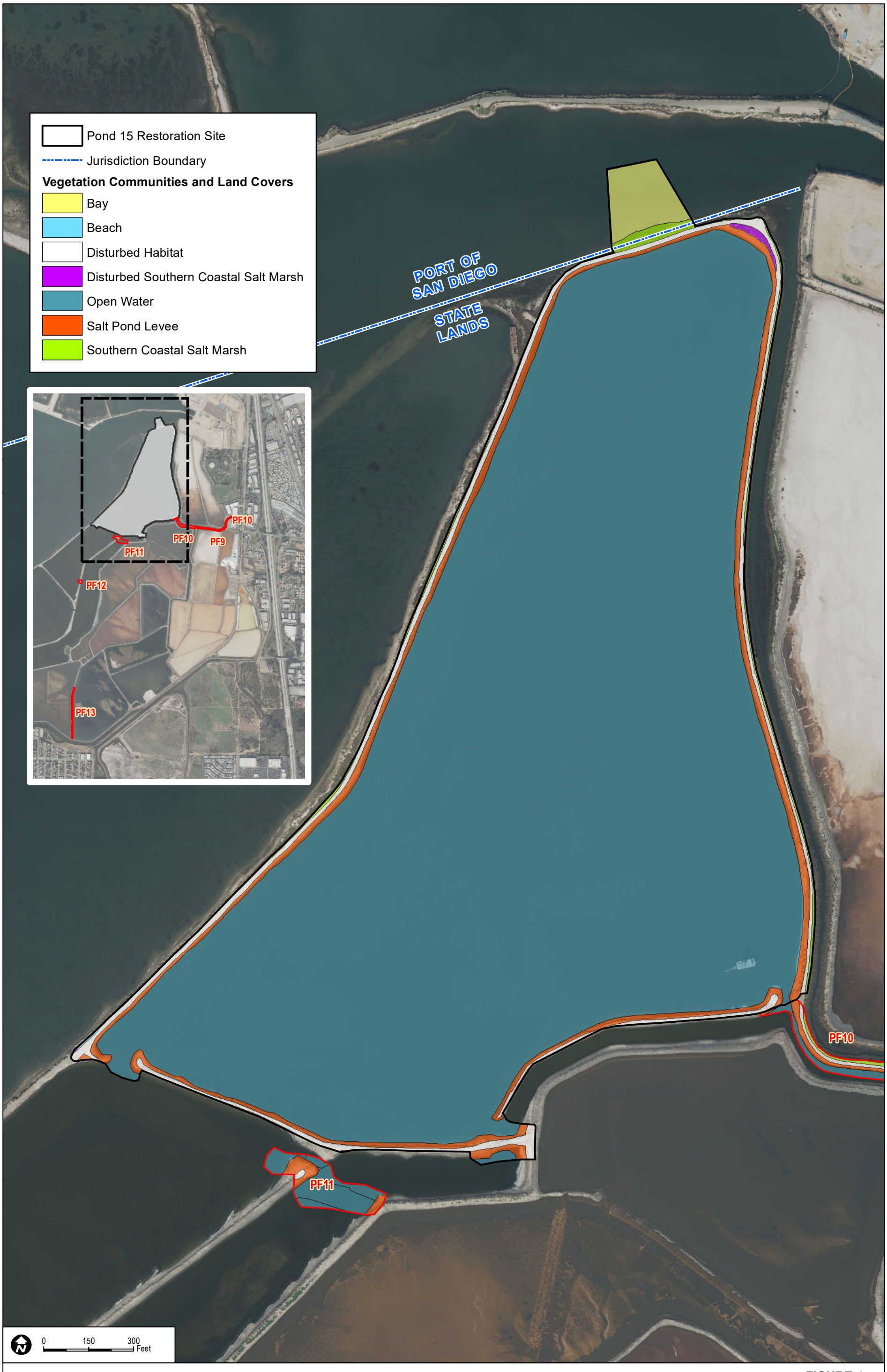
Vegetation Community/Land Cover Type	Acreage
Bay	1.15
Beach	0.01
Disturbed Land	2.77
Open Water	82.34
Salt Pond Levee	3.67
Southern Coastal Salt Marsh	0.87
Disturbed Southern Coastal Salt Marsh	0.10
Total	**90.90**

4.1.2.1 Bay

Areas mapped as bay refer to the open water located within the San Diego Bay. An area mapped as bay is located at the north of the Pond 15 Site. The Pond 15 Site includes a 1.30-acre portion of San Diego Bay located immediately to the north of the area proposed for the Pond 15 levee breach (Figure 4). Approximately 1.15 acres of the 1.30 acres is designated as "Bay". This portion of San Diego Bay is managed by the San Diego Unified Port District.

4.1.2.2 Beach

Beach refers to areas that are on the Bay side of the levees and that are subject to tidal inundation but are generally exposed sand. Areas that are mapped as beach are lacking vegetation. Beach areas are infrequently tidally inundated, whereas tidal flat and mudflat areas are inundated on a daily basis.



AERIAL SOURCE: SANDAG IMAGERY 2014

Document Path: Z:\Projects\j675801\MAPDOC\MAPS\BioResourcesReport\Fig 4 Pond15_Veg.mxd

DUDEK

FIGURE 4

Pond 15 Restoration Site and Project Features Vegetation

Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

INTENTIONALLY LEFT BLANK

4.1.2.3 Disturbed Land

Disturbed land refers to areas that are not developed but generally lack vegetation and generally are the result of severe or repeated mechanical perturbation. ~~Disturbed land refers to areas that are not developed but lack vegetation, and generally are the result of severe or repeated mechanical perturbation.~~ The disturbed land on site includes the top surface of the levees surrounding the Pond 15 Site. These areas are used for vehicular access and do not support significant stands of vegetation.~~These areas are driven on for vehicular access, and do not support vegetation.~~

4.1.2.4 Open Water

Open water consists of concentrated brines and areas that are perennially inundated by brines within the Pond 15 Site. The salt pond brines are hypersaline and vary in salinity from pond to pond, depending on each pond's position in the sequential evaporative water process and the timing associated with seasonal intakes of bay water. ~~The salt pond brines are hypersaline and vary in salinity from pond to pond, depending on its position in the sequential evaporative water process.~~ Overall salinity within the South Bay Salt Works varies from the salinity of south San Diego Bay (32 parts per thousand (ppt)) to 356 ppt, with the Pond 15 Site varying from 71.3 to 128.5 ppt (USFWS 2006b). As a matter of reference, ocean water salinity varies from 32 to 37 ppt (Office of Naval Research 2014).

4.1.2.5 Salt Pond Levee

The salt pond levees separate the salt ponds for controlling the salinity as part of the salts works operation. The levees vary in the degree to which they are compacted, with the lower and outer edges being less compacted, and the surfaces intended for vehicle access being more compacted. Areas with less compaction occasionally support disjunct patches of vegetation, but the compacted areas are devoid of vegetation. Areas intended for driving access that are devoid of vegetation were classified as disturbed habitat to distinguish them in the context of regulated versus non-regulated jurisdictional areas. Patchy vegetation occurring on the salt pond levees consists of a combination of native and non-native species. Native species that occur on the levees are typical of middle and upper salt marsh habitat, such as saltgrass, Parish's glasswort, and seablite. Non-native species occurring on the levees consists of iceplant (*Mesembryanthemum* spp.), bromes, and patches of Australian saltbrush (*Atriplex semibaccata*).

4.1.2.6 Southern Coastal Salt Marsh and Disturbed Southern Coastal Salt Marsh

Southern coastal salt marsh typically occurs in bays, lagoons, and estuaries along the coast and is subject to tidal inundation. Dominant species include alkali seaheath, seablite, and Parish's

glasswort along the drier upper edges of the marshes; Pacific swampfire and turtleweed at middle elevations; and cordgrass closest to the water.

On site, southern coastal salt marsh occurs as small patches of vegetation along the levee that surrounds the salt pond. It is classified as a disturbed form of the habitat in areas where there is overall low vegetative cover of the community. Salt marsh vegetation is also present off site along some of the internal levees of the South Bay Salt Works, on the Otay River and Bay side of the levee system, and along the Palomar Street channel and the channel east of Pond 15. On the Pond 15 Site, the internal levees are lacking in vegetation. The southern coastal salt marsh on site includes seablite, Parish's glasswort, and California cordgrass.

4.1.3 Project Features

Implementation of the project features in support of the overall habitat restoration activities at the Otay River Floodplain Site and Pond 15 Site would involve approximately 1.61 acres of native vegetation communities and 39.14 acres of non-native vegetation communities and land covers (Figures3 and 4; Figures 5 and 6, Project Features Vegetation). Table 4 provides a summary of the acreage of existing vegetation communities and land cover types associated with the project features.

Table 4
Vegetation Communities and Land Covers within the Project Features

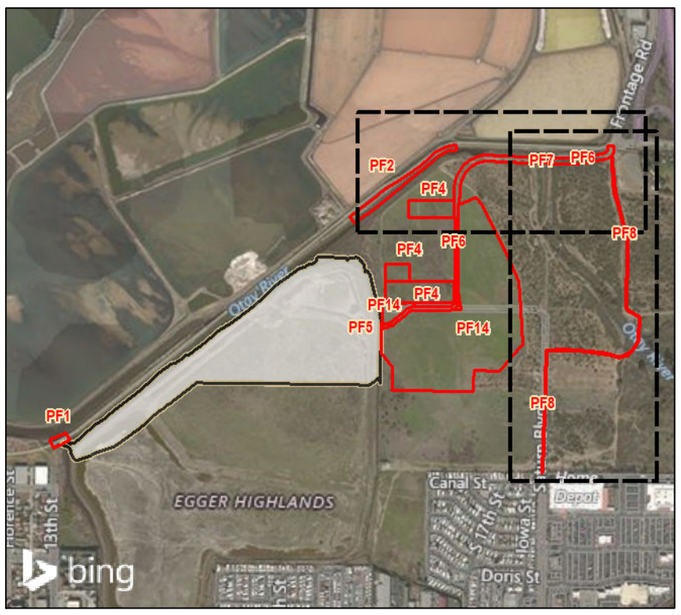
Vegetation Community/ Land Cover Type	Project Features (Acres)														
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*Total*
Non-Native Communities and Land Covers															
Brackish Water	0.13	0.08	—	—	—	—	—	—	0.01	—	—	—	—	—	0.22 ~~0.21~~
Developed Land	0.02	—	—	—	—	0.12	0.01	0.74	0.04	0.49	—	—	—	—	1.42
Disturbed Habitat	0.03	0.68	— ~~4.07~~	4.11 ~~6.06~~	0.02	1.96 ~~1.87~~	0.07	0.02	0.04	0.30	0.02	0.02	0.41	23.11 ~~21.50~~	30.79 ~~35.11~~
Salt Flat	—	—	—	—	—	—	—	—	—	0.06	—	—	—	—	0.06
Open Water	—	—	—	—	—	—	—	—	—	0.40	0.79	0.08	0.03	—	1.30
Salt Pond Levee	—	—	—	—	—	—	—	—	0.01	0.45	0.19	0.08	0.31	—	1.04
Non-Native Communities Subtotal	0.18	0.76	0.00 ~~4.07~~	4.11 ~~6.06~~	0.02	2.08 ~~1.99~~	0.08	0.76	0.10	1.70	1.00	1.08	0.75	23.11 ~~21.50~~	34.83 ~~39.26~~
Native Communities															
Otay River Floodplain ~~Otay River Floodplain Restoration~~	—	—	—	—	—	0.56	—	0.03	—	—	—	—	—	—	0.59
Freshwater Marsh	—	—	—	—	—	—	0.08	—	—	—	—	—	—	—	0.08
Isocoma Scrub	—	0.06	—	—	—	—	—	—	—	—	—	—	—	—	0.06
Mulefat Scrub	—	—	—	—	—	0.06	—	—	—	—	—	—	—	—	0.06
Southern Coastal Salt Marsh	0.06	0.47	—	—	—	0.02	0.02	—	0.06	0.19	—	—	—	—	0.82
Native Communities Subtotal	*0.06*	*0.53*	*0.00*	*0.00*	*0.00*	*0.64*	*0.10*	*0.03*	*0.06*	*0.19*	*0.00*	*0.00*	*0.00*	*0.00*	*1.61*
Total	**0.24**	**1.29**	**0.00 ~~4.07~~**	**4.11 ~~6.06~~**	**0.02**	**2.72 ~~2.63~~**	**0.18**	**0.79**	**0.16**	**1.89 ~~1.90~~**	**1.00**	**0.18**	**0.75 ~~0.76~~**	**23.11 ~~21.50~~**	**36.44 ~~40.76~~**

Project Features:
1 Otay Channel Protection under Bikeway Bridge (Temporary and Permanent)

2 Otay Channel Protection (Permanent)
~~3 Stockpiles (Permanent)~~
Note: The material that was to be stockpiled will be used to cover a 23.11-acre area of disturbed habitat east of Nestor Creek; see Project Feature 14.
4 Staging Area (Temporary)
5 Crossing at Nestor Creek (Temporary)
6 Two-Lane Truck Route Connecting Nestor Creek (Temporary)
7 Crossing at Otay River (Temporary)
8 Bike Path Reroute (Temporary)
9 Crossing at Palomar Channel (Temporary)
10 Two-Lane Truck Crossing at Salt Pond levee (Temporary)
11 Levee Modification of Ponds 13 and 14 – North (Temporary and Permanent)
12 Levee Modification of Ponds 13 and 14 – South (Temporary and Permanent)
13 Raised Levee between Ponds 22 and 23 (Permanent)
14 Exposure Reduction Cover (Permanent) ~~14 Restoration Area East of Nestor Creek (Permanent)~~







Otay River Floodplain Restoration Site

Project Feature (PF)

Vegetation Communities and Land Covers

- Brackishwater
- Disturbed Habitat
- Former Salt Pond Bottom and Borrow Area
- Isocoma Scrub
- Southern Coastal Salt Marsh
- Cismontane Alkali Marsh
- Developed Land
- Otay River Floodplain Restoration

AERIAL SOURCE: SANDAG IMAGERY 2014

DUDEK

FIGURE 5

Project Features Vegetation

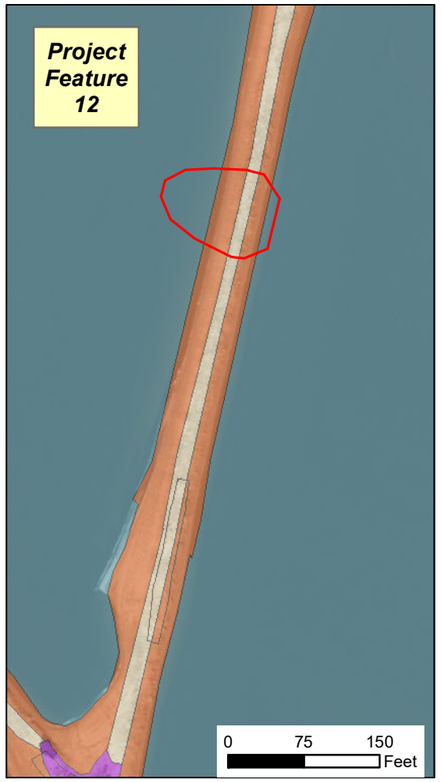
Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

Document Path: Z:\Projects\j675801\MAPDOC\MAPS\BioResourcesReport\Fig 5 ORFS Proj Features Veg.mxd

INTENTIONALLY LEFT BLANK





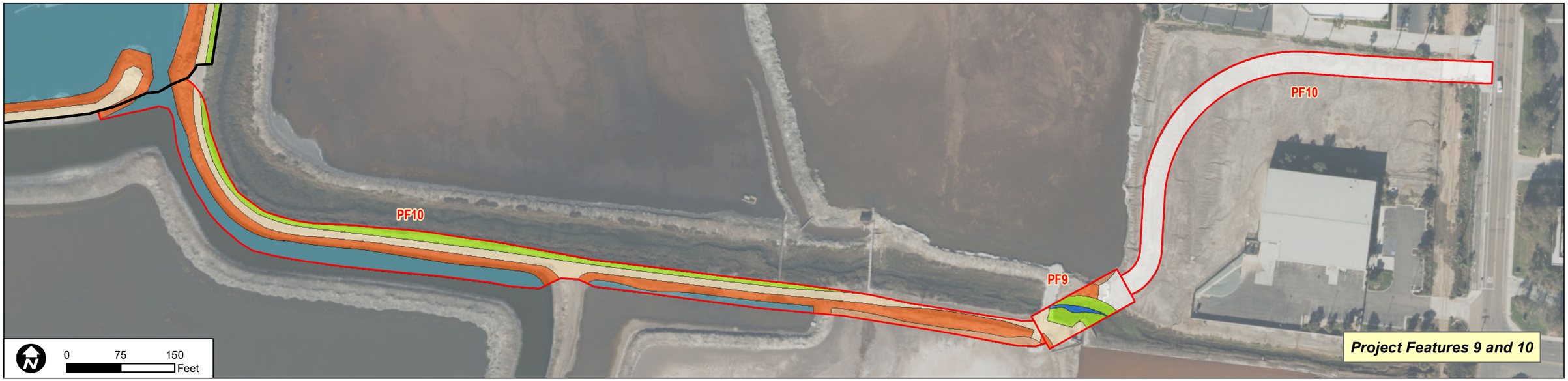


Pond 15 Restoration Site

Project Feature (PF)

Vegetation Communities and Land Covers

- Bay
- Beach
- Brackishwater
- Disturbed Southern Coastal Salt Marsh
- Open Water
- Salt Flats
- Disturbed Habitat
- Developed Land
- Salt Pond Levee
- Southern Coastal Salt Marsh



AERIAL SOURCE: SANDAG IMAGERY 2014

DUDEK

FIGURE 6

Project Features Vegetation

Biological Resources Existing Conditions Technical Report

INTENTIONALLY LEFT BLANK

The proposed action would consist of the following:

1. ***Otay Channel Protection under Bikeway Bridge.*** The channel protection would be a permanent impact except for the impacts to brackishwater which are temporary.
2. ***Otay Channel Protection.*** The channel protection would be a permanent impact.
3. ~~***Stockpiles.*** Within the proposed staging area, two areas encompassing a total of 4.07 acres would be set aside for stockpiling excavated material.~~ Stockpile areas have been removed.
4. ***Staging Area.*** Implementation of the proposed action would require a site where the logistics of mobilization and demobilization can occur, as well as where other activities related to the proposed action can be coordinated.
5. ***Crossing at Nestor Creek.*** To access the western portion of the Otay River Floodplain Site from the staging area east of Nestor Creek, the contractor would install a temporary crossing across Nestor Creek composed of fill material and associated culverts.
6. ***Truck Route Connecting Nestor Creek.*** The truck construction access route would be used under either of the construction material transfer alternatives. ~~The truck construction access route would be used under any one of the three construction material transfer alternatives.~~
7. ***Crossing at Otay River.*** To access the construction staging area and western portion of the Otay River Floodplain Site from the end of Main Street, the contractor would install a temporary crossing at the Otay River channel.
8. ***Bike Path Reroute.*** The existing bike path would be temporarily rerouted during construction to minimize conflicts between bicyclists and construction vehicles and to ensure user safety.
9. ***Crossing at Palomar Channel.*** The temporary crossing would be composed of fill material and associated culverts to ensure that the temporary crossing would not create impediments to water flow.
10. ***Truck Crossing at Salt Pond Levee***. This would be a temporary impact.
11. ***Pond 13 and Pond 14 Levee Modifications.*** Permanent modifications in the northern areas of these ponds except for areas that will remain within open water; these will be temporary.
12. ***Pond 13 and Pond 14 Levee Modifications.*** Permanent modifications in the southern areas of these ponds except for areas that will remain within open water; these will be temporary.

13. ***Raised Levee between Pond 22 and Pond 23.*** The elevation of the levee that extends for approximately 14,000 feet between Ponds 22 and 23 would be permanently raised by 2 feet to a new crest elevation of +13 feet NAVD 88.
14. **Exposure Reduction Cover.** Excess material from the excavation of the Otay River Floodplain Site would be spread over 23.11 acres to the east of Nestor Creek.~~***Restoration Area East of Nestor Creek.*** The 21.5-acre area east of Nestor Creek would be restored to native vegetation following completion of the proposed action. Stockpiled material on the staging area would partially be used for this restoration effort.~~

4.1.4 Floral Diversity

A total of 61 species of vascular plants, 36 native (59%) and 25 non-native (4%), were identified on the site in 2011. The complete list of plant species identified on site during surveys conducted in 2011 is provided as Appendix A.

4.2 Zoology – Wildlife Diversity

4.2.1 Otay River Floodplain Site

The Otay River Floodplain Site offers moderate habitat value for wildlife species, primarily for migratory birds and common upland species, but also provides foraging habitat for a number of raptor species. The habitat supports a number of upland species prevalent within disturbed and urbanized areas. The habitat within the project site lacks cover and structural diversity and, except for the patches of *Isocoma* scrub, is dominated by non-native species, providing relatively few resources for wildlife. A total of 83 species of wildlife (79 birds and four mammals) were observed on the project site. Typical species commonly observed on site were house finch (*Carpodacus mexicanus*) and lesser goldfinch (*Spinus tristis*). Several swallow species were observed over the survey period, and many individuals were observed foraging in flight over the site. A number of raptor species were observed foraging on small mammals within the vegetation. Coastal shorebirds and gulls were periodically observed flying over the site. No reptile or amphibian species were observed on site. Some species that are likely to occur include western fence lizard (*Sceloporus occidentalis*), side-blotched lizard (*Uta stansburiana*), and gopher snake (*Pituophis melanoleucus*). Common species of mammals recorded in upland parts of the site included brush rabbit (*Sylvilagus bachmani*), coyote (*Canis latrans*), and California ground squirrel (*Spermophilus beecheyi*). Other mammals adapted to living in areas near human disturbance, such as striped skunk (*Mephitis mephitis*) and Virginia opossum (*Didelphis virginica*), may also occur on the site.

4.2.2 Pond 15 Site

The Pond 15 Site offers moderate habitat value for wildlife species, primarily for migratory and water birds, with some support for common upland species that typically inhabit a wide range of sites. Habitat on the project site consists mostly of saline brines, with a narrow upland perimeter formed by the levee system. The pond environment provides habitat for a variety of bird species, with the open water in the ponds supporting bird rafting and loafing and various levees surrounding the ponds providing nesting habitat for seabirds, shorebirds, and waterfowl. Although no fish or marine invertebrates are present in the Pond 15 due to the high salinities, this pond does support brine invertebrates, including brine shrimp and brine flies, which provide foraging opportunities for various avian species. In addition, some areas along the levee slopes provide appropriate vegetation to support Belding's Savannah sparrows. Immediately to the east of Pond 15 is a tidally-influenced drainage channel that also supports a variety of avian species.

The Final EIS for the San Diego Bay NWR CCP (USFWS) describes the range of avian species present within the salt ponds, as well as in the Palomar Channel that borders the eastern edge of Pond 15. The results of a comprehensive evaluation of migratory bird use at the salt works and adjacent tidal habitats conducted between February 1993 and February 1994 found that Pond 15 supported approximately 23,075 birds, as compared to 48,025 in Pond 23 and approximately 19,250 in Pond 27 (Stadtlander and Konecny 1994). At that time, Pond 15 attracted large numbers of foraging phalaropes, as well as roosting gulls, terns, double-crested cormorant (*Phalacrocorax auritus*), bufflehead (*Bucephala albeola*), American wigeon (*Anas americana*), and ruddy duck (*Oxyura jamaicensis*).

The results of monthly surveys conducted in 2012-2013 indicated that Pond 15 continues to support similar species, as well as high numbers of eared grebes (*Podiceps nigricollis*). Of the 20,458 eared grebes observed in the salt works during the survey, 4,965 were observed in Pond 15 (San Diego Natural History Museum & Avian Research Associates 2014). Survey results also indicated that all 1,592 red phalaropes (*Phalaropus fulicarius*) observed in the salt works where present in Pond 15, while none of the red-necked phalaropes (*Phalaropus lobatus*), 7,580 individuals, were observed in Pond 15. Of the Wilson's phalaropes (*Phalaropus tricolor*) observed in the salt works (a total of 1,127 individuals), 130 were seen in Pond 15. Additional results of the survey conducted in 2012-2013 are present in Table 5.

The avian use of the western salt ponds and the rest of south bay is but one ecological functionality. *The South San Diego Bay Coastal Wetland Restoration and Enhancement Project Year 4 (2015) Post-construction Monitoring Report* (Southwest Wetlands Interpretive Association 2016), which is the most recent monitoring report that is available, provides a summary of the physical and biological processes recorded for the restoration of the western salt

ponds. The tidal amplitude of the western salt ponds now matches that in south San Diego Bay. Natural recruitment and growth of salt marsh vegetation is taking place with expansion of cordgrass and pickleweed species. The fish species assemblage shows the trending toward similarity with south San Diego Bay. The microbenthic invertebrate assemblages are developing and now provide food for migratory shorebirds and fish.

During a visit to the site on September 16, 2015, it was noted that although the number of birds on the Pond 15 Site was high, the species richness was low. ~~During a visit to the site, it was noted that although numbers of birds within the Pond 15 Site were high, species richness was low.~~ In comparison, immediately adjacent to the Pond 15 Site within the San Diego Bay, species richness was very high, as species responded to the tidal influence cycles and the foraging opportunities within the periodically exposed mudflat. The results of surveys conducted between 2009 and 2010 in San Diego Bay indicated that species richness was slightly higher in Pond 15 (55 -77 unique species) than on the adjacent mudflats (41- 55 unique species) (Navy and SDUPD 2011). With respect to bird abundance, the 2009 to 2010 San Diego Bay surveys identified 21-50 birds per month per hectare in Pond 15 and 51-100 birds per month per hectare on the adjacent mudflats (Navy and SDUPD 2011).

Table 5
Results of the 2012-2013 Avian Surveys Conducted for the South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge

Common Name	Scientific Name	Numbers of individuals observed during the 2012-2013 avian surveys of the salt ponds and adjacent bay waters		
		Surveywide	*Pond 15 Only*	*Western Salt Ponds*
American Avocet	*Recurvirostra americana*	1274	18	153
American Coot	*Fulican americana*	1		6
American White Pelican	*Pelecanus erythrorhynchos*	90	12	25
American Wigeon	*Anas americana*	195	15	775
Black Skimmer	*Rynchops niger*	2186		18
Black Turnstone	*Arenaria melanocephala*	71	9	6
Black-bellied Plover	*Pluvialis squatarola*	6436	21	1242
Black-crowned Night-Heron	*Nycticorax nycticorax*	2		
Black-necked Stilt	*Himantopus mexicanus*	3094	256	153
Blue-winged Teal	*Anas discors*	0		3
Bonaparte's Gull	*Chroicocephalus philadelphia*	29	2	7
Brant	*Branta bernicla*	0		909
Brown Pelican	*Pelecanus occidentalis*	479	13	39
Bufflehead	*Bucephala albeola*	771	17	85

Table 5
Results of the 2012-2013 Avian Surveys Conducted for the South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge

Common Name	Scientific Name	Numbers of individuals observed during the 2012-2013 avian surveys of the salt ponds and adjacent bay waters		
		Surveywide	*Pond 15 Only*	*Western Salt Ponds*
California Gull	*Larus californicus*	3700	344	44
Canada Goose	*Branta canadensis*	12		
Caspian Tern	*Hydroprogne caspia*	1365	355	52
Cinnamon Teal	*Anas cyanoptera*	4		
Clark's Grebe	*Aechmophorus clarkii*	0		7
Common Goldeneye	*Bucephala clangula*	52		
Common Tern	*Sterna hirundo*	3		1
Double-crested Cormorant	*Phalacrocorax auritus*	940	444	72
Dowitcher sp.	*Limnodromus* sp.	758	1	1357
Duck sp.		12		
Dunlin	*Calidris alpina*	3376		1429
Eared Grebe	*Podiceps nigricollis*	20458	4965	36
Elegant Tern	*Thalasseus elegans*	6959	314	394
Eurasian Wigeon	*Anas penelope*	0		3
Forster's Tern	*Sterna forsteri*	204	3	62
Gadwall	*Anas strepera*	33	12	21
Great Blue heron	*Ardea herodias*	7		14
Great Egret	*Ardea alba*	8	2	30
Greater Scaup	*Aythya marila*	0		5
Greater Yellowlegs	*Tringa melanoleuca*	142	13	109
Green-winged Teal	*Anas crecca*	0		115
Gull sp.		135	2	
Gull-billed Tern	*Gelochelidon nilotica*	165		99
Heermann's Gull	*Larus heermanni*	2	2	
Herring Gull	*Larus argentatus*	119	44	29
Horned Grebe	*Podiceps auritus*	9		9
Killdeer	*Charadrius vociferus*	1034	3	71
Lapland Longspur	*Calcarius lapponicus*	3		
Large-billed Savannah Sparrow	*Passerculus sandwichensis rostratus*	3	1	5
Least Sandpiper	*Calidris minutilla*	3120	236	2476
California Least Tern	*Sterna antillarum browni*	70	1	49
Lesser Scaup	*Aythya affinis*	323	65	144
Lesser Yellowlegs	*Tringa flavipes*	4	2	

Table 5
Results of the 2012-2013 Avian Surveys Conducted for the South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge

Common Name	Scientific Name	Numbers of individuals observed during the 2012-2013 avian surveys of the salt ponds and adjacent bay waters		
		Surveywide	*Pond 15 Only*	*Western Salt Ponds*
Long-billed Curlew	*Numenius americanus*	21	8	101
Long-billed Dowitcher	*Limnodromus scolopaceus*	3		361
Long-tailed Duck	*Clangula hyemalis*	3		
Mallard	*Anas platyrhynchos*	31	8	9
Marbled Godwit	*Limosa fedoa*	1329	159	692
Marsh Wren	*Cistothorus palustris*	2		10
Northern Pintail	*Anas acuta*	33	5	252
Northern Shoveler	*Anas clypeata*	7490	944	526
Osprey	*Pandion haliaetus*	19	1	12
Sandpiper sp.		13286	148	70
Phalarope sp.	*Phalaropus* sp.	50		
Red Knot	*Calidris canutus*	1911	2	467
Red Phalarope	*Phalaropus fulicarius*	0	1592	
Red-breasted Merganser	*Mergus serrator*	0		17
Reddish Egret	*Egretta rufescens*	1		14
Redhead	*Aythya americana*	82		4
Red-necked Phalarope	*Phalaropus lobatus*	7580		25
Ring-billed Gull	*Larus delawarensis*	296	5	71
Royal Tern	*Thalasseus maximus*	1352	71	115
Ruddy Duck	*Oxyura jamaicensis*	1		66
Ruddy Turnstone	*Arenaria interpres*	24		107
Savannah Sparrow, Belding's	*Passerculus sandwichensis beldingi*	644	106	333
Scaup sp.	*Aythya* sp.	140	24	54
Semipalmated Plover	*Charadrius semipalmatus*	940		1358
Short-billed Dowitcher	*Limnodromus griseus*	11	5	305
Snow Goose	*Chen caerulescens*	3	3	
Snowy Egret	*Egretta thula*	9	2	94
Western Snowy Plover	*Charadrius nivosus nivosus*	141	1	5
Song Sparrow	*Melospiza melodia*	52		
Spotted Sandpiper	*Actitis macularius*	6	3	1
Surf Scoter	*Melanitta perspicillata*	0		13
Western Grebe	*Aechmophorus occidentalis*	1		30
Western Gull	*Larus occidentalis*	986	165	94
Western Sandpiper	*Calidris mauri*	51307	370	48069

Table 5
Results of the 2012-2013 Avian Surveys Conducted for the South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge

Common Name	Scientific Name	Numbers of individuals observed during the 2012-2013 avian surveys of the salt ponds and adjacent bay waters		
		Surveywide	*Pond 15 Only*	*Western Salt Ponds*
Whimbrel	*Numenius phaeopus*	184		12
Willet	*Tringa semipalmata*	6554	415	1831
Wilson's Phalarope	*Phalaropus tricolor*	1127	130	

~~Habitat within the project site consists mostly of saline brines, with a narrow upland perimeter formed by the levee system.~~

There are a few dominant species that use the Pond 15 Site. Within the shorebird group, per surveys conducted between 1999 and 2011 (SDNHM and ARA 2011), the most common species within the salt pond complex include red-necked phalarope (*Phalaropus lobatus*), Wilson's phalarope (*P. tricolor*), western sandpiper (*Calidris mauri*), marbled godwit (*Limosa fedoa*), willet (*Tringa semipalmatus*), and black-necked stilt (*Himantopus mexicanus*). ~~Within the shorebird group, the most common species included red-necked phalarope (*Phalaropus lobatus*), Wilson's phalarope (*P. tricolor*), western sandpiper (*Calidris mauri*), marbled godwit (*Limosa fedoa*), willet (*Tringa semipalmatus*), and black-necked stilt (*Himantopus mexicanus*).~~ Eared grebes (*Podiceps nigricollis*) represent the largest population of any species occurring within the Pond 15 Site. California brown pelican (*Pelecanus occidentalis californicus*), California gull (*Larus californicus*), double-crested cormorant (*Phalacrocorax auritus*), and elegant terns (*Thalasseus elegans*) also show a large population size at the South Bay Salt Works in general. ~~California brown pelican (*Pelecanus occidentalis californicus*), California gull (*Larus californicus*), double-crested cormorant (*Phalacrocorax auritus*), and elegant terns (*Thalasseus elegans*) also show a large population size at the salt ponds in general.~~ Various levees within the South Bay Salt Works provide nesting habitat for a number of colonial nesting seabirds, including the federally endangered California least tern (*Sternula antillarum browni*), Caspian tern (*Hydroprogne caspia*), elegant tern, royal tern (*Thalasseus maximus*), gull-billed tern (*Gelochelidon nilotica vanrossemi*), Forster's tern (*Sterna forsteri*), and black skimmer (*Rynchops niger*).~~Various levees within the South Bay Salt Works provide nesting habitat for a number of colonial nesting seabirds, including the Federally endangered California least tern (*Sternula antillarum browni*), Caspian tern (*Hydroprogne caspia*), elegant tern, royal tern~~

~~(*Thalasseus maximus*), gull-billed tern (*Gelochelidon nilotica vanrossemi*), Forster's tern (*Sterna forsteri*), and black skimmer (*Rynchops niger*).~~

Many of the levees within the salt pond complex, including those around Pond 15 provide nesting habitat for a diverse array of colonial nesting seabirds and some shorebirds. Seabirds that nest on the salt pond levees include the federally endangered California least tern, Caspian tern (*Hydroprogne caspia*), elegant tern, royal tern (*Thalasseus maximus*), western gull-billed tern (*Gelochelidon nilotica vanrossemi*), Forster's tern (*Sterna forsteri*), and black skimmer (*Rynchops niger*). Western snowy plovers, American avocets, and black-necked stilts also nest on or along the levees. California least terns, western snowy plovers, gull-billed terns, Caspian terns, Forster's terns, black skimmers, black-necked stilts, and double-crested cormorants have been documented nesting within or in proximity to the Pond 15 Site in various years between 1999 and the present. The locations of these nesting areas within the salt works between 2006 and 2017 are presented in Tables 6a and 6b, and Figure 7.

Table 6a
Locations[1] of Waterbird Nest Sites at the Salt Works Between 2006 – 2011[2]

	2006	2007	2008	2009	2010	2011
Nesting Seabirds *Common Name (Scientific Name)*						
California least tern *(Sterna antillarum browni)*	dikes VI, VII, IX, X, XII, spits 4, 6	dikes IV, VI, VII, IX, X, XII, spits 4, 6, berm A	dikes IV, VII, IX, X, XI, XII, spits 4, 6, berms A, E	dikes IV,VII, IX, X, XI, XII, XV, spits 4, 6, berm A, E, H	dikes III, IV, VII, IX, X, XII, XV, XVI, spits 4,6, berm A, E, H	dikes IV, VII, IX, X, XII, spits 4,6, berm E, E levee of Pond 11
Gull-billed tern *(Gelochelidon nilotica vanrossemi)*	dikes II, III, V	dikes II, III, V	dikes III, IV, V, XIII, berm C	dikes III, V, VI, XIII, spits 9, 10	dikes I, II, III, V	dikes II, III, IV, V, VI
Caspian tern *(Hydroprogne caspia)*	dikes I, II, III, VIII, perimeter road pond 14	dikes I, II, III, VIII	dikes I, II, III, V, VIII, spit 5, perimeter road pond 14	dike II, III, V, VIII, spit 5	dikes II, V, VIII	dikes II, V
Royal tern *(Thalasseus maxiumus)*	dikes I, II	dikes II, III	dikes I, II, III, VIII, perimeter road pond 14	dikes II,V, VIII	dikes II, III, V, VIII, berm F	dikes II, V, VIII
Elegant tern *(Thalasseus elegans)*	dikes I, II	dikes I, II, III, VI	dikes I, II, III, VIII, perimeter road pond 14	dikes I,II, III, V, VIII, spit 5, berm F	dikes II, III, IV, V, VIII, berm F	dike I, II, III, V, spit 1, berm F

Table 6a
Locations[1] of Waterbird Nest Sites at the Salt Works Between 2006 – 2011[2]

	2006	2007	2008	2009	2010	2011
Forster's tern *(Sterna forsteri)*	dikes I, II, III, V, VI, VII, spits 1,9, 10 perimeter road ponds 12,14,15	dikes III, V, VI, VII, spit 1, perimeter road ponds 12, 15	dike II, III, V, VI, VII, spits 1, 9, perimeter road ponds 12, 15	dikes II, III, V, VI, VII, spit 1, perimeter road ponds 12, 15	dikes I, II, III, V, VII, spit 1, perimeter road ponds 12, 15	dikes II, III, V, VI, VII, spit 1, perimeter road pond 12
Black skimmer *(Rynchops niger)*	dikes I, II, III, V, VI, VII, XIII, spit 8	dikes I, II, III, IV, V, VI, VII, spits 9, 10, perimeter road pond 12	dike II, III, IV, V, VI, VII, XIII	dikes III, IV, VI, VII, XIII, spit 4	dikes I, III, IV, V, VI, VII, XIII, spit 1, perimeter road ponds 12, 15	dikes II, III, IV, V, VI, VII, spit 1, perimeter road pond 12
Other Nesting Waterbirds Common Name/Scientific Name						
Western Snowy Plover *(Charadrius nivosus nivosus)*	dike IV	dike IV	dike IV	dikes IV, IX, spit 6, berm E, perimeter road pond 22	dikes IV, VIII, berm D	dikes IV, X, XII, spit 2, berm A, Pond 42, E levee of Pond 11
Double-crested cormorant *(Phalacrocorax auritus)*	dike II, barge	dikes II, III, VIII, barge	dike III, barge	dike II, barge	dike II, III, barge	dike II, barge

[1] These locations are illustrated in Figure ~~3.3-11~~7.
[2] Results of annual surveys conducted at the salt works by Robert Patton for the USFWS.

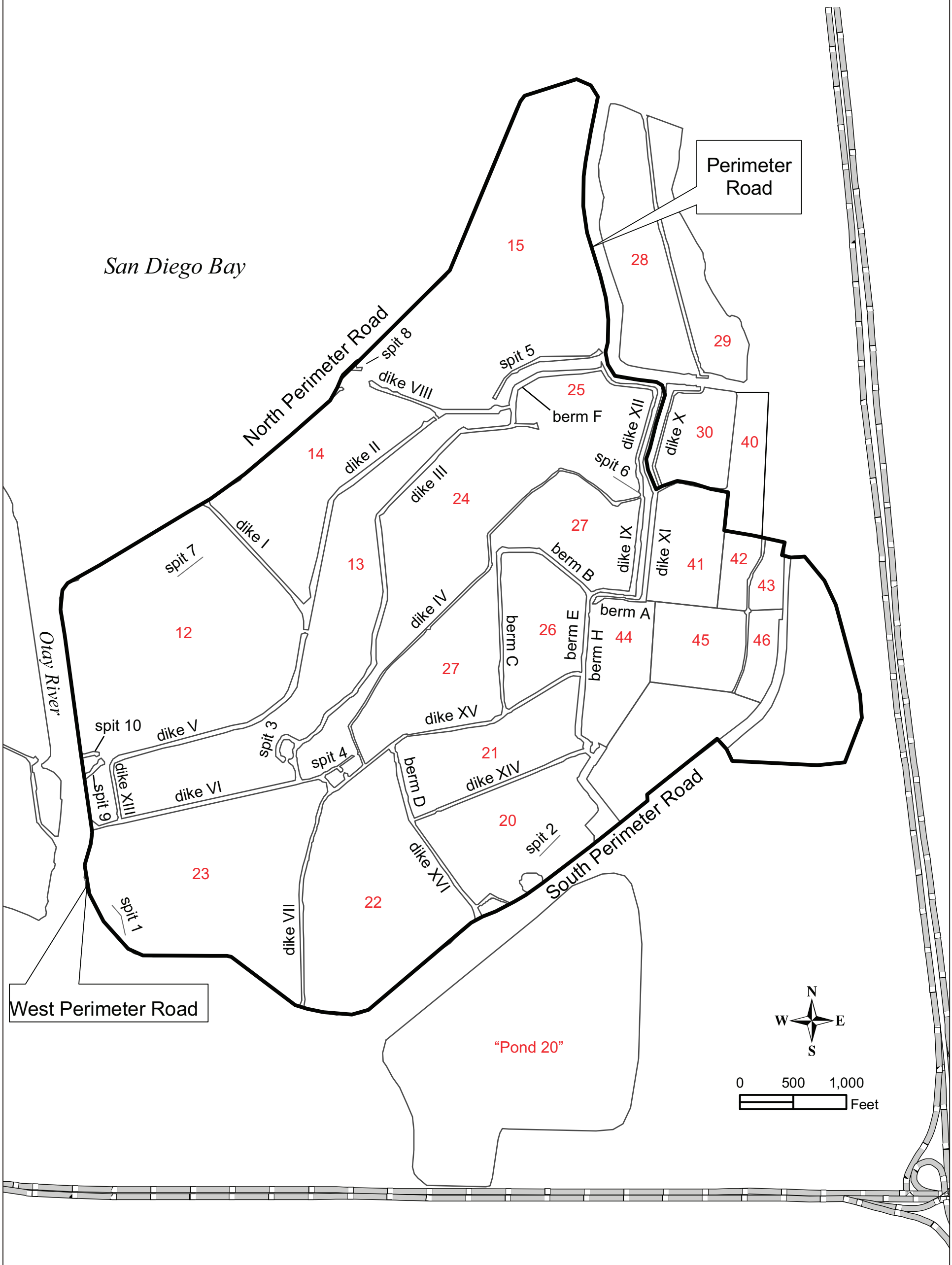
Table 6b
Locations[1] of Waterbird Nest Sites at the Salt Works Between 2012 – 2017[2]

	2012	2013	2014	2015	2016	2017
Nesting Seabirds						
California least tern *(Sterna antillarum browni)*	dikes IV, VII, IX, X, XII, spit 6, berm A, E levee of Pond 11	dikes III, IV, VII, IX, X, XII, spits 4, 6, berms A, E, E levee of Pond 11	dikes IV, VII, IX, X, spit 6, berm A, E levee of Pond 11	dikes IV, VII, IX, X, berm A, levee of Pond 11	dikes IV, VII, IX, X, spit 6, berms A, H, levee of Pond 11	dikes IV, VI, VII, IX, X, XII, spit 6, berm A
Gull-billed tern *(Gelochelidon nilotica vanrossemi)*	dikes II, III, V, VI, spit 3	dikes II, V	dikes II, IV, spit 3	dikes I, II, III, V	dikes I, II, V	dikes II, III, V

Table 6b
Locations[1] of Waterbird Nest Sites at the Salt Works Between 2012 – 2017[2]

	2012	2013	2014	2015	2016	2017
Caspian tern *(Hydroprogne caspia)*	dikes I, II, V, VIII	dikes II, V, VIII	dikes II, III, V, VIII	dikes II, III, V, VIII	dikes II, VIII, spit 8	dike II, VIII, perimeter road pond 14
Royal tern *(Thalasseus maxiumus)*	dikes I, II, V, VIII	dikes II, V	dikes II, III, V, VI	dikes II, V, VIII	dikes II, III, V, VIII, spit 5, berm F	dikes I, II, III, IV, V,XIII, perimeter road pond 14
Elegant tern *(Thalasseus elegans)*	dikes II, III, V, VIII	dikes II, V	dikes I, II, III, V, VI, VIII, spit 1	dikes II, III,IV, VI, VIII	dikes I, II, III, V, VI, VIII, XIII, spits 1, 5, 9, 10, berm F	dikes II, IV, V, VIII, XIII, berm F, perimeter road ponds 14, 15
Forster's tern *(Sterna forsteri)*	dikes II, III, V, VII, spit 1, perimeter road pond 12	spit 1, perimeter road pond 15	spit 1, perimeter road pond 12	dike VI, VII, spit 1, perimeter road ponds 12, 15	dike VII, spit 1, perimeter road pond 12, nw corner of Pond 23	dike VII, spit 1, perimeter road pond 12
Black skimmer *(Rynchops niger)*	dikes II, III, V, VI, VII, spits 1,4	dikes I, II, IV, V, VII, perimeter road pond 15	dikes II, III,IV, V, VI, VII, spits 1, 9, 10	dikes II, III, IV, V, VI, spits 1, 9, perimeter road pond 15	dikes I, II, III, V, VI, VII, spit 1	dikes II, III, IV, V, VI, VII
Other Nesting Waterbirds						
Western Snowy Plover *(Charadrius nivosus nivosus)*	dikes IV, IX, X, XII, spit 2, berm A, E levee of Pond 11, Ponds 30, 40, 41	dikes IV, IX, X, XII, spit 2, 4, 6, berm A, F, E levee of Pond 11, Pond 40	dikes IV, VII, IX, X, XI, XII, XIV, spits 2, 4, 6, berms A, C, F, H, ponds 29, 30, 45, 52, Pond 20	dikes I, III,IV, VI, VII, IX, X, XI, XII, XV, XVI, spits 2, 4, 6, berms A, C, E, H, ponds 29, 40, 42, 46	dikes III, IV, VI, VII, X, XII, XV, spits 2, 4, 6, 9, berms C, D, E, berm between ponds 28 & 25, ponds 28, 29, 30, 43, 44, Pond 20	dikes III, IV, VI, VII, IX, X, XI, XII, XIV, XV, XVI, spits 2, 3, 4, 6, berms C, D, E, F, ponds 28, 29, 42, 43, 46, Pond 20
Double-crested cormorant *(Phalacrocorax auritus)*	dike II, barge	barge	dikes II, VIII, barge	dike V, barge	dikes III, V,	dike II, V, VIII, barge

[1] These locations are illustrated in Figure ~~3.3-1~~17.
[2] Results of annual surveys conducted at the salt works by Robert Patton for the USFWS.



SOURCE: USFWS,2017.

FIGURE 7

Nesting Locations as Described in Tables 6a and 6b

DUDEK

Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

Z:\Projects\j675801\MAPDOC\MAPS\EIS\

INTENTIONALLY LEFT BLANK

4.3 Sensitive Biological Resources

The following resources are discussed in this section: (1) plant and animal species present in the project vicinity that are given special recognition by Federal, State, or local conservation agencies and organizations owing to declining, limited, or threatened populations that are the result, in most cases, of habitat reduction, and (2) habitat areas that are unique, are of relatively limited distribution, or are of particular value to wildlife. Sources used for determining sensitive biological resources are as follows: the Service (USFWS 2010) and CDFW (CDFG 2009, 2011c) for wildlife; CDFW (CDFG 2011a, 2011b, 2011c) and CNPS (2015) for plants; and Holland (1986) and the City of San Diego (2004) for habitats.

4.3.1 Special-Status Plant Species

4.3.1.1 Otay River Floodplain Site

Three special-status plants were observed during the 2011 surveys of the Otay River Floodplain Site: California desert-thorn (*Lycium californicum*) (CRPR 4.2), estuary seablite (*Suaeda esteroa*) (CRPR 1B.2), and woolly seablite (*Suaeda taxifolia*) (CRPR 4.2) (Table 7 and Figure 8, Otay River Floodplain Restoration Site Special-Status Plant Species).~~Three special-status plants were observed during the 2011 surveys of the Otay River Floodplain Site: California desert-thorn (*Lycium californicum*) (CRPR 4.2), estuary seablite (*Suaeda esteroa*) (CRPR 1B.2), and woolly seablite (*Suaeda taxifolia*) (CRPR 4.2) (Table 5 and Figure 7, Otay River Floodplain Restoration Site Special-Status Plant Species).~~

California desert-thorn is a perennial shrub that is located within coastal bluff scrub or coastal scrub habitats at an elevation ranging from 5 to 150 meters. Within the Otay River Floodplain Site, approximately 16 individuals were mapped within southern coastal salt marsh and disturbed habitat (Figure 8).~~Within the Otay River Floodplain Site, approximately 16 individuals were mapped within southern coastal salt marsh and disturbed habitat (Figure 7).~~

Estuary seablite is a perennial herb that is found within coastal salt marshes and swamps at an elevation ranging from 0 to 5 meters (CNPS 2015). Within the Otay River Floodplain Site, several populations totaling approximately 230 individuals were found within areas mapped as southern coastal salt marsh and estuarine brackish water (Figure 8).~~Within the Otay River Floodplain Site, several populations totaling approximately 230 individuals were found within areas mapped as southern coastal salt marsh and estuarine brackish water (Figure 7).~~

Woolly seablite is a perennial evergreen shrub that occurs between 0 and 50 meters within coastal bluff scrub and dune habitats, as well as along the margins of coastal salt marshes and swamps (CNPS 2015). Small occurrences consisting of 94 individuals are located throughout the

Otay River Floodplain Site and within areas designated as project features in areas mapped as southern coastal salt marsh and disturbed habitat.

4.3.1.2 Pond 15 Site

One special-status plant was observed during the 2013 surveys of the Pond 15 Site: estuary seablite, a CRPR 1B.2 species (Table 7 and Figure 9, Pond 15 Restoration Site Special-Status Plant Species). ~~One special-status plant was observed during the 2013 surveys of the Pond 15 Site: estuary seablite, a CRPR 1B.2 species (Table 5 and Figure 8, Pond 15 Restoration Site Special-Status Plant Species).~~ Approximately 129 individuals were mapped within areas of southern coastal salt marsh.

Table 7 lists several sensitive plant species that have a moderate to high potential to occur within the project site based on the location of the site and general soils mapping, or that were observed (see also Figure 10, Ponds 22 and 23 Site Special-Status Plant Species). ~~Table 5 lists several sensitive plant species that have a moderate to high potential to occur within the project site based on the location of the site and general soils mapping, or that were observed (see also Figure 9, Ponds 22 and 23 Site Special-Status Plant Species).~~ For each species listed in Table 7, a determination is made regarding the potential for the species to occur, based on the location of the site, habitats present, and degree of disturbance to the vegetation. ~~For each species listed in Table 5, a determination is made regarding the potential for the species to occur, based on the location of the site, habitats present, and degree of disturbance to the vegetation.~~ Table 8 provides the list of those species with no or low potential to occur on site. ~~Table 6 provides the list of those species with no or low potential to occur on site.~~

Table 7~~Table 5~~
Special-Status Plant Species Detected or Potentially Occurring on the Project Site

Scientific Name	Common Name	Status Federal/ State/ NCCP	CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (ft amsl)	Status on Site or Potential to Occur
Corethrogyne filaginifolia var. *incana*	San Diego sand aster	None/ None/ None	1B.1	Chaparral, coastal bluff scrub, coastal scrub/perennial herb/ June–September/10–380	Moderate potential to occur but not detected. Although the plant may not have been flowering during the May focused survey, the vegetative form of the species would have been observed and none were detected. There is suitable habitat, and the project site is located within the elevation range for this species.

Table 7~~Table 5~~
Special-Status Plant Species Detected or Potentially Occurring on the Project Site

Scientific Name	Common Name	Status Federal/ State/ NCCP	CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (ft amsl)	Status on Site or Potential to Occur
Lycium californicum	California box-thorn	None/ None/ None	4.2	Costal bluff scrub, coastal scrub/perennial shrub/ December–August/15–590	Observed on the Otay River Floodplain Site during focused plant survey.
Suaeda esteroa	Estuary seablite	None/ None/ None	1B.2	Coastal salt marshes and swamps/perennial herb/May–October (Jan)/<20	Observed during focused plant surveys at Otay River Floodplain Site and Pond 15 Site.
Suaeda taxifolia	Woolly seablite	None/ None/ None	4.2	Coastal bluff scrub, coastal dunes, marshes and swamps (margins of coastal salt)/ perennial evergreen shrub/ January–December/0–165	Observed during focused plant survey on Otay River Floodplain Site.

NCCP = Natural Communities Conservation Plan; ft amsl = feet above mean sea level.
CRPR: California Rare Plant Rank
1B: Plants rare, threatened, or endangered in California and elsewhere
4: Plants of limited distribution – a watch list
Threat Rank
.1 – Seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat)
.2 – Fairly threatened in California (20%–80% occurrences threatened/moderate degree and immediacy of threat)

Table 8~~Table 6~~
Special-Status Plant Species Not Detected or with Low or No Potential to Occur on the Project Site

Scientific Name	Common Name	Status Federal/ State/ NCCP	CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (ft amsl)	Status on Site or Potential to Occur
Abronia maritima	Red sand-verbena	None/ None/ None	4.2	Coastal dunes/perennial herb/ February–November/ 10–330	No potential to occur. Although the project site is located within the elevation range for this species, there is no suitable habitat on site.
Acanthomintha ilicifolia	San Diego thorn-mint	FT/SE/ MSCP NE	1B.1	Chaparral, coastal scrub, valley and foothill grassland, vernal pools; clay/annual herb/ April–June/30–3,150	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.

Table 8~~Table 6~~

Special-Status Plant Species Not Detected or with Low or No Potential to Occur on the Project Site

Scientific Name	Common Name	Status Federal/ State/ NCCP	CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (ft amsl)	Status on Site or Potential to Occur
Agave shawii var. *shawii*	Shaw's agave	None/ None/ MSCP	2B.1	Coastal bluff scrub, coastal scrub/leaf succulent/ September–May/30–250	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.
Ambrosia pumila	San Diego ambrosia	FE/ None/ MSCP NE	1B.1	Chaparral, coastal scrub, valley and foothill grassland, vernal pools; often disturbed, sometimes alkaline/ rhizomatous herb/ May–October/60–1,360	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.
Aphanisma blitoides	Aphanisma	None/ None/ None	1B.2	Coastal bluff scrub, coastal dunes, coastal scrub; sandy/ annual herb/March–June/ <1,000	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.
Arctostaphylos glandulosa ssp. *crassifolia*	Del Mar manzanita	FE/ None/ MSCP	1B.1	Maritime chaparral; sandy/ evergreen shrub/December–June/<1,200	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.
Artemisia palmeri	San Diego sagewort	None/ None/ None	4.2	Chaparral, coastal scrub, riparian forest, scrub, and woodland; sandy, mesic/ deciduous shrub/May–September/50–3,000	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.
Astragalus tener var. *titi*	Coastal dunes milk-vetch	FE/SE/ MSCP	1B.1	Coastal bluff scrub, coastal dunes, coastal prairie; mesic, often vernally mesic/annual herb/March–May/<170	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.

Table 8~~Table 6~~
Special-Status Plant Species Not Detected or with Low or No Potential to Occur on the Project Site

Scientific Name	Common Name	Status Federal/ State/ NCCP	CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (ft amsl)	Status on Site or Potential to Occur
Atriplex coulteri	Coulter's saltbush	None/ None/ None	1B.2	Coastal bluff scrub, coastal dunes, coastal scrub, valley and foothill grassland; alkaline or clay/perennial herb/March–October/10–1,500	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.
Atriplex pacifica	South Coast saltscale	None/ None/ None	1B.2	Coastal bluff scrub, coastal dunes, coastal scrub, playas/ annual herb/March–October/ <500	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.
Atriplex parishii	Parish's brittlescale	None/ None/ None	1B.1	Chenopod scrub, playas, vernal pools/annual herb/ June–October/80–6,300	Low potential to occur. There is suitable habitat within the playa on site and the project site is located within the elevation range for this species. However, the species tends to be associated with a claypan soil and vernal pools, which are not present.
Atriplex serenana var. *davidsonii*	Davidson's saltscale	None/ None/ None	1B.2	Coastal bluff scrub, coastal scrub; alkaline/annual herb/ April–October/30–650	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.
Bergerocactus emoryi	Golden-spined cereus	None/ None/ None	2B.2	Closed-cone conifer forest, chaparral, coastal scrub; sandy/shrub/May–June/ 10–1,300	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.

Table 8~~Table 6~~

Special-Status Plant Species Not Detected or with Low or No Potential to Occur on the Project Site

Scientific Name	Common Name	Status Federal/ State/ NCCP	CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (ft amsl)	Status on Site or Potential to Occur
Calandrinia breweri	Brewer's calandrinia	None/ None/ None	4.2	Chaparral, coastal scrub; sandy or loamy, disturbed sites and burns/annual herb/March–June/30–4,000	Absent. There is suitable habitat on site and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.
California (=*Erodium*) *macrophylla*	Round-leaved filaree	None/ None/ None	1B.1	Cismontane woodland, valley and foothill grassland; clay/ annual herb/March–May/ 50–4,000	Absent. There is suitable habitat and the project site is located within the elevation range for this species, but this species would have been observed during the focused plant survey.
Camissoniopsis lewisii	Lewis's evening primrose	None/ None/ None	3	Coastal bluff scrub, cismontane woodland, coastal dunes, coastal scrub, valley and foothill grassland; sandy or clay/annual herb/March–May (June)/<1,000	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.
Ceanothus verrucosus	Wart-stemmed ceanothus	None/ None/ MSCP	2B.2	Chaparral/evergreen shrub/ December–May/<1,250	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.
Centromadia (=*Hemizonia*) *parryi* spp. *australis*	Southern tarplant	None/ None/ None	1B.1	Marshes and swamps (margins), valley and foothill grassland (vernally mesic), vernal pools/annual herb/May–November/<400	Low potential to occur. There is suitable habitat on site and the project site is located within the elevation range for this species. However, the site is too disturbed for the species, and the soils required for the species need to have a clay pan.

Table 8~~Table 6~~
Special-Status Plant Species Not Detected or with Low or No Potential to Occur on the Project Site

Scientific Name	Common Name	Status Federal/ State/ NCCP	CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (ft amsl)	Status on Site or Potential to Occur
Centromadia (=*Hemizonia*) *pungens* ssp. *laevis*	Smooth tarplant	None/ None/ None	1B.1	Chenopod scrub, meadows and seeps, playas, riparian woodland, valley and foothill grassland; alkaline/annual herb/April–September/<1,580	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.
Chaenactis glabriuscula var. *orcuttiana*	Orcutt's pincushion	None/ None/ None	1B.1	Coastal bluff scrub, coastal dunes/annual herb/January–August/10–330	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.
Chorizanthe orcuttiana	Orcutt's spineflower	FE/SE	1B.1	Maritime chaparral, closed-cone conifer forest, coastal scrub/annual herb/March–May/<400	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Cistanthe maritima	Seaside cistanthe	None/ None/ None	4.2	Coastal bluff scrub, coastal scrub, valley and foothill grassland/annual herb/ February–August/6–984	Absent. There is suitable habitat and the project site is located within the elevation range for this species, but the species would have been observed during the focused plant survey.
Chloropyron maritimum ssp. *maritimum*	Salt marsh bird's-beak	FE/SE/ MSCP	1B.2	Coastal dunes, coastal saltwater marshes and swamps/annual herb; hemiparisitic/May–October/ <100	Absent. There is suitable habitat and the project site is located within the elevation range for this species, but the species would have been observed during the focused plant survey.
Dicranostegia orcuttiana	Orcutt's bird's-beak	None/ None/ MSCP	2B.1	Coastal scrub/annual herb/ (Mar) April–July (Sept)/ 30–1,150	Absent. There is suitable habitat and the project site is located within the elevation range for this species; however, this species would have been observed during the focused plant survey.

Table 8~~Table 6~~
Special-Status Plant Species Not Detected or with Low or No Potential to Occur on the Project Site

Scientific Name	Common Name	Status Federal/ State/ NCCP	CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (ft amsl)	Status on Site or Potential to Occur
Corethrogyne filaginifolia var. *linifolia*	Del Mar Mesa sand aster	None/ None/ None	1B.1	Coastal bluff scrub, maritime chaparral (openings), coastal scrub; sandy/perennial herb/ May–September/10–380	Low potential to occur. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would likely have been observed during the focused plant survey.
Deinandra [=Hemizonia] paniculata	Paniculate tarplant	None/ None/ None	4.2	Coastal scrub, valley and foothill grassland, vernal pools; usually vernally mesic/annual herb/April–November/80–3,100	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Dudleya blochmaniae spp. *blochmaniae*	Blochman's dudleya	None/ None/ None	1B.1	Chaparral, coastal bluff scrub, coastal scrub, valley and foothill grassland, rocky; often clay or serpentinite/perennial herb/April–June/15–1,500	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Dudleya variegata	Variegated dudleya	None/ None/ MSCP NE	1B.2	Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland, vernal pools; clay/perennial herb/ April–June/<1,900	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Dudleya viscida	Sticky dudleya	None/ None/ MSCP	1B.2	Coastal bluff scrub, chaparral, coastal scrub; gabbroic soils/ rocky/perennial herb/May–June/30–1,800	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Eryngium aristulatum var. *hooveri*	Hoover's button-celery	None/ None/ None/ None	1B.1	Vernal pools/annual-perennial herb/July/10–150	Absent. Although the project site is located within the elevation range for this species, there are no vernal pools on site.

Table 8~~Table 6~~
Special-Status Plant Species Not Detected or with Low or No Potential to Occur on the Project Site

Scientific Name	Common Name	Status Federal/ State/ NCCP	CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (ft amsl)	Status on Site or Potential to Occur
Eryngium aristulatum var. *parishii*	San Diego button-celery	FE/SE/ MSCP NE	1B.1	Coastal scrub, valley and foothill grassland, vernal pools, mesic/annual-perennial herb/ April–June/60–2,000	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Eryngium pendletonense	Pendleton button-celery	None/ None/ None	1B.1	Coastal bluff scrub, valley and foothill grassland, vernal pools; clay, vernally mesic/perennial herb/April–June/50–360	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Erysimum ammophilum	Sand-loving wallflower	None/ None/ MSCP	1B.2	Maritime chaparral, coastal dunes, coastal scrub; sandy, openings/perennial herb/ February–June/<200	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Euphorbia misera	Cliff spurge	None/ None/ None	2B.2	Coastal bluff scrub, coastal scrub, Mojavean desert scrub; rocky/shrub/December–August/ 30–1,650	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Ferocactus viridescens	San Diego barrel cactus	None/ None/ MSCP	2B.1	Chaparral, coastal scrub, valley and foothill grassland, vernal pools/perennial stem succulent/ May–June/<1,500	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Geothallus tuberosus	Campbell's liverwort	None/ None/ None	1B.1	Coastal scrub (mesic), vernal pools; soil/ephemeral liverwort/ NA/30–2,000	Low potential to occur. There is marginal habitat and the project site is located within the elevation range for this species. However, this species is only known from four locations.

Table 8~~Table 6~~
Special-Status Plant Species Not Detected or with Low or No Potential to Occur on the Project Site

Scientific Name	Common Name	Status Federal/ State/ NCCP	CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (ft amsl)	Status on Site or Potential to Occur
Harpagonella palmeri	Palmer's grapplinghook	None/ None/ None	4.2	Chaparral, coastal scrub, valley and foothill grassland; clay/ annual herb/March–May/ 60–3,100	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Heterotheca sessiliflora ssp. *sessiliflora*	Beach goldenaster	None/ None/ None/	1B.1	Coastal dunes, coastal scrub, coastal chaparral/annual herb/ July–November/<35	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Isocoma menziesii var. *decumbens*	Decumbent goldenbush	None/ None/ None	1B.2	Chaparral, coastal scrub (sandy, often disturbed areas)/ shrub/April–November/ 30–450	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Iva hayesiana	San Diego marsh-elder	None/ None/ None	2B.2	Marshes and swamps, playas/ perennial herb/April–November/30–1,650	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Juncus acutus spp. *leopoldii*	Southwestern spiny rush	None/ None/ None	4.2	Coastal dunes (mesic), meadows and alkaline seeps, coastal saltwater marshes and swamps/rhizomatous herb/ May–June/<3,000	Absent within the project site; however, the species was observed during the focused plant survey just off site to the northeast of the Otay River Floodplain Site.
Lasthenia glabrata ssp. *coulteri*	Coulter's goldfields	None/ None/ None	1B.1	Saltwater marsh and swamps, playas, vernal pools/annual herb/February–June/<4,000	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.

Table 8~~Table 6~~
Special-Status Plant Species Not Detected or with Low or No Potential to Occur on the Project Site

Scientific Name	Common Name	Status Federal/ State/ NCCP	CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (ft amsl)	Status on Site or Potential to Occur
Lepidium virginicum var. *robinsonii*	Robinson's pepper-grass	None/ None/ None	4.3	Chaparral, coastal scrub/ annual herb/January–July/ <2,900	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Leptosyne maritima	Sea dahlia	None/ None/ None	2B.2	Coastal bluff scrub, coastal scrub/perennial herb/March–May/16–492	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Microseris douglasii ssp. *platycarpha*	Small-flowered microseris	None/ None/ None	4.2	Cismontane woodland, coastal scrub, valley and foothill grassland, vernal pools; clay/ annual herb/March–May/ 50–3,500	Absent. There are no suitable clay soils within the project area and this species would have been observed during the focused plant survey.
Myosurus minimus ssp. *apus*	Little mousetail	None/ None/ None	3.1	Vernal pools, valley and foothill grassland; alkaline/annual herb/March–June/60–2,100	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Nama stenocarpum	Mud nama	None/ None/ None	2B.2	Marshes and swamps, lake margins, riverbanks/annual-perennial herb/January–July/ 15–1,650	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Nemacaulis denudata var. *denudata*	Coast woolly-heads	None/ None/ None	1B.2	Coastal dunes/annual herb/ April–September/<330	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.

Table 8~~Table 6~~

Special-Status Plant Species Not Detected or with Low or No Potential to Occur on the Project Site

Scientific Name	Common Name	Status Federal/ State/ NCCP	CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (ft amsl)	Status on Site or Potential to Occur
Orcuttia californica	California Orcutt grass	FE/SE/ MSCP NE	1B.1	Vernal pools/annual herb/ April–August/50–2,200	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Orobanche parishii ssp. *brachyloba*	Short-lobed broom-rape	None/ None/ None	4.2	Coastal bluff scrub, coastal dunes, coastal scrub; sandy/ perennial herb parasitic/ April –October/<1,000	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Phacelia ramosissima var. *austrolitoralis*	South coast branching phacelia	None/ None/ None	3.2	Chaparral, coastal dunes, coastal scrub, coastal salt marshes and swamps; sandy, sometimes rocky/perennial herb/March–August/20–1,000	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Phacelia stellaris	Brand's star phacelia	FC/ None	1B.1	Coastal dunes, coastal scrub/ annual herb/March–June/ <1,300	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Piperia cooperi	Chaparral rein orchid	None/ None/ None	4.2	Chaparral, cismontane woodland, valley and foothill grassland/perennial herb/ March–June/50–5,200	Absent. No suitable habitat exists on site and this species would have been observed during the focused plant survey.
Psilocarphus brevissimus var. *multiflorus*	Delta woolly-marbles	None/ None/ None	4.2	Vernal pools/annual herb/ May–June/30–1,650	Absent. Although the project site is located within the elevation range for this species, there are no vernal pools on site.

Table 8~~Table 6~~
Special-Status Plant Species Not Detected or with Low or No Potential to Occur on the Project Site

Scientific Name	Common Name	Status Federal/ State/ NCCP	CRPR	Primary Habitat Associations/Life Form/ Blooming Period/Elevation Range (ft amsl)	Status on Site or Potential to Occur
Quercus dumosa	Nuttall's scrub oak	None/ None/ None	1B.1	Chaparral, coastal scrub, closed-cone coniferous forest; sandy, clay loam/evergreen shrub/February–April/50–1,300	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Senecio aphanactis	Chaparral ragwort	None/ None/ None	2B.2	Chaparral, cismontane woodland, coastal scrub; sometimes alkaline/annual herb/January–April/50–2,630	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.
Triquetrella californica	Coastal triquetrella	None/ None/ None	1B.2	Coastal bluff scrub, coastal scrub; soil/moss/NA/30–330	Absent. There is suitable habitat and the project site is located within the elevation range for this species. However, this species would have been observed during the focused plant survey.

NCCP = Natural Communities Conservation Plan; ft amsl = feet above mean sea level; NA = not applicable
FC: Federal candidate
FE: Federally listed as endangered
FT: Federally listed as threatened
SE: State-listed as endangered

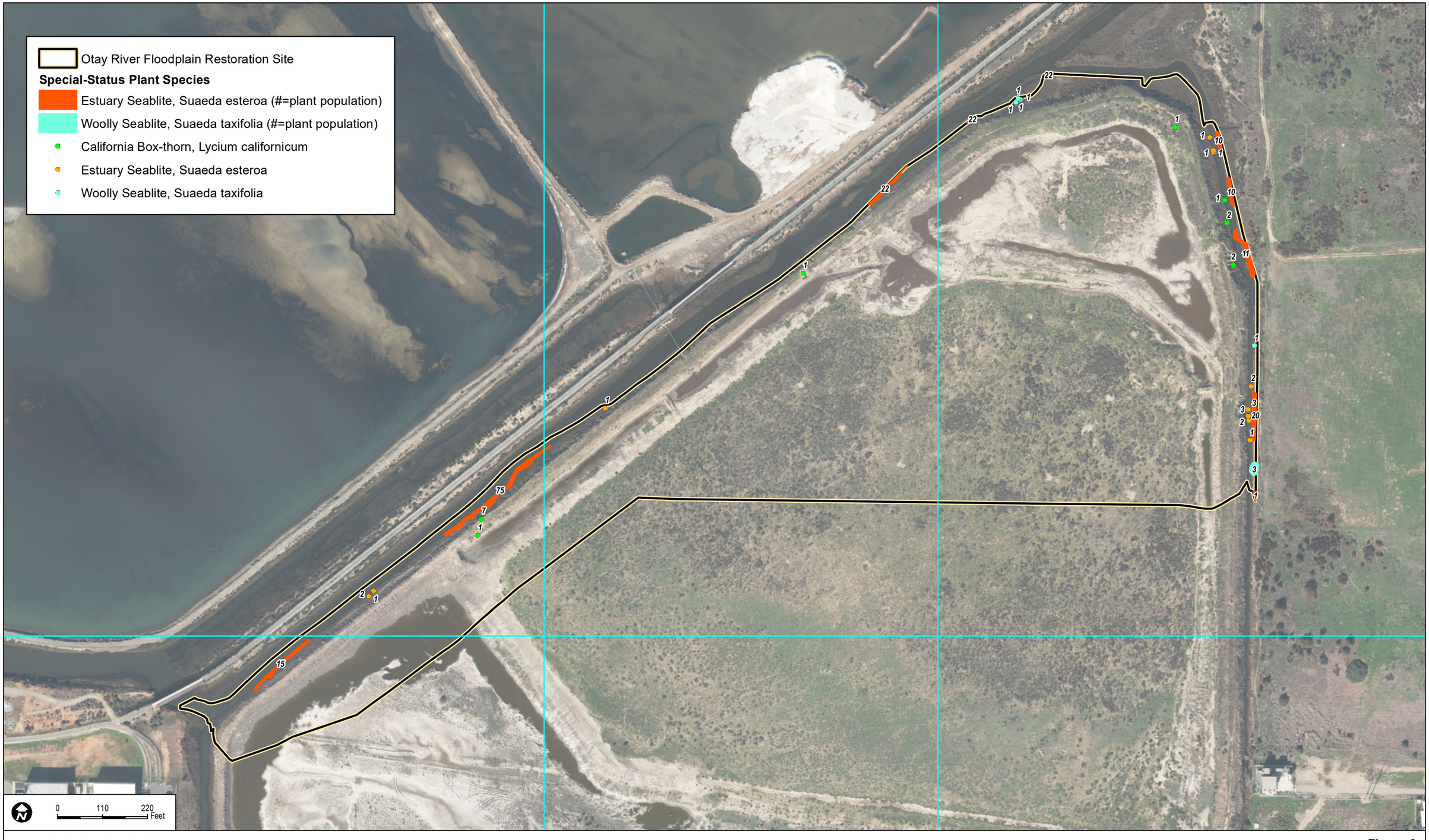
Multiple Species Conservation Program (MSCP):
MSCP: Covered by the MSCP
MSCP NE: Narrow endemic species

CRPR: California Rare Plant Rank
1B: Plants rare, threatened, or endangered in California and elsewhere
2B: Plants rare, threatened, or endangered in California, but more common elsewhere
3: Plants about which we need more information – a review list
4: Plants of limited distribution – a watch list
Threat Rank
.1 – Seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat)
.2 – Fairly threatened in California (20%–80% occurrences threatened/moderate degree and immediacy of threat)
.3 – Not very threatened in California (<20% of occurrences threatened/low degree and immediacy of threat or no current threats known)

4.3.2 Special-Status Wildlife Species

4.3.2.1 Otay River Floodplain Site

Nine special-status wildlife species were detected within the Otay River Floodplain Site or adjacent to it or the project features during the 2011 surveys: northern harrier, white-tailed kite (*Elanus leucurus*), elegant tern, gull-billed tern, light-footed Ridgway's rail, burrowing owl, short-eared owl (*Asio flammeus*), Belding's Savannah sparrow, and San Diego black-tailed jackrabbit (*Lepus californicus bennettii*) (Figure 11, Otay River Floodplain Restoration Site Special-Status Wildlife Species). ~~Nine special-status wildlife species were detected within the Otay River Floodplain Site or adjacent to it or the project features during the 2011 surveys: northern harrier, white-tailed kite (*Elanus leucurus*), elegant tern, gull-billed tern, light-footed Ridgway's rail, burrowing owl, short-eared owl (*Asio flammeus*), Belding's Savannah sparrow, and San Diego black-tailed jackrabbit (*Lepus californicus bennettii*) (Figure 10, Otay River Floodplain Restoration Site Special-Status Wildlife Species).~~ Six special-status wildlife species were detected off site to the west or in the Otay River drainage immediately off site during the 2011 surveys: merlin (*Falco columbarius*), northern harrier, white-tailed kite, Clark's marsh wren (*Cistothorus palustris clarkae*), yellow warbler (*Dendroica petechia brewsteri*), and yellow-breasted chat (*Icteria virens*) (Figure 11). ~~Six special-status wildlife species were detected off site to the west or in the Otay River drainage immediately off site during the 2011 surveys: merlin (*Falco columbarius*), northern harrier, white-tailed kite, Clark's marsh wren (*Cistothorus palustris clarkae*), yellow warbler (*Dendroica petechia brewsteri*), and yellow-breasted chat (*Icteria virens*) (Figure 10).~~ Focused survey reports for California gnatcatcher and light-footed Ridgway's rail are provided in Appendix C and Appendix D, respectively.



AERIAL SOURCE: SANDAG IMAGERY 2014

DUDEK

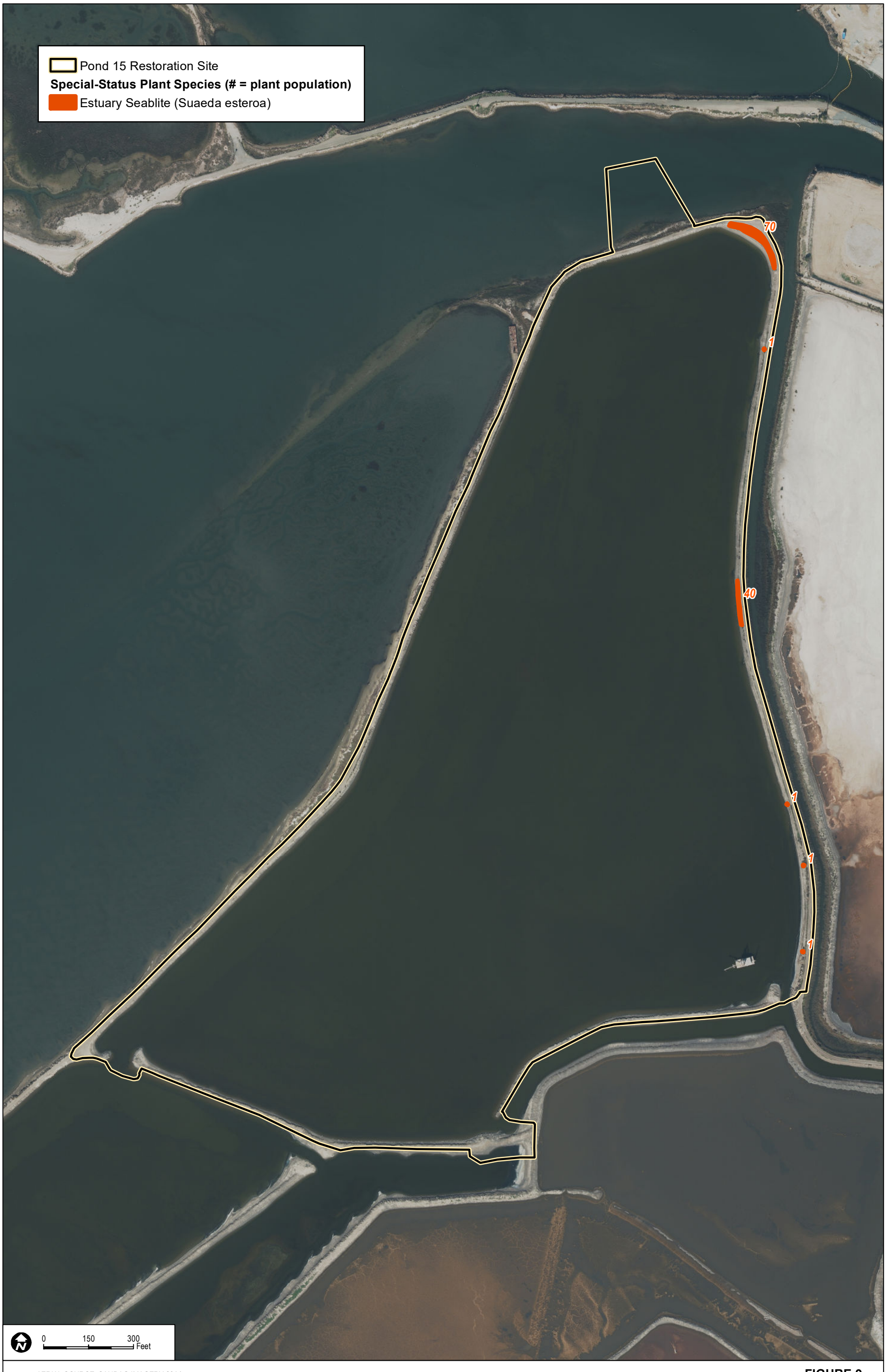
Document Path: Z:\Projects\675801\MAPDOC\MAPS\BioResourcesReport\Fig 8 ORFS_Plants.mxd

Figure 8

Otay River Floodplain Restoration Site Special-Status Plant Species

Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

INTENTIONALLY LEFT BLANK



AERIAL SOURCE: SANDAG IMAGERY 2014

FIGURE 9

Pond 15 Restoration Site Special-Status Plant Species

DUDEK

Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

Document Path: Z:\Projects\j675801\MAPDOC\MAPS\BioResourcesReport\Fig 9 Pond15_Plants.mxd

INTENTIONALLY LEFT BLANK



AERIAL SOURCE: SANDAG IMAGERY 2014

FIGURE 10

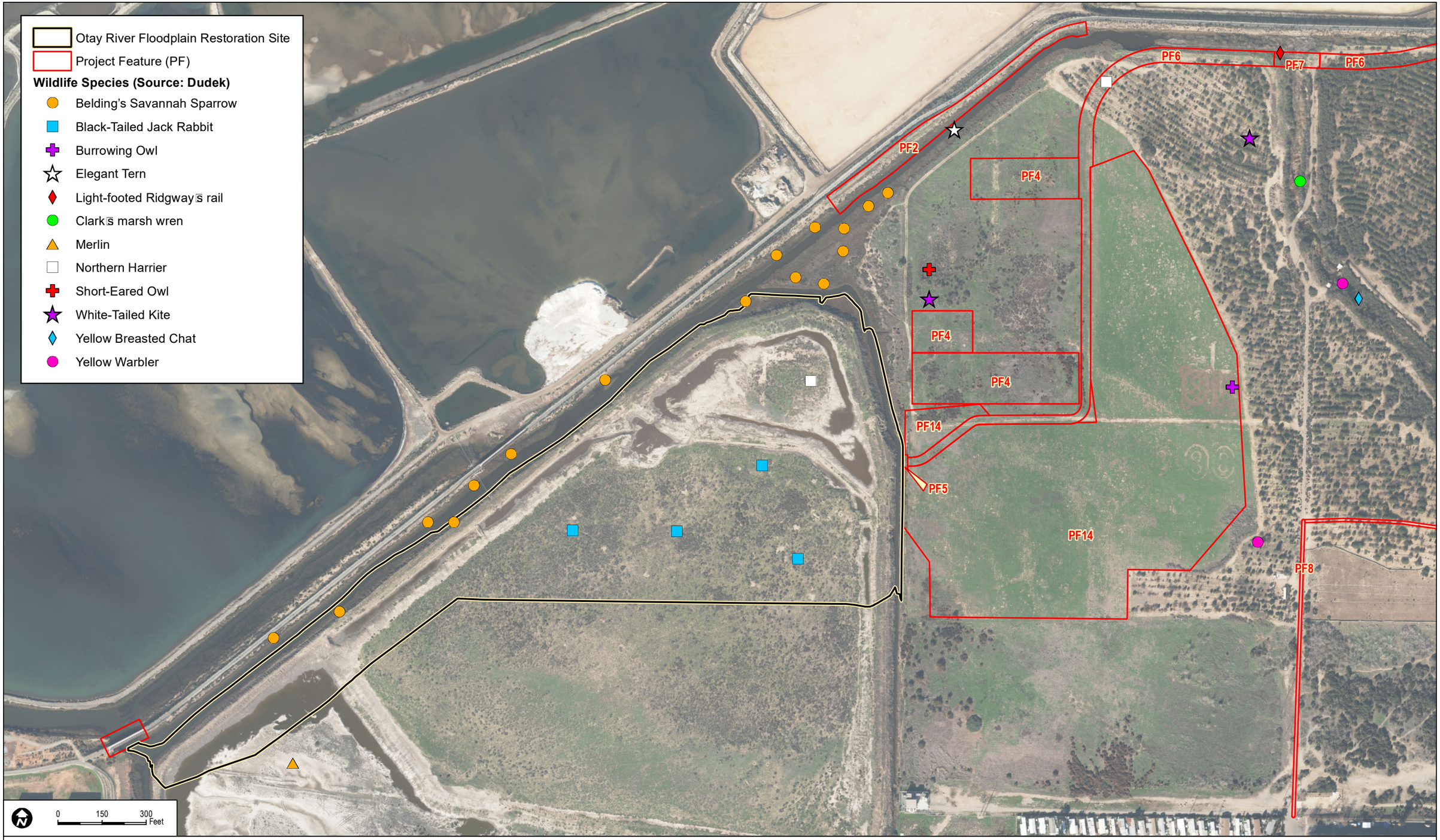
Ponds 22 and 23 Site Special-Status Plant Species

DUDEK

Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

Document Path: Z:\Projects\j675801\MAPDOC\MAPS\BioResourcesReport\Fig 10 Pond22_23_Plants.mxd

INTENTIONALLY LEFT BLANK



AERIAL SOURCE: SANGIS IMAGERY 2014

DUDEK

Figure 11

Otay River Floodplain Restoration Site Special Status Wildlife Species

Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

Document Path: Z:\Projects\j675801\MAPDOC\MAPS\BioResourcesReport\Fig 11 ORFS_Wildlife.mxd

INTENTIONALLY LEFT BLANK

Observed at the Otay River Floodplain Site

Belding's Savannah Sparrow

Belding's Savannah sparrow, a State-listed endangered species, is found year-round in Southern California coastal salt marshes and is endemic to salt marshes. Its habitat, and in turn its population size, has been greatly reduced by the impacts of increasing human populations (Zembal and Hoffman 2010).

Belding's Savannah sparrow makes its nests in dense pickleweed (swampfire) in small, semi-colonial breeding territories. They are secretive birds and forage throughout the marsh habitats, often far from their nests (Zembal and Hoffman 2010).

During focused surveys for Belding's Savannah sparrow, 18 individuals were observed in the disturbed habitat and southern coastal salt marsh habitats in the channel that runs along the northwest boundary of the project site. A number of these locations are outside the boundary of the Otay River Floodplain Site, but Belding's Savannah sparrow could use on-site areas (Figure 12, Otay River Floodplain Restoration Site Special-Status Nesting Locations).~~A number of these locations are outside the boundary of the Otay River Floodplain Site, but Belding's Savannah sparrow could use on-site areas (Figure 11, Otay River Floodplain Restoration Site Special-Status Nesting Locations).~~

Burrowing Owl

Burrowing owl inhabits open grasslands with low-level vegetation, and occurs in areas with finer soils without many rocks. It will take a vacant burrow created by a small mammal and enlarge it to create a nesting chamber. It will also remove any vegetation immediately around the burrow and raise the opening to provide a raised perch for watching for predators. It feeds primarily on arthropods, small mammals and birds, some amphibians, and some reptiles. Burrowing owl hunts mainly at night, but sometimes during the day (Haug et al. 1993).

Burrowing owls are active year-round in Southern California and winter in Northeastern California in suitable habitat. Breeding occurs from October through March, during which time the male prepares a burrow and the female lays one clutch of six to 11 eggs, incubating them for 28 to 30 days (Haug et al. 1993).

During focused species surveys for burrowing owl, one individual was observed in the eastern part of the project site, outside of the Otay River Floodplain Site but within areas that are part of the project features. It was observed flying from a burrow, but was only seen once. Although it was observed at a burrow, there was very little sign, and a repeat visit determined that no additional sign was present.

Elegant Tern

Elegant tern inhabits coastal and island estuaries and sandy habitats in Southern California, Baja California, and Mexico. It feeds on schooling fish species, primarily northern anchovy (*Engraulis mordax*), and rarely on crustaceans, by flying above salt and estuarine waters and diving to catch prey (Burness et al. 1999).

The breeding distribution of elegant tern is limited to a few isolated mainland or island colonies. Pair formation occurs toward the end of migration and at the nesting colony. In San Diego Bay, most pairs are formed by their arrival in early April. Nesting in San Diego Bay begins shortly after arrival in dense, preexisting groups of mixed species of gulls and terns. They nest in flat, sandy habitat with good visibility on marine islands or in estuaries. The nest itself is formed by scraping soft sediments into depressions or by polishing harder sediments and forming a rim out of nearby debris. Elegant terns usually lay one egg that camouflages with the surrounding ground, and they incubate for approximately 26 days (Burness et al. 1999).

During the focused species surveys, one elegant tern was observed in the southern coastal salt marsh habitat hunting along the channel.

Gull-Billed Tern

Gull-billed tern breeds locally in Southern California, south to Baja California Norte, and has a population size estimated to be 600 to 700 pairs (Molina 2008). Within California, breeding locations include a colony at the Salton Sea and a small colony in San Diego Bay. Gull-billed tern nests on small, bare islets of fine clay within the impoundments at the Salton Sea and isolated sections of earthen levees at the South Bay Salt Works in south San Diego Bay (Molina 2008). It forages along inshore marine habitats such as shallow bays, mudflats, sandy beaches, and dunes, as well as along freshwater drainages and over agricultural fields and scrub habitats (Molina 2008). Its diet varies from small fish to a variety of insects, lizards, and crabs (Molina 2008).

During focused surveys, a number of gull-billed terns were observed flying over or possibly foraging on the site. Although they were not observed actively foraging, the species is known to forage in open fields for invertebrate prey.



AERIAL SOURCE: BING MAPPING SERVICE

DUDEK

Figure 12

Otay River Floodplain Restoration Site Special Status Nesting Locations

Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

Document Path: Z:\Projects\675801\MAPDOC\MAPS\BioResourcesReport\Fig 12 USFWS Nest Data Otay.mxd

INTENTIONALLY LEFT BLANK

Light-Footed Ridgway's Rail

Light-footed Ridgway's rail inhabits coastal wetlands in Southern California and northern Baja California. Predators such as raptors and degradation of wetlands have led to the decline of the species. Light-footed Ridgway's rails lay four to eight eggs (Zembal et al. 2007). The prey of this species typically consists of crustaceans (Eddleman and Conway 1998).

During the focused species surveys for light-footed Ridgway's rail, one individual was observed in the far northeastern portion of the site within the Otay River channel (Appendix D). This location is not within the boundary of the Otay River Floodplain Site, but it is adjacent to one of the project features.

Northern Harrier

Northern harrier inhabits meadows, grasslands, open rangelands, desert sinks, and fresh and saltwater emergent wetlands; this species is rarely found in wooded areas. Northern harrier nests in shrubby vegetation on the ground, usually at the edge of a marsh, and feeds on voles and other small mammals, birds, frogs, small reptiles, crustaceans, and insects; northern harriers rarely feed on fish (Zeiner et al. 1990).

Northern harrier is a permanent resident in the northeastern plateau and coastal areas of California, and a less common resident of the Central Valley. This species is a widespread winter resident and migrant in suitable habitat. Northern harriers breed up to 5,700 feet elevation in the Central Valley and Sierra Nevada, and up to 3,600 feet elevation in northeastern California from April through September, with peak activity in June and July (Zeiner et al. 1990).

During the focused surveys for northern harrier, one to three individuals were observed hunting over the project site in *Isocoma* scrub habitat and disturbed habitat. The species was observed frequently, but never exhibited nesting or territorial behavior. Thus, although the species was observed during almost every survey visit, no breeding activity was detected. The species was also observed off site.

Short-Eared Owl

Short-eared owl inhabits marshes, grasslands, and tundra habitats in North America and Eurasia. It is active during the day and night, and hunts low over the ground. It locates prey mainly by following noises made by the prey, but also by sight. Prey includes small mammals, especially voles, and sometimes birds (Wiggins et al. 2006).

Short-eared owl breeds from late March until mid-June. Pair formation begins in the middle of February, and it selects nests based on food abundance, nesting cover, and area. It constructs nests on the ground by scraping a bowl and lining it with grasses and downy feathers in dry areas with dead and matted-down vegetation. Short-eared owls lay one to 11 eggs, and the female incubates them for 21 to 37 days (Wiggins et al. 2006).

During the focused species surveys, one short-eared owl was observed in the mulefat scrub habitat in the northern one-third of the project site within one of the project features. It was only observed one time, so was assumed to not be breeding on site.

White-Tailed Kite

White-tailed kite is found in open grasslands and other similar habitats. It hunts for food by hovering while visually looking for small mammals on the ground and diving to catch prey. It prefers hunting over ungrazed grasslands, grassy wetlands, fence rows, and irrigation ditches near to grazed lands (Dunk 1995).

White-tailed kite breeds from mid-February through early July. Pairs can be found together year-round, although more pairs form from December through August. They nest in 3- to 50-meter-tall trees that are isolated or in forested areas near grasslands. Nests are constructed in the upper one-third of the trees out of small twigs and are lined with grass, hay, or leaves. The females lay and incubate three to six eggs for 30 to 32 days (Dunk 1995).

During the focused species surveys, two white-tailed kites were observed in the disturbed habitat in a project feature, and one white-tailed kite was observed in the disturbed habitat off site to the east of the project site within or near project features.

San Diego Black-Tailed Jackrabbit

San Diego black-tailed jackrabbit occupies many diverse habitats, but primarily is found in arid regions supporting short-grass habitats. Jackrabbits typically are not found in high grass or dense brush where it is difficult for them to move easily, and the openness of open scrub habitat probably is preferred over dense chaparral. Jackrabbits are common in grasslands that are overgrazed by cattle, and they are well adapted to using low-intensity agricultural habitats. In fact, to a point, drought and overgrazing may create better habitat for black-tailed-jackrabbits. Jackrabbit populations exhibit large fluctuations, and the risk of extirpation from marginal isolated habitat patches probably is high (Hall 1981). Suitable habitat linkages, including agriculture, may be important for colonization of unoccupied habitat patches.

Throughout the focused species surveys, four San Diego black-tailed jackrabbits were observed in the *Isocoma* scrub habitat.

Observed Off Site

A number of special-status wildlife species were observed in off-site areas and could occur on site. Six special-status species were observed off site, including northern harrier and white-tailed kite, which are discussed above and were also observed on site.

Merlin

Merlins inhabit forest and prairie habitats of North America, Europe, and Asia. They feed primarily on small to medium-sized birds that are caught in mid-air during short, quick flights. Because of their small size, they are unable to catch larger birds (Warkentin et al. 2005).

Merlins breed from late April through July, forming pairs 1 to 2 months before nesting. They select nesting sites in riparian and coniferous trees with good views of the surrounding area near open prairie habitats. Merlins do not construct nests, but make changes to preexisting hawk or falcon nests. They lay one to eight eggs that are incubated for 28 to 32 days (Warkentin et al. 2005).

During the focused species surveys, one Merlin was observed in the saltpan/mudflat habitat off site to the south of the project site.

Clark's Marsh Wren

Clark's marsh wren inhabits marshland habitats with cattails and bulrush, within which it constructs nests. It feeds on small insects and spiders found near or at the surface of the water, and on vegetation stems and leaves. They are rarely seen because they forage so close to the water in dense vegetation (Kroodsma and Verner 1997).

Marsh wren nests from early April through mid-August. It constructs a nest of cattail, sedge, or grass woven to form a completely enclosed nest with a single entrance above the equator of the nest. Males construct many nests that are not used by the female. Females usually lay four to six chocolate-colored eggs, and the female incubates them for 12 to 14 days (Kroodsma and Verner 1997).

During the focused species surveys, one Clark's marsh wren was observed in the Otay River channel off site to the east.

Yellow-Breasted Chat

Yellow-breasted chat occurs in low, dense vegetation in riparian habitats along streams, swamps, and ponds. They range in south-eastern North America, some places in California and the northwest, and northern Central America. They hunt insects and spiders and will feed on fruits and berries when available (Eckerle and Thompson 2001).

Yellow-breasted chat breeds from mid-May through mid-August, forming pairs at the breeding grounds in the beginning of May. Nests are constructed by females near the ground in dense and concealing vegetation. They are made out of grasses, leaves, bark, and weed stems, and are lined with fine grasses, pine needles, and sometimes roots and hair. Females lay three to five eggs and incubate them for 10 to 12 days (Eckerle and Thompson 2001).

During the focused species surveys, one yellow-breasted chat was observed in the riparian habitat off site to the east of the project site.

Yellow Warbler

Yellow warbler inhabits wet, deciduous riparian habitats containing willow species. They occur in Southern California, Central Mexico, Central America, and most of northern North America. They will sometimes consume wild fruits, but feed primarily on insects by gleaning them from vegetation or by hovering and taking them from vegetation (Lowther et al. 1999).

Yellow warbler breeds from late May through the end of July, forming pairs within 3 days of arriving in breeding locations in northern North America. Nests are formed in vegetation forks from 0 to 14 meters above the ground. They construct their nests out of grasses and bark strips, and the outside is covered in plant down and fine fibers. Females lay four to five eggs, and the female incubates them for 11 to 12 days (Lowther et al. 1999).

During the focused species surveys, two yellow warblers were observed near the project site. One was observed in the riparian habitat off site to the east of the project site.

Not Observed at the Otay River Floodplain Site

Least Bell's Vireo

Least Bell's vireo occurs in riparian habitats in California and Baja California. It feeds on a wide variety of insects primarily by gleaning prey from vegetation, but also by hovering and sometimes by chasing and capturing prey in flight. Foraging occurs mainly in the lower to middle levels of vegetation (Kus 2002).

Breeding begins in mid- to late-March and continues through late September. Least Bell's vireo constructs nests in dense vegetation that is 2.8 to 5 meters tall, especially in willows, mulefat (*Baccharis salicifolia*), California wild rose (*Rosa californica*), poison oak (*Toxicodendron diversilobum*), mugwort (*Artemisia douglasiana*), and cottonwood species. The nests are an open cup placed in a tree or shrub, and are constructed out of pieces of soft plants, leaves, bark, and spider webs. Three to four eggs are laid and are incubated by both sexes for approximately 14 days (Kus 2002).

No least Bell's vireos were observed during any focused species surveys.

California Gnatcatcher

California gnatcatcher is almost exclusively associated with coastal sage scrub habitat, especially in habitats with California sagebrush as the predominant plant species. It can occur in chaparral, riparian, and disturbed habitats. It ranges from southern coastal California into most of Baja California, and is found in elevations below 500 meters above sea level. California gnatcatcher feeds primarily on small, less-active insects by gleaning them from leaves and sometimes by fly-catching (Atwood and Bontrager 2001).

Breeding for California gnatcatcher begins in February and lasts through July. Males select nesting sites and both sexes build the nest in a fork of two branches in a plant. The clutch of two to five eggs is incubated for approximately 14 days (Atwood and Bontrager 2001).

During the focused species surveys for California gnatcatcher, no individuals were observed in the project site, but at least one pair was observed off site to the southeast, at least 1,000 feet away.

Focused surveys based on the most recent protocols were conducted within the Otay River Floodplain Site for a number of special-status species, and the results are provided in Tables 9 and 10. ~~Focused surveys based on the most recent protocols were conducted within the Otay River Floodplain Site for a number of special-status species, and the results are provided in Tables 7 and 8.~~ Special-status wildlife species that were observed or have potential to occur on the Otay River Floodplain Site are listed in Table 9. ~~Special-status wildlife species that were observed or have potential to occur on the Otay River Floodplain Site are listed in Table 7.~~ Special-status wildlife species with low or no potential to occur, based on location and conditions, are provided in Table 10. ~~Special-status wildlife species with low or no potential to occur, based on location and conditions, are provided in Table 8.~~

Table 9~~Table 7~~
Special-Status Wildlife Observed or Potentially Occurring on the Otay River Floodplain Site

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status On Site or Potential to Occur
		Reptiles		
Phrynosoma blainvillii	Coast (San Diego) horned lizard	None/SSC/ MSCP	Coastal sage scrub, annual grassland, chaparral, oak and riparian woodland, coniferous forest.	Moderate potential to occur within the sandy soils and in the *Isocoma* scrub areas.
Aspidoscelis hyperythra	Orange-throated whiptail	None/SSC/ MSCP	Coastal sage scrub, chaparral, grassland, juniper and oak woodland.	Moderate potential to occur within the sandy soils and in the *Isocoma* scrub areas.
Thamnophis hammondii	Two-striped garter snake	None/SSC/ Not Covered	Streams, creeks, pools, streams with rocky beds, ponds, lakes, vernal pools.	Moderate potential. Suitable habitat is present within the freshwater portion of the Otay River channel and Nestor Creek.
		Birds		
Athene cunicularia (burrow sites and some wintering sites)	Burrowing owl	BCC/SSC/ MSCP	Grassland, lowland scrub, agriculture, coastal dunes, and other artificial open areas.	Observed. Has been recorded in the region. Numerous holes for their use and sandy soils. However, vegetation grows so tall there is little vantage point for them to use. One owl observed once at the beginning of the breeding season about 1,000 feet to the east. It did not stay to breed. Three were observed nearby in a 2011 survey (Southwest Wetlands Interpretive Association data).~~Three were observed nearby in off-site surveys conducted in 2011 (Southwest Wetlands Interpretive Association data).~~

Table 9~~Table 7~~
Special-Status Wildlife Observed or Potentially Occurring on the Otay River Floodplain Site

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status On Site or Potential to Occur
Asio flammeus	Short-eared owl	None/SSC/ Not Covered	Open areas with few trees, such as grasslands, prairies, dunes, meadows, irrigated lands, saline and fresh emergent wetlands. Breeds in coastal areas in Del Norte and Humboldt Counties, San Francisco Bay Delta, northeastern Modoc plateau, east side of Sierra Nevada from Lake Tahoe south to Inyo County, and San Joaquin Valley. Uncommon winter migrant in Southern California, and widespread during winter in Central Valley and coastline.	Observed. The species was observed once during other focused surveys, resting under a shrub, in March 2011. It was only observed the one time. Observed in the area by others during winter.
Circus cyaneus (nesting)	Northern harrier	None/SSC/ MSCP	Open wetlands (nesting), pasture, fields, dry uplands, grasslands, rangelands, coastal sage scrub.	Observed. Suitable foraging areas are present on site. Nesting could occur within the *Isocoma* scrub or possibly the disturbed habitat. One to three harriers were detected during almost every site visit. Observed foraging. In surveys conducted nearby from 2010–2012, west of the site, 42 observations were recorded (SDNHM and ARA 2011). No nesting was detected, but a nesting attempt was observed in 2012 off site near the dirt access road for the sewer pump station.
Cistothorus palustris clarkae	Clark's marsh wren	None/SSC/ Not Covered	Narrowly distributed along the coast of Southern California. Restricted to freshwater and brackish marshes dominated by bulrushes or cattails.	Observed. Eleven individuals detected within the Otay River channel and San Diego Bay coastline immediately off site to the west. Other individuals could be present within suitable habitat in the channel.
Dendroica petechia brewsteri (nesting)	Yellow warbler	None/SSC/ Not Covered	Nests in lowland and foothill riparian woodlands dominated by cottonwoods, alders, and willows; winters in a variety of habitats.	Detected within the eucalyptus on site, and within the willow habitat off site to the east within the Otay River.

Table 9~~Table 7~~
Special-Status Wildlife Observed or Potentially Occurring on the Otay River Floodplain Site

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status On Site or Potential to Occur
Egretta rufescens	Reddish egret	None/None/ MSCP	Saltmarsh, mudflats, coastal lagoons.	High potential to occur on site due to suitable saltmarsh, mudflat, and salt pan present on site.
Elanus leucurus (nesting)	White-tailed kite	None/FP/Not Covered	Open grasslands, savannah-like habitats, agriculture, wetlands, oak woodlands, riparian.	Observed. Suitable foraging areas are present on site. Nesting could occur within the eucalyptus trees on site or the riparian habitat adjacent to the site. Detected during a number of site visits and in nearby areas. Observed foraging; no nesting was detected.
Icteria virens (nesting)	Yellow-breasted chat	None/SSC/ Not Covered	Dense, relatively wide riparian woodlands and thickets of willows, vine tangles, and dense brush.	Detected within the riparian habitat off site to the east within the Otay River.
Rallus obsoletus levipes	Light-footed Ridgway's rail	FE/SE, FP/ MSCP	Coastal saltmarsh.	Observed. Suitable marsh habitat within the channel of the Otay River. One bird was detected in an area just off site of the Otay River Floodplain Site during focused surveys.
Falco columbarius	Merlin	None/WL/ Not Covered	Coastlines, open grasslands, savannahs, woodlands, lakes, wetlands, montane hardwood-conifer habitats, ponderosa pine. Found throughout western half of California below 4,920 feet.	Observed. Observed perched just off site on a post at the western end of the site. It was only observed once. Observed by others in the winter.
Falco peregrinus anatum	American peregrine falcon	BCC/DL/ MSCP	Nests on cliffs, buildings, and bridges; forages in wetlands, riparian, meadows, and croplands, especially where waterfowl are present.	High potential to occur on site for foraging; regularly observed in the general area. ~~High potential to occur on site for foraging.~~ Species is well known to forage on shorebirds during the winter (USFWS 2006b).

Table 9~~Table 7~~
Special-Status Wildlife Observed or Potentially Occurring on the Otay River Floodplain Site

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status On Site or Potential to Occur
Gelochelidon nilotica vanrossemi	Western gull-billed tern	BCC/SSC/ Not Covered	Nests on protected spits, berms, and islands composed of sand or other small material. Forages primarily in freshwater ponds and flooded agricultural fields. Forages for small fish, crayfish, lizards, butterflies, beetles, crickets, weevils, and occasionally the young chicks of other shorebirds.	Observed. A number of individuals of the species were observed possibly foraging over or flying over the site during focused surveys for other species. Because the species was observed briefly in flight over the site, it was not mapped. Observed foraging in the area by others.
Passerculus sandwichensis beldingi	Belding's Savannah sparrow	None/SE/ MSCP	Saltmarsh, Pacific swampfire.	Observed. Approximately 18 birds were observed on site or within 500 feet, and many were observed nearby off site within the San Diego Bay NWR from 2010 to 2012 (SDNHM and ARA 2011) (Figure 12).~~Approximately 18 birds were observed on site or within 500 feet, and many were observed nearby off site within the San Diego Bay NWR from 2010 to 2012 (SDNHM and ARA 2011) (Figure 11).~~
Haliaeetus leucocephalus (nesting and nonbreeding/ wintering)	Bald eagle	(FD)/SE/ MSCP	Seacoasts, rivers, swamps, large lakes; winters at large bodies of water in lowlands and mountains.	Could winter or occur on site in transit for foraging; a juvenile was photographed on site in 2013 (Collins, pers. comm. 2014).
Rynchops niger	Black skimmer	BCC/SSC/ Not Covered	Nests on barrier beaches, shell banks, spoil islands, and salt marsh; forages over open water; roosts on sandy beaches and gravel bars.	High potential to occur. Has been observed nearby during 2010 to 2012 surveys, and suitable foraging habitat is present within the lower reaches of the Otay River channel (SDNHM and ARA 2011; USFWS 2006b) (Figure 12).~~Has been observed nearby during 2010 to 2012 surveys, and suitable foraging habitat is present within the lower reaches of the Otay River channel (SDNHM and ARA 2011; USFWS 2006b) (Figure 11).~~

Table 9~~Table 7~~
Special-Status Wildlife Observed or Potentially Occurring on the Otay River Floodplain Site

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status On Site or Potential to Occur
Chlidonias niger	Black tern	None/SSC/ Not Covered	Freshwater marsh with emergent vegetation; in the Central Valley primarily breed and forage in rice fields and other flooded agricultural fields with weeds and other residual aquatic vegetation.	Moderate potential to occur. Four individuals were observed nearby in off-site areas during 2012 focused surveys (Southwest Wetlands Interpretive Association data). Limited foraging habitat on the project site (SDNHM and ARA 2011).
Branta bernicla	Brant	None/SSC/ Not Covered	Breeding habitat includes the edges of salt marshes in the low Arctic Region. Migratory habitats include shallow marine lakes. Winter range includes intertidal mudflats in shallow marine alters with abundant eelgrass and/or green algae.	Moderate potential to occur. Could occur in the area during winter months, and was observed nearby during surveys conducted from 2010 to 2012. Limited habitat occurs on site (SDNHM and ARA 2011; USFWS 2006b).
Larus californicus	California gull	None/WL/ Not Covered	Nests in alkali and freshwater lacustrine habitats; abundant in coastal and interior lowlands during nonbreeding period.	High potential to occur. Suitable habitat occurs on the north and west portions of the site. Species also observed during surveys conducted nearby off site in 2011 and 2012 (SDNHM and ARA 2011; USFWS 2006b).
Eremophila alpestris actia	California horned lark	None/WL/ Not Covered	Open habitats, grassland, rangeland, shortgrass prairie, montane meadows, coastal plains, fallow grain fields.	High potential to occur on site, especially during winter. Could breed on site (USFWS 2006b). Although not observed during surveys, observed to occur and breed on site by others.
Sternula [=Sterna] antillarum browni (nesting colony)	California least tern	FE/SE/ MSCP	Coastal waters, estuaries, large bays and harbors, mudflats; nests on sandy beaches.	High potential. Suitable flat areas are present and the species is known in the area. Salt pans are present. Known to forage in lower portions of the Otay River channel (SDNHM and ARA 2011; USFWS 2006b) (Figure 12).~~Known to forage in lower portions of the Otay River channel (SDNHM and ARA 2011; USFWS 2006b) (Figure 11).~~

Table 9~~Table 7~~
Special-Status Wildlife Observed or Potentially Occurring on the Otay River Floodplain Site

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status On Site or Potential to Occur
Thalasseus [=Sterna] elegans (nesting colony)	Elegant tern	BCC/WL/ MSCP	Coastal waters, estuaries, large bays and harbors, mudflats.	Observed. Suitable flat areas are present and the species is known in the area (salt pans are present). Observed flying over the site a number of times but did not forage on site.
Hydroprogne caspia	Caspian tern	BCC/None/ Not Covered	Coastal estuarine, salt marsh, and barrier islands; nests on islands in rivers and salt lakes.	High potential to occur. Known to reside year-round in coastal San Diego County. Suitable marsh habitat occurs on the north and west portions of the site. Was observed nearby during surveys in 2011 and 2012. Known to forage in the lower portions of the Otay River channel (SDNHM and ARA 2011; USFWS 2006b).
Accipiter cooperii (nesting)	Cooper's hawk	None/WL/ MSCP	Riparian and oak woodlands, montane canyons.	High potential to occur within the willows that are adjacent to the site. Frequently roost and forage in neighboring suburban areas (Collins, pers. comm. 2014). High potential to forage on site and nest in adjacent riparian areas to the east. One was observed flying over the area but did not land or pause on site. It may have been hunting or may have been in transit (USFWS 2006b).
Passerculus sandwichensis rostratus (nonbreeding/ wintering)	Large-billed Savannah sparrow	None/SSC/ MSCP	Saltmarsh, pickleweed (swampfire).	High potential to occur on site during winter due to presence of suitable habitat.
Numenius americanus (nesting)	Long-billed curlew	BCC/WL/ MSCP	Nests in upland shortgrass prairies and wet meadows in northeast California; winters in coastal estuaries, open grasslands, and croplands.	High potential to occur on site during the winter for foraging within the marsh areas along the Otay River channel (USFWS 2006b).

Table 9~~Table 7~~
Special-Status Wildlife Observed or Potentially Occurring on the Otay River Floodplain Site

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status On Site or Potential to Occur
Charadrius alexandrinus nivosus (nesting)	Western snowy plover (coastal population)	FT,BCC/ SSC/MSCP	Nests primarily on coastal beaches, in flat open areas, with sandy or saline substrates; less commonly in salt pans, dredged spoil disposal sites, dry salt ponds, and levees.	High potential. Suitable flat areas are present and the species is known for the area. Salt pans are present (USFWS 2006b) (Figure 12).~~Salt pans are present (USFWS 2006b) (Figure 11).~~
Plegadis chihi (rookery site)	White-faced ibis	None/WL/ MSCP	Nests in marsh; winter foraging in shallow lacustrine waters, muddy ground of wet meadows, marshes, ponds, lakes, rivers, flooded fields, and estuaries.	High potential to occur on site during the winter for foraging within the salt pond bottom (USFWS 2006b).
Mammals				
Taxidea taxus	American badger	None/SSC/ MSCP	Dry, open, treeless areas; grasslands; coastal sage scrub.	Moderate potential due to sandy soils. No signs of digging were observed.
Chaetodipus californicus femoralis	Dulzura pocket mouse	None/SSC/ Not Covered	Coastal sage scrub, chaparral, riparian-scrub ecotone; more mesic areas.	Moderate potential due to presence of sandy soils and *Isocoma* scrub habitat.
Chaetodipus fallax fallax	Northwestern San Diego pocket mouse	None/SSC/ Not Covered	Coastal sage scrub, grassland, sage scrub-grassland ecotones, sparse chaparral; rocky substrates, loams, and sandy loams.	Moderate potential due to presence of sandy soils and *Isocoma* scrub habitat.
Perognathus longimembris pacificus	Pacific pocket mouse	FE/SSC/ Not Covered	Grassland, coastal sage scrub with sandy soils; along immediate coast.	Moderate potential due to presence of sandy soils and *Isocoma* scrub habitat. Known locations are a long distance from the site (Camp Pendleton and southern Orange County).
Neotoma lepida intermedia	San Diego desert woodrat	None/SSC/ Not Covered	Coastal sage scrub, chaparral, pinyon-juniper woodland with rock outcrops, cactus thickets, dense undergrowth.	Moderate potential due to presence of sandy soils and *Isocoma* scrub habitat.
Lepus californicus bennettii	San Diego black-tailed jackrabbit	None/SSC/ Not Covered	Arid habitats with open ground; grasslands, coastal sage scrub, agriculture, disturbed areas, rangelands.	Observed. Several jackrabbits were detected on site during surveys.

Federal Designations:
BCC Fish and Wildlife Service: Birds of Conservation Concern

(FD) Federally delisted; monitored for 5 years
FE Federally listed as endangered
FT Federally listed as threatened

State Designations:

SSC California Species of Special Concern
FP California Department of Fish and Wildlife Protected and Fully Protected Species
DL State delisted
SE State listed as endangered
WL California Department of Fish and Wildlife Watch List

Multiple Species Conservation Program (MSCP):

MSCP Covered by the MSCP
Not Covered Not covered by the MSCP

Table 10~~Table 8~~
Special-Status Wildlife with Low Potential or No Potential to Occur on the Otay River Floodplain Site

Scientific Name	Common Name	Status Federal / State / MSCP	Primary Habitat Associations	Status On Site or Potential to Occur
Amphibians				
Spea [=Scaphiopus] hammondi	Western spadefoot	None/SSC/ Not Covered	Most common in grasslands, coastal sage scrub near rain pools or vernal pools; riparian habitats.	Low potential. Small amount of suitable habitat is present within the cismontane alkali marsh habitat.
Reptiles				
Salvadora hexalepis virgultea	Coast patch-nosed snake	None/SSC/ Not Covered	Chaparral, washes, sandy flats, rocky areas.	Low potential. Small amount of suitable habitat is present within the *Isocoma* scrub, but there are no rocky areas within the habitat.
Plestiodon skiltonianus interparietalis	Coronado Island skink	None/SSC/ Not Covered	Grassland, woodlands, pine forests, chaparral. Prefers rocky areas near streams with lots of vegetation but is also found away from water.	Low potential. Small amount of suitable habitat is present within the *Isocoma* scrub, but there are no rocky areas within the habitat.
Crotalus ruber	Northern red-diamond rattlesnake	None/SSC/ Not Covered	Variety of shrub habitats where there is heavy brush, large rocks, or boulders.	Low potential. Small amount of suitable habitat is present within the *Isocoma* scrub, but there are no rocky areas within the habitat.

Table 10~~Table 8~~
Special-Status Wildlife with Low Potential or No Potential to Occur on the Otay River Floodplain Site

Scientific Name	Common Name	Status Federal / State / MSCP	Primary Habitat Associations	Status On Site or Potential to Occur
		Birds		
Pelecanus erythrorhynchos	American white pelican	None/SSC/ Not Covered	Nests colonially on isolated islands in freshwater lakes with sandy, earthen, or rocky substrates; minimal disturbance from humans or mammalian predators required, as is close access to productive foraging areas; forages on inland marshes, lakes, or rivers; winters on shallow coastal bays, inlets, and estuaries.	Low potential to occur due to lack of freshwater habitat and the site's proximity to urbanization (USFWS 2006b).
Laterallus jamaicensis coturniculus	California black rail	BCC/ST/ Not Covered	Saline, brackish, and fresh emergent wetlands.	Low potential due to lack of extensive emergent habitat. Species was recorded in the region but is assumed to be extirpated from San Diego County.
Pelecanus occidentalis californicus ~~*Pelecanus occidentalis californicus* (nesting colony and communal roosts)~~	California brown pelican	FD/DL/ MSCP	Open sea, large water bodies, coastal bays, and harbors.	Low potential due to lack of extensive open water. Species could perch on posts located within the site or could occur within the Otay River channel, but the channel is relatively narrow. Species does occur within the region, and was observed nearby in surveys conducted in 2011 and 2012 (SDNHM and ARA 2011; USFWS 2006b).
Polioptila californica californica	Coastal California gnatcatcher	FT/SSC/ MSCP	Coastal sage scrub, coastal sage scrub–chaparral mix, coastal sage scrub–grassland ecotone, riparian in late summer.	Low potential due to lack of suitable habitat. Focused survey conducted nearby in 2006 was negative. Species was detected off site within suitable habitat. It was observed at the southern portion of the area adjacent to the parking lot near Home Depot.

Table 10~~Table 8~~
Special-Status Wildlife with Low Potential or No Potential to Occur on the Otay River Floodplain Site

Scientific Name	Common Name	Status Federal / State / MSCP	Primary Habitat Associations	Status On Site or Potential to Occur
Gavia immer	Common loon	None/SSC/ Not Covered	Extirpated as a breeder from California; winters in coastal waters such as bays, channels, coves, and inlets; also winters inland at large, deep lakes and reservoirs.	Low potential to occur. Range has been limited in California from anthropogenic activities. Known to visit San Diego coastal areas during winter, but lacks habitat on the project site (USFWS 2006b).
Phalacrocorax auritus	Double-crested cormorant	None/WL/ Not Covered	Nests in riparian trees near ponds, lakes, artificial impoundments, slow-moving rivers, lagoons, estuaries, and open coastlines; winter habitat includes lakes, rivers, and coastal areas.	Low potential to occur. Was observed during surveys nearby off site from 2010 to 2012. Limited suitable habitat on site (SDNHM and ARA 2011; USFWS 2006b).
Buteo regalis (nonbreeding/ wintering)	Ferruginous hawk	BCC/WL/ MSCP	Open, dry country; grasslands; open fields; agriculture.	May forage on site during migration or for wintering. Does not breed in the region.
Aquila chrysaetos (nesting and nonbreeding/ wintering)	Golden eagle	BCC/WL/ MSCP	Open country, especially hilly and mountainous regions; grassland, coastal sage scrub, chaparral, oak savannas, open coniferous forest.	Low potential. May forage over the site but no nesting habitat is present.
Ammodramus savannarum (nesting)	Grasshopper sparrow	None/SSC/ Not Covered	Open grassland and prairie, especially native grassland with a mix of grasses and forbs.	Low potential due to lack of suitable grassland habitat.
Vireo bellii pusillus (nesting)	Least Bell's vireo	FE, BCC/SE/ MSCP	Nests in southern willow scrub with dense cover within 1–2 meters of the ground; habitat includes willows, cottonwoods, baccharis, wild blackberry, or mesquite on desert areas.	Low potential due to lack of suitable habitat. Suitable habitat is located off site to the east within the channel of the Otay River, but this habitat is limited. Focused surveys were negative.
Lanius ludovicianus	Loggerhead shrike	BCC/SSC/ Not Covered	Nests and forages in open habitats with scattered shrubs, trees, or other perches.	Low potential to occur. Limited perching structures and suitable habitat occur across the project site (USFWS 2006b).
Charadrius montanus (nonbreeding/ wintering)	Mountain plover	BCC/SSC/ MSCP	Nests in open, shortgrass prairies or grasslands; winters in shortgrass plains, plowed fields, open sagebrush, and sandy deserts.	Low potential. Does not nest within the region but may forage on site during winter.

Table 10~~Table 8~~
Special-Status Wildlife with Low Potential or No Potential to Occur on the Otay River Floodplain Site

Scientific Name	Common Name	Status Federal / State / MSCP	Primary Habitat Associations	Status On Site or Potential to Occur
Aythya americana	Redhead	None/SSC/ Not Covered	Breeds in relatively deep (>3 feet) permanent or semi-permanent wetlands of at least 1 acre, with about 75% open water and emergent tules, bulrushes (*Scirpus* spp.), and cattails (*Typha* spp.) up to about 3 feet in height; winters in coastal estuaries and large, deep ponds, lakes, and reservoirs of the interior.	Low potential to occur. Limited suitable habitat occurs on the site. Seven individuals were observed nearby off site in surveys conducted from 2011 to 2012, but none were detected in surveys covering the same area in 2010 (SDNHM and ARA 2011; USFWS 2006b).
Accipiter striatus	Sharp-shinned hawk	None/WL/ Not Covered	Nests in coniferous forests, ponderosa pine, black oak, riparian deciduous, mixed conifer, Jeffrey pine; winters in lowland woodlands and other habitats.	Low potential to occur due to lack of suitable habitat on the project site or nearby areas. Could forage on site during migration or winter (USFWS 2006b).
Aimophila ruficeps canescens	Southern California rufous-crowned sparrow	None/WL/ MSCP	Grass-covered hillsides, coastal sage scrub, chaparral with boulders and outcrops.	Low potential due to small amount of habitat in the *Isocoma* scrub area.
Buteo swainsoni (nesting)	Swainson's hawk	BCC/ST/ MSCP	Open grassland, shrublands, croplands.	May forage on site during migration. Does not breed in the region.
Agelaius tricolor (nesting colony)	Tricolored blackbird	BCC/SSC/ MSCP	Nests near fresh water, emergent wetland with cattails or tules; forages in grasslands, woodland, and agriculture.	Low potential. Small amount of suitable habitat is present.
Mammals				
Nyctinomops macrotis	Big free-tailed bat	None/SSC/ Not Covered	Rugged, rocky canyons.	No roost habitat is present but could forage on site or overhead.
Choeronycteris mexicana	Mexican long-tongued bat	None/SSC/ Not Covered	Desert and montane riparian, desert succulent scrub, desert scrub, and pinyon–juniper woodland. Roosts in caves, mines, and buildings.	No roost habitat is present but could forage on site or overhead.

Table 10~~Table 8~~
Special-Status Wildlife with Low Potential or No Potential to Occur on the Otay River Floodplain Site

Scientific Name	Common Name	Status Federal / State / MSCP	Primary Habitat Associations	Status On Site or Potential to Occur
Felis concolor	Mountain lion	None/None/ MSCP	Occupies a wide variety of habitats: swamps, riparian woodlands, broken country with good cover of brush or woodland.	Low potential due to location in an urbanized area. Cover is limited on site.
Antrozous pallidus	Pallid bat	None/SSC/ Not Covered	Rocky outcrops, cliffs, and crevices with access to open habitats for foraging.	No roost habitat is present but could forage on site or overhead.
Nyctinomops femorosaccus	Pocketed free-tailed bat	None/SSC	Rocky desert areas with high cliffs or rock outcrops.	No roost habitat is present but could forage on site or overhead.
Euderma maculatum	Spotted bat	None/SSC/ Not Covered	Arid deserts and grasslands through mixed conifer forests; roosts in cliffs, feeds over water and along washes.	No roost habitat is present but could forage on site or overhead.
Eumops perotis californicus	Western mastiff bat	None/SSC/ Not Covered	Roosts in small colonies in cracks and small holes, seeming to prefer artificial structures.	No roost habitat is present but could forage on site or overhead.
Lasiurus blossevillii	Western red bat	None/SSC/ Not Covered	Roosts in forests and woodlands from sea level up through mixed conifer forests. Feeding habitat variable and includes grasslands, shrublands, open woodlands and forests, and croplands. Not found in desert areas.	No roost habitat is present but could forage on site or overhead.
Invertebrates				
Panoquina errans	Wandering (saltmarsh) skipper	None/None/ MSCP	Occurs strictly in coastal salt marsh habitat where salt grass (*Distichlis spicata*) occurs and functions as the host plant. Marshes with tidal flow are the more likely occupied areas.	Low potential. Some limited areas of the host plant present within the edges of the saltmarsh habitat. In general, salt grass is mixed in with other plant species and does not exist as an isolated stand. Locations where component species are present around the margins of the salt marsh vegetation that line the Otay River and Nestor Creek channels were surveyed. ~~Locations where observed as a component species are around the margins of the salt~~

Table 10~~Table 8~~
Special-Status Wildlife with Low Potential or No Potential to Occur on the Otay River Floodplain Site

Scientific Name	Common Name	Status Federal / State / MSCP	Primary Habitat Associations	Status On Site or Potential to Occur
				~~marsh vegetation that line the Otay River and Nestor Creek channels.~~

Federal Designations:
BCC U.S. Fish and Wildlife Service: Birds of Conservation Concern
(FD) Federally delisted; monitored for 5 years
FE Federally listed as endangered
FT Federally listed as threatened
State Designations:
SSC California Species of Special Concern
DL State delisted
SE State listed as endangered
ST State listed as threatened
WL California Department of Fish and Wildlife Watch List
Multiple Species Conservation Program (MSCP):
MSCP Covered by the MSCP

4.3.2.2 Pond 15 Site

Focused wildlife surveys were not conducted by Dudek staff within the Pond 15 Site. ~~Due to the limited accessibility of the site, focused wildlife surveys were not conducted by Dudek staff.~~ However, observation data was available through State and Federal agencies (SDNHM and ARA 2011), as well as through California Natural Diversity Database records (CDFG 2011b). Four federally or State-listed species have been observed within or in wetland habitat adjacent to the Pond 15 Site: western snowy plover, light-footed Ridgway's rail, Belding's Savannah sparrow, and California least tern. ~~Three Federally or State-listed species have been observed within the Pond 15 Site: western snowy plover, Belding's Savannah sparrow, and California least tern.~~ One federally listed endangered species, East Pacific green sea turtle (*Chelonia mydas*), has been recorded in the bay adjacent to the Pond 15 Site (SDSU and NOAA 2011).~~One Federally listed endangered species, East Pacific green sea turtle (*Chelonia mydas*), has been recorded adjacent to the Pond 15 Site (SDSU and NOAA 2011).~~ Additionally, nine special-status wildlife species were observed on the site during the surveys conducted in 2010–2012, as listed in Table 11. ~~Additionally, nine special-status wildlife species were observed on the site during the surveys conducted in 2010–2012, as listed in Table 9.~~ Special-status species documented for the salt evaporator area and that have high potential to occur within the Pond 15 Site include American peregrine falcon (*Falco peregrinus anatum*), black skimmer, California brown pelican, California gull, California horned lark (*Eremophila alpestris*), Caspian tern, double-crested

cormorant, elegant tern, and long-billed curlew (*Numenius americanus*). Special-status wildlife species with low or no potential to occur are provided in Table 12.~~Special-status wildlife species with low or no potential to occur are provided in Table 10.~~

Table 11~~Table 9~~
Special-Status Wildlife Documented as Present or Potentially Occurring on the Pond 15 Site

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status on Site or Potential to Occur
Reptiles				
Chelonia mydas	East Pacific green sea turtle	FT/None/ None	Shallow waters of bays, reefs, inlets, and undisturbed sandy beaches for egg laying.	Has been documented within San Diego Bay.
Birds				
Falco peregrinus anatum	American peregrine falcon	BCC/DL/ MSCP	Nests on cliffs, buildings, bridges; forages in wetlands, riparian, meadows, and croplands, especially where waterfowl are present.	High potential to occur on site for foraging. Species is well known to forage on shorebirds year round. ~~Species is well known to forage on shorebirds during the winter.~~ Individuals observed during surveys conducted from 2010 to 2012 (SDNHM and ARA 2011).
Circus cyaneus (nesting)	Northern harrier	None/SSC/ MSCP	Open wetlands (nesting), pasture, fields, dry uplands, grasslands, rangelands, coastal sage scrub.	Low potential to nest within Pond 15 site; however forages over the site (SDNHM and ARA 2011).
Falco columbarius	Merlin	None/WL/ Not Covered	Coastlines, open grasslands, savannahs, woodlands, lakes, wetlands, montane hardwood-conifer habitats, ponderosa pine. Found throughout western half of California below 4,920 feet.	Regularly observed in winter (Patton pers. comm).
Asio flammeus	Short-eared owl	None/SSC/ Not Covered	Open areas with few trees, such as grasslands, irrigated lands, saline and fresh emergent wetlands. Uncommon winter migrant in Southern California, and widespread during winter in Central Valley and coastline.	Observed during winter at the salt works (Patton pers. comm).

Table 11~~Table 9~~
Special-Status Wildlife Documented as Present or Potentially Occurring on the Pond 15 Site

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status on Site or Potential to Occur
Egretta rufescens	Reddish egret	None/None/ MSCP	Saltmarsh, mudflats, coastal lagoons.	High potential to occur on site due to suitable saltmarsh, mudflat, and salt pan present on site. Observed by others on the adjacent mudflats (Patton pers. comm).
Pelecanus erythrorhynchos	American white pelican	None/SSC/ Not Covered	Nests colonially on isolated islands in freshwater lakes with sandy, earthen, or rocky substrates; minimal disturbance from humans or mammalian predators required, as is close access to productive foraging areas; forages around inland marshes, lakes, or rivers; winters on shallow coastal bays, inlets, and estuaries.	Historically observed roosting on the levees of the salt pond complex. Moderate potential to roost on the levees of the Pond 15 Site (USFWS 2006b).
Passerculus sandwichensis beldingi	Belding's Savannah sparrow	None/SE/ MSCP	Nests and forages in coastal salt marsh dominated by Pacific swampfire.	Documented as occurring within Pond 15 Site; suitable salt marsh habitat occurs in a small area on site. Observed during surveys conducted from 2010 to 2012 (SDNHM and ARA 2011). 211 birds were recorded in 2012. 2015 territory locations are shown in Figure 13.~~2015 territory locations are shown in Figure 12.~~
Rynchops niger	Black skimmer	BCC/SSC/ Not Covered	Nests on barrier beaches, shell banks, spoil islands, and salt marsh; forages over open water; roosts on sandy beaches and gravel bars.	High potential to occur. Observed during surveys conducted from 2010 to 2012 (SDNHM and ARA 2011; USFWS 2006b); some suitable nesting areas occur on the southwestern end of the project site, and foraging occurs within the open water areas of the salt pond complex. 2015 nesting locations are shown in Figure 13.~~2015 nesting locations are shown in Figure 12.~~

Table 11~~Table 9~~
Special-Status Wildlife Documented as Present or Potentially Occurring on the Pond 15 Site

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status on Site or Potential to Occur
Chlidonias niger	Black tern	None/SSC/ Not Covered	Freshwater marsh with emergent vegetation; in the Central Valley primarily breeds and forages in rice fields and other flooded agricultural fields with weeds and other residual aquatic vegetation.	Moderate potential to occur. Four individuals were observed flying over the area during 2012 focused surveys. Some foraging habitat occurs on the project site. Was not recorded during surveys of the site in 2010–2012 (SDNHM and ARA 2011).
Branta bernicla	Brant	None/SSC/ Not Covered	Breeding habitat includes the edges of salt marshes in the low Arctic region. Migratory habitats include shallow marine lakes. Winter range includes intertidal mudflats in shallow marine alters with abundant eelgrass and/or green algae.	Moderate potential to occur. Could occur in the area during winter and was observed adjacent to the salt ponds during surveys conducted from 2010 to 2012 (SDNHM and ARA 2011). Suitable migratory habitat occurs within project site.
Pelecanus occidentalis californicus (nesting colony and communal roosts)	California brown pelican	FD/DL/ MSCP	Open sea, large water bodies, coastal bays, and harbors.	High potential to occur over open water areas on the project site; has been observed roosting on the salt pond levees. Observed during surveys conducted from 2010 to 2012 (SDNHM and ARA 2011).
Larus californicus	California gull	None/WL/ Not Covered	Nests in alkali and freshwater lacustrine habitats; abundant in coastal and interior lowlands during nonbreeding period.	High potential to occur. Suitable habitat occurs on the north and west portions of the site. Observed during surveys conducted from 2010 to 2012 (SDNHM and ARA 2011).
Eremophila alpestris actia	California horned lark	None/WL/ Not Covered	Open habitats, grassland, rangeland, shortgrass prairie, montane meadows, coastal plains, fallow grain fields.	High potential to occur on site, especially during winter. Individuals observed during surveys conducted from 2010 to 2012 (SDNHM and ARA 2011).
Sternula [=Sterna] antillarum browni (nesting colony)	California least tern	FE/SE/ MSCP	Coastal waters, estuaries, large bays and harbors, mudflats; nests on sandy beaches.	High potential. Suitable flat areas are present, and the species is known to nest in the general area. Individuals were observed during surveys conducted from 2010 to 2012 (SDNHM and ARA 2011). 2015 nesting locations are shown in Figure 13.~~2015 nesting locations are shown in Figure 12.~~

Table 11~~Table 9~~
Special-Status Wildlife Documented as Present or Potentially Occurring on the Pond 15 Site

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status on Site or Potential to Occur
Hydroprogne caspia	Caspian tern	BCC/None/ Not Covered	Coastal estuarine, salt marsh, and barrier islands; nests on islands in rivers and salt lakes.	High potential to occur. Known to reside year-round in coastal San Diego County. Suitable foraging and nesting habitat occurs on the north and western portions of the site. Was observed nearby during surveys in 2011 and 2012 (SDNHM and ARA 2011). 2015 nesting locations are shown in Figure 13.~~2015 nesting locations are shown in Figure 12.~~
Gelochelidon nilotica vanrossemi	Western gull-billed tern	BCC/SSC/Not Covered	Nests on protected spits, berms, and islands composed of sand or other small material. Forages primarily in freshwater ponds and flooded agricultural fields. Forages for small fish, crayfish, lizards, butterflies, beetles, crickets, weevils, and occasionally the young chicks of other shorebirds.	High potential to occur. Suitable foraging and nesting habitat occurs on the north and western portions of the site. Was observed nearby during surveys in 2011 and 2012 (SDNHM and ARA 2011). 2015 nesting locations are shown in Figure 13.~~2015 nesting locations are shown in Figure 12.~~
Phalacrocorax auritus	Double-crested cormorant	None/WL/ Not Covered	Nests in riparian trees near ponds, lakes, artificial impoundments, slow-moving rivers, lagoons, estuaries, and open coastlines; winter habitat includes lakes, rivers, and coastal areas.	High potential to occur. Large numbers of individuals were observed during surveys conducted from 2010 to 2012 (SDNHM and ARA 2011), and suitable habitat occurs on the project site. 2015 nesting locations are shown in Figure 13.~~2015 nesting locations are shown in Figure 12.~~

Table 11~~Table 9~~
Special-Status Wildlife Documented as Present or Potentially Occurring on the Pond 15 Site

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status on Site or Potential to Occur
Thalasseus [=Sterna] elegans (nesting colony)	Elegant tern	BCC/WL/ MSCP	Coastal waters, estuaries, large bays and harbors, mudflats.	High potential to occur. Large numbers of individuals were observed during surveys conducted from 2010 to 2012 (SDNHM and ARA 2011; USFWS 2006b), and suitable habitat occurs on the project site. 2015 nesting locations are shown in Figure 13.~~2015 nesting locations are shown in Figure 12.~~
Passerculus sandwichensis rostratus (nonbreeding/ wintering)	Large-billed Savannah sparrow	None/SSC/ MSCP	Saltmarsh, pickleweed (swampfire).	Moderate potential to occur on site during winter due to presence of some suitable habitat on site. Not recorded for the site in 2010–2012 (SDNHM and ARA 2011).
Numenius americanus (nesting)	Long-billed curlew	BCC/WL/ MSCP	Nests in upland shortgrass prairies and wet meadows in northeast California; winters in coastal estuaries, open grasslands, and croplands.	High potential to occur on site during winter for foraging within marsh areas. Individuals were observed during focused surveys conducted from 2010 to 2012 (SDNHM and ARA 2011).
Aythya americana	Redhead	None/SSC/ Not Covered	Breeds in relatively deep (>3 feet) permanent or semi-permanent wetlands of at least 1 acre with about 75% open water and emergent tules, bulrushes (*Scirpus* spp.), and cattails (*Typha* spp.) up to about 3 feet in height; winters in coastal estuaries and large, deep ponds, lakes, and reservoirs of the interior.	Moderate potential to occur. Limited suitable habitat occurs on site. Seven individuals were observed during surveys conducted in 2012, but none were detected in surveys covering the same area in 2010 (SDNHM and ARA 2011).

Table 11~~Table 9~~
Special-Status Wildlife Documented as Present or Potentially Occurring on the Pond 15 Site

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status on Site or Potential to Occur
Charadrius alexandrinus nivosus (nesting)	Western snowy plover (coastal population)	FT, BCC/SSC/ MSCP	Nests primarily on coastal beaches in flat, open areas with sandy or saline substrates; less commonly in salt pans, dredged spoil disposal sites, dry salt ponds, and levees.	High potential. Suitable flat areas are present and the species is known to nest and forage near the site, but has not been recorded on the site. 2015 nesting locations are shown in Figure 13 (USFWS 2006b).~~2015 nesting locations are shown in Figure 12 (USFWS 2006b).~~

Federal Designations:
BCC Fish and Wildlife Service: Birds of Conservation Concern
(FD) Federally delisted; monitored for 5 years
FE Federally listed as endangered
FT Federally listed as threatened
State Designations:
SSC California Species of Special Concern
DL State delisted
SE State listed as endangered
WL California Department of Fish and Wildlife Watch List
Multiple Species Conservation Program (MSCP):
MSCP Covered by the MSCP
Not Covered Not covered by the MSCP

Table 12~~Table 10~~
Special-Status Wildlife with Low Potential or No Potential to Occur on the Pond 15 Site but That Have Been Recorded at the South Bay Salt Works

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status on Site or Potential to Occur
			Birds	
Gavia immer	Common loon	None/SSC/ Not Covered	Extirpated as a breeder from California; winters in coastal waters such as bays, channels, coves, and inlets; also winters inland at large, deep lakes and reservoirs.	Low potential to occur. Range has been limited in California from anthropogenic activities. Known to visit San Diego coastal areas during winter, but lacks significant suitable habitat on the project site (USFWS 2006b).

Table 12~~Table 10~~

Special-Status Wildlife with Low Potential or No Potential to Occur on the Pond 15 Site but That Have Been Recorded at the South Bay Salt Works

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status on Site or Potential to Occur
Accipiter cooperii (nesting)	Cooper's hawk	None/WL/ MSCP	Riparian and oak woodlands, montane canyons.	No potential to occur on site for breeding. Could forage on site and nest in nearby woodland areas to the east (SDNHM and ARA 2011; USFWS 2006b).
Plegadis chihi (rookery site)	White-faced ibis	None/WL/ MSCP	Nests in marsh; winter foraging in shallow lacustrine waters, muddy ground of wet meadows, marshes, ponds, lakes, rivers, flooded fields, and estuaries.	Low potential to occur on site during the winter for foraging within the marsh areas due to the small size of the area. Was not observed during surveys conducted from 2010 to 2012 (SDNHM and ARA 2011).
Athene cunicularia (burrow sites and some wintering sites)	Burrowing owl	BCC/SSC/ MSCP	Grassland, lowland scrub, agriculture, coastal dunes, and other artificial open areas.	Low potential to occur within Pond 15 Site, but has been recorded in the region. Three were observed nearby in off-site surveys conducted in 2011 (SDNHM and ARA 2011).
~~*Circus cyaneus* (nesting)~~	~~Northern harrier~~	~~None/SSC/ MSCP~~	~~Open wetlands (nesting), pasture, fields, dry uplands, grasslands, rangelands, coastal sage scrub.~~	~~Low potential to nest within Pond 15 Site, but might forage near or over the site (SDNHM and ARA 2011).~~
Cistothorus palustris clarkae	Clark's marsh wren	None/SSC/ Not Covered	Narrowly distributed along the coast of Southern California. Restricted to freshwater and brackish marshes dominated by bulrushes or cattails.	Low potential to nest within Pond 15 Site, but might forage near the site (SDNHM and ARA 2011).
Elanus leucurus (nesting)	White-tailed kite	None/FP/Not Covered	Open grasslands, savannah-like habitats, agriculture, wetlands, oak woodlands, riparian.	Low potential to nest within Pond 15 Site, but might forage near the site (SDNHM and ARA 2011).
Rallus obsoletus levipes	Light-footed Ridgway's rail	FE/SE, FP/ MSCP	Coastal saltmarsh.	Low potential to nest within Pond 15 Site, but known to be present in the adjacent Palomar channel (SDNHM and ARA 2011). Low potential to nest within Pond 15 Site, but might forage near the site (SDNHM and ARA 2011).

Table 12~~Table 10~~
Special-Status Wildlife with Low Potential or No Potential to Occur on the Pond 15 Site but That Have Been Recorded at the South Bay Salt Works

Scientific Name	Common Name	Status Federal/ State/MSCP	Primary Habitat Associations	Status on Site or Potential to Occur
Invertebrates				
Panoquina errans	Wandering (saltmarsh) skipper	None/None/ MSCP	Occurs strictly in coastal salt marsh habitat where salt grass (*Distichlis spicata*) occurs and functions as the host plant. Marshes with tidal flow are the more likely occupied areas.	Low potential. There are some limited areas of the host plant present mixed in with other plant species, but it does not exist as an isolated stand.

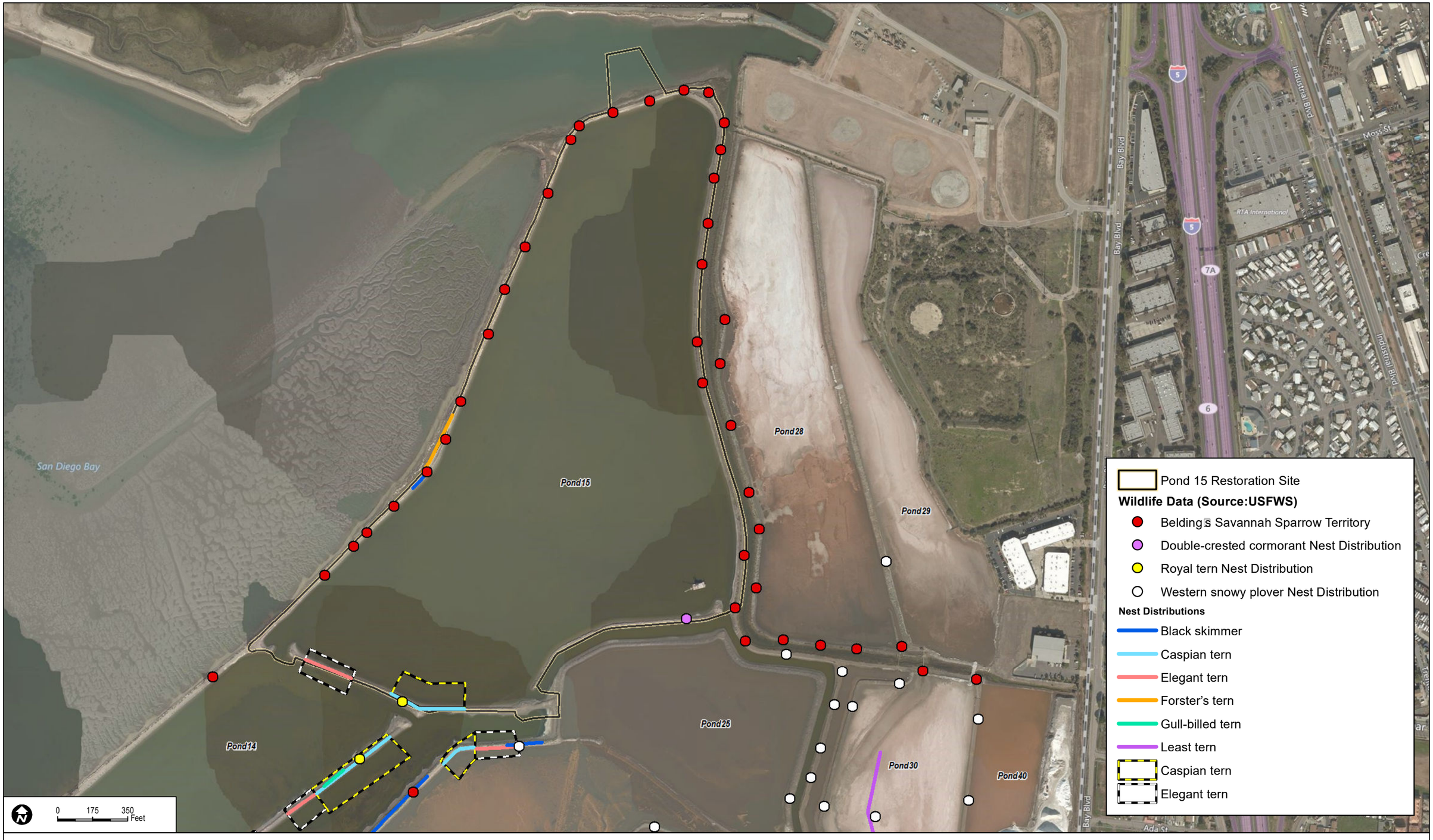
Federal Designations:
BCC Fish and Wildlife Service: Birds of Conservation Concern
FE Federally listed as endangered
State Designations:
SSC California Species of Special Concern
FP California Department of Fish and Wildlife Protected and Fully Protected Species
SE State listed as endangered
WL California Department of Fish and Wildlife Watch List
Multiple Species Conservation Program (MSCP):
MSCP Covered by the MSCP
Not Covered Not covered by the MSCP

Other areas of the salt pond complex that could be affected by project activities include those levees identified as part of the two potential routes that could be used for conveyor belt transport of material from the Otay River Floodplain Site to the Pond 15 Site. Based on comprehensive bird nesting surveys conducted between 2006 and 2017 within the salt pond complex, both routes would use levees that support California least tern, western snowy plover, and other seabird nesting. Use of the levees for nesting varies from year to year; however, the presence of these nesting species on the affected levees in any given year is relatively high, as indicated in Table 5.

4.3.3 Sensitive Habitats/Regulated Resources

Sensitive habitats are those that are considered to support unique vegetation communities, sensitive plant and/or wildlife species, or function as corridors for wildlife movement. Unique vegetation communities include habitats found only in the San Diego region, a local representative of species not generally found in San Diego County, or are outstanding examples of CDFW sensitive plant communities. Regulated biological resources may or may not be considered sensitive, but are regulated under Federal, State, and/or local laws.

The project site contains a number of sensitive resources, including *Isocoma* scrub and various wetland communities.



Document Path: Z:\Projects\j675801\MAPDOC\MAPS\BioResourcesReport\Fig 13 USFWS Nest Data Pond15.mxd

AERIAL SOURCE: BING MAPPING SERVICE

DUDEK

Figure 13

Pond 15 Restoration Site Special Status Nesting Locations

Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

INTENTIONALLY LEFT BLANK

The extensive shallow-water habitat and eelgrass (*Zostera* spp.) beds of the south San Diego Bay provide important habitat for a variety of fish, including midwater schooling fish such as northern anchovy, slough anchovy (*Anchoa delicatissima*), and topsmelt (*Atherinops affinis*). Although not present within the Pond 15 Site, an eelgrass survey conducted in San Diego Bay in 2014 indicated that eelgrass occurs along the southern edge of the Chula Vista Wildlife Reserve, approximately 850 feet to the west of the northern portion of the Pond 15 Site (NAVFAC and Port of San Diego 2014). Although the distribution of eelgrass may vary from year to year, the survey indicated a relatively large population within south San Diego Bay (Figure 14, San Diego Bay 2014 Eelgrass Survey).~~Although the distribution of eelgrass may vary from year to year, the survey indicated a relatively large population within south San Diego Bay (Figure 13, San Diego Bay 2014 Eelgrass Survey).~~

4.3.4 Wildlife Corridors and Habitat Linkages

Wildlife corridors are linear features that connect large patches of natural open space and provide avenues for the migration of animals. Wildlife corridors contribute to population viability by ensuring continual exchange of genes between populations, providing access to adjacent habitat areas for foraging and mating, and providing routes for recolonization of habitat after local extirpation or ecological catastrophes (e.g., fires).

Habitat linkages are small patches that join larger blocks of habitat and help reduce the adverse effects of habitat fragmentation. Habitat linkages provide a potential route for gene flow and long-term dispersal of plants and animals, and may also serve as primary habitat for smaller animals such as reptiles and amphibians. Habitat linkages may be continuous habitat or discrete habitat islands that function as stepping stones for dispersal.

The project site is located within the Otay River floodplain and within the South Bay Salt Works. As such, wildlife movement often is directed in the path of least resistance, and could easily move within the Otay River Floodplain Site from upstream, more riparian areas to on-site areas that are open and more functional as grassland, to the more saltmarsh and wetland areas within the southern part of San Diego Bay. Wildlife movement is generally unrestricted within the Pond 15 Site, other than general avoidance of human activity as it occurs as part of the operation of the South Bay Salt Works.

4.3.5 Jurisdictional Waters and Wetlands

The jurisdictional delineation identified 97.11 acres of wetlands and non-wetland waters under the joint jurisdiction of the Corps (under the Preliminary Jurisdictional Determination

procedures), RWQCB, and Commission (Figures 15~~14~~ through 18~~17~~). The delineation also identified 0.62 acres of Commission-only jurisdictional wetlands within project features.

The results of each federally defined delineation parameter occurring at each data station for the Otay River Floodplain Site, Pond 15 Site, and project features are provided in Table 13. ~~The results of each Federally defined delineation parameter occurring at each data station for the Otay River Floodplain Site, Pond 15 Site, and project features are provided in Table 11.~~ The type and amount of jurisdictional waters occurring within each site are summarized in Tables 14 and 15. ~~The type and amount of jurisdictional waters occurring within each site are summarized in Tables 12 and 13.~~ The jurisdictional delineation report (Appendix B) includes a greater area within the delineation so that if the project boundary changes, the area will be addressed thoroughly. The acreages and figures presented in this document reflect the current project boundaries. In addition to conducting a jurisdictional delineation, a California Rapid Assessment Method (CRAM) survey was conducted for the Otay River Floodplain Site and Pond 15 Site (Appendix E). CRAM is the most widely used wetland rapid assessment method in the State. The purpose of the assessment was to determine the functional condition of vegetated resources within the project area prior to the onset of the project.

Table 13 ~~Table 11~~
Wetland Delineation Sampling Point Summary for All Three Sites

Otay River Floodplain Site						
Data Station	*Wetland Determination Field Indicators*			*Stream Association?*	*Tidal Channel Association?*	*Jurisdiction*
	Vegetation	*Hydric Soils*	*Hydrology*			
5[1]	✓		✓	Yes	No	Commission
6				Yes	No	None
7	✓	✓	✓	Yes	No	Corps, Regional Board, Commission
8	✓			No	No	Commission
9	✓	✓	✓	No	Yes	Corps, Regional Board, Commission
10	✓	✓	✓	No	Yes	Corps, Regional Board, Commission
11	✓		✓	No	Yes	Corps, Regional Board, Commission[2]
12				No	No	None
13	✓	✓		No	No	Commission
14				No	No	None[3]
15	✓		✓	No	No	Commission
16				No	No	None
17	✓		✓	No	Yes	Corps, Regional Board, Commission[2]

Table 13 ~~Table 11~~
Wetland Delineation Sampling Point Summary for All Three Sites

Otay River Floodplain Site						
Data Station	*Wetland Determination Field Indicators*			*Stream Association?*	*Tidal Channel Association?*	*Jurisdiction*
	Vegetation	*Hydric Soils*	*Hydrology*			
18	✓	✓	✓	No	Yes	Corps, Regional Board, Commission
19				No	No	None
20	✓	✓	✓	No	No	Corps, Regional Board, Commission
21	✓			No	No	None
22			✓	No	No	None
23				No	No	None
24		✓	✓	No	No	None
25	✓			No	No	None

Salt Ponds 12–15[4]						
Data Station	*Location*	*Wetland Determination Field Indicators*			*Hydrologic Association?*	*Jurisdiction*
		Vegetation	*Hydric Soils*	*Hydrology*		
1	Inside slope (salt pond side) of levee at Pond 15	✓	✓	✓	Salt Pond	Corps, Regional Board, Commission
2	Outer slope of levee adjacent to Palomar Street tidal channel	✓	✓		Tidal Channel	Corps, Regional Board, Commission
3	Top of levee along access road		✓		None	None*
4	Salt marsh habitat on Bay side of salt pond levee	✓	✓	✓	Bay	Corps, Regional Board, Commission
5	Salt marsh habitat on Bay side of salt pond levee	✓	✓	✓	Bay	Corps, Regional Board, Commission
6	Top of levee between salt ponds		✓		None	None*
7	Top of outer salt pond levee				None	None
8	Top of levee between salt ponds	✓	✓		None	None*
9	Inside slope (salt pond side) of levee at Pond 12		✓	✓	Salt Pond	Corps, Regional Board, Commission
10	Top of outer salt pond levee	✓			None	None
11	Salt marsh habitat on Otay River channel side of salt pond levee	✓	✓	✓	Tidal Channel	Corps, Regional Board, Commission
12	Top of outer salt pond levee		✓		None	None*
13	Top of levee between salt ponds		✓		None	None*

Table 13 ~~Table 11~~
Wetland Delineation Sampling Point Summary for All Three Sites

Salt Ponds 12–15[4]						
		Wetland Determination Field Indicators				
Data Station	*Location*	*Vegetation*	*Hydric Soils*	*Hydrology*	*Hydrologic Association?*	*Jurisdiction*
14	Outer slope of levee adjacent to Palomar Street tidal channel	✓	✓		Tidal Channel	Corps, Regional Board, Commission
15	Inside slope (salt pond side) of levee at Pond 15		✓	✓	Salt Pond	Corps, Regional Board, Commission
Project Features						
		Wetland Determination Field Indicators				
Data Station	*Location*	*Vegetation*	*Hydric Soils*	*Hydrology*	*Hydrologic Association?*	*Jurisdiction*
1	Northwestern side of Egger Highlands near Silver Strand Bikeway associated with freshwater marsh	✓	✓	✓	Freshwater marsh	Corps, Regional Board, Commission
2	Northwestern side of Egger Highlands near Silver Strand Bikeway associated with mulefat scrub				Mulefat scrub	Commission
3	Northwestern side of Egger Highlands near Silver Strand Bikeway within the Otay River Floodplain Site				Restoration area	Commission[5]
4	Northwestern side of Egger Highlands near Silver Strand Bikeway associated with mulefat scrub				Mulefat scrub	Commission
5	North side of Egger Highlands near Silver Strand Bikeway associated with the Otay River Floodplain Site	✓			Restoration area	Commission[5]
6	North side central section of Egger Highlands near Silver Strand Bikeway associated with southern coastal salt marsh in the channel	✓	✓	✓	Southern coastal salt marsh	Corps, Regional Board, Commission
7	North side central section of Egger Highlands near Silver Strand Bikeway associated with mulefat scrub				Mulefat scrub	Commission

* Although these soils retain hydric soil indicators, the soils were derived from dredged bay mud that was placed on the top of the salt pond levees.

1 Data stations 1–4 are located outside of the Otay River Floodplain Site.

[2] Although not all three parameters were met, Corps jurisdiction was presumed because the area was below the elevation of the high tide line (7.79 feet above mean lower low water). See also the section "Corps/Regional Board/Commission Jurisdiction," below.

[3] See Data Stations 2, 4, and 7 for the project features.

[4] Ponds 12–15 were delineated based on preliminary project design. Only Pond 15 is included in the graphics and acreage quantification for this report, but the results of the data stations are included for all areas.

[5] These areas are within the Otay River Floodplain Site, which was recently planted with riparian species. The site is actively irrigated to promote plant establishment. Evident hydric soils and hydrology per the Corps delineation manual are not yet present within the restoration site; therefore, the areas were not classified as Corps jurisdictional, but may eventually develop the indicators necessary to classify these areas as Corps jurisdictional.

Table 14 ~~Table 12~~
Wetland Delineation Existing Acreage Summary

Vegetation Community	Jurisdiction Corps, Regional Board, Commission (acres) ~~Corps, Regional Board, Commission~~
Otay River Floodplain Site	
Non-Wetland Waters ~~Non-Wetlands~~	—
Brackish Water	0.77
Former Salt Pond Bottom and Borrow Area	3.52
Wetlands	—
Southern Coastal Salt Marsh	1.26
Former Salt Pond Bottom and Borrow Area	0.87
Subtotal	*6.42 ~~6.43~~*
Pond 15 Site[1]	
Non-Wetland Waters ~~Non-Wetlands~~	—
Beach	0.01
Bay	1.15
Open Water	82.33
Salt Pond Levee	3.67
Wetlands	—
Southern Coastal Salt Marsh	0.87
Southern Coastal Salt Marsh – disturbed	0.10
Subtotal	*88.13 ~~88.14~~*

Note: Acreages may not total due to rounding.

[1] Ponds 12–15 were delineated, but only Pond 15 is presented in graphics and for acreage.

Otay River Floodplain Site

The results of the study include areas delineated as jurisdictional by the Corps, Regional Board, and the Commission (Figure 15, Otay River Floodplain Restoration Site and Project Features Jurisdictional Delineation). ~~The results of the study include areas delineated as jurisdictional by the Corps, Regional Board, and the Commission (Figure 14, Otay River Floodplain Restoration Site and Project Features Jurisdictional Delineation).~~ Although the non-tidal portion of the Otay River channel would have qualified for CDFW jurisdiction, the portion is on Federal land, and, thus, not

subject to Section 1600 et seq. of the California Fish and Game Code. Representative photos of the study area and sampling locations can be found in Figures 6a and 6b of Appendix B.

Ponds 15 Site

The results of the study include areas delineated as jurisdictional by the Corps, Regional Board, and the Commission (Figure 16, Pond 15 Restoration Site and Project Features Jurisdictional Delineation). ~~The results of the study include areas delineated as jurisdictional by the Corps, Regional Board, and the Commission (Figure 15, Pond 15 Restoration Site and Project Features Jurisdictional Delineation).~~ The Otay River channel and Palomar Street channel are tidal channels within the study area in the San Diego Bay NWR, and do not qualify for CDFW jurisdiction, and thus are not subject to Section 1600 et seq. of the California Fish and Game Code. Representative photos of the Ponds 12–15 study area and sampling locations can be found in Figures 7a–7c of Appendix B.

Project Features

The results of the study include areas delineated as jurisdictional by the Corps, Regional Board, and the Commission (Figures 15~~14~~–18~~17~~; Table 15). ~~The results of the study include areas delineated as jurisdictional by the Corps, Regional Board, and the Commission (Figures 14–17; Table 13).~~ Although the non-tidal portion of the Otay River channel would have qualified for CDFW jurisdiction, the portion is on Federal land within the San Diego Bay NWR, and, thus, is not subject to Section 1600 et seq. of the California Fish and Game Code. Representative photos of the access routes study area and sampling locations can be found in Figures 8a and 8b of Appendix B. In addition to the joint jurisdiction, there are areas that are delineated as Commission-only jurisdiction due to lack of hydric soils and/or hydrology. These include areas that are dominated by mulefat scrub vegetation or were recently restored by River Partners to riparian habitat (designated as Otay River floodplain restoration).

Table 15~~Table 13~~
Jurisdictional Waters within Project Features

Vegetation Community/ Land Cover Type	Project Features (Acres under Corps, Regional Board, and Commission Jurisdiction, except where noted as Commission-only)*														
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*Total*
Brackish water	0.13	0.08	—	—	—	—	—	—	0.01	—	—	—	—	—	**0.22 ~~0.21~~**
Open water	—	—	—	—	—	—	—	—	—	0.40	0.79	0.08	0.03	—	1.30
Otay River floodplain –	—	—	—	—	—	0.56	—	0.03 —	—	—	—	—	—	—	**0.59 ~~0.56~~**

Table 15~~Table 13~~
Jurisdictional Waters within Project Features

Vegetation Community/ Land Cover Type	Project Features (Acres under Corps, Regional Board, and Commission Jurisdiction, except where noted as Commission-only)*														
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*Total*
Commission only ~~Otay River floodplain restoration – Commission only~~															
Freshwater marsh	—	—	—	—	—	—	0.08	—	—	—	—	—	—	—	**0.08**
Mulefat scrub – Commission only	—	—	—	—	—	0.06	—	—	—	—	—	—	—	—	**0.06**
Southern coastal salt marsh	0.06	0.47	—	—	—	0.02	0.02	—	0.06	0.19	—	—	—	—	**0.82**
Salt pond levee	—	—	—	—	—	—	—	—	—	0.33	0.19	0.08	0.31		**0.91**
Total	**0.19**	**0.55**	**—**	**—**	**—**	**0.64 ~~0.65~~**	**0.10**	**0.03 ~~—~~**	**0.07**	**0.92 ~~0.59~~**	**0.98 ~~0.79~~**	**0.16 ~~0.08~~**	**0.34 ~~0.03~~**	**—**	**3.98 ~~3.04~~**

* Commission wetlands define wetland boundaries by a single parameter (i.e., hydric soils, hydrophytic vegetation, or hydrology).
1 Otay Channel Protection under Bikeway Bridge (Temporary and Permanent)
2 Otay Channel Protection (Permanent)
~~3 Stockpiles (Permanent)~~
3 Note: The material that was to be stockpiled will be used to cover a 23.11-acre area of disturbed habitat east of Nestor Creek; see Project Feature 14
4 Staging Area (Temporary)
5 Crossing at Nestor Creek (Temporary)
6 Two-Lane Truck Route Connecting Nestor Creek (Temporary)
7 Crossing at Otay River (Temporary)
8 Bike Path Reroute (Temporary)
9 Crossing at Palomar Channel (Temporary)
10 Two-Lane Truck Crossing at Salt Pond Levee (Temporary)
11 Levee Modification of Ponds 13 and 14 – North (Temporary and Permanent)
12 Levee Modification of Ponds 13 and 14 – South (Temporary and Permanent)
13 Raised Levee between Ponds 22 and 23 (Permanent)
14 Exposure Reduction Cover (Permanent)
~~14 Restoration Area East of Nestor Creek (Permanent)~~

Corps/Regional Board/Commission Jurisdiction

Areas meeting all three parameters were classified as wetlands under the jurisdiction of the Corps, Regional Board, and the Commission.

Otay River Floodplain Site

Results of the wetland delineation (summarized in Tables 13 and 14) indicate that approximately 6.43 acres of wetlands and non-wetland waters of the United States under the joint jurisdiction of

the Corps, Regional Board, and the Commission occur within the Otay River Floodplain Site. ~~Results of the wetland delineation (summarized in Tables 11 and 12) indicate that approximately 6.43 acres of wetlands and non-wetland waters of the United States under the joint jurisdiction of the Corps, Regional Board, and the Commission occur within the Otay River Floodplain Site.~~ The predominant native vegetation communities associated with the wetlands are adjacent to tidal channels and support southern coastal salt marsh. Soils in these areas are characterized by variable textures (including clay loam, sand, loam, clay, loamy sand, loamy clay, and sandy clay loam) with redox dark surfaces or a loamy gleyed matrix. Wetland hydrology indicators present include surface water, high water table, and saturation. Areas supporting all three wetland indicators were mapped as Corps, Regional Board, and Commission wetlands. Additionally, in some locations along the tidal channels, there is a narrow strip along the outer perimeter of the salt marsh habitat where hydrology indicators were not apparent and soils did not have hydric indicators. In these instances, Corps jurisdiction was assumed because they are tidally influenced areas that are below the elevation of the high tide line (7.79 feet above mean lower low water).

A total of 2.13 acres of wetlands occur within the Otay River Floodplain Site, which supports southern coastal salt marsh and former salt pond bottom and borrow area. Because the site is primarily unvegetated, the hydrophytic vegetation parameter was rarely met at the sampling locations. When present, vegetation consisted of species typical of southern coastal salt marsh habitat, including estuary seablite, alkali seaheath, Pacific swampfire, turtleweed, marsh rosemary (*Limonium californicum*), and dwarf saltwort (*Salicornia bigelovii*). Also observed in the southern coastal salt marsh habitat were coast weed (*Amblyopappus pusillus*), slenderleaf iceplant (*Mesembryanthemum nodiflorum*), common iceplant (*Mesembryanthemum crystallinum*), and arrow grass (*Triglochin concinna*). Outside of the tidally influenced areas adjacent to the two tidal channels that abut portions of the site on the southwestern and northeastern flanks, coastal salt marsh habitat is extremely patchy and disturbed, with low cover and low species diversity.

The site contains a series of low-lying areas that are remnants of construction and operation of the former industrial salt evaporation pond. The areas are surrounded by a tall levee that separates them from the adjacent tidal channels. The levee was constructed, in part, using soil excavated from within the basin (borrow areas) that are lower in elevation than the basin bottom. These unvegetated areas in the bottom of the basin were mapped as former salt pond bottom and borrow areas. Because of their historical long-term use as industrial salt evaporation ponds, the soil conditions are hypersaline, and much of the land does not support vegetation. The functions and values of these areas are considered degraded and low due to the extensive site disturbance, lack of vegetation, lack of surface water hydrologic connectivity, and excessive salinity.

The portions of the former salt pond bottom and borrow area can occasionally become inundated from precipitation, as was the case during the February 2012 site visit. However, with the exception of a few small areas in the southwestern corner, the areas were completely dry during the July 2012 site visit. A review of aerial photographs shows that ponding does not occur in every year, and varies in location and extent. Although the borrow areas may exhibit periods of ponding during the rainy season, the surface water evaporates quickly.

Although not physically connected to either tidal channels or freshwater channels due to the presence of perimeter berms, the Corps classified the former salt pond bottom and borrow area as jurisdictional for the purposes of the Preliminary Jurisdictional Determination (Appendix B). The portions of these areas that support hydrophytic vegetation were classified as wetlands, and the remaining areas below the ordinary high water mark were classified as non-wetlands waters of the United States.

The CRAM Assessment Areas (AAs) within the site were analyzed for a suite of variables that pertain to common attributes that estuarine systems are expected to perform. CRAM consists of scoring the AAs based on the condition metrics and stressor checklist. Results for the Otay River Floodplain Site are summarized below, and details are provided in Appendix E.

Buffer and Landscape Context: The AA at the Otay River Floodplain Site scored 65 for the Buffer and Landscape Context attribute. The entire AA has a buffer, but the aquatic area abundance, buffer width, and buffer condition are diminished due to surrounding land use associated with the Bayshore Bikeway, unnatural berms surrounding the site, and historic agricultural uses nearby.

Hydrology: The Hydrology attribute scored 42. All metrics (Water Source, Hydroperiod, and Hydrologic Connectivity) scored low due to the constructed berms surrounding the AA that affect a potential tidal connection. Hydrology at the site is due to a combination of urban runoff and groundwater (elevated water table), rather than tidal inundation.

Physical Structure: The Physical Structure attribute (including Structural Patch Richness and Topographic Complexity metrics) scored low (38) due to a general lack of structural patch types and low topographic complexity as a consequence of the constructed salt pond setting (i.e., dredged pond area and surrounding berms).

Biotic Structure: The AA is primarily unvegetated, and where there is vegetation, it is dominated by non-native species. The vegetation has little biotic structural diversity and very low horizontal interspersion, which is reflected in the scores for this category (28). The center island within the

AA is vegetated with some sparse coast goldenbush shrubs, with primarily non-native slenderleaf iceplant growing in the interstices and occasionally near seasonally ponded areas.

Pond 15 Site

Results of the wetland delineation (summarized in Tables 13 and 14) indicate that approximately 88 acres of wetlands and non-wetland waters of the United States under the joint jurisdiction of the Corps, Regional Board, and the Commission occur within the Pond 15 Site. ~~Results of the wetland delineation (summarized in Tables 11 and 12) indicate that approximately 88 acres of wetlands and non-wetland waters of the United States under the joint jurisdiction of the Corps, Regional Board, and the Commission occur within the Pond 15 Site.~~ Of the total area classified as jurisdictional, 0.97 acres was classified as wetlands and 87.16 acres was classified as non-wetland waters of the United States. In general, the jurisdictional features are unvegetated, with the exception of areas that abut the Otay River and the Palomar Street tidal channels, and a few patchy areas along the salt pond levees. The predominant native vegetation community associated with the wetlands is southern coastal salt marsh. Soils in these areas are characterized by variable textures (including sand, clay, sandy loam, clay loam, sandy clay loam, and silty clay loam), often with a with depleted matrix. Wetland hydrology indicators present included high water table, saturation, oxidized rhizospheres along living roots, and aquatic invertebrates. Areas supporting all three wetland indicators were mapped as Corps, Regional Board, and Commission wetlands.

The majority of the Pond 15 Site contains the active salt pond that is a component of the solar salt evaporation system. The salt ponds are surrounded by levees that separate them from the adjacent San Diego Bay and tidal channels. The levees were constructed using soil excavated from within the San Diego Bay, and they reach a maximum elevation that is slightly greater than the highest observed water level (7.79 feet, NAVD 88), approximately 8 feet and up to 12 feet in some places.

A review of aerial photographs shows that the salt ponds and the levees surrounding them have been in the same configuration for decades. The water elevation within the salt ponds is controlled by a tide gate, and, thus, remains relatively constant.



SAN DIEGO BAY

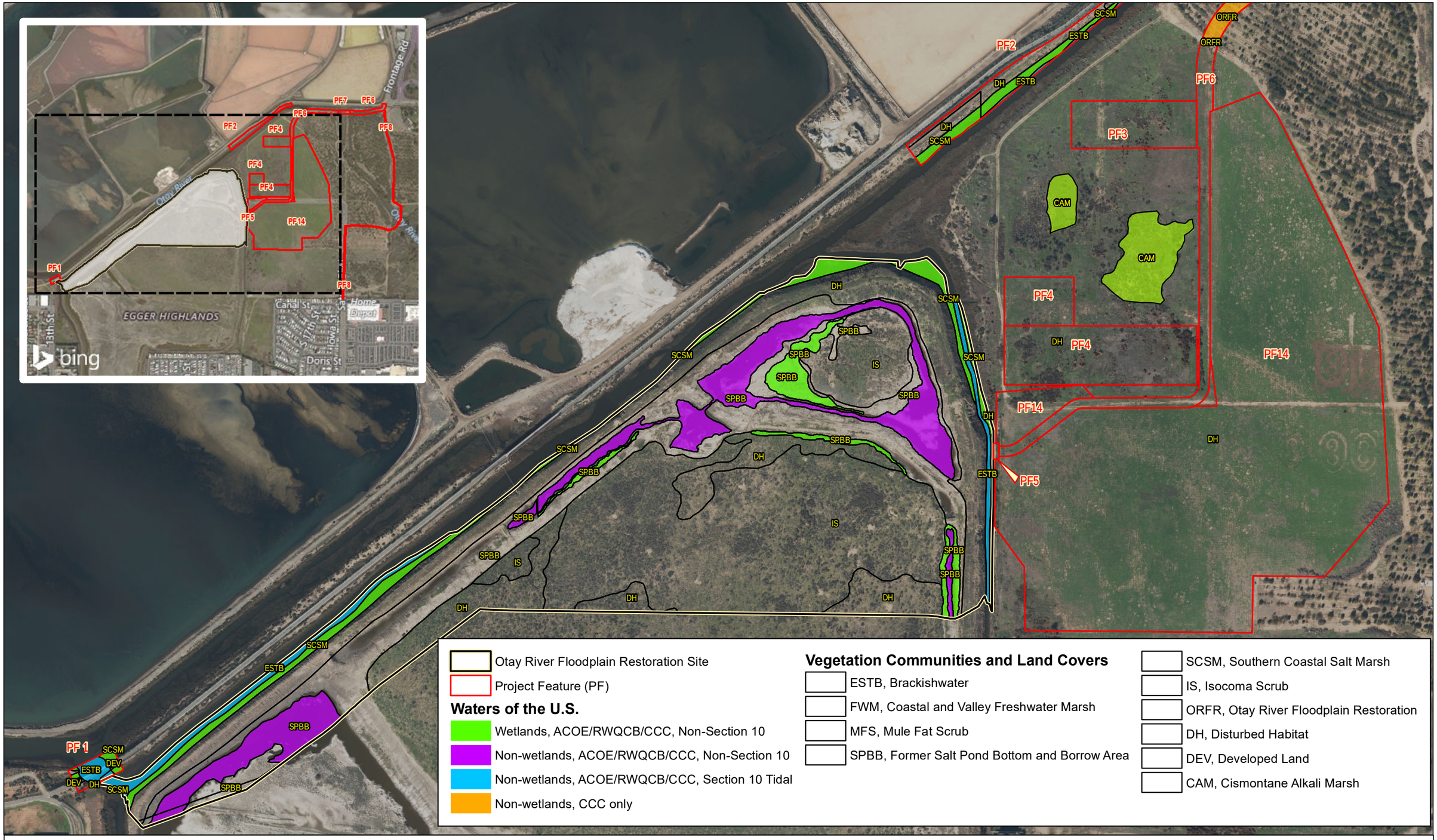
2014 EELGRASS SURVEY

SOURCE: Merkel & Associates, Inc., Naval Facilities Engineering Command Southwest, Port of San Diego, 2014.

FIGURE 14

San Diego Bay 2014 Eelgrass Survey

INTENTIONALLY LEFT BLANK



Otay River Floodplain Restoration Site

Project Feature (PF)

Waters of the U.S.

- Wetlands, ACOE/RWQCB/CCC, Non-Section 10
- Non-wetlands, ACOE/RWQCB/CCC, Non-Section 10
- Non-wetlands, ACOE/RWQCB/CCC, Section 10 Tidal
- Non-wetlands, CCC only

Vegetation Communities and Land Covers

- ESTB, Brackishwater
- FWM, Coastal and Valley Freshwater Marsh
- MFS, Mule Fat Scrub
- SPBB, Former Salt Pond Bottom and Borrow Area
- SCSM, Southern Coastal Salt Marsh
- IS, Isocoma Scrub
- ORFR, Otay River Floodplain Restoration
- DH, Disturbed Habitat
- DEV, Developed Land
- CAM, Cismontane Alkali Marsh

AERIAL SOURCE: SANDAG IMAGERY 2014

DUDEK

FIGURE 15

Otay River Floodplain Restoration Site and Project Features Jurisdictional Delineation

Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

Document Path: Z:\Projects\j675801\MAPDOC\MAPS\BioResourcesReport\Fig 15 ORFS JD.mxd

INTENTIONALLY LEFT BLANK

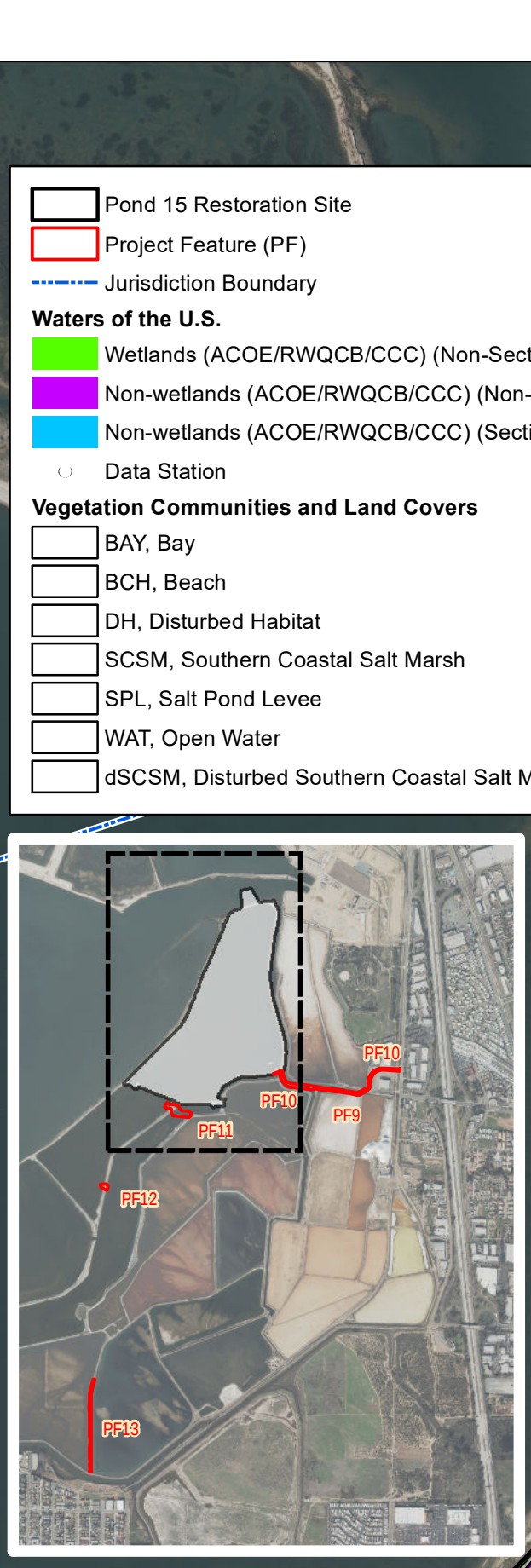
Pond 15 Restoration Site
Project Feature (PF)
Jurisdiction Boundary

Waters of the U.S.

Wetlands (ACOE/RWQCB/CCC) (Non-Section 10)
Non-wetlands (ACOE/RWQCB/CCC) (Non-Section 10)
Non-wetlands (ACOE/RWQCB/CCC) (Section 10 Tidal)
Data Station

Vegetation Communities and Land Covers

BAY, Bay
BCH, Beach
DH, Disturbed Habitat
SCSM, Southern Coastal Salt Marsh
SPL, Salt Pond Levee
WAT, Open Water
dSCSM, Disturbed Southern Coastal Salt Marsh



PORT OF SAN DIEGO
STATE LANDS
BAY
3
SCSM
dSCSM
Pond 15 Restoration Site
WAT
SPL
DH
BCH
7
6
15
PF10
PF11

0 150 300 Feet

AERIAL SOURCE: SANGIS IMAGERY 2014

Document Path: Z:\Projects\j675801\MAPDOC\MAPS\BioResourcesReport\Fig 16 Pond15_JD.mxd

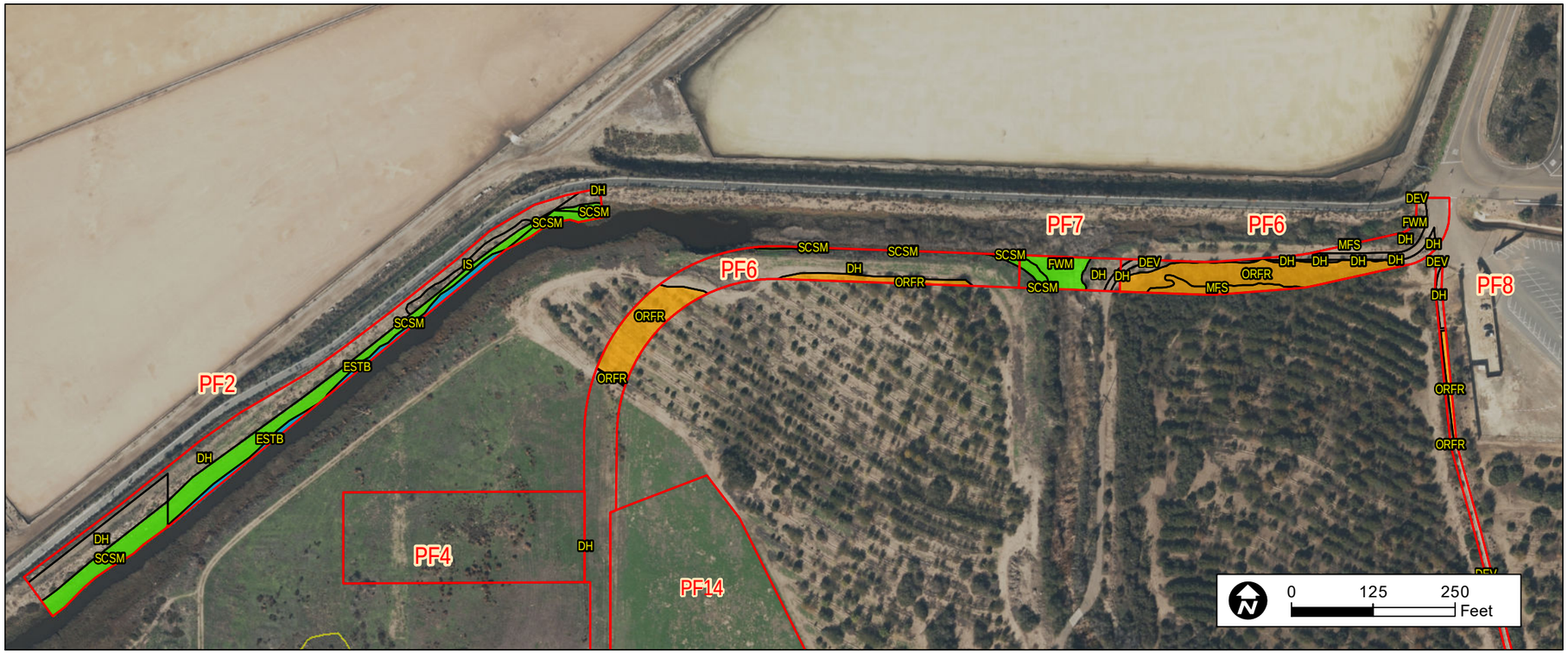
FIGURE 16

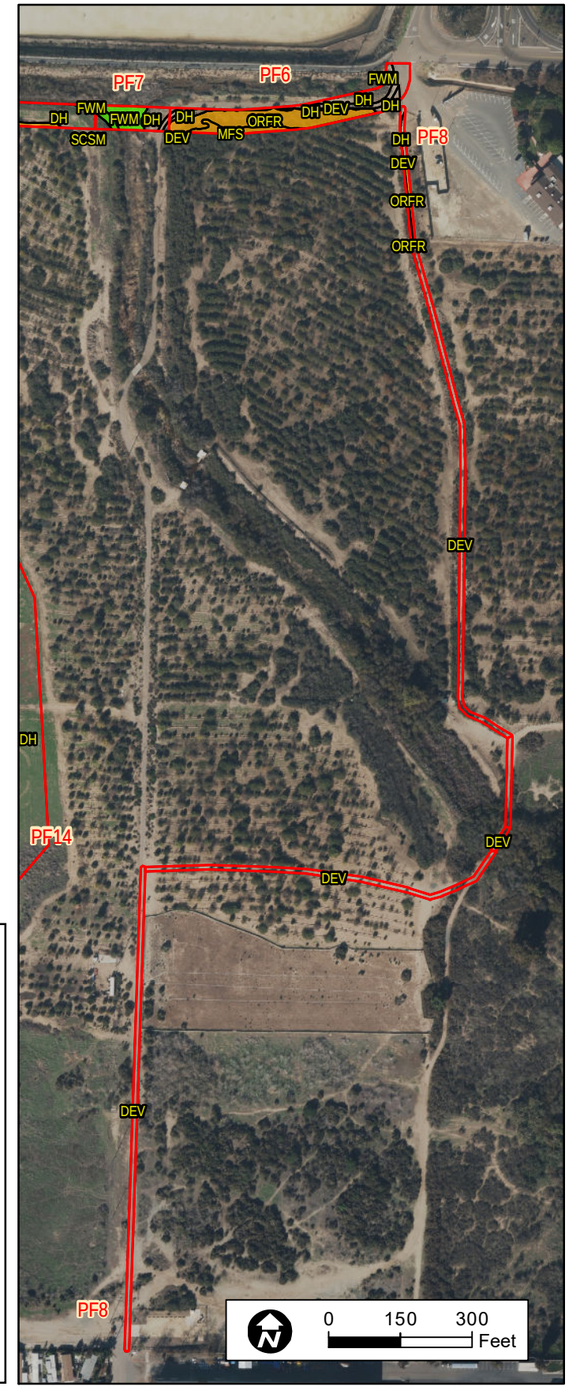
Pond 15 Restoration Site and Project Features Jurisdictional Delineation

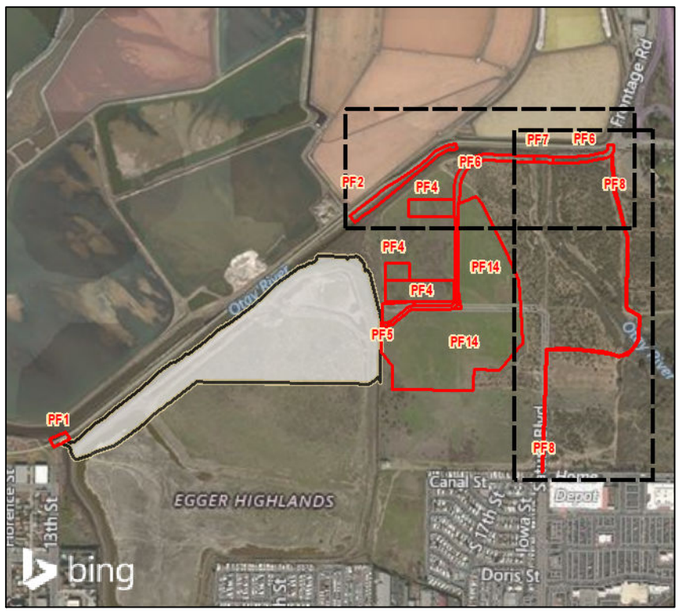
DUDEK

Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

INTENTIONALLY LEFT BLANK







Otay River Floodplain Restoration Site

Project Feature (PF)

Waters of the U.S.

- Wetlands, ACOE/RWQCB/CCC, Non-Section 10
- Non-wetlands, ACOE/RWQCB/CCC, Non-Section 10
- Non-wetlands, ACOE/RWQCB/CCC, Section 10 Tidal
- Non-wetlands, CCC only

Vegetation Communities and Land Covers

- ESTB, Brackishwater
- FWM, Coastal and Valley Freshwater Marsh
- MFS, Mule Fat Scrub
- SCSM, Southern Coastal Salt Marsh
- SPBB, Former Salt Pond Bottom and Borrow Area
- IS, Isocoma Scrub
- ORFR, Otay River Floodplain Restoration
- DH, Disturbed Habitat
- DEV, Developed Land
- CAM, Cismontane Alkali Marsh

AERIAL SOURCE: SANDAG IMAGERY 2014

DUDEK

FIGURE 17

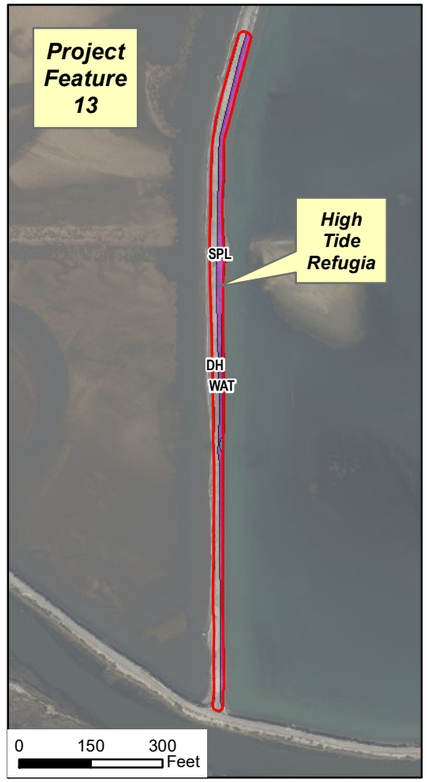
Project Features Jurisdictional Delineation

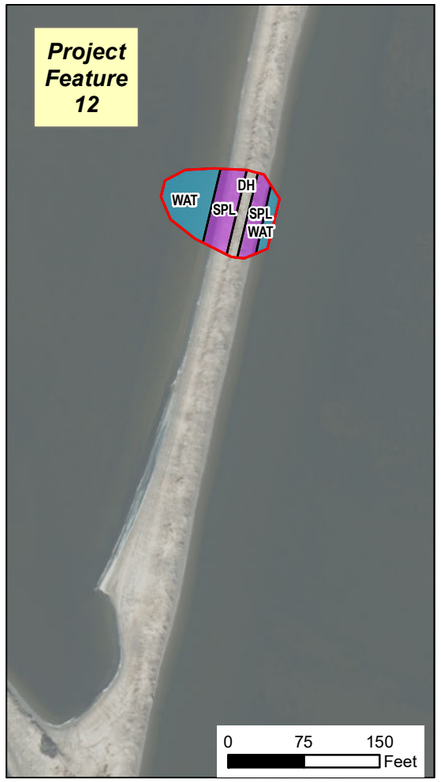
Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

Document Path: Z:\Projects\j675801\MAPDOC\MAPS\BioResourcesReport\Fig 17 ORFS JD Proj Features.mxd

INTENTIONALLY LEFT BLANK







Pond 15 Restoration Site

Project Feature (PF)

Waters of the U.S.

Wetlands (ACOE/RWQCB/CCC) (Non-Section 10)

Non-wetlands (ACOE/RWQCB/CCC) (Non-Section 10)

Non-wetlands (ACOE/RWQCB/CCC) (Section 10 Tidal)

Vegetation Communities and Land Covers

BAY, Bay

BCH, Beach

DEV, Developed Land

DH, Disturbed Habitat

ESTB, Brackishwater

SCSM, Southern Coastal Salt Marsh

SF, Salt Flats

SPL, Salt Pond Levee

WAT, Open Water

dSCSM, Disturbed Southern Coastal Salt Marsh



AERIAL SOURCE: SANDAG IMAGERY 2014

DUDEK

FIGURE 18

Project Features Jurisdictional Delineation

Biological Resources Existing Conditions Technical Report for the Otay River Estuary Restoration Project

INTENTIONALLY LEFT BLANK

The portions of the site that met all three parameters were classified as wetlands, and the remaining areas below the high tide line (7.79 feet above mean lower low water) were classified as non-wetland waters of the United States. The top of the salt pond levees that is above the high tide line did not meet the three parameters, and was classified as non-jurisdictional.

The CRAM AAs within the Pond 15 Site were analyzed for a suite of variables similar to what was conducted for the Otay River Floodplain Site. Results for the Pond 15 Site are summarized below, and details are provided in Appendix E.

Buffer and Landscape Context: The AA at the Pond 15 Site scored 81 for the Buffer and Landscape Context attribute. The score was relatively high because the entire AA has a buffer, and the buffer extends well beyond the edge of the AA. The Buffer Width score was high due to the CRAM guidelines that allow for the extension of buffer measurements into open water in situations where there is buffer between the AA and the open water (as is the case at this AA). The overall score for Buffer and Landscape Context was slightly diminished due to surrounding land use associated with the salt pond operations and periodic maintenance of the perimeter berms.

Hydrology: The Hydrology attribute scored 25. All metrics (Water Source, Hydroperiod, and Hydrologic Connectivity) scored low due to the constructed berms surrounding the AA that affect a potential tidal connection. Hydrology at the site is due to manually operated tide gates that route water through the evaporative salt pond cycle, rather than natural tidal inundation. There are no freshwater sources from upstream and no natural tidal connection to affect the hydrology of the AA.

Physical Structure: The Physical Structure attribute (including Structural Patch Richness and Topographic Complexity metrics) scored low (25) due to a general lack of structural patch types and low topographic complexity as a consequence of the constructed salt pond setting.

Biotic Structure: The AA is primarily unvegetated. There are a few small patches of vegetated land on the inside slope of the berm within the AA, dominated by non-native slenderleaf iceplant and native Watson's saltbush (*Atriplex watsonii*). Biotic structural diversity and horizontal interspersion are very low, which is reflected in the score (31) for this category.

Project Features

Results of the wetland delineation (Tables 13 and 15) indicate that approximately 3.04 acres of wetlands and non-wetland waters of the United States under the joint jurisdiction of the Corps, Regional Board, and Commission occur within the project features. ~~Results of the wetland delineation (Tables 11 and 13) indicate that approximately 3.04 acres of wetlands and non-~~

~~wetland waters of the United States. under the joint jurisdiction of the Corps, Regional Board, and Commission occur within the project features.~~ The jurisdictional areas are associated with tidal channels, the salt ponds, and the San Diego Bay. The predominant native vegetation community associated with the wetlands is southern coastal salt marsh along the Palomar Street channel. Soils in these areas are characterized by variable textures (including sand, clay, sandy clay, and clay loam), with the predominant soil texture clay loam. Wetland hydrology indicators present included high water table, saturation, surface water, sediment deposits, drift deposits, and drainage patterns. Areas supporting all three wetland indicators were mapped as Corps, Regional Board, and Commission wetlands.

Salt pond levees below the high tide line elevation (7.79 feet above mean lower low water) were classified as jurisdictional waters of the United States, and salt pond levees above the high tide line were classified as non-jurisdictional where the wetland delineation parameters were not present (e.g., hydrophytic vegetation and hydrology).

Commission-Only Jurisdiction

Otay River Floodplain Site

There were no areas classified as jurisdictional only by the Commission within the Otay River Floodplain Site.

Pond 15 Site

There were no areas classified as jurisdictional only by the Commission within the Pond 15 Site.

Non-Jurisdictional Areas

Two areas were mapped by Dudek as mulefat scrub or Otay River floodplain restoration within the project site. The isolated patch of mulefat scrub in the eastern portion of the project site did not meet any of the three criteria (hydric soils, hydrology, or hydrophytic vegetation).

Data station 14 was placed within the isolated patch of mulefat scrub. For the hydrophytic vegetation, the sample was dominated by mulefat, a facultative wetland species, with garland chrysanthemum (*Glebionis coronaria*), an upland species, dominant in the understory. The coverage of dominants across all strata versus the coverage of hydrophytic dominants (i.e., plants with a Facultative (FAC), Facultative Wet (FACW), or Obligate (OBL) rating) was assessed. The percent cover of dominant hydrophytic species was at 50% but did not exceed 50%, which is necessary to meet the hydrophytic vegetation parameter. This station also failed the prevalence index test, with a value greater than 3.0. Therefore, this location does not support hydrophytic vegetation.

For hydrology, because wetland hydrology indicators are often the most transitory of the three wetland parameters, special attention was paid in assessing the landscape features to determine how water flows through these areas, and, if so, what are the potential sources of hydrology (e.g., rainfall, sheet flow, creek flow). Hydrology indicators such as an ordinary high water mark via a bed and bank, surface cracks, drainage patterns, drift deposits, scour/erosion, saturation, permanence of surface water, and wetland vegetation were not present. The mulefat scrub occurs on a nearly level terrace with a 0–1% slope. This area does not support microtopography conducive to the collection or conveyance of surface flows or groundwater, and no signs of hydrology were identified (e.g., cracked soils, biotic crusts, drainage patterns).

Regarding hydric soils, soils in these areas were composed of a dry, sandy loam with a value of 3 and chroma of 2 with no evidence of mottling. These areas also lacked standard hydric soil indicators typically seen in wetland environments, including sulfate reduction, organic matter accumulation, and presence of saturated or inundated soils (ACOE 2008).

Because the mulefat scrub area lacked all three wetland parameters necessary to define a Corps wetland, and lacked a single parameter needed to define a Commission wetland pursuant to the Cowardin method, this area does not meet the definition of a wetland, and is not jurisdictional by any regulating authority in the context of this analysis.

4.4 Regional Resource Planning Context

The San Diego Multiple Species Conservation Program (MSCP) is a long-term regional conservation plan established to protect sensitive species and habitats in San Diego County. The MSCP is divided into subarea plans that are implemented separately from one another. The entire project site is within the City of San Diego MSCP subarea plan. This subarea encompasses 206,124 acres and is generally characterized by urban land use. The City of San Diego Multi-Habitat Planning Area (MHPA) is a “hard line” preserve developed by the City of San Diego in cooperation with the wildlife agencies, property owners, developers, and environmental groups. The MHPA identifies biological core resource areas and corridors targeted for conservation, within which only limited development may occur (City of San Diego 1997).

The project site is located within the MSCP plan area within southern San Diego. This area is composed of the Otay Mesa and Otay River Valley areas of the MHPA. The Otay River Valley area supports a number of sensitive species and also provides an important linkage from Otay Mountain and Otay Lakes to the San Diego Bay. Where the river delta mouth opens into the San Diego Bay, the area is divided by dikes into salt ponds. These ponds may potentially support several threatened and endangered species.

Covered species that potentially occur within the City of San Diego's MSCP area include Otay tarplant (*Deinandra conjugens*), Orcutt's bird's-beak (*Dicranostegia orcuttiana*), variegated dudleya (*Dudleya variegata*), San Diego barrel cactus (*Ferocactus viridescens*), western snowy plover, long-billed curlew, Belding's Savannah sparrow, large-billed Savannah sparrow (*Passerculus sandwichensis rostratus*), light-footed Ridgway's rail, California least tern, least Bell's vireo, and California gnatcatcher. Various raptors species, including northern harrier, use the valley area for foraging and nesting.

The following MHPA guidelines pertain to the general vicinity of the project site:

- A11. The existing Western Salt Company salt extraction use is expected to continue for an undetermined period. The sensitive animal and plant species should continue to be managed to ensure protection. If the extraction use is terminated, the site should be converted to a use compatible with the resource goals and objectives of the MHPA and other regulations and the policies applicable to the site, or enhanced/restored.
- A12. Work with SANDAG [the San Diego Association of Governments], South Bay jurisdictions, and the Bayshore Bikeway Committee to develop a bike path in or adjacent to the MHPA in the South San Diego Bay area. Design of the bikeway should minimized disturbance to the natural areas.
- A14. The MHPA boundaries within the proposed Special Study Areas of the Otay-Nestor Community Plan may be modified to reflect future changes to land use designations and may require an amendment to the Subarea Plan. Any such modification shall include a wildlife corridor approximately 1,000 feet in width, preserving connections between the Otay River and the San Diego Bay (City of San Diego 1997).

There are also management policies and directives for the Otay River Valley, Otay River Mouth area, as follows :

- In the long-term, should salt production operations cease, restore the tidelands leased for salt mining to baylands by breaching the levees in several locations, if determined appropriate by the MSCP habitat management technical committee in consultation with the wildlife agencies.
- Convert the agricultural area/tilled lands west of I-5 to sustainable agriculture (e.g., grain crops), or restore to native habitats to provide foraging areas for wildlife. Although appropriate habitats for this area appear to include wetlands (e.g., saltmarsh and riparian habitat) and grasslands, research into historic and possibly pre-historic land uses and habitat types in this area should be conducted to help guide restoration efforts if pursued (City of San Diego 1997).

5 ACKNOWLEDGMENTS

This report was prepared by Dudek biologist Anita M. Hayworth, PhD, and Andy Thomson. Figures were provided by Mark McGinnis.

INTENTIONALLY LEFT BLANK

6 LITERATURE CITED

ACOE (U.S. Army Corps of Engineers). 1987. *Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1*, U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.

ACOE. 2008. *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region*. ed. J.S. Wakeley, R.W. Lichvar, and C. V. Noble. ERDC/EL TR-08-13. Vicksburg, MS: U.S. Army Engineer Research and Development Center. http://el.erdc.usace.army.mil/elpubs/pdf/trel08-13.pdf. September.

ACOE and EPA (U.S. Army Corps of Engineers and U.S. Environmental Protection Agency). 2007. Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in *Rapanos v. United States & Carabell v. United States*. June 5.

AOU (American Ornithologists' Union). 2015. The AOU Check-List of North American Birds, 7th Edition. Accessed from http://www.aou.org/checklist/north/full.php.

Atwood, Jonathan L., and David R. Bontrager. 2001. California Gnatcatcher (*Polioptila californica*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online. http://bna.birds.cornell.edu/bna/species/574.

Burness, Gary P., Kara Lefevre, and Charles T. Collins. 1999. Elegant Tern (*Thalasseus elegans*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/404.

CDFG (California Department of Fish and Game). 1995. Staff Report on Burrowing Owl Mitigation. October 17. http://www.dfg.ca.gov/wildlife/nongame/docs/burowlmit.pdf.

CDFG. 2000. Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities. Revision of the 1983 Guidelines. Sacramento, California.

CDFG. 2001. Recommendations for Conducting Belding's Savannah Sparrow (*Passerculus sandwichensis belding*) surveys. Prepared by Terri Stewart. May 9, 2001.

CDFG. 2009. California Natural Diversity Data Base (CNDDB). Special Animals. Biannual publication, mimeo. July. 59 pp.

CDFG. 2011a. CNDDB. State and Federally Listed Endangered and Threatened Animals of California. Biannual publication, mimeo. January. 13 pp.

CDFG. 2011b. CNDDB. Special Vascular Plants, Bryophytes, and Lichens List. Biannual publication, mimeo. January. 85 pp.

CDFG. 2011c. CNDDB. Rarefind Version 4. Online database.

City of Chula Vista. 2005. City of Chula Vista General Plan. December 13, 2005. Prepared through City of Chula vista Planning and building Department.

City of San Diego. 1997. City Of San Diego MSCP Subarea Plan. March.

City of San Diego. 2004. Land Development Code Biology Guidelines.

CNPS (California Native Plant Society). 2001. Botanical Survey Guidelines. California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California, ed. D.P. Tibor. Sixth edition. Special Publication No. 1. Sacramento, California.

CNPS. 2015. Inventory of Rare and Endangered Plants (online edition, v8-02). Sacramento, California: California Native Plant Society. Accessed January 2015. www.rareplants.cnps.org.

Collins, B. 2014. Personal communication between B. Collins (U.S. Fish and Wildlife Service) and A. Hayworth (Dudek). April 3, 2014.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Fish and Wildlife Service Report No. FWS/OBS/-79/31.Washington, D.C.

Crother, B.I. 2008. Scientific and Standard English Names of Amphibians and Reptiles of North America North of Mexico, with Comments Regarding Confidence in our Understanding. 6th ed. Herpetological Circular No. 37. Ed. J.J. Moriarty. Shoreview, Minnesota: Society for the Study of Amphibians and Reptiles.CRST (Clapper Rail Study Team). 2009. Survey Guidelines to Determine Presence/Absence of the Light-Footed Clapper Rail in Southern California; Recommendations of the Clapper Rail Study Team (John Konecny, Richard Zembal, Susan Hoffman). Draft Recommendations Provided to the Fish and Wildlife Service. 2pp.

Dunk, Jeffrey R. 1995. White-Tailed Kite (*Elanus leucurus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/178.

Eckerle, Kevin P., and Charles F. Thompson. 2001. Yellow-Breasted Chat (*Icteria virens*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/575.

Eddleman, William R., and Courtney J. Conway. 1998. Clapper Rail (*Rallus longirostris*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/340.

Emmel, T.C., and J.F. Emmel. 1973. The Butterflies of Southern California. *Natural History Museum of Los Angeles County, Science Series* 26:1–148.

Hall, E.R. 1981. *The Mammals of North America*, Second Edition. John Wiley & Sons, New York, NY. 1181 pp.

Haug, E.A., B.A. Millsap, and M.S. Martell. 1993. Burrowing Owl (*Athene cunicularia*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/061.

Holland, R.F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. Nongame-Heritage Program, California Department of Fish and Game. 156pp.

Ingles, L.G. 1965. *Mammals of the Pacific States*. Stanford University Press, Stanford. 506 pp.

Jepson Flora Project. 2015. Jepson eFlora. Berkeley, California: University of California. Accessed January 27, 2015. http://ucjeps.berkeley.edu/cgi-bin/get_JM_name_data.pl.

Kroodsma, Donald E., and Jared Verner. 1997. Marsh Wren (*Cistothorus palustris*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/308.

Kus, B. 2002. Least Bell's Vireo (*Vireo bellii pusillus*). *In* The Riparian Bird Conservation Plan: A Strategy for Reversing the Decline of Riparian-Associated Birds in California. California Partners in Flight. http://www.prbo.org/calpif/htmldocs/riparian_v-2.html.

Lowther, P.E., C. Celada, N.K. Klein, C.C. Rimmer, and D.A. Spector. 1999. Yellow Warbler (*Dendroica petechia*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/454.

Molina, K.C. 2008. Gull-Billed Tern (*Gelochelidon nilotica*). *In* Shuford, W. D., and Gardali, T., editors. 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

NABA (North American Butterfly Association). 2001. Checklist of North American Butterflies Occurring North of Mexico. Adapted from North American Butterfly Association (NABA) Checklist & English Names of North American Butterflies, eds. B. Cassie, J. Glassberg, A. Swengel, and G. Tudor. 2nd ed. Morristown, New Jersey: NABA. Accessed June 9, 2009. http://www.naba.org/pubs/enames2.html.

NAVFAC and Port of San Diego (Naval Facilities Engineering Command Southwest). 2014. San Diego Bay 2014 Eelgrass Survey. Prepared by Merkel & Associates Inc.

Office of Naval Research. 2014. Ocean Water: Salinity. Accessed 10 January 2014. http://www.onr.navy.mil/.

Rebman, J.P., and M.G. Simpson. 2006. *Checklist of the Vascular Plants of San Diego County*, Fourth Edition. San Diego Natural History Museum and San Diego State University: San Diego, California.

Reed, P.B., Jr. 1988. *National List of Plant Species that Occur in Wetlands: California* (*Region 0*). U.S. Fish and Wildlife Service, Biol. Rep. 88(26.10). 135 pp.

Roberts, F.M. 1998. *A Checklist of the Vascular Plants of Orange County, California*. Second edition. F.M. Roberts Publications, Encinitas, California. 96 pp.

SDNHM and ARA (San Diego Natural History Museum and Avian Research Associates). 2011. *Draft Final Summary Report South San Diego Bay Wetland Restoration Project Preconstruction Biological Monitoring Avian Use of Salt Evaporation Ponds*.

SDSU and NOAA (San Diego State University and National Oceanic and Atmospheric Administration). 2011. Final Report to the Port of San Diego. Identifying Critical Habitat for an Endangered Species in San Diego Bay. May 2011.

Stebbins, R.C. 2003. *A Field Guide to Western Reptiles and Amphibians*. Houghton Mifflin Co., Boston, Massachusetts.

SWANCC (Solid Waste Association of Northern Cook Counties) v. United States Corps of Engineers, 531 U.S. 159. 2001.

Unitt, P.A. 1984. Birds of San Diego County. Memoir 13, San Diego Society of Natural History. 287 pp.

Unitt, P. 2004. *San Diego County Bird Atlas*. San Diego, California: San Diego Natural History Museum.

USDA (U.S. Department of Agriculture). 1994. Soil Conservation Service. *Changes in Hydric Soils of the United States*. Federal Register 59(133): 35680–35681, July 13.

USDA. 2009. Natural Resources Conservation Service. *Websoil Survey*. http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm.

USDA. 2015. "California." State PLANTS Checklist. Accessed January 27, 2015. http://plants.usda.gov/dl_state.html.

USFWS (U.S. Fish and Wildlife Service). 1996. *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed, and Candidate Plants*. Sacramento, California: U.S. Fish and Wildlife Service.

USFWS. 1997. Coastal California Gnatcatcher (*Polioptila californica californica*) Presence/Absence Survey Guidelines. Carlsbad, California. February 28, 1997.

USFWS. 2006a. New Official Survey Protocol for Yuma Clapper Rail Surveys. Arizona Ecological Services Field Office. 9pp.

USFWS. 2006b. *San Diego Bay National Wildlife Refuge (NWR) Final Comprehensive Conservation Plan (CCP) and Environmental Impact Statement (EIS).* Adopted September 29, 2006.

USFWS. 2008. National Wetlands Inventory. Data Limitations and Uses. http://www.fws.gov/wetlands/Data/Limitations.html.

USFWS. 2009. National Wetlands Inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. September 5, 2009. http://www.fws.gov/wetlands/.

USFWS. 2010. Occurrence Information for Multiple Species within Jurisdiction of the Carlsbad Fish and Wildlife Office (CFWO): U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office, Carlsbad, California.

USGS (U.S. Geological Survey). 2007. The National Hydrologic Database. Reston, Virginia: U.S. Geological Survey.

Warkentin, I.G., N.S. Sodhi, R.H.M. Espie, Alan F. Poole, L.W. Oliphant, and P.C. James. 2005. Merlin (*Falco columbarius*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/044.

Wiggins, D.A., D.W. Holt, and S.M. Leasure. 2006. Short-Eared Owl (*Asio flammeus*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/062.

Wilson, D.E., and D.M. Reeder, eds. 2005. *Mammal Species of the World: A Taxonomic and Geographic Reference*. 3rd ed. Baltimore, Maryland: Johns Hopkins University Press.

Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White, ed. 1990. *California's Wildlife, Volume 2: Birds*. Sacramento, California: California Department of Fish and Game.

Zembal, R., and S.M. Hoffman. 2010. A Survey of the Belding's Savannah Sparrow (*Passerculus sandwichensis beldingi*) in California, 2010. California Department of Fish and Game, Wildlife Branch, Nongame Wildlife Program Report 2010-10, Sacramento, California 17 pp.

Zembal, R., S. Hoffman, C. Gailband, and L. Conrad. 2007. Light-Footed Clapper Rail Management, Study, and Propagation in California, 2006. California Department of Fish and Game, Wildlife Branch, Nongame Wildlife Unit Report, 2007-02. Sacramento, California. 31 pp.

APPENDIX A

Cumulative List of Vascular Plant and Wildlife Species Observed on the Project Site

APPENDIX A
Cumulative List of Vascular Plant and Wildlife Species Observed on the Project Site

VASCULAR PLANT SPECIES

MONOCOTS

CYPERACEAE—SEDGE FAMILY

Schoenoplectus acutus—hardstem bulrush

JUNCACEAE—RUSH FAMILY

Juncus acutus ssp. *leopoldii*—Leopold's rush

JUNCAGINACEAE—ARROW-GRASS FAMILY

Triglochin maritima—seaside arrowgrass

POACEAE—GRASS FAMILY

Distichlis littoralis—shoregrass
Distichlis spicata—saltgrass
Arundo donax—giant reed
Avena barbata—slender oat
Bromus diandrus—ripgut brome
Bromus madritensis—compact brome
Hordeum murinum—mouse barley
Polypogon monspeliensis—annual rabbitsfoot grass
Schismus barbatus—common Mediterranean grass
Stipa miliacea var. *miliacea*—smilograss

TYPHACEAE—CATTAIL FAMILY

Typha latifolia—broadleaf cattail

EUDICOTS

AIZOACEAE—FIG-MARIGOLD FAMILY

Mesembryanthemum crystallinum—common iceplant
Mesembryanthemum nodiflorum—slenderleaf iceplant

ASTERACEAE—SUNFLOWER FAMILY

Amblyopappus pusillus—dwarf coastweed
Ambrosia psilostachya—Cuman ragweed
Artemisia californica—coastal sagebrush
Baccharis pilularis—coyotebrush

Baccharis sarothroides—desertbroom
Heterotheca grandiflora—telegraphweed
Isocoma menziesii—Menzies' goldenbush
Centaurea melitensis—Maltese star-thistle
Glebionis coronaria—crowndaisy
Sonchus oleraceus—common sowthistle
Baccharis salicifolia—mule-fat

BATACEAE—SALTWORT FAMILY

Batis maritima—turtleweed

BORAGINACEAE—BORAGE FAMILY

Heliotropium curassavicum—salt heliotrope

BRASSICACEAE—MUSTARD FAMILY

Hirschfeldia incana—shortpod mustard
Raphanus raphanistrum—wild radish
Lepidium sp.—pepperweed
Sisymbrium sp.—tumblemustard/rocket

CACTACEAE—CACTUS FAMILY

Cylindropuntia prolifera—coastal cholla
Opuntia littoralis—coastal pricklypear

CARYOPHYLLACEAE—PINK FAMILY

Spergularia marina—salt sandspurry

CHENOPODIACEAE—GOOSEFOOT FAMILY

Arthrocnemum subterminale—Parish's glasswort
Atriplex argentea var. *expansa*—silverscale saltbush
Atriplex serenana var. *serenana*—bractscale
Salicornia pacifica—Pacific swampfire
Suaeda taxifolia—woolly seablite
Suaeda esteroa—seablite
Atriplex semibaccata—Australian saltbush
Salsola tragus—prickly Russian thistle
Kochia scoparia—no common name

CONVOLVULACEAE—MORNING-GLORY FAMILY

Cressa truxillensis—spreading alkaliweed

EUPHORBIACEAE—SPURGE FAMILY

Ricinus communis—castorbean

FABACEAE—LEGUME FAMILY

Astragalus trichopodus—Santa Barbara milkvetch
Melilotus indicus—annual yellow sweetclover

FRANKENIACEAE—FRANKENIA FAMILY

Frankenia salina—alkali seaheath

MALVACEAE—MALLOW FAMILY

Malva parviflora—cheeseweed mallow

ONAGRACEAE—EVENING PRIMROSE FAMILY

Camissoniopsis bistorta—southern suncup

PLUMBAGINACEAE—LEADWORT FAMILY

Limonium californicum—marsh rosemary

POLYGONACEAE—BUCKWHEAT FAMILY

Rumex crispus—curly dock

SALICACEAE—WILLOW FAMILY

Salix lasiolepis—arroyo willow

SAURURACEAE—LIZARD'S-TAIL FAMILY

Anemopsis californica—yerba mansa

SOLANACEAE—NIGHTSHADE FAMILY

Datura wrightii—sacred thorn-apple
Lycium californicum—California desert-thorn
Nicotiana acuminata—manyflower tobacco
Lycium sp.—desert-thorn

URTICACEAE—NETTLE FAMILY

Urtica urens—dwarf nettle

WILDLIFE SPECIES – VERTEBRATES

BIRDS

ACCIPITRIDAE—HAWKS, KITES, EAGLES, AND ALLIES

Accipiter cooperii—Cooper's hawk
Buteo jamaicensis—red-tailed hawk
Buteo lineatus—red-shouldered hawk
Circus cyaneus—northern harrier
Elanus leucurus —white-tailed kite

AEGITHALIDAE—LONG-TAILED TITS AND BUSHTITS

Psaltriparus minimus—bushtit

ALAUDIDAE—LARKS

Eremophila alpestris—horned lark

ALCEDINIDAE—KINGFISHERS

Ceryle alcyon—belted kingfisher

ANATIDAE—DUCKS, GEESE, AND SWANS

Anas americana—American wigeon
Anas clypeata—northern shoveler
Anas crecca—green-winged teal
Anas cyanoptera—cinnamon teal
Anas platyrhynchos—mallard
Anas strepera—gadwall
Aythya affinis—lesser scaup
Bucephala albeola—bufflehead
Oxyura jamaicensis—ruddy duck

APODIDAE—SWIFTS

Chaetura vauxi—Vaux's swift
Aeronautes saxatalis—white-throated swift

ARDEIDAE—HERONS, BITTERNS, AND ALLIES

Ardea herodias—great blue heron
Ardea alba—great egret
Egretta thula—snowy egret
Nycticorax nycticorax—black-crowned night-heron

CARDINALIDAE—CARDINALS AND ALLIES

Passerina caerulea—blue grosbeak

COLUMBIDAE—PIGEONS AND DOVES

Zenaida macroura—mourning dove

CORVIDAE—CROWS AND JAYS

Corvus brachyrhynchos—American crow
Corvus corax—common raven

EMBERIZIDAE—EMBERIZIDS

Melospiza melodia—song sparrow
Passerculus sandwichensis beldingi—Belding's Savannah sparrow
Melozone crissalis—California towhee
Zonotrichia leucophrys—white-crowned sparrow

FALCONIDAE—CARACARAS AND FALCONS

Falco columbarius—merlin
Falco sparverius—American kestrel

FRINGILLIDAE—FRINGILLINE AND CARDUELINE FINCHES AND ALLIES

Carpodacus mexicanus—house finch
Spinus psaltria—lesser goldfinch
Spinus tristis—American goldfinch

HIRUNDINIDAE—SWALLOWS

Hirundo rustica—barn swallow
Petrochelidon pyrrhonota—cliff swallow
Stelgidopteryx serripennis—northern rough-winged swallow
Tachycineta bicolor—tree swallow
Tachycineta thalassina—violet-green swallow

ICTERIDAE—BLACKBIRDS

Agelaius phoeniceus—red-winged blackbird
Icterus cucullatus—hooded oriole
Sturnella neglecta—western meadowlark

LARIDAE—GULLS, TERNS, AND SKIMMERS

Gelochelidon nilotica—gull-billed tern
Larus delawarensis—ring-billed gull
Larus occidentalis—western gull

Rynchops niger—black skimmer
Hydroprogne caspia—Caspian tern
Thalasseus elegans—elegant tern
Sterna forsteri—Forster's tern

MIMIDAE—MOCKINGBIRDS AND THRASHERS

Mimus polyglottos—northern mockingbird

PARULIDAE—WOOD-WARBLERS

Dendroica coronata—yellow-rumped warbler
Dendroica petechia—yellow warbler
Dendroica nigrescens—black-throated gray warbler
Dendroica townsendi—Townsend's warbler
Geothlypis trichas—common yellowthroat
Icteria virens—yellow-breasted chat
Oreothlypis celata—orange-crowned warbler
Wilsonia pusilla—Wilson's warbler

PASSERIDAE—OLD WORLD SPARROWS

* *Passer domesticus*—house sparrow

PHALACROCORACIDAE—CORMORANTS

Phalacrocorax auritus—double-crested cormorant

***RALLIDAE*—RAILS, GALLINULES, AND COOTS**

Fulica americana—American coot

***RECURVIROSTRIDAE*—STILTS AND AVOCETS**

Himantopus mexicanus—black-necked stilt
Recurvirostra americana—American avocet

SCOLOPACIDAE—SANDPIPERS, PHALAROPES, AND ALLIES

Tringa semipalmata—willet
Limosa fedoa—marbled godwit
Numenius americanus—long-billed curlew
Numenius phaeopus—whimbrel

STRIGIDAE—TYPICAL OWLS

Asio flammeus—short-eared owl
Athene cunicularia—burrowing owl

STURNIDAE—STARLINGS

* *Sturnus vulgaris*—European starling

TROCHILIDAE—HUMMINGBIRDS

Calypte anna—Anna's hummingbird

TROGLODYTIDAE—WRENS

Cistothorus palustris clarkae—Clark's marsh wren

TYRANNIDAE—TYRANT FLYCATCHERS

Myiarchus cinerascens—ash-throated flycatcher
Sayornis nigricans—black phoebe
Sayornis saya—Say's phoebe
Tyrannus vociferans—Cassin's kingbird

VIREONIDAE—VIREOS

Vireo gilvus—warbling vireo

MAMMALS

LEPORIDAE—HARES AND RABBITS

Sylvilagus bachmani—brush rabbit
Lepus californicus—black-tailed jackrabbit

CANIDAE—WOLVES AND FOXES

Canis latrans—coyote

SCIURIDAE—SQUIRRELS

Spermophilus beecheyi—California ground squirrel

* signifies introduced (non-native) species

INTENTIONALLY LEFT BLANK

APPENDIX B

Results of the Jurisdictional Wetlands Delineation

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

March 10, 2015 6758-02

Stan Williams
Poseidon Resources
501 West Broadway, Suite 2020
San Diego, California 92101

Subject: ***Results of a Preliminary Jurisdictional Wetland Delineation for the Otay River Estuary Restoration Project (ORERP), South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge***

Dear Mr. Williams:

The proposed Otay River Estuary Restoration Project (ORERP [proposed project]) is a partnership between Poseidon Resources (Poseidon), the U.S. Fish and Wildlife Service (Service or USFWS), and San Diego Bay National Wildlife Refuge (Refuge). The purpose of ORERP is to create, restore, and enhance coastal wetlands to benefit native fish, wildlife, and plant species and to provide habitat for migratory seabirds, shorebirds and salt marsh-dependent species.

This proposed project would occur at two distinct and non-contiguous sites within the South San Diego Bay Unit of the Refuge and would be consistent with the goals and objectives of the Service's San Diego Bay National Wildlife Refuge Comprehensive Conservation Plan (CCP) (USFWS 2006) (Figures 1 and 2). The proposed project would also follow the terms and conditions of the permits issued by the California Coastal Commission (CCC) and San Diego Regional Water Quality Control Board (Regional Board) for Poseidon's Carlsbad Desalination Project.

When completed the creation and restoration of tidal influenced estuarine, and salt marsh habitats within the Refuge by Poseidon would benefit many species of fish found in south San Diego Bay by providing new and expanded nursery and feeding areas. While avoiding and minimizing impacts to existing seabird and shorebird nesting areas, the proposed project would provide additional and enhanced foraging and nesting habitats for federal and state listed birds. These include species such as the endangered light-footed Ridgway's rail (*Rallus obsoletus levipes*), endangered California least tern (*Sternula antillarum browni*), and threatened western snowy plover (*Charadrius alexandrinus nivosus*) and a diversity of migratory seabirds and shorebirds.

This Preliminary Jurisdictional Delineation report combines the results of field findings for three separate surveys that were conducted as the project design has evolved. The first two surveys were previously submitted to the Corps and confirmed during preliminary jurisdictional

determination processes. The third survey consists of access roads and crossings between the two sites. The third location has not been reviewed or confirmed. The Corps recommended that rather than submit a third delineation report for review, to combine all survey results into a single report. Therefore, this report combines the following survey locations:

Site 1: Otay River/Pond 20 Site

On February 22, 2011, Dudek staff conducted a preliminary jurisdictional wetland delineation on the proposed Poseidon salt marsh restoration site (Pond 20 Study Area), located in the South Bay Unit of the San Diego Bay National Wildlife Refuge within the City of San Diego (City), San Diego County, California. The Pond 20 Study Area is located in the southern portion of the City, at the south end of the San Diego Bay (Figure 3). The western portion of the Pond 20 Study Area is owned by the State of California (State) and the eastern portion of the Pond 20 Study Area is owned by the United States of America (US).The U.S. Fish and Wildlife Service manages the Refuge.

Dudek coordinated with the ACOE regarding this delineation. Additional fieldwork was conducted by ACOE in August 2012 to refine ACOE-jurisdictional boundaries. This report presents the results of the analysis and incorporates the additional field information from ACOE (ACOE File #SPL 2011-00743-PJB). The PJD for the Pond 20 Study Area was confirmed by ACOE October 31, 2012 (Attachment 1).

Site 2: Salt Ponds 12-15

On March 13, 2013, Dudek staff conducted a preliminary jurisdictional wetland delineation, on Salt Ponds 12–15 (Salt Ponds 12-15 Study Area) of the Salt Works salt pond complex located in the South Bay Unit of the San Diego Bay National Wildlife Refuge. The Salt Ponds 12-15 Study Area is partially within the City of Chula Vista, National City and the City of San Diego, San Diego County, California. The Salt Ponds 12-15 Study Area is located at the south end of the San Diego Bay (Figures 4a – 4c). The land where the Salt Ponds occur is owned by the California State Lands Commission, State of California (State), but is leased to the U.S. Fish and Wildlife Service (USFWS), which manages the Refuge.

Dudek coordinated with the ACOE regarding this delineation. The PJD for the Salt Ponds 12-15 Study Area was confirmed by ACOE November 12, 2013 (Attachment 2).

Site 3: Access Routes and Crossings

On May 29, 2014, Dudek staff conducted a preliminary jurisdictional wetland delineation on the proposed Poseidon – ORERP access routes (Access Routes Study Area) located in the San Diego

Bay National Wildlife Refuge and northwest of Egger highlands just off of Bay Shore Bikeway (Silver strand Bikeway) San Diego County, California (Figures 5a and 5b). The Access Routes Study Area is owned by the US (southern access route and crossing) and the State (northern access route and crossing). Both areas are within the Refuge boundaries and managed by the USFWS.

The results of the delineation within the Access Routes Study Area are presented in this report, combined with the Pond 20 Study Area and the Salt Ponds 12-15 Study Area.

Initial Focus of Aquatic Resources Subject to Regulation within all Three Sites

Dudek's investigation concentrated on identifying resources that may be subject to regulation under Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act (RHA) as administered U.S. Army Corps of Engineers (ACOE), the Porter Cologne Act as administered by Regional Water Quality Control Board (RWQCB), Section 1600 *et seq*. of the Fish and Code as administered by the California Department of Fish and Wildlife (CDFW), and/or the Coastal Act as administered by the California Coastal Commission (CCC).

STUDY AREA DESCRIPTIONS

Site 1: Otay River/Pond 20 Site

The Pond 20 Study Area occupies approximately 86 acres of the South Bay Unit of the San Diego Bay National Wildlife Refuge. The site is located within Sections 20 and 21, Township 18 South, Range 2 West on the U.S. Geological Survey (USGS) 7.5-minute Imperial Beach quadrangle map (1966); longitude 117°5'46.02" W and latitude 32°35'29.95" N (Figure 2). The Pacific Ocean is approximately 1.5 miles west of the Pond 20 Study Area. Channelized water flows through the site along the northern boundary (Otay River) and through the center of the site in a north-south direction (Nestor Creek). The western portion of the site contains levees and basins that were constructed as part of the former solar salt evaporation system in southern San Diego Bay (Pond 20a) and the eastern portion of the site is land that was formerly used for sewage treatment facilities and agriculture. Elevations in the Study Area range from sea level to approximately 20 feet above mean sea level (AMSL).

Site 2: Salt Ponds 12-15

The South Bay Salt Works occupies approximately 1,068 acres of the San Diego Bay. The South Bay Salt Works operates with a Special Use Permit as a solar salt production facility. The Study Area (Salt Ponds 12–15) occupies approximately 309 acres of the South Bay Unit of the San Diego Bay National Wildlife Refuge. The site is located within Sections 16, 17, 20 and 21,

Township 18 South, Range 2 West on the U.S. Geological Survey (USGS) 7.5-minute Imperial Beach quadrangle map (1966); longitude 117° 6' 24 " W and latitude 32° 36' 05" N (Figure 2). The Pacific Ocean is approximately 1.5 miles west of the Salt Ponds 12-15 Study Area. The Otay River tidal channel flows north into San Diego Bay at the southern and western boundary of the Study Area, and the Palomar Street tidal channel flows north into San Diego Bay at the eastern boundary of the northern portion (Pond 15) of the Study Area. The Salt Ponds 12-15 Study Area contains levees and ponds that were constructed as part of the solar salt evaporation system in southern San Diego Bay. Elevations in the Salt Ponds 12-15 Study Area range from sea level to approximately 12 feet AMSL.

Site 3: Access Routes and Crossings

The study area includes two general locations. One is located northwest of Egger highlands just off of Bay Shore Bikeway (Silver strand Bikeway), west of Interstate 5 (Figure 5a; Southern Location). The second location is within the Salt Works facility located north of Palm Avenue, west of Interstate 5, and east of Silver Strand Boulevard (Figure 5b; Northern Location). These locations are within Sections 16, 17, 20 and 21, Township 18 South, Range 2 West on the U.S. Geological Survey (USGS) 7.5-minute Imperial Beach quadrangle map (1966); longitude 117° 5' 33" W and latitude 32° 35' 40" N and longitude 117° 5' 46 " W and latitude 32° 36' 96" N.

The northern portion of the Access Routes Study Area includes salt ponds (including associated levees and access roads) and the Palomar Street channel, which bisects salt ponds running east to west. The southern portion of the Access Routes Study Area includes the Otay River Floodplain Restoration Site, the Otay River channel, and a tributary channel to the Otay River. Elevations in the Access Routes Study Area range from sea level to approximately 16 feet AMSL.

SUMMARY OF REGULATIONS

The following agencies regulate activities within streams, wetlands, and riparian areas throughout California: ACOE, CDFW, and RWQCB. The ACOE Regulatory Program regulates activities in jurisdictional resources under Section 404 of the CWA and Section 10 of the RHA. The CDFW regulates activities to wetlands and non-wetland waters under Sections 1600–1616 of the Fish and Wildlife Code. The RWQCB regulates activities to wetlands and non-wetland waters exhibiting surface water under Section 401 of the CWA and the Porter-Cologne Water Quality Control Act (Porter-Cologne Act).The CCC also regulates wetlands within the coastal zone pursuant to the California Coastal Act (California Public Resources Code Section 30233).

U.S. Army Corps of Engineers

The ACOE regulates "discharge of dredged or fill material" into "waters of the U.S.," which includes tidal waters, interstate waters, and all other waters that are part of a tributary system to interstate waters or to navigable "waters of the U.S.," the use, degradation, or destruction of which could affect interstate or foreign commerce or which are tributaries to waters subject to the ebb and flow of the tide (33 CFR. 328.3 (a)), pursuant to provisions of Section 404 of the CWA and Section 10 of the RHA. The ACOE jurisdiction within rivers and streams extends to the "ordinary high water mark" (OHWM). The ACOE defines jurisdictional wetlands as areas supporting a predominance of hydrophytic vegetation, hydric soils, and wetland hydrology, in accordance with the procedures established in the ACOE Wetland Delineation Manual (Environmental Laboratory 1987). However, the United States Supreme Court ruling in the *Solid Waste Agency of Northern Cook County vs. United States Army Corps of Engineers, No. 99-1178* (January 9, 2001) ("the SWANCC case"), held that the CWA does not give the federal government regulatory authority over non-navigable, isolated, intrastate waters. Because of this decision, some previously regulated depressional areas such as mudflats, sandflats, wetlands, prairie potholes, wet meadows, playa lakes, natural ponds, and vernal pools, which lack a hydrologic connection to other intra- or inter-state "waters of the U.S.," are no longer regulated by the ACOE. However, some of these areas (e.g., isolated streams, lakes or ponds) may still be regulated by the CDFW under Section 1600 of the Fish and Code or the RWQCB under the Porter-Cologne Act.

For tidally influenced waters, the Corps has two limits to jurisdiction: one for Section 10 and one for Section 404. The shoreward limit to the ACOE Regulatory program jurisdiction under the Section 10 authorities of the RHA in coastal areas extends to the line on the shore reached by the plane of the mean high water, which is 5 feet above MLLW (Mean Lower Low Water (MLLW) = 0 datum). The shoreward limit for the Regulatory programs jurisdiction under the ACOE Section 404 authorities is based on the high tide line, or in the San Diego Bay 7.79 feet above MLLW. If there are wetlands meeting the ACOE criteria abutting or adjacent the high tide line, then the ACOE jurisdiction under section 404 would extend to the limit of those wetlands.

California Department of Fish and Wildlife

In accordance with Section 1600 et seq. of the California Fish and Game Code (Streambed Alteration), the CDFW regulates activities which "will substantially divert, obstruct, or substantially change the natural flow or bed, channel or bank, of any river, stream, or lake designated by the Department in which there is at any time an existing fish or wildlife resource or

from which these resources derive benefit." The CDFW takes jurisdiction to the top of bank of a stream, or the limit of the adjacent riparian vegetation, referred to in this report as "streambed and associated riparian habitats." The exception would be on lands owned by the US, wherein CDFW would not have jurisdiction, as is the case with the Otay River channel on the northeast corner of the Study Area. Applications to the CDFW for Streambed Alteration under Section 1600 et. seq. must include a complete certified California Environmental Quality Act (CEQA) document.

In 14 CCR 1.72, the CDFW defines a "stream" (including creeks and rivers) as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having surface or subsurface flow that supports or has supported riparian vegetation."

In 14 CCR 1.56, the CDFW's definition of "lake" includes "natural lakes or man-made reservoirs." Diversion, obstruction, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake that supports fish or wildlife requires authorization from CDFW by means of entering into an agreement pursuant to Section 1602 of the Fish and Game Code.

Section 1600 et seq. does not extend to isolated wetlands and waters, such as small ponds not located on a drainage course, wet meadows, vernal pools, or tenajas, nor does it extend over marine waters influenced by the ebb and flow of the tide that lack a bed and bank form typical of stream channels.

Within estuary environments, a preponderance of evidence standard is necessary where it is not readily apparent where Section 1600 jurisdiction ends. Under this standard, the geometry of the water feature, the predominant salinity of the waters, the composition of vegetation, and the predominant fauna are used to determine the limits of CDFW jurisdiction under section 1600. Waters are not regulated under section 1600 of the Fish and Game Code where waters are principally marine, aquatic shorelines are shaped principally by tidal current and wave action not by fluvial processes, vegetation is saline marsh and not brackish or freshwater vegetation, and marine fish and invertebrate communities are prevalent. Conversely, areas dominated by fresh and brackish salinities and freshwater aquatic species, with fluvial erosion patterns, are regulated under section 1600.

Regional Water Quality Control Board

The RWQCB regulates discharging waste, or proposing to discharge waste, within any region that could affect the "waters of the state" (Water Code Section 13260 (a)), pursuant to provisions of the Porter-Cologne Act. "Waters of the State" are defined as "any surface water or

groundwater, including saline waters, within the boundaries of the state" (Water Code Section 13050 (e)). Although the Porter-Cologne Act definition of "Waters of the State" may not apply on federally owned land, the RWQCB may still assert jurisdiction over qualifying aquatic resources on land owned by the US where the CWA Section 401 applies. Before the ACOE will issue a CWA Section 404 permit, applicants must receive a CWA Section 401 Water Quality Certification from the RWQCB. If a CWA Section 404 permit is not required for the project, the RWQCB may still require a permit (i.e., Waste Discharge Requirement) under the Porter-Cologne Act. Applications to the RWQCB must include a completed certified CEQA document.

California Coastal Commission

Under the California Coastal Act (CCA), the CCC regulates impacts to wetlands in the "coastal zone" and requires a coastal development permit for almost all development within this zone. From three miles seaward the coastal zone generally extends approximately 1,000 yards inland. In less developed areas, it can extend up to 5 miles inland from the mean high tide line, but can also be considerably less than 1,000 yards inland in developed areas. While the Coastal Zone Management Act (CZMA) excludes from its definition of the coastal zone "lands the use of which by law is subject solely to the discretion of or which is held in trust by the Federal Government." (15 USC 1453(1)]), CCC regulations may still apply if the proposed project is a private activity (CCC 2011).

The CCA also protects designated sensitive coastal areas by providing additional review and approvals for proposed actions in these areas. Section 30121 of the CCA defines wetlands as "...lands within the coastal zone which may be covered periodically or permanently with shallow water and include saltwater marshes, swamps, mudflats, and fens…" The CCA allows disking, filling, or dredging of wetlands for certain uses, such as restoration. The CCA also directs each city or county within the coastal zone to prepare a Local Coastal Program (LCP) for Coastal Commission certification (CCC 2009).

In contrast to the ACOE, which uses a three-parameter definition to delineate wetlands, the CCC essentially uses the Cowardin method of wetlands classification, which defines wetland boundaries by a single parameter (i.e., hydric soils, hydrophytic vegetation, or hydrology) (Cowardin et al. 1979).

The CCC wetland definition is generally more encompassing than either the ACOE or CDFW definition in most respects. However, Section 13577(b) of the Administrative Regulations suggests that, where conditions are not capable of supporting hydric soils or hydrophytic vegetation, hydrologic indicators of saturation or surface waters should be expressed on an

annual basis ("at some time during each year") rather than under ordinary high water conditions as is the case under the federal regulatory standard.

METHODS

Data regarding jurisdictional resources present within the Study Area were obtained through a review of pertinent literature and field reconnaissance; both are described in detail below.

Literature Review

The following data sources were reviewed to assist in the delineation effort:

- National Wetlands Inventory Maps (U. S. Fish and Wildlife Service (USFWS 2009))
- National Hydric Soils List
- Natural Resource Conservation Service Websoil Survey (U.S. Department of Agriculture (USDA 2009))
- Historic aerial photographs.

Field Assessment

The delineation work was performed in accordance with the methods prescribed in the ACOE's 1987 Wetland Delineation Manual, Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (September 2008), and the ACOE/Environmental Protection Agency (EPA) Rapanos Guidance (Environmental Laboratory 1987, ACOE 2008, ACOE and EPA 2007). The ACOE and RWQCB wetlands delineation consists of the field identification of jurisdictional wetlands using the three parameters described in the ACOE manual: hydric soils, hydrology, and hydrophytic vegetation. A predominance of hydrophytic vegetation, where associated with a stream channel, was used to determine CDFW-regulated riparian areas. Wetlands under the jurisdiction of the CCC were delineated using the Cowardin method of wetlands classification, which, as previously discussed, defines wetland boundaries by a single parameter (i.e., hydric soils, hydrophytic vegetation, or hydrology). In some instances where isolated surface waters are present, the RWQCB may choose to take jurisdiction over these resources under the State's Porter-Cologne Act.

Site 1: Otay River/Pond 20 Site

Dudek biologists Andrew Thomson and Kathleen Dayton performed a formal (routine) wetlands delineation within the approximately 86-acre Pond 20 Study Area on February 22, 2011. An

additional analysis of the site was conducted by Dudek's Stuart Fraser on July 20, 2011, to confirm lack of ponding in the former salt pond areas in the western portion of the Study Area. The ACOE conducted fieldwork in August 2012 to refine ACOE-jurisdictional areas. All areas identified as being potentially subject to the jurisdiction of the ACOE, RWQCB, CDFW, and the CCC were field verified and mapped.

Hydrology, vegetation, and soils were assessed at 21 geographically distinct sampling locations (Sampling Points 5-25) (Appendix A) throughout the Pond 20 Study Area to determine the presence or absence of wetland field indicators (Figure 3). The overall area was assessed for evidence of an OHWM, saturation, permanence of surface water, wetland vegetation, and nexus to traditional navigable waters. A more detailed description of the methods is described below.

The location of sampling points and the limits of wetlands were collected in the field using a 100 scale (1 inch = 100 feet) aerial photograph, topographic base, and Global Positioning System (GPS) equipment with sub-meter accuracy. ArcGIS software was used to compile the information into a geospatial database.

Site 2: Salt Ponds 12-15

Dudek biologists Andrew Thomson and Kathleen Dayton performed a formal wetlands delineation within the approximately 309-acre Study Area on March 13, 2013. All areas identified as being potentially subject to the jurisdiction of the ACOE, RWQCB, CDFW, and the CCC were field verified and mapped.

Hydrology, vegetation, and soils were assessed at 15 geographically distinct sampling locations (Sampling Points 1–15) (Appendix B) throughout the Study Area to determine the presence or absence of wetland field indicators (Figures 4a–4c). The overall area was assessed for evidence of an OHWM, saturation, permanence of surface water, wetland vegetation, and nexus to traditional navigable waters. A more detailed description of the methods is described below.

The location of sampling points and the limits of wetlands were collected in the field using a 100 scale (1 inch = 100 feet) aerial photograph, topographic base, and Global Positioning System (GPS) equipment with sub-meter accuracy. ArcGIS software was used to compile the information into a geospatial database.

Site 3: Access Routes and Crossings

Dudek biologist Andrew Thomson performed a formal wetlands delineation within the approximately 20-acre Access Routes Study Area on May 29, 2014. All areas identified as being

potentially subject to the jurisdiction of the ACOE, RWQCB, CDFW, and the CCC were field verified and mapped.

Hydrology, vegetation, and soils were assessed at seven geographically distinct sampling locations (Sampling Points 1-7) (Appendix C) throughout the Access Routes Study Area to determine the presence or absence of wetland field indicators (Figures 5a and 5b). The overall area was assessed for evidence of an OHWM, saturation, permanence of surface water, wetland vegetation, and nexus to traditional navigable waters. A more detailed description of the methods is described below.

The location of sampling points and the limits of wetlands were collected in the field using a 100 scale (1 inch = 100 feet) aerial photograph, topographic base, and Global Positioning System (GPS) equipment with sub-meter accuracy. Dudek geographic information system (GIS) technician Lesley Terry digitized the jurisdictional extents based on the GPS data and data collected directly onto field maps into a project-specific GIS using ArcGIS software.

Hydrophytic Vegetation

Dudek consulted the 2012 National Wetland Plant List (NWPL; ACOE 2012) to determine the indicator status of each plant species within each sampling location.

During the delineation, a data station point was considered positive for hydrophytic vegetation if it passed the basic dominance test (Indicator 1), meaning that more than 50% of the dominant species sampled were characterized as either obligate, facultative wetland, and/or facultative per the NWPL. In those cases where the dominance test failed but there were positive indicators of hydric soils and/or hydrology, the vegetation parameter was re-evaluated using the prevalence index (Indicator 2), which takes into account all plant species in the community, not just dominants. The standard plot sampling technique was used to sample vegetation within a two-meter radius for herbaceous vegetation and a four-meter radius for shrubs. All plant species observed during the surveys were identified and recorded.

Hydric Soils

According to the National Technical Committee for Hydric Soils (NTCHS), hydric soils are "soils that are formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part" (USDA Soil Conservation Service 1994). Soil pits were prepared using a shovel to determine if hydric soils were present. The presence of hydric soils was determined through consultations with the 1987 Manual as well

as Field Indicators of Hydric Soils in the United States v. 7.0 (NRCS 2010) and the ACOE's Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)(September 2008). Munsell Soil Color Charts were used to determine soil chroma and value. Where feasible, soil pits were prepared to depths ranging from 10–16 inches. Dry soils were moistened to obtain the most accurate color. In general, soils from test pits were determined to be hydric if they exhibited redoximorphic features (e.g., redox concentrations, redox depletions, reduced matrix or depleted matrix).

Hydrology

Per the guidelines prescribed in the Arid West Supplement (September 2008), wetland hydrology indicators are separated into four major groups: Group A, B, C, and D. Group A indicators are based on direct observations of surface flow, ponding, and soil saturation/groundwater. Group B indicators consist of evidence that the site has been or is currently subjected to ponding including, but not limited to, water marks, drift deposits, and sediment deposits. Group C indicators include signs of previous and/or current saturation including oxidized rhizospheres surrounding living roots and the presence of reduced iron or sulfur, both of which are indicative of extended periods of soil saturation. Group D indicators consist of "vegetation and soil features that are indicative of current rather than historic wet conditions and include a shallow aquitard and results of the FAC-Neutral test." Each group is subdivided into primary and secondary categories based on their frequency and reliability to occur in the Arid West region. Signs of hydrology were investigated on site by intensive field review. Please see Appendices A - C for the completed data station forms.

REVIEW OF SITE HISTORY

Site 1: Otay River/Pond 20 Site

The South San Diego Bay Unit was established in 1999 as a Unit of the San Diego National Wildlife Refuge following the execution of a lease from the California State Lands Commission to the USFWS for 2,209 acres of State Tidelands. An additional 91 acres of land in the Otay River floodplain (encompassing the Study Area evaluated in this document) was acquired by the USFWS for inclusion in this Refuge Unit in January 2000.

On July 13, 2004, the acreage in the South San Diego Bay Unit was added to the Sweetwater Marsh National Wildlife Refuge and both areas were renamed the "San Diego Bay National Wildlife Refuge." The Study Area is encompassed by the San Diego Bay National Wildlife Refuge.

The eastern portion of the Study Area was previously used for sewage treatment facilities and agriculture, but is currently dominated by non-native plant species. Most of the native upland and wetland habitat of the Otay River floodplain was removed during the twentieth century as a result of industrial, agricultural, and municipal activities. Maps dating back to 1916 depict the Otay River in its present channelized configuration (USFWS 2006). A narrow corridor of salt marsh, freshwater marsh, and native riparian habitat are supported within the Otay River channel.

In the western portion of the Study Area, remnant conditions from a former industrial salt evaporation pond (Pond 20a) are present. Solar salt production has occurred in the San Diego Bay for over 100 years (USFWS 2006). Pond 20A was last regularly used as an evaporator pond in the 1940s with a failed subsequent effort in the 1960s to reintegrate the pond into the evaporator process of the salt works (Merkel and Associates, 2008).

Due to construction of levees surrounding Pond 20a, the basin is isolated from tributary fresh or saltwater surface input and experiences occasional storm runoff from the internal pond basin and a roadway surface drain from Palm Avenue (Merkel and Associates, 2008). Seasonal water levels in the basin fluctuate significantly and waters are strongly saline due both to the basin's history as a salt concentrator and the continued closed system evaporative processes occurring in the basin today (Merkel and Associates, 2008). Due to the hypersaline conditions in the basin bottoms of the former industrial salt evaporation ponds, native wetland vegetation and bay invertebrates are essentially absent (USFWS 2006). Highly variable annual precipitation levels influence the location and extent of standing water in the pond.

Site 2: Salt Ponds 12-15

The South Bay Salt Works is an active solar salt production facility that is operated in accordance with a Special Use Permit issued by the Service for solar salt production. The Study Area is entirely within the active South Bay Salt Works production area, and composes Ponds 12–15.

The South San Diego Bay Unit was established in 1999 as a Unit of the San Diego National Wildlife Refuge following the execution of a lease from the California State Lands Commission to the USFWS for 2,209 acres of State Tidelands. An additional 91 acres of land in the Otay River floodplain was acquired by the USFWS for inclusion in this Refuge Unit in January 2000.

On July 13, 2004, the acreage in the South San Diego Bay Unit was added to the Sweetwater Marsh National Wildlife Refuge and both areas were renamed the "San Diego Bay National Wildlife Refuge." The Study Area is encompassed by the San Diego Bay National Wildlife Refuge.

Site 3: Access Routes and Crossings

The site history of the Access Routes Study Area is effectively described above as these areas occur in the same vicinity of Pond 20 (southern area) and Salt Ponds 12-15 (northern area). The only additional information relative to the site history of the Access Routes Study Area is the recent implementation of the Otay River Floodplain Restoration Project (ORFRP). The ORFRP included a large-scale planting area on the floodplain of the Otay River within the Refuge. The site has been planted with riparian trees and shrubs and was irrigated to promote establishment. The Access Routes Study Area encompasses a portion of the ORFRP (Figure 5a).

RESULTS

The results of each federally defined delineation parameter occurring at each field datapoint (field station) for all three sites are located in Table 1. The type and amount of jurisdictional waters occurring within each site are summarized in Table 2.

Table 1
Wetland Delineation Sampling Point Summary for all three sites

Site 1: Otay River/Pond 20 Site						
Data Station[1]	*Wetland Determination Field Indicators*			*Stream Association?*	*Tidal Channel Association?*	*Jurisdiction*
	Vegetation	*Hydric Soils*	*Hydrology*			
5	✓		✓	Yes	No	CCC
6				Yes	No	None
7	✓	✓	✓	Yes	No	ACOE, RWQCB, CCC
8	✓			No	No	CCC
9	✓	✓	✓	No	Yes	ACOE, RWQCB, CCC
10	✓	✓	✓	No	Yes	ACOE, RWQCB, CCC
11	✓		✓	No	Yes	ACOE, RWQCB, CCC[2]
12				No	No	None
13	✓	✓		No	No	CCC
14				No	No	None[3]
15	✓		✓	No	No	CCC
16				No	No	None
17	✓		✓	No	Yes	ACOE, RWQCB, CCC[2]
18	✓	✓	✓	No	Yes	ACOE, RWQCB, CCC

Table 1
Wetland Delineation Sampling Point Summary for all three sites

Site 1: Otay River/Pond 20 Site						
Data Station[1]	Wetland Determination Field Indicators			Stream Association?	Tidal Channel Association?	Jurisdiction
	Vegetation	Hydric Soils	Hydrology			
19				No	No	None
20	✓	✓	✓	No	No	ACOE, RWQCB, CCC
21	✓			No	No	None
22			✓	No	No	None
23				No	No	None
24		✓	✓	No	No	None
25	✓			No	No	None

Site 2: Salt Ponds 12-15						
Data Station	Location	Wetland Determination Field Indicators			Hydrologic Association?	Jurisdiction
		Vegetation	Hydric Soils	Hydrology		
1	Inside slope (salt pond side) of levee at Pond 15	✓	✓	✓	Salt Pond	ACOE, RWQCB, CCC
2	Outer slope of levee adjacent to Palomar Street tidal channel	✓	✓		Tidal Channel	ACOE, RWQCB, CCC
3	Top of levee along access road		✓		None	None*
4	Salt marsh habitat on bay side of salt pond levee	✓	✓	✓	Bay	ACOE, RWQCB, CCC
5	Salt marsh habitat on bay side of salt pond levee	✓	✓	✓	Bay	ACOE, RWQCB, CCC
6	Top of levee between salt ponds		✓		None	None*
7	Top of outer salt pond levee				None	None
8	Top of levee between salt ponds	✓	✓		None	None*
9	Inside slope (salt pond side) of levee at Pond 12		✓	✓	Salt Pond	ACOE, RWQCB, CCC
10	Top of outer salt pond levee	✓			None	None
11	Salt marsh habitat on Otay Channel side of salt pond levee	✓	✓	✓	Tidal Channel	ACOE, RWQCB, CCC
12	Top of outer salt pond levee		✓		None	None*
13	Top of levee between salt ponds		✓		None	None*
14	Outer slope of levee adjacent to Palomar Street tidal channel	✓	✓		Tidal Channel	ACOE, RWQCB, CCC
15	Inside slope (salt pond side) of levee at Pond 15		✓	✓	Salt Pond	ACOE, RWQCB, CCC

Table 1
Wetland Delineation Sampling Point Summary for all three sites

Site 3: Access Routes and Crossings						
Data Station	*Location*	*Wetland Determination Field Indicators*			*Hydrologic Association?*	*Jurisdiction*
		Vegetation	*Hydric Soils*	*Hydrology*		
1	Northwestern side of Egger Highlands near Silver Strand Bikeway associated with Freshwater Marsh	✓	✓	✓	Freshwater marsh	ACOE, RWQCB, CCC
2	Northwestern side of Egger Highlands near Silver Strand Bikeway associated with Mulefat Scrub				Mulefat Scrub	CCC
3	Northwestern side of Egger Highlands near Silver Strand Bikeway within the Otay River Floodplain Restoration				Restoration area	CCC[4]
4	Northwestern side of Egger Highlands near Silver Strand Bikeway associated with Mulefat Scrub				Mulefat Scrub	CCC
5	North side of Egger Highlands near Silver Strand Bikeway associated with the Otay River Floodplain Restoration	✓			Restoration Area	CCC[4]
6	North side central section of Egger Highlands near Silver Strand Bikeway associated with southern coastal salt marsh in the channel	✓	✓	✓	Southern Coastal Salt Marsh	ACOE, RWQCB, CCC
7	North side central section of Egger Highlands near Silver Strand Bikeway associated with Mulefat Scrub				Mulefat Scrub	CCC

* Although these soils retain hydric soil indicators, the soils were derived from dredged bay mud that has been placed on the top of the salt pond levees.

1 Data stations 1–4 are located outside of the Otay River/Pond 20 Study Area.

2 Although not all three parameters were met, ACOE jurisdiction was presumed because the area was below the elevation of the high tide line (7.79 feet above MLLW). See also the Results section below.

3 See Section Non-Jurisdictional Mulefat Scrub below

4 These areas are within the Otay River Floodplain Restoration site, which has been recently planted with riparian species. The site is actively irrigated to promote plant establishment. Evident hydric soils and hydrology per the ACOE delineation manual are not yet present within the restoration site; therefore, the areas were not classified as ACOE jurisdictional but may eventually develop the indicators necessary to classify these areas as ACOE jurisdictional.

Table 2
Wetland Delineation Existing Acreage Summary

Vegetation Community	Jurisdiction	
	ACOE, RWQCB, CCC	*CCC Only*
Site 1: Otay River/Pond 20		
Brackish water	3.31	—
Cismontane Alkali Marsh	1.28	—
Coastal and Valley Freshwater Marsh	0.31	—
Former Salt Pond Bottom and Borrow Area	4.35	—
Mulefat Scrub	—	0.01
Southern Coastal Salt Marsh	6.07	0.04
Subtotal	*15.31*	*0.05*
Site 2: Salt Ponds 12-15		
Beach	0.89	—
Brackishwater	1.69	—
Open Water	270.42	—
Salt Pond Levee	18.16	—
Southern Coastal Salt Marsh	8.12	—
Subtotal	*299.26*	—
Site 3a: Southern Access Roads and Crossings		
Coastal and Valley Freshwater Marsh	0.59	—
Mulefat Scrub	—	0.70
Otay River Floodplain Restoration	—	5.92
Southern Coastal Salt Marsh	0.26	0.10
Former Salt Pond Bottom and Borrow Area	0.07	—
Subtotal	*0.92*	*6.72*
Site 3b: Northern Access Routes and Crossings		
Bay	0.59	—
Brackish water	0.14	—
Southern Coastal Salt Marsh	2.19	—
Salt Pond Levee	0.76	—
Water	3.29	—
Subtotal	*6.97*	—
Grand Total	**322.46**	**6.77**

Note: Acreages may not total due to rounding.

Site 1: Otay River/Pond 20

The results of the study include areas delineated as jurisdictional by the ACOE, RWQCB and the CCC. Although the non-tidal portion of the Otay River channel would have qualified for CDFW jurisdiction, the portion is on federal land, and thus not subject to Section 1600 et seq. of the California Fish and Game Code. Representative photos of the Study Area and sampling locations can be found in Figures 6a and 6b.

Site 2: Salt Ponds 12-15

The results of the study include areas delineated as jurisdictional by the ACOE, RWQCB and the CCC. The Otay River channel and the Palomar Street channel are tidal channels within the study area in the Refuge and do not qualify for CDFW jurisdiction, and thus are not subject to Section 1600 et seq. of the California Fish and Game Code. Representative photos of the Ponds 12-15 Study Area and sampling locations can be found in Figures 7a – 7c.

Site 3:Access Routes and Crossings

The results of the study include areas delineated as jurisdictional by the ACOE, RWQCB, and CCC. Although the non-tidal portion of the Otay River channel would have qualified for CDFW jurisdiction, the portion is on federal land within the Refuge, and thus not subject to Section 1600 et seq. of the California Fish and Game Code. Representative photos of the Access Routes Study Area and sampling locations can be found in Figures 8a and 8b.

ACOE/RWQCB/CCC Jurisdiction

Areas meeting all three parameters were classified as wetlands under the jurisdiction of the ACOE, RWQCB, and CCC.

Site 1: Otay River/Pond 20

Results of the wetland delineation (summarized in Tables 1 and 2) indicate that approximately 15.31 acres of wetlands and non-wetland Waters of the U.S. under the joint jurisdiction of the ACOE, RWQCB, and CCC occur within the Pond 20 Study Area. In general, the predominant native vegetation communities associated with the wetlands are adjacent to tidal channels and support southern coastal salt marsh. Soils in these areas are characterized by variable textures (including clay loam, sand, loam, clay, loamy sand, loamy clay, and sandy clay loam) with redox dark surfaces or a loamy gleyed matrix. Wetland hydrology indicators present include surface

water, high water table, and saturation. Areas supporting all three wetland indicators were mapped as ACOE, RWQCB, and CCC wetlands. Additionally, in some locations along the tidal channels, there is a narrow strip along the outer perimeter of the salt marsh habitat where hydrology indicators were not apparent and soils did not have hydric indicators. In these instances, ACOE jurisdiction was assumed because they are tidally influenced areas that are below the elevation of the high tide line (7.79 feet above MLLW).

There was a total of 8.12 acres of wetlands within the Pond 20 Study Area, all of which supported southern coastal salt marsh. Because the Pond 20 Study Area is primarily unvegetated, the hydrophytic vegetation parameter was rarely met at the sampling locations. When present, vegetation consisted of species typical of southern coastal salt marsh habitat, including estuary seablite (*Suaeda esteroa*), alkali heath (*Frankenia salina*), pacific pickleweed (*Sarcocornia pacifica*), saltwort (*Batis maritima*), sea lavender (*Limonium californica*), and dwarf saltwort (*Salicornia bigelovii*). Also observed in the southern coastal salt marsh habitat were coast weed (*Amblyopappus pusilus*), non-native iceplant (*Mesembryanthemum nodiflorum; M. crystalinum*), and arrow grass (*Triglochin concina*). Outside of the tidally influenced areas adjacent to the two tidal channels that abut portions of the site on the southwestern and northeastern flanks, coastal salt marsh habitat is extremely patchy and disturbed, with low cover and low species diversity.

The Pond 20 Study Area also supports two geographically distinct cismontane alkali marsh areas (1.28 acres) that, based on intensive field review, support greater than 50% hydrophytic vegetation and, in some instances, hydric soils but lack hydrology indicators (Table 1). A sewer treatment facility and settling ponds were formerly located in this area. For the purposes of the PJD, the ACOE determined that although the areas are more than 700 feet from the hydrophytic vegetation associated with the tidal channel, that these areas were close enough to be considered adjacent wetlands under the ACOE's jurisdiction. These areas also meet the definition of wetland pursuant to CCC guidelines. However, because these areas are on federal land and because they are more than 700 feet from the tidal channels, CDFW jurisdiction is not presumed.

The western portion of the Study Area contains a series of low-lying areas that are remnants from the construction and operation of the former industrial salt evaporation pond. The areas are surrounded by a tall levee that separates them from the adjacent tidal channels. The levee was constructed, in part, using soil excavated from within the basin (borrow areas) that are lower in elevation than the basin bottom. These unvegetated areas in the bottom of the basin were mapped as former salt pond bottom and borrow areas. Because of their historical long-term use as industrial salt evaporation ponds, the soil conditions are hypersaline, and much of the land does not support vegetation. The functions and values of these areas are considered degraded and low

due to the extensive site disturbance, lack of vegetation, lack of surface water hydrologic connectivity, and excessive salinity.

The portions of the former salt pond bottom and borrow area can occasionally become inundated from precipitation, as was the case during the February site review. However, with the exception of a few small areas in the southwestern corner, the areas were completely dry during the July 2012 site review. A review of aerial photographs shows that ponding does not occur in every year and varies in location and extent. While the borrow areas may exhibit periods of ponding during the rainy season, the surface water evaporates quickly.

While not physically connected to either tidal channels or freshwater channels due to the presence of perimeter berms, the ACOE classified them as jurisdictional for the purposes of the PJD. The portions of these areas that support hydrophytic vegetation were classified as wetlands, and the remaining areas below the ordinary high water mark were classified as non-wetlands Waters of the U.S.

Site 2: Salt Ponds 12-15

Results of the wetland delineation (summarized in Tables 1 and 2) indicate that approximately 299 acres of wetlands and non-wetland Waters of the U.S. under the joint jurisdiction of the ACOE, RWQCB, and CCC occur within the Salt Ponds 12-15 Study Area. Of the total area classified as jurisdictional, 8.12 acres were classified as wetlands and 291.14 acres were classified as non-wetland Waters of the U.S. In general, the jurisdictional features are unvegetated, with the exception of areas that abut the Otay River and the Palomar Street tidal channels, and a few patchy areas along the salt pond levees. The predominant native vegetation community associated with the wetlands is southern coastal salt marsh. Soils in these areas are characterized by variable textures (including sand, clay, sandy loam, clay loam, sandy clay loam, and silty clay loam) often with a with depleted matrix. Wetland hydrology indicators present included high water table, saturation, oxidized rhizospheres along living roots, and aquatic invertebrates. Areas supporting all three wetland indicators were mapped as ACOE, RWQCB, and CCC wetlands.

The majority of the Salt Ponds 12-15 Study Area contains a series of active salt ponds that are components of the solar salt evaporation system. The salt ponds are surrounded by levees that separate them from the adjacent San Diego Bay and tidal channels. The levees were constructed using soil excavated from within the bay and reach a maximum elevation that is slightly greater than the highest observed water level (7.79 feet; North American Vertical Datum (NAVD 88)), approximately eight feet and up to 12 feet in some places.

A review of aerial photographs shows that the salt ponds, and levees surrounding them, have been in the same configuration for decades. The water elevation within the salt ponds is controlled by a tide gate, and thus remains relatively constant.

The portions of the Salt Ponds 12-15 Study Area that met all three parameters were classified as wetlands, and the remaining areas below the high tide line (7.79 feet above MLLW) were classified as non-wetlands Waters of the U.S. The top of the salt pond levees that is above the high tide line did not meet the three parameters, and was classified as non-jurisdictional.

Site 3: Access Routes and Crossings –Poseidon ORERP

Results of the wetland delineation (summarized in Tables 1 and 2) indicate that approximately 7.89 acres of wetlands and non-wetland Waters of the U.S. under the joint jurisdiction of the ACOE, RWQCB, and CCC occur within the Access Routes Study Area (northern and southern areas combined). Of the total area classified as jurisdictional, 3.04 acres were classified as wetlands and 4.85 acres were classified as non-wetland Waters of the U.S. In general, the jurisdictional features are associated with tidal channels, salt ponds and the San Diego Bay. The predominant native vegetation community associated with the wetlands is southern coastal salt marsh along the Palomar Street channel and freshwater marsh along the Otay River channel. Soils in these areas are characterized by variable textures (including sand, clay, sandy clay and clay loam), with the predominant soil texture clay loam. Wetland hydrology indicators present included high water table, saturation, surface water, sediment deposits, drift deposits and drainage patterns. Areas supporting all three wetland indicators were mapped as ACOE, RWQCB, and CCC wetlands.

A large portion of the southern study area of Site 3 is part of the Otay River Floodplain Restoration site. This area was recently planted with riparian trees and shrubs. The site is being irrigated to promote plant establishment. While these areas did not meet hydric soil and hydrology criteria per the delineation manual, these areas may eventually meet those criteria. However, for this study, these areas were not classified as ACOE jurisdictional.

The salt flats in the northern portion of Site 3 were classified as non-jurisdictional. These areas are not subject to tidal inundation, are primarily above the elevation of the high tide line (7.79 feet above MLLW), and are routinely disturbed to harvest salt.

Salt pond levees below the high tide line elevation (7.79 feet above MLLW) were classified as jurisdictional Waters of the U.S., whereas salt pond levees above the high tide line were

classified as non-jurisdictional where the wetland delineation parameters were not present (e.g., hydrophytic vegetation and hydrology).

CCC-Only Jurisdiction

Site 1: Otay River/Pond 20

There is a 0.04-acre area of southern coastal salt marsh and a 0.01-acre area of mulefat scrub that would be under the jurisdiction of the CCC that occur in the northeastern portion of the site along the freshwater stream channel but are above the OHWM and outside of ACOE and RWQCB jurisdiction. These areas are dominated by more than 50% hydrophytic vegetation (i.e., saltgrass and mulefat), thus meeting the hydrophytic vegetation parameter, and a high water table and saturation indicate hydrology, but they lack hydric soils needed to meet the ACOE's definition of wetland.

Site 2: Salt Ponds 12-15

There were no areas classified as jurisdictional only by CCC within the Salt Ponds 12-15 Study Area.

Site 3: Access Routes and Crossings –Poseidon ORERP

There are some patches of mulefat scrub that would be under the jurisdiction of the CCC that occur in the southern portion of Site 3. These areas did not meet the ACOE delineation criteria for hydrophytic vegetation, hydric soils, or hydrology, and therefore were not classified as ACOE jurisdictional. However, because they are dominated by mulefat, they were classified as CCC jurisdictional. Similarly, the Otay River Floodplain Restoration site was dominated by riparian trees and shrubs that have been recently planted, but the site did not meet the ACOE delineation criteria for hydric soils or hydrology. Therefore, these areas were classified as CCC jurisdictional, but not ACOE jurisdictional. Lastly, there was a small area (0.10 acre) of southern coastal salt marsh dominated by salt grass that did not meet the ACOE delineation criteria and was thus classified as only CCC jurisdictional.

CONCLUSION

In summary, for all study areas combined, there are 322.46 acres of wetlands and non-wetland waters under the joint jurisdiction of the ACOE, RWQCB, and CCC and 6.77 acres of riparian vegetation under the jurisdiction of the CCC only. As such, any impacts to these areas resulting from project implementation shall be subject to the regulations and requirements of the relevant

regulating resource agency authorities. The jurisdictional delineations for two of the study areas (Sites 1 and 2) have already been reviewed and confirmed by ACOE (Appendices D and E). The third study area (Site 3) includes access routes and crossings near both Sites 1 and 2 and will require review and confirmation from ACOE for the preliminary jurisdictional delineation.

If you have any questions or comments regarding the content of this letter, please do not hesitate to call me at 760.479.4282.

Sincerely,

Andrew Thomson
Biologist/Restoration Ecologist

Att: Figure 1, Regional Map
Figure 2, Vicinity Map
Figure 3, Vegetation Communities with Jurisdictional Delineation for the Otay River/Pond 20 Site
Figures 4a–4c, Vegetation Communities with Jurisdictional Delineation for the Salt Ponds 12-15 Site
Figures 5a and 5b, Vegetation Communities with Jurisdictional Delineation for the Access Routes and Crossings Site
Figures 6a and 6b, Representative Site Photos of the Otay River/Pond 10 Study Area
Figures 7a – 7c, Representative Site Photos of the Salt Ponds 12-15 Study Area
Figures 8a and 8b, Representative Site Photos of the Access Routes Study Area

Appendix A, Otay River/Pond 20 Study Area - Wetland Determination Data Forms
Appendix B, Salt Ponds 12-15 Study Area - Wetland Determination Data Forms
Appendix C, Access Routes Study Area - Wetland Determination Data Forms
Appendix D, Otay River/Pond 20 Study Area – Preliminary Jurisdictional Determination Form
Appendix E, Ponds 12-15 Study Area – Preliminary Jurisdictional Determination Form
Appendix F, Site 3 Access Routes Study Area – Preliminary Jurisdictional Determination Form

REFERENCES CITED

ACOE (U.S. Army Corps of Engineers) and U.S. Environmental Protection Agency (EPA). 2007. Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in *Rapanos v. United States & Carabell v. United States*. June 5.

ACOE. 2008. *Interim regional supplement to the Corps of Engineers wetland delineation manual: Arid West Region*. ed. J.S. Wakeley, R.W. Lichvar, and C. V. Noble. ERDC/EL TR-08-13.Vicksburg, MS: U.S. Army Engineer Research and Development Center. http://el.erdc.usace.army.mil/elpubs/pdf/trel08-13.pdf. September.

ACOE. 2012. National Wetland Plant List. June 1.

CCC (California Coastal Commission). 2009. Public Resources Code, Division 20. *California Coastal Act*. Accessed October 26, 2009: http://www.coastal.ca.gov/coastact.pdf.

CCC. 2011. Frequently Asked Questions about the Federal Consistency Program. Accessed August 10, 2011. http://www.coastal.ca.gov/coastact.pdf.

Cowardin, L.M., V. Carter V., F.C. Golet, E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Fish and Wildlife Service Report No. FWS/OBS/-79/31.Washington, D.C.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1*. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.

SWANCC (Solid Waste Agency of Northern Cook Counties) v. United States Army Corps of Engineers. 531 U.S. 159. 2001.

USDA (U.S. Department of Agriculture) Soil Conservation Service. 1994. *Changes in hydric soils of the United States*. Federal Register 59(133): 35680–35681. July 13.

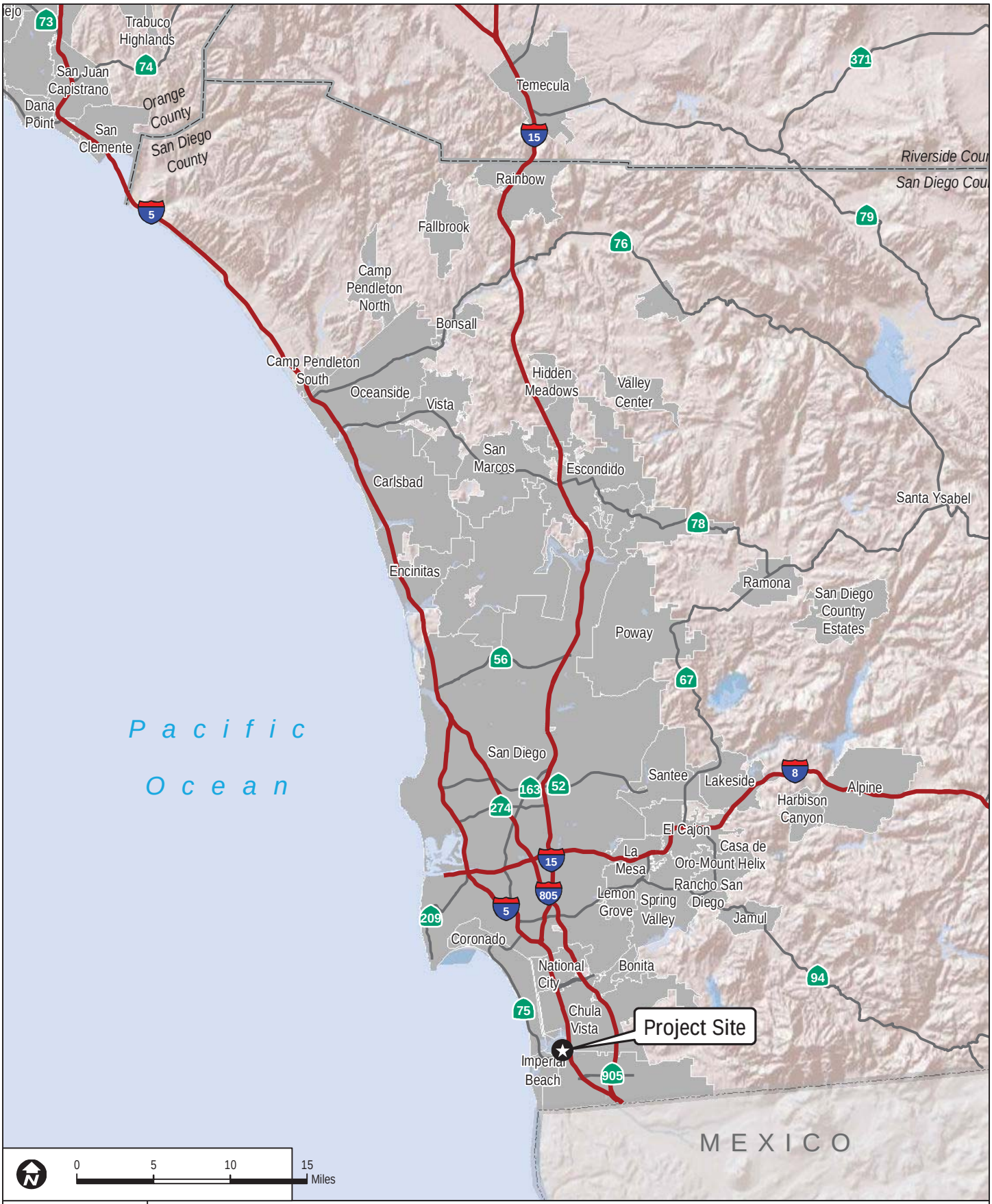
USDA, Natural Resources Conservation Service. 2009. *Websoil Survey*. Accessed http://web soilsurvey.nrcs.usda.gov/app/HomePage.htm.

USDA, Natural Resources Conservation Service. 2010. *Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils, Version 7.0,* Prepared in cooperation with the National Technical Committee for Hydric Soils. Edited by L.M. Vasilas, G.W. Hurt, and C.V. Noble.

USFWS (U.S. Fish and Wildlife Service). 2006. *San Diego Bay National Wildlife Refuge Sweetwater Marsh and South San Diego Bay Units Final Comprehensive Conservation Plan and Environmental Impact Statement Summary –August 2006.* Accessed March 19, 2013. http://www.fws.gov/sandiegorefuges/new/ccp/final/Summary_web.pdf

USFWS. 2006. San Diego Bay National Wildlife Refuge, Sweetwater Marsh and South San Diego Bay Units, Comprehensive Conservation Plan (CCP) and EIS and Record of Decision (ROD) 71 FR 64552, November 2, 2006.

USFWS. 2009. National Wetlands Inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. http://www.fws.gov/wetlands/. September 5.



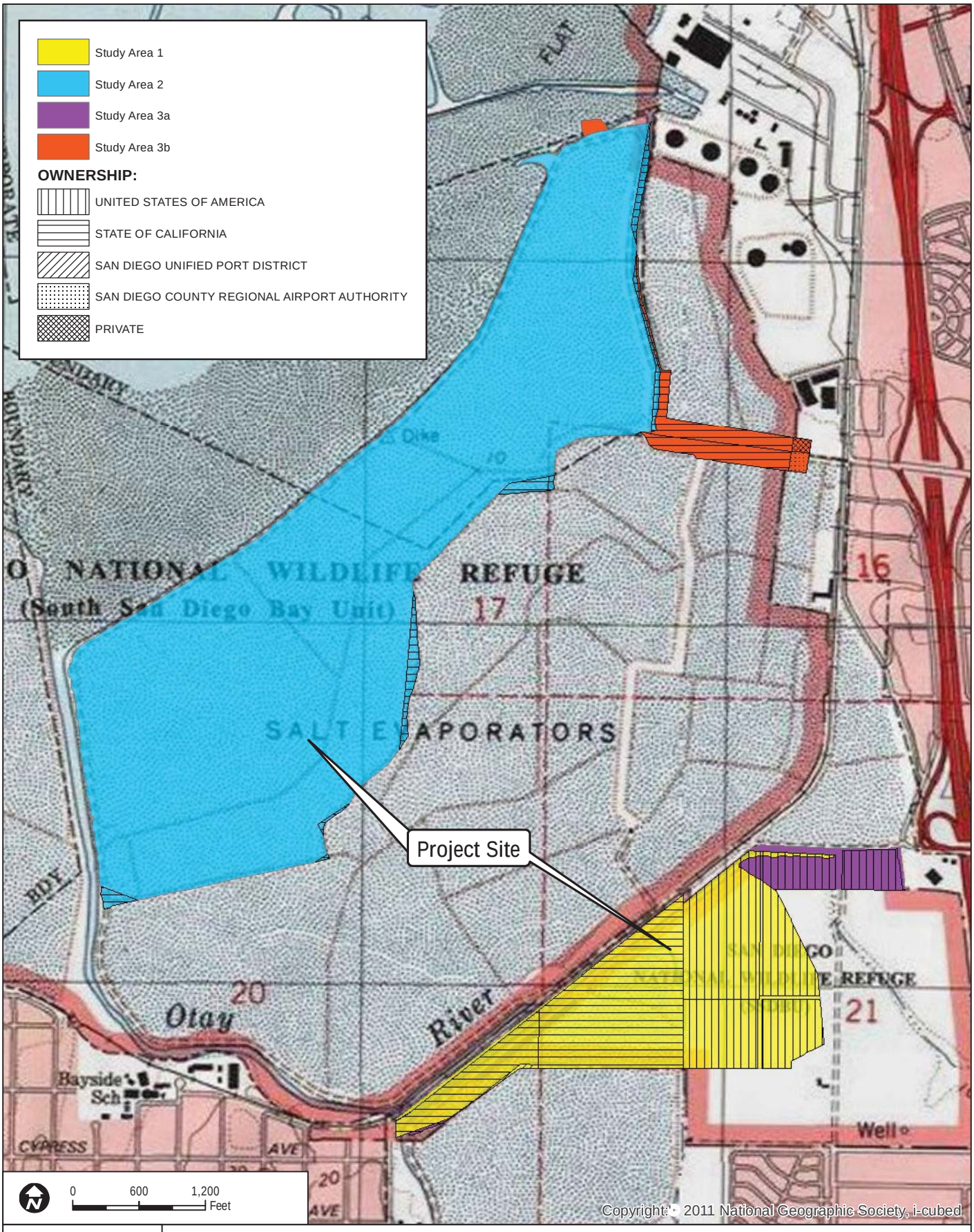
DUDEK

6758

FIGURE 1

Regional Map

Jurisdictional Wetland Delineation for the Otay River Estuary Restoration Project (ORERP)



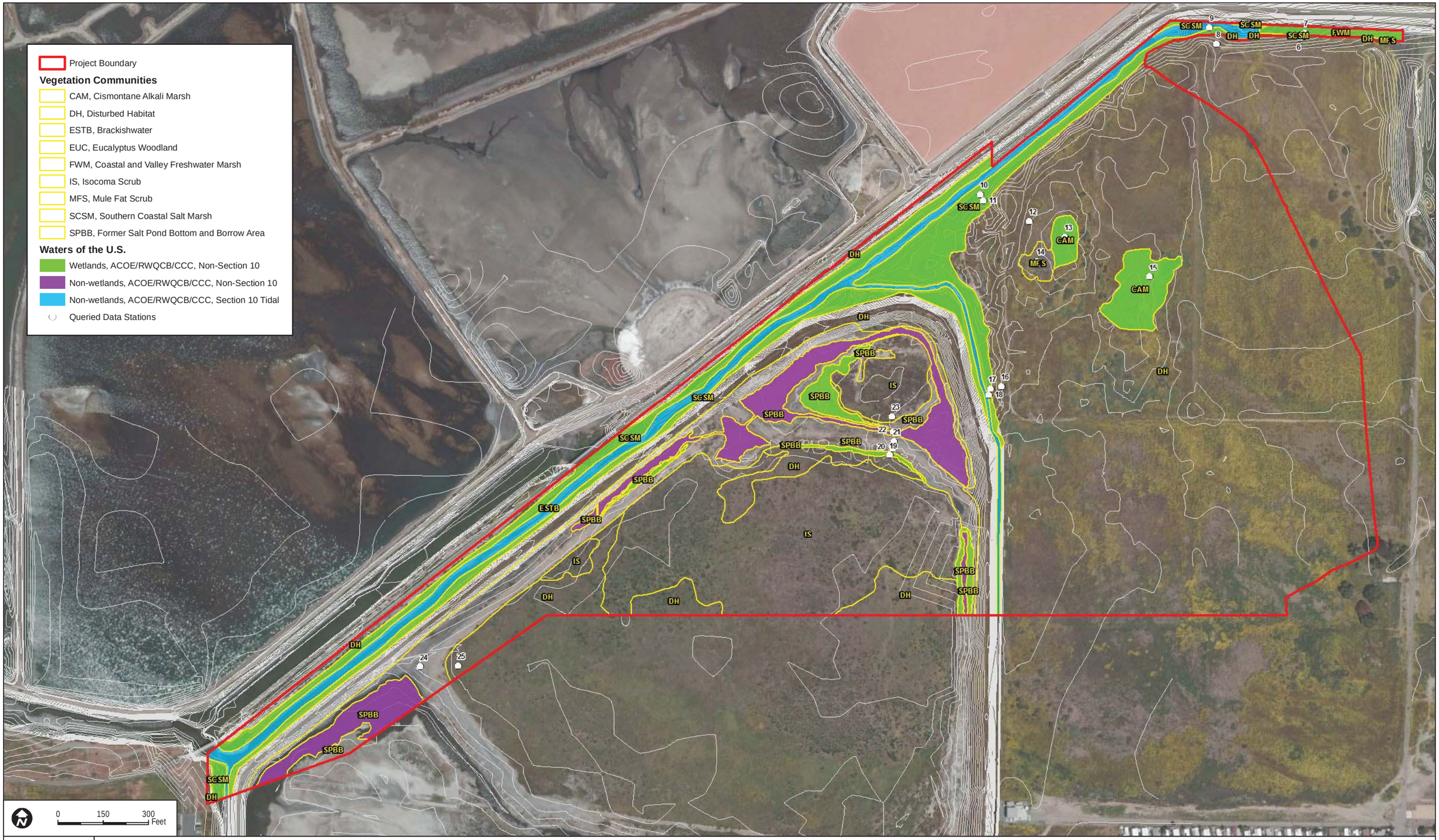
DUDEK

6758

SOURCE: USGS 7.5-Minute Series Quadrangle, USA Topographic Maps Service, Imperial Beach Quadrangle.

FIGURE 2
Vicinity Map

Jurisdictional Wetland Delineation for the Otay River Estuary Restoration Project (ORERP)



DUDEK

6758

AERIAL SOURCE: BING MAPPING SERVICE

FIGURE 3

Vegetation Communities with Jurisdictional Delineation for the Otay River/Pond 20 Site

Jurisdictional Wetland Delineation for the Otay River Estuary Restoration Project (ORERP)



DUDEK

AERIAL SOURCE: NAIP 2009

6758

FIGURE 4a

Vegetation Communities with Jurisdictional Delineation for the Salt Ponds 12-15 Site

Jurisdictional Wetland Delineation for the Otay River Estuary Restoration Project (ORERP)



DUDEK

AERIAL SOURCE: NAIP 2009

6758

FIGURE 4b

Vegetation Communities with Jurisdictional Delineation for the Salt Ponds 12-15 Site

Jurisdictional Wetland Delineation for the Otay River Estuary Restoration Project (ORERP)



DUDEK

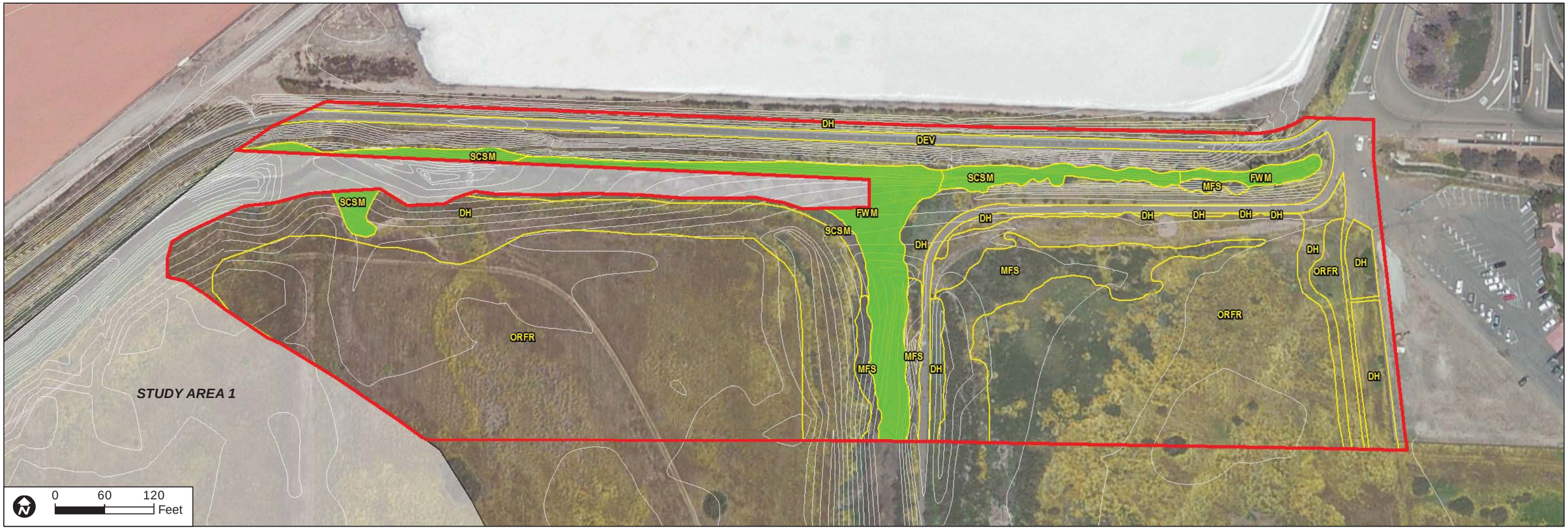
AERIAL SOURCE: NAIP 2009

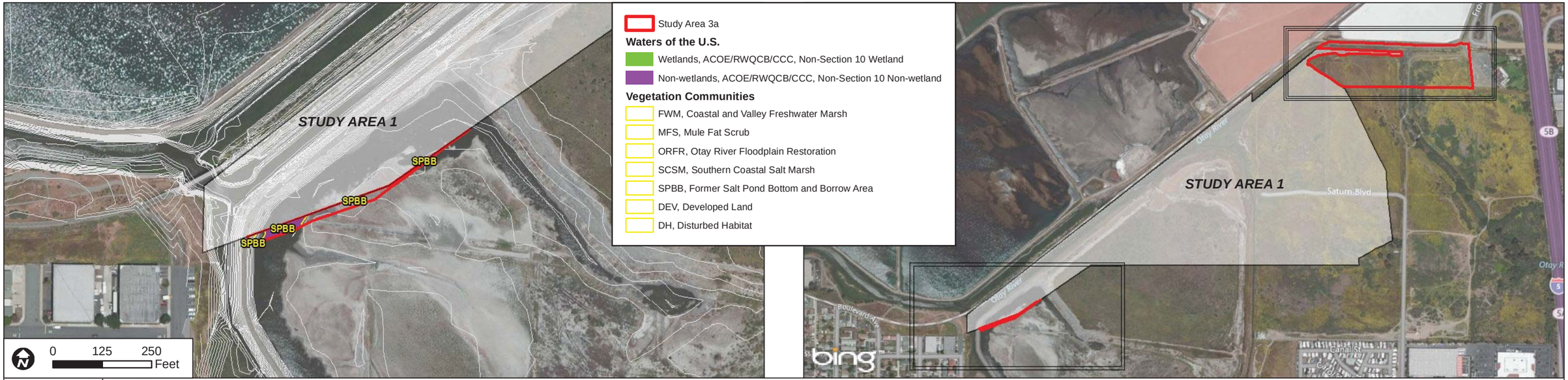
6758

FIGURE 4c

Vegetation Communities with Jurisdictional Delineation for the Salt Ponds 12-15 Site

Jurisdictional Wetland Delineation for the Otay River Estuary Restoration Project (ORERP)





DUDEK

6758

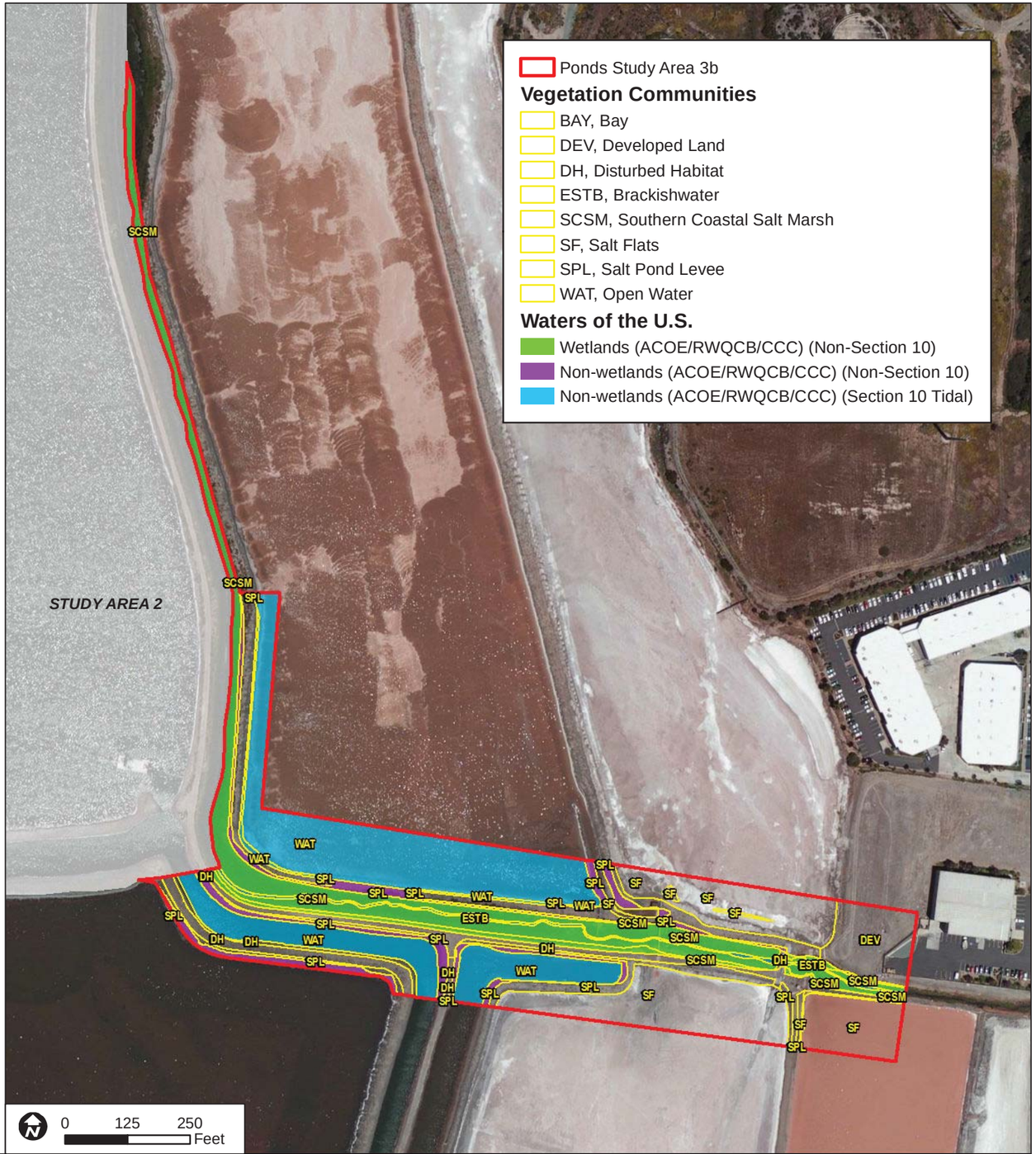
AERIAL SOURCE: BING MAPPING SERVICE

FIGURE 5a

Vegetation Communities with Jurisdictional Delineation for the Southern Access Routes and Crossings Site

Jurisdictional Wetland Delineation for the Otay River Estuary Restoration Project (ORERP)







DUDEK

6758

AERIAL SOURCE: NAIP 2009

FIGURE 5b

Vegetation Communities with Jurisdictional Delineation for the Northern Access Routes and Crossings Site

Jurisdictional Wetland Delineation for the Otay River Estuary Restoration Project (ORERP)

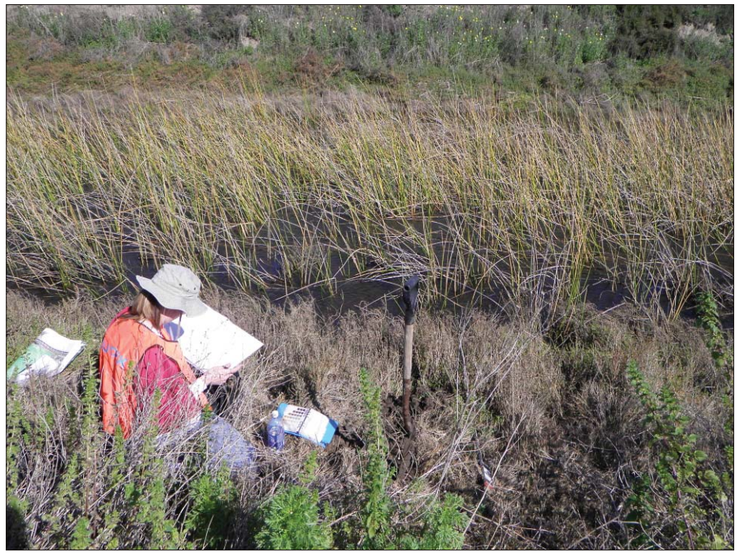


Photo 1: View of the Site Conditions at Data Stations 5, 6 and 7 (February 22, 2011)



Photo 2: View of the Site Conditions at Data Stations 8 and 9 (February 22, 2011)

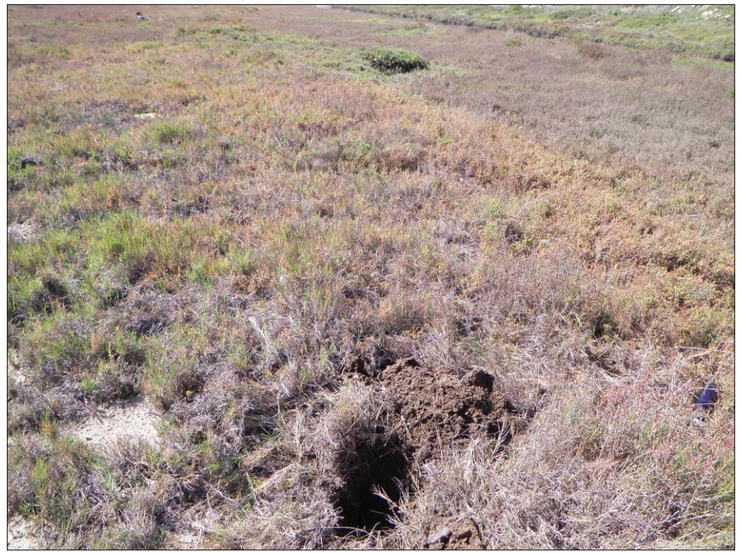


Photo 3: View of the Site Conditions at Data Stations 10 and 11 (February 22, 2011)



Photo 4: View of the Site Conditions at Data Station 15 (February 22, 2011)



Photo 5: View of the Site Conditions at Data Stations 16, 17 and 18 (February 22, 2011)

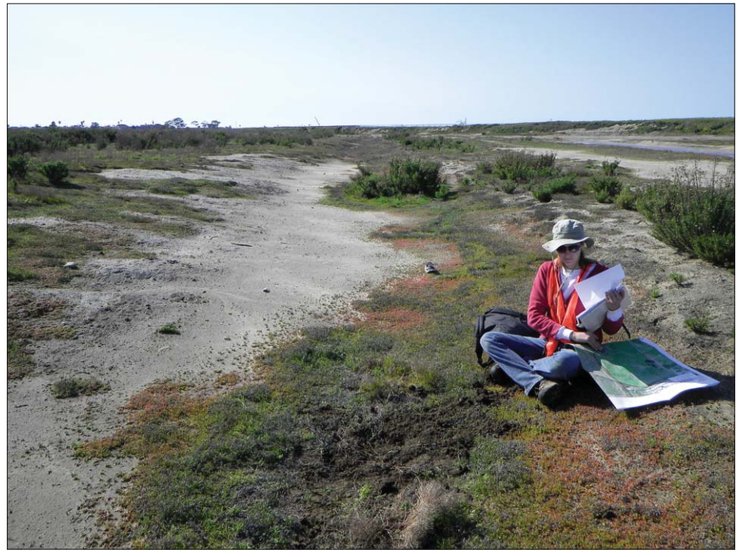


Photo 6: View of the Site Conditions at Data Stations 19, 20 and 21 (February 22, 2011)



Photo 7: View of the Site Conditions at Data Stations 22 and 23 (February 22, 2011)



Photo 8: View of the Site Conditions at Data Station 24 (February 22, 2011)



Photo 9: Representative View of the Salt Panne/Mudflat and Non-vegetated Channel and Floodway Areas (February 22, 2011)



Photo 10: Representative View of the Southern Coastal Salt Marsh Habitat in the Tidal Channel Downstream of the Otay River Channel in the Western Portion of the Site (February 22, 2011)



Photo 11: Representative View of the Southern Coastal Salt Marsh Habitat in the Tidal Channel Downstream of the Otay River Channel in the Eastern Portion of the Site (February 22, 2011)



Photo 12: View of Berm on the Northern Edge of the Old Salt Evaporation Pond (May 19, 2011)



Data Station 1



Data Station 2



Data Station 3



Data Station 4



Data Station 5



Data Station 6

DUDEK

6758

SOURCE: Dudek 2013

FIGURE 7a

Representative Site Photos of the Salt Ponds 12-15 Study Area

Jurisdictional Wetland Delineation for the Otay River Estuary Restoration Project (ORERP)



Data Station 7



Data Station 8



Data Station 9



Data Station 10



Data Station 11



Data Station 12

DUDEK

6758

SOURCE: Dudek 2013

FIGURE 7b

Representative Site Photos of the Salt Ponds 12-15 Study Area

Jurisdictional Wetland Delineation for the Otay River Estuary Restoration Project (ORERP)



Data Station 13



Data Station 14



Data Station 15

DUDEK

6758

SOURCE: Dudek 2013

FIGURE 7c

Representative Site Photos of the Salt Ponds 12-15 Study Area

Jurisdictional Wetland Delineation for the Otay River Estuary Restoration Project (ORERP)



Photo 1: View of the Silver Strand Bikeway that bisects the Study Area (May 27, 2014)



Photo 2: View of the Otay River Floodplain Restoration Project (May 27, 2014)



Photo 3: View of the berm between the Otay River channel and the Otay River Floodplain Restoration Project (May 27, 2014)



Photo 4: View of the soil pit in freshwater marsh habitat associated with the Otay River, data station #1 (May 27, 2014)



Photo 5: View of the soil pit in mulefat scrub habitat along the Silver Strand Bikeway, data station #7 (May 27, 2014)



Photo 6: View of the soil pit in southern coastal salt marsh habitat in the tributary channel to the Otay River, data station #6 (May 27, 2014)



Photo 1: View of typical salt pond levee conditions (March 13, 2013)



Photo 2: View of typical salt flat conditions (March 13, 2013)



Photo 3: View of southern coastal salt marsh habitat associated with the Palomar Street channel (March 13, 2013)



Photo 4: View of the Palomar Street channel at low tide (March 13, 2013)



Photo 5: View of the Bay tie-in point for the Pond 15 salt marsh restoration (March 13, 2013)



Photo 6: View of open water associated with the salt ponds (March 13, 2013)

APPENDIX A

Site 1 Otay River/Pond 20 Study Area – Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon City/County: San Diego, San Diego Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources State: CA Sampling Point: 5

Investigator(s): Andy Thomson and Katie Dayton Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel Local relief (concave, convex, none): concave Slope (%): 0-20

Subregion (LRR): C - Mediterranean California Lat: 32°35'29.95"N Long: 117°5'46.02W Datum: NAD83

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (•) No ( ) (If no, explain in Remarks.)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (•) No ( )

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (•)	No ( )	
Hydric Soil Present?	Yes ( )	No (•)	**Is the Sampled Area within a Wetland?** Yes ( ) No (•)
Wetland Hydrology Present?	Yes (•)	No ( )	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. Distichlis spicata	50	Yes	FAC
2. Salifornia virginica	15	No	OBL
3. Frankenia salina	35	Yes	FACW
4.			
5.			
Total Cover:	100 %		
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	%		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- [x] Dominance Test is >50%
- [ ] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (•) No ( )

Remarks:

SOIL

Sampling Point: 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture[3]	Remarks
0-12	7.5 YR 3/2	100					clay loam	
12-15	NA	60					sand	
12-15	7.5 YR 4/1	39	7.5 YR 4/6	1	C	M	clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ●

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ○	No ●	Depth (inches):	0
Water Table Present?	Yes ●	No ○	Depth (inches):	16
Saturation Present? (includes capillary fringe)	Yes ●	No ○	Depth (inches):	12

Wetland Hydrology Present? Yes ● No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon City/County: San Diego, San Diego Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources State: CA Sampling Point: 6

Investigator(s): Andy Thomson and Katie Dayton Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel Local relief (concave, convex, none): concave Slope (%): 0-20

Subregion (LRR): C - Mediterranean California Lat: 32°35'29.95"N Long: 117°5'46.02W Datum: NAD83

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ○	No ◉	
Hydric Soil Present?	Yes ○	No ◉	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. Urtica urens	40	Yes	NI
2. Glebionis coronaria	40	Yes	NI
3. Hirschfeldia incana	20	No	NI
4.			
5.			
6.			
7.			
8.			
Total Cover:	100 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

◉ Dominance Test is >50%

Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:

SOIL

Sampling Point: 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture[3]	Remarks
0-12	7.5 YR 3/2	100					loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ●

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ● Depth (inches):

Water Table Present? Yes ○ No ● Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ● Depth (inches):

Wetland Hydrology Present? Yes ○ No ●

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon City/County: San Diego, San Diego Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources State: CA Sampling Point: 7

Investigator(s): Andy Thomson and Katie Dayton Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel Local relief (concave, convex, none): concave Slope (%): 0-20

Subregion (LRR): C - Mediterranean California Lat: 32°35'29.95"N Long: 117°5'46.02W Datum: NAD83

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	
Hydric Soil Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. Scirpus maritimus	60	Yes	OBL
2.			
3.			
4.			
5.			
Total Cover:	60 %		
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	%		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

✘ Dominance Test is >50%

Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks: Flowing water comprises the remaining 40% cover.

SOIL

Sampling Point: 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture[3]	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks: At least one foot of water is covering soil so no soil sample was taken. Hydric soils are assumed based on inundation and cover of dominance of obligate wetland species.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ◉ No ○ Depth (inches): 0

Water Table Present? Yes ◉ No ○ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ◉ No ○ Depth (inches): 0

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon | City/County: San Diego, San Diego | Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: 8

Investigator(s): Andy Thomson and Katie Dayton | Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel | Local relief (concave, convex, none): concave | Slope (%): 0-20

Subregion (LRR): C - Mediterranean California | Lat: 32°35'29.95"N | Long: 117°5'46.02W | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (•) No ( ) (If no, explain in Remarks.)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (•) No ( )

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (•)	No ( )	
Hydric Soil Present?	Yes ( )	No (•)	**Is the Sampled Area within a Wetland?** Yes ( ) No (•)
Wetland Hydrology Present?	Yes ( )	No (•)	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. Distichlis spicata	100	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	100 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- [x] Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (•) No ( )

Remarks: Flowing water comprises the remaining 40% cover.

SOIL

Sampling Point: 8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-7	NA	100					sand	
7-14	7.5 YR 3/3	100					sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ●

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ● Depth (inches):

Water Table Present? Yes ○ No ● Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ● Depth (inches):

Wetland Hydrology Present? Yes ○ No ●

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon City/County: San Diego, San Diego Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources State: CA Sampling Point: 9

Investigator(s): Andy Thomson and Katie Dayton Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel Local relief (concave, convex, none): concave Slope (%): 0-20

Subregion (LRR): C - Mediterranean California Lat: 32°35'29.95"N Long: 117°5'46.02W Datum: NAD83

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	
Hydric Soil Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. Salifornia virginica	90	Yes	OBL
2. Frankenia salina	10	No	FACW
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	100 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum ____ % % Cover of Biotic Crust ____ %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

✘ Dominance Test is >50%

Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks: Flowing water comprises the remaining 40% cover.

SOIL

Sampling Point: 9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-2	7.5 YR 4/2	100					loamy sand	
2-6	NA	100					sand	
6-7	GLEY 2.5/SPB	100					clay loam	
7-11	7.5 YR 4/1	100					loamy sand	
11-14	NA	100					sand	saturated

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☒ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ◉ No ○ Depth (inches): 6

Saturation Present? (includes capillary fringe) Yes ◉ No ○ Depth (inches): 5

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon City/County: San Diego, San Diego Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources State: CA Sampling Point: 10

Investigator(s): Andy Thomson and Katie Dayton Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel Local relief (concave, convex, none): concave Slope (%): 0-20

Subregion (LRR): C - Mediterranean California Lat: 32°35'29.95"N Long: 117°5'46.02W Datum: NAD83

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	
Hydric Soil Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. Salifornia virginica	98	Yes	OBL
2. Batis maritima	2	No	OBL
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	100 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

✘ Dominance Test is >50%

Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks: Flowing water comprises the remaining 40% cover.

SOIL

Sampling Point: 10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture[3]	Remarks
0-9	7.5 YR 2.5/1	99	7.5 YR 4/6	1	C	M	clay loam	
9-15	7.5 YR 3/3	90	7.5 YR 4/6	10	C	M	sandy clay loam	Redox also along pore linings

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ◉ No ○ Depth (inches): 0

Water Table Present? Yes ◉ No ○ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ◉ No ○ Depth (inches): 0

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon | City/County: San Diego, San Diego | Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: 11

Investigator(s): Andy Thomson and Katie Dayton | Section, Township, Range: Section 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): Channel | Local relief (concave, convex, none): Concave | Slope (%): 0-20

Subregion (LRR): C - Mediterranean California | Lat: 32 35 29.95 | Long: 117 5 46.02 | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ○ No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	
Hydric Soil Present?	Yes ○	No ◉	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks: Although not all 3 parameters were met, the sampling point is below the high tide line of 7.79 feet (above MLLW) and therefore ACOE jurisdiction is presumed.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *1socoma menziesii*	5	Yes	FAC
2. *Suaeda nigra*	1	No	OBL
3.			
4.			
5.			
Total Cover:	6 %		
Herb Stratum			
1. *Distichlis spicata*	70	Yes	FAC
2. *Salicornia virginica*	10	No	OBL
3. *Frankenia salina*	15	No	FACW
4. *Atriplex semibaccata*	1	No	FAC
5.			
6.			
7.			
8.			
Total Cover:	96 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 4 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	11	x 1 =	11
FACW species	15	x 2 =	30
FAC species	76	x 3 =	228
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	102 (A)		269 (B)

Prevalence Index = B/A = 2.64

Hydrophytic Vegetation Indicators:

- ☒ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:

SOIL

Sampling Point: 11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-4	7.5 YR 2.5/1	100					sandy clay loam	some organic streaking
4-10	7.5 YR 3/2	100					sandy loam	
10-13	7.5 YR 3/2	80					loam	
10-13	7.5 YR 4/1	19	7.5 YR 4/6	1	C	M	loamy clay	
13-15	7.5 YR 3/1	100					clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Sampling location is below the high tide line (7.79 feet above MLL W) and therefore hydrology is presumed.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon | City/County: San Diego, San Diego | Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: 12

Investigator(s): Andy Thomson and Katie Dayton | Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel | Local relief (concave, convex, none): concave | Slope (%): 0-20

Subregion (LRR): C - Mediterranean California | Lat: 32 35 29.95 N | Long: 117 5 46.02 W | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ○	No ◉	
Hydric Soil Present?	Yes ○	No ◉	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Isocoma menziesii*	10	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	10 %		
Herb Stratum			
1. *Glebionis coronaria*	75	Yes	NI
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	75 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 25 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	10	x 3 =	30
FACU species		x 4 =	0
UPL species	75	x 5 =	375
Column Totals:	85 (A)		405 (B)

Prevalence Index = B/A = 4.76

Hydrophytic Vegetation Indicators:

- ◉ Dominance Test is >50%
- ◉ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:

SOIL

Sampling Point: 12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-14	7.5 YR 3/3	100					loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): _____

Water Table Present? Yes ○ No ◉ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): _____

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon City/County: San Diego, San Diego Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources State: CA Sampling Point: 13

Investigator(s): Andy Thomson and Katie Dayton Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel Local relief (concave, convex, none): concave Slope (%): 0-20

Subregion (LRR): C - Mediterranean California Lat: 32°35'29.95"N Long: 117°5'46.02W Datum: NAD83

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	
Hydric Soil Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. Tamarix ramosissima	2	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	2 %		
Herb Stratum			
1. Salicornia virginica	75	Yes	OBL
2. Distichlis spicata	10	No	FAC
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	85 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 15 % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

✘ Dominance Test is >50%

Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:

SOIL

Sampling Point: 13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture[3]	Remarks
0-4	7.5 YR 3/2	90	7.5 YR 4/6	10	C	M	loam	
4-15	10 YR 4/3	100					loamy sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon | City/County: San Diego, San Diego | Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: 14

Investigator(s): Andy Thomson and Katie Dayton | Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel | Local relief (concave, convex, none): concave | Slope (%): 0-20

Subregion (LRR): C - Mediterranean California | Lat: 32 35 29.95 N | Long: 117 5 46.02 W | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ○	No ◉	
Hydric Soil Present?	Yes ○	No ◉	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Baccharis salicifolia*	30	Yes	FAC
2. *Nicotiana glauca*	1	No	FAC
3.			
4.			
5.			
Total Cover:	31 %		
Herb Stratum			
1. *Glebionis coronaria*	50	Yes	NI
2. *Mesembryanthemum nodiflorum*	2	No	FAC
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	52 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 48 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	33	x 3 =	99
FACU species		x 4 =	0
UPL species	50	x 5 =	250
Column Totals:	83 (A)		349 (B)

Prevalence Index = B/A = 4.20

Hydrophytic Vegetation Indicators:

- ◉ Dominance Test is >50%
- ◉ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:

SOIL

Sampling Point: 14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-14	7.5 YR 3/2	100					sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): _____

Water Table Present? Yes ○ No ◉ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): _____

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon | City/County: San Diego, San Diego | Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: 15

Investigator(s): Andy Thomson and Katie Dayton | Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel | Local relief (concave, convex, none): concave | Slope (%): 0-20

Subregion (LRR): C - Mediterranean California | Lat: 32°3 5'29.95 "N | Long: 117°5'46.02W | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )	
Hydric Soil Present?	Yes ( )	No (●)	**Is the Sampled Area within a Wetland?** Yes ( ) No (●)
Wetland Hydrology Present?	Yes (●)	No ( )	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Suaeda nigra*	5	Yes	OBL
2.			
3.			
4.			
5.			
Total Cover:	5 %		
Herb Stratum			
1. *Salicornia virginica*	90	Yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	90 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 10 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	95	x 1 =	95
FACW species		x 2 =	0
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	95 (A)		95 (B)

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:

- [X] Dominance Test is >50%
- [X] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks:

SOIL

Sampling Point: 15

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-4	7.5 YR 3/1	100					loamy clay	
4-12	7.5 YR 3/2	100					sandy loam	
12-15	10 YR 5/3	100					sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks: Dark gray material around roots in soil sample: GLEY2 2.5/ l0B in color; comprised <1% of the sample

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ◉ No ○ Depth (inches): 12

Saturation Present? (includes capillary fringe) Yes ◉ No ○ Depth (inches): 6

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon City/County: San Diego, San Diego Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources State: CA Sampling Point: 16

Investigator(s): Andy Thomson and Katie Dayton Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel Local relief (concave, convex, none): concave Slope (%): 0-20

Subregion (LRR): C - Mediterranean California Lat: 32°35'29.95"N Long: 117°5'46.02W Datum: NAD83

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (•) No ( ) (If no, explain in Remarks.)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (•) No ( )

Are Vegetation [x] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ( )	No (•)	
Hydric Soil Present?	Yes ( )	No (•)	**Is the Sampled Area within a Wetland?** Yes ( ) No (•)
Wetland Hydrology Present?	Yes ( )	No (•)	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. Bromus diandrus	1	No	NI
2. Glebionis coronaria	2	Yes	NI
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	3 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	3 %		

% Bare Ground in Herb Stratum 97 % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

(•) Dominance Test is >50%

Prevalence Index is ≤3.0[1]

[ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

[ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ( ) No (•)

Remarks:

SOIL

Sampling Point: 16

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture[3]	Remarks
0-15	7.5 YR 3/2	100					loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ●

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ● Depth (inches):

Water Table Present? Yes ○ No ● Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ● Depth (inches):

Wetland Hydrology Present? Yes ○ No ●

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon | City/County: San Diego, San Diego | Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: 17

Investigator(s): Andy Thomson and Katie Dayton | Section, Township, Range: Section 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): Channel | Local relief (concave, convex, none): Concave | Slope (%): 0-20

Subregion (LRR): C - Mediterranean California | Lat: 32 35 29.95 | Long: 117 5 46.02 | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ○ No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	
Hydric Soil Present?	Yes ○	No ◉	Is the Sampled Area within a Wetland? Yes ◉ No ○
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks: Although not all 3 parameters were met, the sampling point is below the high tide line of 7.79 feet (above MLLW) and therefore ACOE jurisdiction is presumed.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Distichlis spicata*	30	Yes	FAC
2. *Salicornia virginica*	40	Yes	OBL
3. *Frankenia salina*	15	No	FACW
4.			
5.			
6.			
7.			
8.			
Total Cover:	85 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 15 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	45	x 2 =	90
FAC species		x 3 =	0
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	85 (A)		130 (B)

Prevalence Index = B/A = 1.53

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☒ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:

SOIL

Sampling Point: 17

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture[3]	Remarks
0-10	7.5 YR 3/2	100					sandy loam	
10-13	7.5 YR 4/3	95					sandy loam	
10-13	7.5 YR 5/1	5	7.5 YR 4/6	<1	C	M	clay loam	
13-15	7.5 YR 4/3	100	7.5 YR 4/6	1	C	M	loamy sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.
[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) **(LRR C)**
- ☐ 1 cm Muck (A9) **(LRR D)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) **(LRR C)**
- ☐ 2 cm Muck (A10) **(LRR B)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) **(Nonriverine)**
- ☐ Sediment Deposits (B2) **(Nonriverine)**
- ☐ Drift Deposits (B3) **(Nonriverine)**
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☒ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) **(Riverine)**
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) **(Riverine)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Sampling location is below the high tide line (7.79 feet above MLLW) and therefore hydrology is presumed.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon City/County: San Diego, San Diego Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources State: CA Sampling Point: 18

Investigator(s): Andy Thomson and Katie Dayton Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel Local relief (concave, convex, none): concave Slope (%): 0-20

Subregion (LRR): C - Mediterranean California Lat: 32°35'29.95"N Long: 117°5'46.02W Datum: NAD83

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (•) No ( ) (If no, explain in Remarks.)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (•) No ( )

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (•)	No ( )	
Hydric Soil Present?	Yes (•)	No ( )	**Is the Sampled Area within a Wetland?** Yes (•) No ( )
Wetland Hydrology Present?	Yes (•)	No ( )	

Remarks: Approximately 3-foot wide band of ACOE wetland along an open channel.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. Salicornia virginica	100	Yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	100 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

(✘) Dominance Test is >50%

Prevalence Index is ≤3.0[1]

[ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

[ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (•) No ( )

Remarks:

SOIL

Sampling Point: 18

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-8	7.5 YR 3/2	90	7.5 YR 4/4	10	C	M	clay loam	
8-12	7.5 YR 4/3	75	7.5 YR 4/4	25	C	M	sandy clay loam	
12-15	7.5 YR 5/1	100					loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ◉ No ○ Depth (inches): 10

Saturation Present? (includes capillary fringe) Yes ◉ No ○ Depth (inches): 8

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon | City/County: San Diego, San Diego | Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: 19

Investigator(s): Andy Thomson and Katie Dayton | Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel | Local relief (concave, convex, none): concave | Slope (%): 0-20

Subregion (LRR): C - Mediterranean California | Lat: 32°3 5'29.95 "N | Long: 117°5'46.02W | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ○	No ◉	
Hydric Soil Present?	Yes ○	No ◉	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Isocoma menziesii*	10	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	10 %		
Herb Stratum			
1. *Mesembranyanthemum crystallinum*	15	Yes	FACU
2. *Melilotus indica*	2	No	FACU
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	17 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 83 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	10	x 3 =	30
FACU species	17	x 4 =	68
UPL species		x 5 =	0
Column Totals:	27 (A)		98 (B)

Prevalence Index = B/A = 3.63

Hydrophytic Vegetation Indicators:

- ◉ Dominance Test is >50%
- ◉ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:

SOIL

Sampling Point: 19

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-10	7.5 YR 3/3	80					loamy sand	
0-10	7.5 YR 3/1	20					clay loam	
10-15	NA	100					sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): _____

Water Table Present? Yes ○ No ◉ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): _____

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon | City/County: San Diego, San Diego | Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: 20

Investigator(s): Andy Thomson and Katie Dayton | Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel | Local relief (concave, convex, none): concave | Slope (%): 0-20

Subregion (LRR): C - Mediterranean California | Lat: 32°3 5'29.95 "N | Long: 117°5'46.02W | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☒ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ○ No ◉

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	
Hydric Soil Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks: Sampling point is within the borrow pit of a former salt evaporation pond where there has been substantial topographic disturbance.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Isocoma menziesii*	5	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	5 %		
Herb Stratum			
1. *Mesembranyanthemum nodiflorum*	40	Yes	FAC
2. *Amblyopappus pusillus*	3	No	FACW
3. *Melilotus indica*	1	No	FACU
4.			
5.			
6.			
7.			
8.			
Total Cover:	44 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 56 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	3	x 2 =	6
FAC species	45	x 3 =	135
FACU species	1	x 4 =	4
UPL species		x 5 =	0
Column Totals:	49 (A)		145 (B)

Prevalence Index = B/A = 2.96

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☒ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:

SOIL

Sampling Point: 20

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-10	7.5 YR 3/1	80	2.5 YR 4/6	20	C	M	sandy loam	
10-15	7.5 YR 4/1	80	2.5 YR 4/8	20	C	M	loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks: There are white mineral deposits intermixed in soil. The soils exhibit low chroma as they are subsoils and likely former bay muds.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☒ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: There is salt crust in a small area, which is likely the result of the site's former use as a salt evaporation pond.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon | City/County: San Diego, San Diego | Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: 21

Investigator(s): Andy Thomson and Katie Dayton | Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel | Local relief (concave, convex, none): concave | Slope (%): 0-20

Subregion (LRR): C - Mediterranean California | Lat: 32°3 5'29.95 "N | Long: 117°5'46.02W | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☒ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ○ No ◉

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	
Hydric Soil Present?	Yes ○	No ◉	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks: Sampling point is within the borrow pit of a former salt evaporation pond where there has been substantial topographical disturbance.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Isocoma menziesii*	20	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	20 %		
Herb Stratum			
1. *Mesembryanthemum nodiflorum*	10	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	10 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 70 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	30	x 3 =	90
FACU species		x 4 =	0
UPL species		x 5 =	0
Column Totals:	30 (A)		90 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☒ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:

SOIL

Sampling Point: 21

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-13	7.5 YR 3/1	90					sandy loam	
0-13	7.5 YR 3/2	10					clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks: white mineral desposits intermixed in soil

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon City/County: San Diego, San Diego Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources State: CA Sampling Point: 22

Investigator(s): Andy Thomson and Katie Dayton Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel Local relief (concave, convex, none): concave Slope (%): 0-20

Subregion (LRR): C - Mediterranean California Lat: 32°35'29.95"N Long: 117°5'46.02W Datum: NAD83

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☒ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ○ No ◉

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ○	No ◉	
Hydric Soil Present?	Yes ○	No ◉	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks: Sampling point is within the borrow pit of a former salt evaporation pond where there has been substantial topographical distrubance.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	%		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 100 % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

◉ Dominance Test is >50%

Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:

SOIL

Sampling Point: 22

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture[3]	Remarks
0-7	7.5 YR 3/1						sandy clay loam	
7-15	7.5 YR 3/2						sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ●

Remarks: There is a think layer (about 1/4 -inch thick) of salt crystals approximately 3 inches deep in soil pit.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☒ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ● No ○ Depth (inches): 0

Water Table Present? Yes ● No ○ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ● No ○ Depth (inches): 0

Wetland Hydrology Present? Yes ● No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Hydrology indicators at this sampling location are a result of rainwater temporarily ponding in the borrow pit locations during the rainy season.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon | City/County: San Diego, San Diego | Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: 23

Investigator(s): Andy Thomson and Katie Dayton | Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel | Local relief (concave, convex, none): concave | Slope (%): 0-20

Subregion (LRR): C - Mediterranean California | Lat: 32°3 5'29.95 "N | Long: 117°5'46.02W | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (•) No ( ) (If no, explain in Remarks.)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (•) No ( )

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ( )	No (•)	
Hydric Soil Present?	Yes ( )	No (•)	**Is the Sampled Area within a Wetland?** Yes ( ) No (•)
Wetland Hydrology Present?	Yes ( )	No (•)	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Suaeda nigra*	2	Yes	OBL
2.			
3.			
4.			
5.			
Total Cover:	2 %		
Herb Stratum			
1. *Sisymbrium sp.*	40	Yes	NI
2. *Melilotus indica*	30	Yes	FACU
3. *Mesembryanthemum nodiflorum*	10	No	FAC
4. *Amblyopappus pusillus*	2	No	FACW
5. *Lepidium sp.*	1	No	NI
6.			
7.			
8.			
Total Cover:	83 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 17 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	2	x 1 =	2
FACW species	2	x 2 =	4
FAC species	10	x 3 =	30
FACU species	30	x 4 =	120
UPL species	41	x 5 =	205
Column Totals:	85 (A)		361 (B)

Prevalence Index = B/A = 4.25

Hydrophytic Vegetation Indicators:

- (•) Dominance Test is >50%
- ( ) Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ( ) No (•)

Remarks:

SOIL

Sampling Point: 23

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture[3]	Remarks
0-8	7.5 YR 4/2	100					sandy loam	
8-15	NA	100					sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay Loam, Sandy Clay Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks: white mineral desposits intermixed in soil

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon City/County: San Diego, San Diego Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources State: CA Sampling Point: 24

Investigator(s): Andy Thomson and Katie Dayton Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel Local relief (concave, convex, none): concave Slope (%): 0-20

Subregion (LRR): C - Mediterranean California Lat: 32°35'29.95"N Long: 117°5'46.02W Datum: NAD83

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (•) No ( ) (If no, explain in Remarks.)

Are Vegetation [ ] Soil [x] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes ( ) No (•)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ( )	No (•)	
Hydric Soil Present?	Yes (•)	No ( )	**Is the Sampled Area within a Wetland?** Yes ( ) No (•)
Wetland Hydrology Present?	Yes (•)	No ( )	

Remarks: Sampling point is within the borrow pit of a former salt evaporation pond where there has been substantial topographical distrubance.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	%		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 100 % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

(•) Dominance Test is >50%

Prevalence Index is ≤3.0[1]

[ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

[ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ( ) No (•)

Remarks:

SOIL

Sampling Point: 24

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture[3]	Remarks
0-8	5 YR 2.5/1	97	5 YR 3/4	3	C	M	silty clay	
8-14	7.5 YR 3/1	95	7.5 YR 4/6	5	C	M	sandy silty clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks: There is a think layer (about 1/4 -inch thick) of salt crystals approximately 3 inches deep in soil pit. This salt crust is likely a result of the site's former use as a salt evaporation pond. The soils exhibit low chroma as they are subsoils and likely former bay mud.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☒ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Saltpan. The salt crust is likely a result of the site's former use as a salt evaporation pond.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon | City/County: San Diego, San Diego | Sampling Date: 2/22/11

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: 25

Investigator(s): Andy Thomson and Katie Dayton | Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel | Local relief (concave, convex, none): concave | Slope (%): 0-20

Subregion (LRR): C - Mediterranean California | Lat: 32°3 5'29.95 "N | Long: 117°5'46.02W | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (•) No ( ) (If no, explain in Remarks.)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (•) No ( )

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (•)	No ( )	
Hydric Soil Present?	Yes ( )	No (•)	**Is the Sampled Area within a Wetland?** Yes ( ) No (•)
Wetland Hydrology Present?	Yes ( )	No (•)	

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Baccharis sarothroides*	2	No	FACU
2. *Cylindropuntia prolifera*	1	No	NI
3. *Salicornia subterminalis*	5	Yes	OBL
4. *Isocoma menziesii*	3	Yes	FAC
5.			
Total Cover:	11 %		
Herb Stratum			
1. *Erodium cicutarium*	20	Yes	NI
2. *Melilotus indica*	1	No	FACU
3. *Mesembryanthemum nodiflorum*	10	Yes	FAC
4. *Amblyopappus pusillus*	1	No	FACW
5. *Schismus barbatus*	1	No	NI
6.			
7.			
8.			
Total Cover:	33 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 67 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	1	x 2 =	2
FAC species	13	x 3 =	39
FACU species	3	x 4 =	12
UPL species	22	x 5 =	110
Column Totals:	44 (A)		168 (B)

Prevalence Index = B/A = 3.82

Hydrophytic Vegetation Indicators:

- [X] Dominance Test is >50%
- [ ] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (•) No ( )

Remarks:

SOIL

Sampling Point: 25

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture[3]	Remarks
0-15	5 YR 3/3	100					loamy sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[4]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ●

Remarks: There is a thick layer (about 1/4-inch thick) of salt crystals approximately 3 inches deep in soil pit.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ● Depth (inches):

Water Table Present? Yes ○ No ● Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ● Depth (inches):

Wetland Hydrology Present? Yes ○ No ●

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX B

Site 2 Salt Ponds 12-15 Study Area – Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Poseidon – Salt Ponds City/County: Chula Vista / SD Sampling Date: 7-23-13

Applicant/Owner: Poseidon / Refuge - Salt Worker State: CA Sampling Point: 1

Investigator(s): ACT & KD Section, Township, Range:

Landform (hillslope, terrace, etc.): slope Local relief (concave, convex, none): Slope (%): 50

Subregion (LRR): Lat: Long: Datum:

Soil Map Unit Name: NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No (If no, explain in Remarks.)

Are Vegetation , Soil ✓, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No	**Is the Sampled Area within a Wetland?** Yes ✓ No
Hydric Soil Present?	Yes ✓ No	
Wetland Hydrology Present?	Yes ✓ No	

Remarks:
Data station is located on slope of salt pond levee.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
*Sapling/Shrub Stratum (Plot size: 4m x 4m)			
1. Suaeda est	2	N	FACW
2. Atri lind	1	N	N/I
3.			
4.			
5.			
	3 = Total Cover		
Herb Stratum (Plot size: 2m x 2m)			
1. Mes nod	20	Y	FAC
2. Mes cry	1	N	FACU
3.			
4.			
5.			
6.			
7.			
8.			
	21 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 79 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

Prevalence Index is ≤3.0[1]

Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No

Remarks:
Data station located on inside slope of levee.
* Shrub cover < 5% = doesn't count as vegetated layer

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	—		—				Sand	Sand & shells
3-16	10YR 4/1	99	10YR 3/6	1	C	M	clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ✓ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ✓ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 16

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Poseidon Salt Ponds City/County: _____ Sampling Date: 3-13-18

Applicant/Owner: _____ State: _____ Sampling Point: 2

Investigator(s): AZT & KP Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil ✓, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes _____ No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. Iva frut. ling	5	Y	N/I
2. Suaeda esteri	2	N	FACW
3. Sarc pac	5	Y	OBL
4. Fran sal	10	Y	FACW
5.			
	22 = Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2. Bat mar	30	Y	OBL
3. Mes nod	5	N	FAC
4.			
5.			
6.			
7.			
8.			
	45 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 55 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species _____	x 2 =	_____
FAC species _____	x 3 =	_____
FACU species _____	x 4 =	_____
UPL species _____	x 5 =	_____
Column Totals: _____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	7.5YR 4/4	100					sandy loam	
2-7	10YR 3/1	99	7.5 YR 3/4	1	C	M	"	
7-12	2.5Y 4/3	98	7.5YR 4/6	2	C	M	sand	
12-16	7.5YR 2.5/1	100	—				clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply) NONE

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Poseidon - Salt Ponds City/County: _____ Sampling Date: 3-13-13

Applicant/Owner: _____ State: _____ Sampling Point: 3

Investigator(s): _____ Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

No veg. Sample point is on edge of road above concrete rubble on inside slope of pond levee.

SOIL

Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2								road base - sand/gravel
* 2-16	10YR 3/1	98	10YR 4/6	2	C	M	clay loam	dredged bay mud
2-16	2.5Y 5/2	99	10YR 5/8	1	C	M	clay loam	"

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

* dredged bay mud, with shells and heterogeneous strata.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply) NONE

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Poseidon – Salt Ponds City/County: _____ Sampling Date: 3-13-18

Applicant/Owner: _____ State: _____ Sampling Point: 4

Investigator(s): _____ Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? NO Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? M (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. Sar pac	80	Y	OBL
2. Fra Sal	10	N	FACW
3.			
4.			
5.			
	90 = Total Cover		
Herb Stratum (Plot size: _____)			
1. Lin cal	1	N	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 99 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Sample point in pickleweed marsh on Bay side of levee.

SOIL

Sampling Point: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 4/1	75	5YR 4/6	25	C	M	s. clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): —

Water Table Present? Yes ✓ No ___ Depth (inches): 5

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 2

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Poseidon - Salt Ponds City/County: _____ Sampling Date: 3-13-13

Applicant/Owner: _____ State: _____ Sampling Point: 5

Investigator(s): _____ Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? No Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. Sar [redacted] pac	40	Y	OBL
2. Fra lat	30	Y	FACW
3.			
4.			
5.			
	70 = Total Cover		
Herb Stratum (Plot size: _____)			
1. Lim cal	40	Y	FACW
2. Triglochin concinna	35	N	OBL
3. Bolboschoenus maritimus	1	N	OBL
4.			
5.			
6.			
7.			
8.			
	76 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 24 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/2	100					Sandy clay	
2-10	10YR 4/2	97	5YR 4/6	3	C	M	Sand	
10-16	10YR 4/2	80	7.5YR 5/8	20	C	M	sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ✓ No ___ Depth (inches): 15

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 10

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Poseidon - Salt Ponds City/County: _____ Sampling Date: _____

Applicant/Owner: _____ State: _____ Sampling Point: 6

Investigator(s): _____ Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? yes Are "Normal Circumstances" present? Yes _____ No ✓

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes _____ No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1. _____			
2. _____			
3. _____			
4. _____			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
	= Total Cover		
Herb Stratum (Plot size: _____)			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
	= Total Cover		
Woody Vine Stratum (Plot size: _____)			
1. _____			
2. _____			
	= Total Cover		

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

Sampling point is on a berm w/in salt ponds. Berm was created by recent dredging.

Sampling Point: 6

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/1	100	—	—	—	—	sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

Dredged mud from salt ponds. Heterogeneous strata & discombobulated texture / constituents.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Poseidon - Salt Ponds City/County: _____ Sampling Date: 3-13-13

Applicant/Owner: _____ State: _____ Sampling Point: 7

Investigator(s): _____ Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____ No ✓	
Wetland Hydrology Present?	Yes _____ No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3. ✓			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3. ✓			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4. ✓			
5.			
6.			
7.			
8.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species _____	x 2 =	_____
FAC species _____	x 3 =	_____
FACU species _____	x 4 =	_____
UPL species _____	x 5 =	_____
Column Totals: _____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

On levee @ road edge - unvegetated

SOIL

Sampling Point: 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-8	7.5YR 5/4	100	—	—	—	—	Sandy loam	road fill - gravel/sand
8 = bottom of pit due to heavily compacted rock layer								

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Above high tide elevation

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Poseidon - Salt Ponds City/County: _____ Sampling Date: 3-13-13

Applicant/Owner: _____ State: _____ Sampling Point: 8

Investigator(s): _____ Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? yes Are "Normal Circumstances" present? Yes _____ No ✓

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Mes nod	90	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust Ø

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species _____	x 2 =	_____
FAC species _____	x 3 =	_____
FACU species _____	x 4 =	_____
UPL species _____	x 5 =	_____
Column Totals: _____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

On levee between salt ~~between~~ ponds.

SOIL

Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-4	2.5Y 5/3	100					Sand	
6-16	10YR 3/2	100					sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Poseidon – Salt Ponds City/County: _____ Sampling Date: 3-13-13

Applicant/Owner: _____ State: _____ Sampling Point: 9

Investigator(s): _____ Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? ✓ Are "Normal Circumstances" present? Yes _____ No ✓

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1. _____			
2. _____			
3. _____			
4. _____			
= Total Cover			
Sapling/Shrub Stratum (Plot size: _____)			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
= Total Cover			
Herb Stratum (Plot size: _____)			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
= Total Cover			
Woody Vine Stratum (Plot size: _____)			
1. _____			
2. _____			
= Total Cover			

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species _____	x 2 =	_____
FAC species _____	x 3 =	_____
FACU species _____	x 4 =	_____
UPL species _____	x 5 =	_____
Column Totals: _____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

No veg. on inside edge of levee of salt pond

SOIL

Sampling Point: 9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-6	2.5Y 3/2	100					silty sand	
6-16	2.5Y 3/1	100					silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ✓ Aquatic Invertebrates (B13) shells
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Poseidon- Salt Ponds City/County: _____ Sampling Date: 3-13-13

Applicant/Owner: _____ State: _____ Sampling Point: 10

Investigator(s): _____ Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? N Are "Normal Circumstances" present? Yes _____ No ✓

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____ No ✓	
Wetland Hydrology Present?	Yes _____ No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. Sua est	5	Y	FACW
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Mes nod	20	Y	FAC
2. Amb pus	64	Y	FACW
3.			
4.			
5.			
6.			
7.			
8.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 76 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Sample location is on upper edge of salt pond levee next to access road.

Sampling Point: 10

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-16	2.5Y 3/3	100					sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply) NONE

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Poseidon – Salt Ponds City/County: _____ Sampling Date: 3-8-13

Applicant/Owner: _____ State: _____ Sampling Point: 11

Investigator(s): _____ Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? NO Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. Sar pac	50	Y	OBL
2. Fra sal	10	N	FACW
3. Sue est	2	N	FACW
4.			
5.			
	62 = Total Cover		
Herb Stratum (Plot size: _____)			
1. Tri con	1	N	OBL
2. Bat mar	1	N	OBL
3. Sal big	5	Y	OBL
4.			
5.			
6.			
7.			
8.			
	7 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species _____	x 2 =	_____
FAC species _____	x 3 =	_____
FACU species _____	x 4 =	_____
UPL species _____	x 5 =	_____
Column Totals: _____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Sampling location is in salt marsh habitat along the Otay River channel.

SOIL

Sampling Point: 11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	2.5Y 4/1	85	5Y 4/6	15	C	M		
7-16	5Y 3/1	97	5Y 4/6	3	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ✓ No ___ Depth (inches): 14

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 8

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Poseidon – Salt Ponds City/County: _____ Sampling Date: 3-13-13

Applicant/Owner: _____ State: _____ Sampling Point: 12

Investigator(s): _____ Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? Yes Are "Normal Circumstances" present? Yes _____ No ✓

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes _____ No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1. _____			
2. _____			
3. _____			
4. _____			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
	= Total Cover		
Herb Stratum (Plot size: _____)			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
	= Total Cover		
Woody Vine Stratum (Plot size: _____)			
1. _____			
2. _____			
	= Total Cover		

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

No veg.

Sampling location is on levee btwn salt ponds. Next to road

SOIL

Sampling Point: 12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	N/A						Sand	road base
2-16	5Y 2.5/1	95	2.5YR 3/6	5	C	M	sandy silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

Dredged bay mud.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Poseidon - Salt Ponds City/County: _____ Sampling Date: 3-13-13

Applicant/Owner: _____ State: _____ Sampling Point: 13

Investigator(s): _____ Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? Y Are "Normal Circumstances" present? Yes _____ No ✓

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes _____ No ✓	

Remarks:
dredged bay mud.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Mes nod	3	N/A	FAC
2. ~~Mat~~			
3.			
4.			
5.			
6.			
7.			
8.			
	3 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 97 % Cover of Biotic Crust Ø

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: Ø (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:
Herb strata <5% so doesn't count as a strata.
Sampling location is on top of levee between ponds.

SOIL

Sampling Point: 13

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	2.5Y 3/1	100					silty clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

dredged soil. No defined strata.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ___ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Shells from dredged material are not natural at location

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Poseidon - Salt Ponds City/County: _____ Sampling Date: _____

Applicant/Owner: _____ State: _____ Sampling Point: L4

Investigator(s): _____ Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? N Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes _____ No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. Sue est	5	Y	FACW
2. Sar pac	5	Y	OBL
3.			
4.			
5.			
	10 = Total Cover		
Herb Stratum (Plot size: _____)			
1. Bat mar	50	Y	OBL
2. Son ole	2	N	NI
3. Malva par	1	N	NI
4. Mes nod	5	N	FAC
5. Atr semi	2	N	FAC
6. Hor mur	1	N	FACW
7.			
8.			
	61 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 39 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: 14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-4	10YR 3/3	100					loam	
4-10	2.5YR 2.5/1	100					clay loam	
10-16	5Y 5/2	100					sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Poseidon - Salt Ponds City/County: _____ Sampling Date: 3-13-13

Applicant/Owner: _____ State: _____ Sampling Point: 15

Investigator(s): _____ Section, Township, Range: _____

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): _____ Slope (%): _____

Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____

Soil Map Unit Name: _____ NWI classification: _____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil ✓, or Hydrology ✓ significantly disturbed? Y Are "Normal Circumstances" present? Yes _____ No ✓

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	= Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

Sampling point on inside slope of salt pond levee. Unvegetated.

SOIL

Sampling Point: 15

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	5Y 3/1	97	10YR 3/4	3	C	M	silty clay	
8-16	5Y 2.5/1	100					clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ✓ No ___ Depth (inches): 15

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 12

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX C

Site 3 Access Routes Study Area – Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon - ORERP | City/County: San Diego, San Diego | Sampling Date: 5/29/14

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: C1

Investigator(s): Andy Thomson | Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel | Local relief (concave, convex, none): concave | Slope (%): 0-20

Subregion (LRR): C - Mediterranean California | Lat: 32°3 5'29.95 "N | Long: 117°5'46.02W | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ◉	No ○	
Hydric Soil Present?	Yes ◉	No ○	**Is the Sampled Area within a Wetland?** Yes ◉ No ○
Wetland Hydrology Present?	Yes ◉	No ○	

Remarks: Sampling point is located at edge of FWM habitat along the Otay River channel.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Heliotropium currassivicum*	30	Yes	FACU
2. *Schoenoplectus californica*	50	Yes	OBL
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	80 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 20 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	50	x 1 =	50
FACW species		x 2 =	0
FAC species		x 3 =	0
FACU species	30	x 4 =	120
UPL species		x 5 =	0
Column Totals:	80 (A)		170 (B)

Prevalence Index = B/A = 2.13

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☒ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:

SOIL

Sampling Point: C1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture[3]	Remarks
0-6	7.5 YR 4/2	95	2.5 YR 4/8	5	C	M	clay loam	
6-16	10 YR 4/1	95	2.5 YR 4/8	5	C	M	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks: The soils exhibit low chroma, with Redox features.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☒ Drainage Patterns (B10)
- ☒ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ◉ No ○ Depth (inches): 8

Saturation Present? (includes capillary fringe) Yes ◉ No ○ Depth (inches): 6

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Data pit began to slowly fill approximately half way with water during analysis.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon - ORERP | City/County: San Diego, San Diego | Sampling Date: 5/29/14

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: C2

Investigator(s): Andy Thomson | Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel | Local relief (concave, convex, none): concave | Slope (%): 0-20

Subregion (LRR): C - Mediterranean California | Lat: 32°3 5'29.95 "N | Long: 117°5'46.02W | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ○	No ◉	
Hydric Soil Present?	Yes ○	No ◉	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks: Sampling point is located in MFS along outer edge of the Otay River channel.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Baccharis salicifolia*	80	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	80 %		
Herb Stratum			
1. *Ambrosia psilostachya*	30	Yes	FACU
2. *Glebionis coronaria*	30	Yes	Not Listed
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	60 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 40 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	80	x 3 =	240
FACU species	30	x 4 =	120
UPL species	30	x 5 =	150
Column Totals:	140 (A)		510 (B)

Prevalence Index = B/A = 3.64

Hydrophytic Vegetation Indicators:

- ◉ Dominance Test is >50%
- ◉ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:

SOIL

Sampling Point: C2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-14	10 YR 3/2	100	none				clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): _____

Water Table Present? Yes ○ No ◉ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): _____

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon - ORERP | City/County: San Diego, San Diego | Sampling Date: 5/29/14

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: C3

Investigator(s): Andy Thomson | Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): floodplain terrace | Local relief (concave, convex, none): none | Slope (%): 0-5

Subregion (LRR): C - Mediterranean California | Lat: 32°3 5'29.95 "N | Long: 117°5'46.02W | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ○	No ◉	
Hydric Soil Present?	Yes ○	No ◉	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks: Sampling point is located in restoration area along bike path.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Baccharis salicifolia*	20	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	20 %		
Herb Stratum			
1. *Heliotropium currassivicum*	80	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	80 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 20 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	20	x 3 =	60
FACU species	80	x 4 =	320
UPL species		x 5 =	0
Column Totals:	100 (A)		380 (B)

Prevalence Index = B/A = 3.80

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:

SOIL

Sampling Point: C3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-4	7.5 YR 3/3	100	none				clay loam	
4-5	5 YR 3/4	100	none				clay	moist from irrigation
5-16	10 YR 3/2	100	none				clay loam	moist from irrigation

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon - ORERP | City/County: San Diego, San Diego | Sampling Date: 5/29/14

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: C4

Investigator(s): Andy Thomson | Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): floodplain terrace | Local relief (concave, convex, none): none | Slope (%): 0-5

Subregion (LRR): C - Mediterranean California | Lat: 32°3 5'29.95 "N | Long: 117°5'46.02W | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ○	No ◉	
Hydric Soil Present?	Yes ○	No ◉	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks: Sampling point is located in MFS that was existing prior to implementation of floodplain restoration that surrounds this habitat.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Baccharis salicifolia*	80	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	80 %		
Herb Stratum			
1. *Heliotropium currassivicum*	2	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	2 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 98 % % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	80	x 3 =	240
FACU species	2	x 4 =	8
UPL species		x 5 =	0
Column Totals:	82 (A)		248 (B)

Prevalence Index = B/A = 3.02

Hydrophytic Vegetation Indicators:

- ◉ Dominance Test is >50%
- ◉ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks: The vegetation at this location was present prior to restoration implementation.

SOIL

Sampling Point: C4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-14	10 YR 3/2	100	none				clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks: None

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Adjacent areas are irrigated for floodplain restoration site.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon - ORERP | City/County: San Diego, San Diego | Sampling Date: 5/29/14

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: C5

Investigator(s): Andy Thomson | Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): floodplain terrace | Local relief (concave, convex, none): none | Slope (%): 0-5

Subregion (LRR): C - Mediterranean California | Lat: 32°3 5'29.95 "N | Long: 117°5'46.02W | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation [ ] Soil [x] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes ( ) No (●)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )	
Hydric Soil Present?	Yes ( )	No (●)	**Is the Sampled Area within a Wetland?** Yes ( ) No (●)
Wetland Hydrology Present?	Yes ( )	No (●)	

Remarks: Sampling point is located in floodplain restoration site between two rows of planted and irrigated shrubs and trees.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix gooddingii*	5	Yes	FACW
2. *Salix lasiolepis*	10	Yes	FACW
3. *Populus fremontii*	5	Yes	Not Listed
4.			
Total Cover:	20 %		
Sapling/Shrub Stratum			
1. *Baccharis salicifolia*	20	Yes	FAC
2. *Sambucus nigra*	5	No	FAC
3. *Salix exigua*	5	No	FACW
4. *Isocoma menziesii*	5	No	FAC
5. *Rosa californica*	2	No	FAC
Total Cover:	37 %		
Herb Stratum			
1. *Heliotropium currassivicum*	2	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	2 %		
Woody Vine Stratum			
1. *Rubus ursinus*	2	Yes	FACU
2. *Vitis girdiana*	1	Yes	FAC
Total Cover:	3 %		

% Bare Ground in Herb Stratum 98 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 57.1 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species	20	x 2 =	40
FAC species	33	x 3 =	99
FACU species	4	x 4 =	16
UPL species	5	x 5 =	25
Column Totals:	62 (A)		180 (B)

Prevalence Index = B/A = 2.90

Hydrophytic Vegetation Indicators:

[x] Dominance Test is >50%

[x] Prevalence Index is ≤3.0[1]

[ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

[ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks: The vegetation at this location was planted as part of the floodplain restoration project. All of the native vegetation is being actively irrigated with drip lines.

SOIL

Sampling Point: C5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-16	10 YR 3/2	100	none				clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks: None. Soil is poorly developed and homogeneous from previous agricultural cultivation.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No hydrology indicators present. Area is actively irrigated for floodplain restoration. Soils are moist below about 2 inches from the irrigation.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon - ORERP | City/County: San Diego, San Diego | Sampling Date: 5/29/14

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: C6

Investigator(s): Andy Thomson | Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel | Local relief (concave, convex, none): concave | Slope (%): 0-5

Subregion (LRR): C - Mediterranean California | Lat: 32°3 5'29.95 "N | Long: 117°5'46.02W | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes (●) No ( ) (If no, explain in Remarks.)

Are Vegetation [ ] Soil [ ] or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? Yes (●) No ( )

Are Vegetation [ ] Soil [ ] or Hydrology [ ] naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes (●)	No ( )	
Hydric Soil Present?	Yes (●)	No ( )	**Is the Sampled Area within a Wetland?** Yes (●) No ( )
Wetland Hydrology Present?	Yes (●)	No ( )	

Remarks: Sampling point is located in channel north of bike path.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
Total Cover:	%		
Herb Stratum			
1. *Heliotropium currassivicum*	2	No	FACU
2. *Sarcoconia pacifica*	50	Yes	OBL
3. *Distichlis spicata*	5	No	FAC
4. *Limonium californicum*	5	No	FACW
5. *Ambrosia psilostachya*	5	No	FACU
6. *Pluchea odorata*	2	No	FACW
7. *Atriplex prostrata*	2	No	FACW
8.			
Total Cover:	71 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 29 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	50	x 1 =	50
FACW species	9	x 2 =	18
FAC species	5	x 3 =	15
FACU species	7	x 4 =	28
UPL species		x 5 =	0
Column Totals:	71 (A)		111 (B)

Prevalence Index = B/A = 1.56

Hydrophytic Vegetation Indicators:

- [X] Dominance Test is >50%
- [X] Prevalence Index is ≤3.0[1]
- [ ] Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- [ ] Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes (●) No ( )

Remarks: Vegetation is salt marsh. The vegetation community covers the bottom of the channel (there is no active flow path).

SOIL

Sampling Point: C6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-1	10 YR 2/2	100	none				sandy clay	
1-2	10 YR 4/3	90	2.5 YR 3/6	10	C	M	sand	
2-6	10 YR 4/2	80	2.5 YR 3/6	20	C	M	sand	
6-7	2.5 YR 5/4	100	none				clay	
7-11	10 YR 3/2	90	2.5 YR 3/6	10	C	M	sandy clay	
11-16	10 YR 4/1	100	none				clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☒ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ◉ No ○

Remarks: Sandy redox at 2-6 inches.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☒ Sediment Deposits (B2) (**Riverine**)
- ☒ Drift Deposits (B3) (**Riverine**)
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ◉ No ○

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Sampling point is within a defined channel. The bottom of the channel is more swale like: fully vegetated with no active flow path.

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: Poseidon - ORERP | City/County: San Diego, San Diego | Sampling Date: 5/29/14

Applicant/Owner: Poseidon Resources | State: CA | Sampling Point: C7

Investigator(s): Andy Thomson | Section, Township, Range: Sections 20 and 21, Township 18S, Range 2W

Landform (hillslope, terrace, etc.): channel | Local relief (concave, convex, none): concave | Slope (%): 0-20

Subregion (LRR): C - Mediterranean California | Lat: 32°3 5'29.95 "N | Long: 117°5'46.02W | Datum: NAD83

Soil Map Unit Name: | NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ (If no, explain in Remarks.)

Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ◉ No ○

Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ○	No ◉	
Hydric Soil Present?	Yes ○	No ◉	**Is the Sampled Area within a Wetland?** Yes ○ No ◉
Wetland Hydrology Present?	Yes ○	No ◉	

Remarks: Sampling point is located in MFS on inner side slope of perimeter berm along channel.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:	%		
Sapling/Shrub Stratum			
1. *Baccharis salicifolia*	90	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	90 %		
Herb Stratum			
1. *Heliotropium currassivicum*	5	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	5 %		
Woody Vine Stratum			
1.			
2.			
Total Cover:	%		

% Bare Ground in Herb Stratum 95 % | % Cover of Biotic Crust %

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0 % (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	0
FACW species		x 2 =	0
FAC species	90	x 3 =	270
FACU species	5	x 4 =	20
UPL species		x 5 =	0
Column Totals:	95 (A)		290 (B)

Prevalence Index = B/A = 3.05

Hydrophytic Vegetation Indicators:

- ◉ Dominance Test is >50%
- ◉ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:

SOIL

Sampling Point: C7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture[3]	Remarks
0-14	10 YR 3/3	100	none				loam	on berm

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix.

[3]Soil Textures: Clay, Silty Clay, Sandy Clay, Loam, Sandy Clay Loam, Sandy Loam, Clay Loam, Silty Clay Loam, Silt Loam, Silt, Loamy Sand, Sand.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils:[4]

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[4]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? Yes ○ No ◉

Remarks: Sampling point is on berm next to channel. Soil is poorly developed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches):

Water Table Present? Yes ○ No ◉ Depth (inches):

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches):

Wetland Hydrology Present? Yes ○ No ◉

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No hydrology indicators.

APPENDIX D

Otay River/Pond 20 Study Area – Preliminary Jurisdictional Determination Form

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

District Office: Los Angeles District | File/ORM #: SPL-2011-00743-PJB | PJD Date: Oct 15, 2012

State: CA | City/County: Chula Vista, San Diego

Nearest Waterbody: Otay River and San Diego Bay

Location: TRS, LatLong or UTM: longitude 117°5'46.02" W and latitude 32°35'29.95" N

Name/ Address of Person Requesting PJD: Stan Williams, Poseidon Resources, 501 West Broadway, Suite 2020, San Diego, CA 92101

Identify (Estimate) Amount of Waters in the Review Area:

Non-Wetland Waters: 9,000 linear ft | 60 width | 7.08 acres | Stream Flow: Perennial

Wetlands: 8.23 acre(s) | Cowardin Class: Estuarine

Name of Any Water Bodies on the Site Identified as Section 10 Waters: Tidal: Otay River and Nestor Creek merging into SD Bay | Non-Tidal:

☐ Office (Desk) Determination
☑ Field Determination: Date of Field Trip: multiple dates; see be

SUPPORTING DATA: Data reviewed for preliminary JD (check all that apply - checked items should be included in case file and, where checked and requested, appropriately reference sources below):

- ☑ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: Dudek JD Report
- ☑ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - ☑ Office concurs with data sheets/delineation report.
  - ☐ Office does not concur with data sheets/delineation report.
- ☑ Data sheets prepared by the Corps
- ☐ Corps navigable waters' study:
- ☐ U.S. Geological Survey Hydrologic Atlas:
  - ☐ USGS NHD data.
  - ☐ USGS 8 and 12 digit HUC maps.
- ☐ U.S. Geological Survey map(s). Cite quad name:
- ☑ USDA Natural Resources Conservation Service Soil Survey. Citation: Websoil Survey: websoilsurvey.nrcs.usda.gov
- ☑ National wetlands inventory map(s). Cite name: NWI website: www.fws.gov/wetlands
- ☐ State/Local wetland inventory map(s):
- ☐ FEMA/FIRM maps:
- ☐ 100-year Floodplain Elevation is:
- ☑ Photographs: ☑ Aerial (Name & Date): NAIP 2009
  - ☑ Other (Name & Date): Field photos in JD report; 2011
- ☐ Previous determination(s). File no. and date of response letter:
- ☑ Other information (please specify): Historic T Sheet Section 10

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Signature and Date of Regulatory Project Manager (REQUIRED): 10/31/2012

Signature and Date of Person Requesting Preliminary JD (REQUIRED, unless obtaining the signature is impracticable)

EXPLANATION OF PRELIMINARY AND APPROVED JURISDICTIONAL DETERMINATIONS:

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "preconstruction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

Appendix A - Sites

District Office	Los Angeles District	File/ORM #	SPL-2011-00743-PJB	PJD Date:	Oct 15, 2012
State	CA	City/County	Chula Vista/ San Diego	Person Requesting PJD	Stan Williams (Poseidon Resources)

Site Number	Latitude	Longitude	Cowardin Class	Est. Amount of Aquatic Resource in Review Area	Class of Aquatic Resource
1	32°35'34.34" N	117°5'46.34" W	Riverine	1.28 acres	Non-Section 10 wetland
2	32°35'33.46" N	117°5'52.18" W	Estuarine	6.07 acres	Non-Section 10 wetland
3	32°35'27.91" N	117°5'54.36" W	Estuarine	0.89 acre	Non-Section 10 wetland
4	32°35'27.91" N	117°5'54.36" W	Estuarine	3.46 acres	Non-Section 10 non-wetland
5	32°35'41.06" N	117°5'34.95" W	Riverine	0.31 acre	Non-Section 10 wetland
6	32°35'32.56" N	117°5'55.56" W	Estuarine	3.31 acres	Section 10 tidal

Notes:

Initial field work conducted by Dudek on February 22, 2011 and July 20, 2011, followed by field work conducted by ACOE August 1 through August 8, 2012.

Site #1 = Cismontane alkali marsh
Site #2 = Salt marsh associated with Otay River and Nestor Creek channels
Site #3 = Wetlands within Salt Pond 20
Site #4 = Non-wetlands within Salt Pond 20
Site #5 = Fresh water marsh on Otay River upstream of tidal influence
Site #6 = Brackish water of Otay River and Nestor Creek tidal channels

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL		
Applicant: County of San Diego, DPW	File Number: SPL-2011-00980-MBS	Date:
Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
	APPROVED JURISDICTIONAL DETERMINATION	D
X	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/cecw/pages/reg_materials.aspx or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

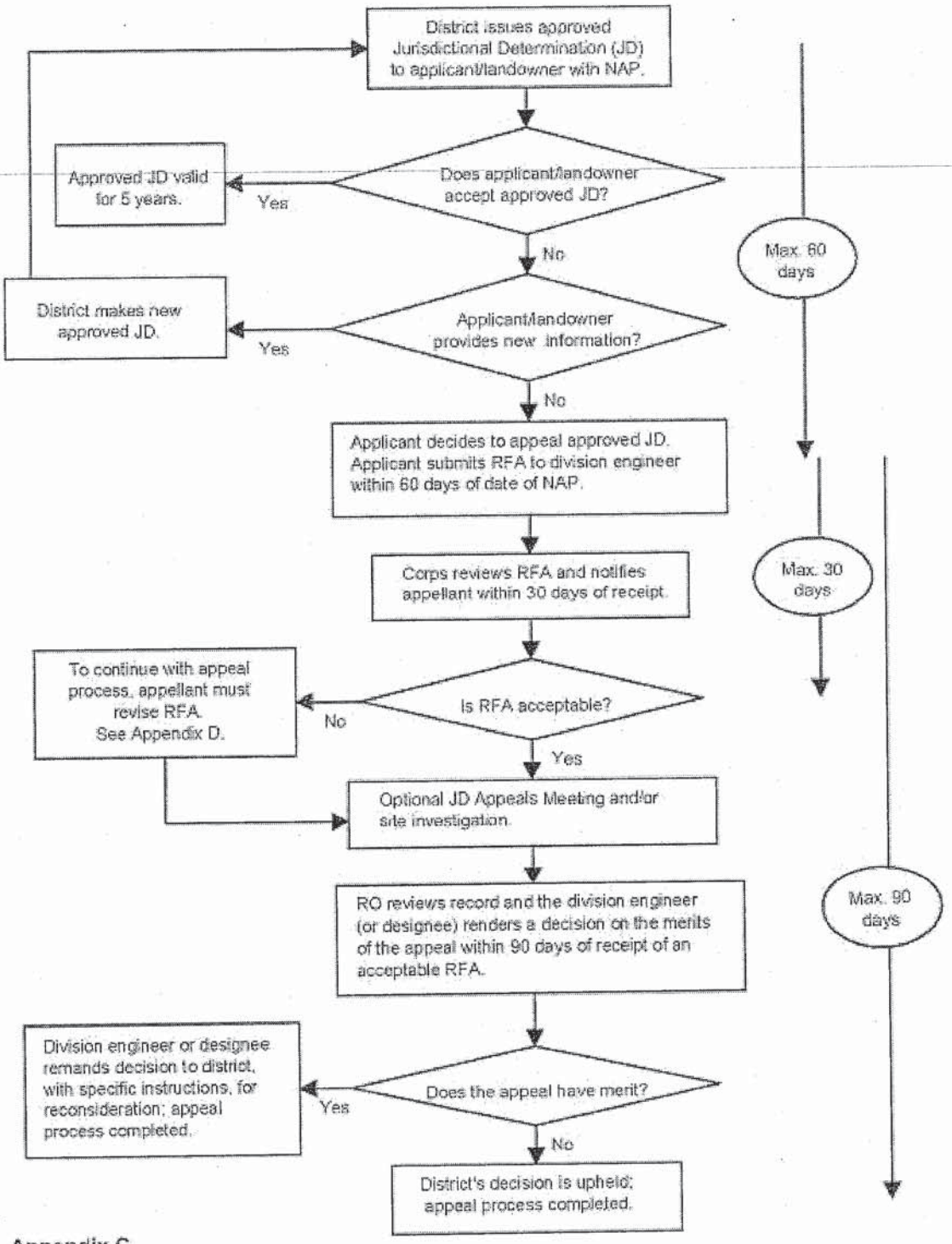
C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.

- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

Administrative Appeal Process for Approved Jurisdictional Determinations



Appendix C

APPENDIX E

Ponds 12-15 Study Area – Preliminary Jurisdictional Determination Form

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT CORPS OF ENGINEERS
REGULATORY DIVISION, CARLSBAD FIELD OFFICE
5900 LA PLACE COURT, SUITE 100
CARLSBAD, CA 92008

November 12, 2013

REPLY TO
ATTENTION OF
Regulatory Division

Mr. Stan Williams
Poseidon Resources
5780 Fleet Street, Suite 140
Carlsbad, CA 92008

SUBJECT: Preliminary Jurisdictional Determination regarding presence/absence of geographic jurisdiction

Dear Mr. Williams:

Reference is made to your request (File No. SPL-2011-00743-MBS) dated July 10, 2013, for a preliminary Department of the Army (DA) jurisdictional determination (JD) for the Poseidon Salt Marsh Restoration Site Ponds 12-15 located in the City of Chula Vista, San Diego County, California (Latitude 32.60321, Longitude -117.10728). As part of the evaluation process, we have made the jurisdictional determination below.

As you may know, the U.S. Army Corps of Engineers' (Corps) evaluation process for determining whether or not a DA permit is needed involves two tests. If both tests are met, then a permit is required. The first test determines whether or not the proposed project is located in a water of the U.S. (i.e., it is within the Corps' geographic jurisdiction). The second test determines whether or not the proposed project is a regulated activity under section 10 of the Rivers and Harbors Act or section 404 of the Clean Water Act (CWA). As part of the evaluation process, pertaining to the first test only, we have made the jurisdictional determination below.

Based on available information, it appears waters of the U.S. may be present on the Poseidon Salt Marsh Restoration Site Ponds 12-15 in the approximate locations noted on the enclosed drawings. The basis for the preliminary JD can be found on the enclosed "Preliminary Jurisdictional Determination Form." Please note preliminary JDs are non-binding ". . . written indications that there may be waters of the United States, including wetlands, on a parcel or indications of the approximate location(s) of waters of the United States or wetlands on a parcel. Preliminary JDs are advisory in nature and may not be appealed" (33 CFR 331.2.). The permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved JD for this site. The option to obtain an approved JD in this instance and at this time has been declined. For purposes of computation of impacts, compensatory mitigation requirements, and other resource protection measures, a permit decision

made on the basis of a preliminary JD will treat all potential waters and wetlands that would be affected in any way by the permitted activity on the site as if they are jurisdictional waters of the U.S.

Please be reminded that preliminary JDs may not be appealed through the Corps' administrative appeal process set out at 33 CFR Part 331. Preliminary jurisdictional determinations are fully explained in the enclosed Regulatory Guidance Letter 08-02, dated June 26, 2008. Further, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 CFR Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 CFR 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

This determination has been conducted to identify the extent of the Corps' CWA jurisdiction on the Poseidon Salt Marsh Restoration Site Ponds 12-15 identified in your request. This determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are U.S. Department of Agriculture (USDA) program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

If you have any questions, please contact me at 760-602-4836 or via e-mail at Meris.Bantilan-Smith@usace.army.mil.

Please be advised that you can now comment on your experience with Regulatory Division by accessing the Corps web-based customer survey form at: http://per2.nwp.usace.army.mil/survey.html.

Sincerely,

Meris Bantilan-Smith
Senior Project Manager
South Coast Branch

Enclosures

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

District Office: Los Angeles District | File/ORM #: SPL-2011-00743-MBS | PJD Date: Nov 8, 2013

State: CA | City/County: Chula Vista/San Diego

Nearest Waterbody: San Diego Bay

Location: TRS, LatLong or UTM: 32.60321 N, -117.10728 W

Name/ Address of Person Requesting PJD: Stan Williams, Poseidon Resources, 5780 Fleet Street, Suite 140, Carlsbad, CA 92008

Identify (Estimate) Amount of Waters in the Review Area:

Non-Wetland Waters: 291.14 linear ft | width | acres | Stream Flow: Perennial

Wetlands: 8.12 acre(s) | Cowardin Class: Estuarine

Name of Any Water Bodies on the Site Identified as Section 10 Waters: Tidal: San Diego Bay, Otay River, Palomar Street Chan; Non-Tidal:

- ☐ Office (Desk) Determination
- ☑ Field Determination: Date of Field Trip: Nov 4, 2013

SUPPORTING DATA: Data reviewed for preliminary JD (check all that apply - checked items should be included in case file and, where checked and requested, appropriately reference sources below):

- ☑ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: See notes.
- ☑ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - ☑ Office concurs with data sheets/delineation report.
  - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps
- ☐ Corps navigable waters' study:
- ☐ U.S. Geological Survey Hydrologic Atlas:
  - ☐ USGS NHD data.
  - ☐ USGS 8 and 12 digit HUC maps.
- ☐ U.S. Geological Survey map(s). Cite quad name:
- ☑ USDA Natural Resources Conservation Service Soil Survey. Citation: Websoil Survey: websoilsurvey.nrcs.usda.gov
- ☑ National wetlands inventory map(s). Cite name: NWI website: www.fws.gov/wetlands
- ☐ State/Local wetland inventory map(s):
- ☐ FEMA/FIRM maps:
- ☐ 100-year Floodplain Elevation is:
- ☑ Photographs: ☑ Aerial (Name & Date): NAIP 2009
  - ☑ Other (Name & Date): Field photos in JD report: 2013
- ☐ Previous determination(s). File no. and date of response letter:
- ☑ Other information (please specify): See notes.

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

11/12/13
Signature and Date of Regulatory Project Manager (REQUIRED)

11/11/2013
Signature and Date of Person Requesting Preliminary JD (REQUIRED, unless obtaining the signature is impracticable)

EXPLANATION OF PRELIMINARY AND APPROVED JURISDICTIONAL DETERMINATIONS:

1 The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

2 In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "preconstruction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

Appendix A - Sites

District Office: Los Angeles District | File/ORM #: SPL-2011-00743-MBS | PJD Date: Nov 8, 2013

State: CA | City/County: Chula Vista/San Diego | Person Requesting PJD: Stan Williams (Poseidon Resources)

Site Number	Latitude	Longitude	Cowardin Class	Est. Amount of Aquatic Resource in Review Area	Class of Aquatic Resource
1	32°36'17.31"N	117° 6'23.71"W	Estuarine	0.89	Section 10 tidal
2	32°35'49.08"N	117° 6'54.03"W	Estuarine	1.69	Section 10 tidal
3	32°36'28.07"N	117° 6'10.83"W	Estuarine	18.16	Non-Section 10 non-wetlanc
4	32°36'19.35"N	117° 6'10.55"W	Estuarine	270.42	Section 10 tidal
5	32°36'42.85"N	117° 6'5.05"W	Estuarine	8.12	Non-Section 10 wetland

Notes:

Site #1 = Beach (associated with the open bay side of the salt pond levees)
Site #2 = Brackishwater (associated with the tidal channels in the Otay River and Palomar Channel)
Site #3 = Salt Pond Levee (area on the salt pond side of the salt pond levees above mean high tide level)
Site #4 = Open Water (includes both the open water in the salt ponds and open water in the bay)
Site #5 = Southern Coastal Salt Marsh and disturbed Southern Coastal Salt Marsh above mean high tide level (salt marsh habitat associated with the tidal channels and the bay side of the shoreline along the salt pond levees)

July 10, 2013. Results of a Preliminary Jurisdictional Wetland Delineation on Salt Ponds 12-15 for the Proposed Poseidon Salt Marsh Restoration Site, City of Chula Vista, California.

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Stan Williams, Poseidon Resources	File Number: SPL-2011-00473-MBS	Date: November 12, 2013

Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
	APPROVED JURISDICTIONAL DETERMINATION	D
X	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://usace.army.mil/inet/functions/cw/cecwo/reg or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:

DISTRICT ENGINEER
Los Angeles District, Corps of Engineers
ATTN: Chief, Regulatory Division
P.O. Box 532711
Los Angeles, CA 90053-2325
Tel. (213) 452-3425

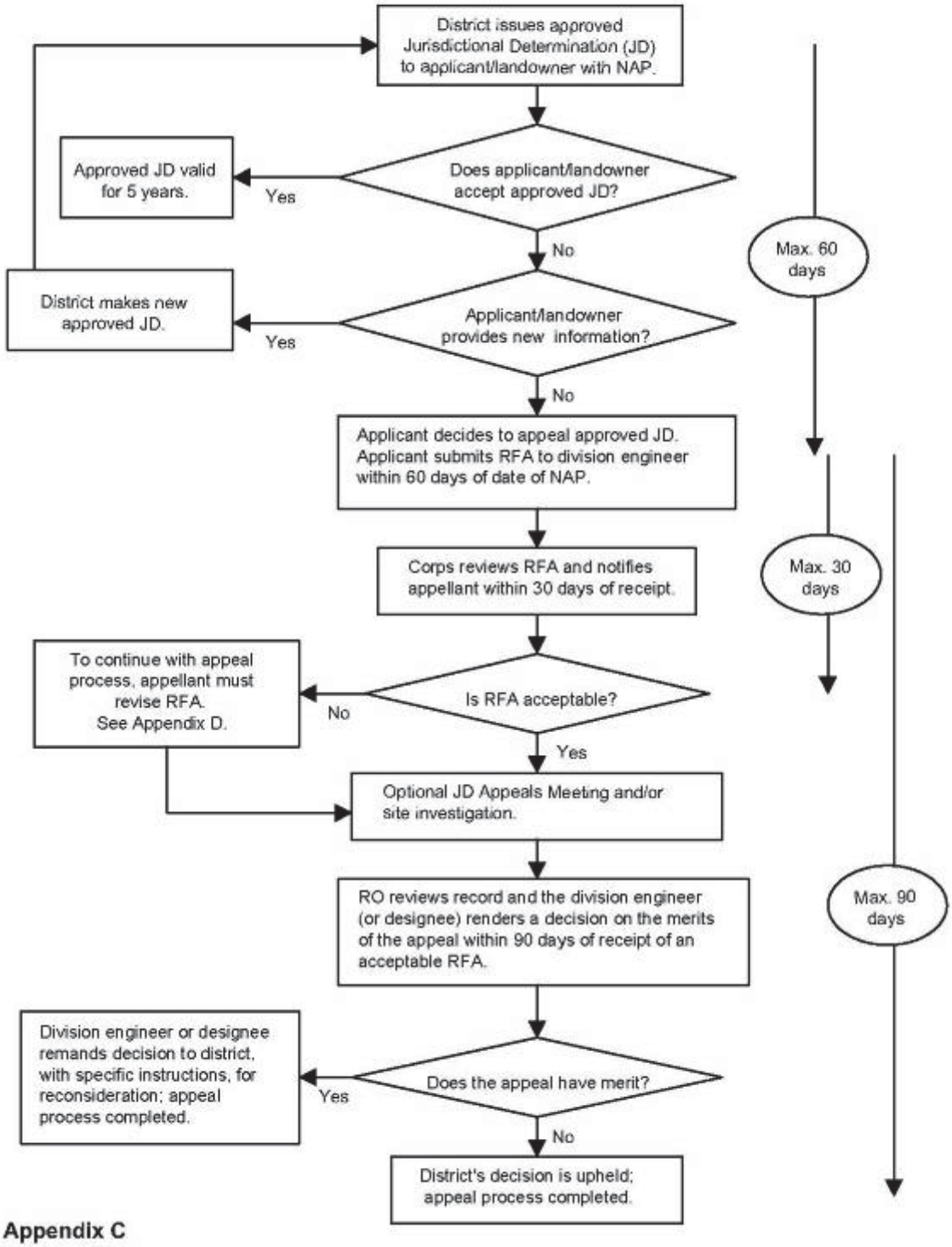
If you only have questions regarding the appeal process you may also contact:

DIVISION ENGINEER
South Pacific Division, Corps of Engineers
Attn: Tom Cavanaugh
Administrative Appeal Review Officer
South Pacific Division, CESPD-PDS-O, 2052B
1455 Market Street, San Francisco, California 94103-1399
Phone: (415) 503-6574 Fax: (415) 503-6646
Email: thomas.j.cavanaugh@usace.army.mil

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

	Date:	Telephone number:
_____ Signature of appellant or agent.		

Administrative Appeal Process for Approved Jurisdictional Determinations



Appendix C



SOURCE: NAIP 2009

DUDEK

6758-01

FIGURE 3

Vegetation Communities with Jurisdictional Delineation

Preliminary Jurisdictional Wetland Delineation on Salt Ponds 12-15 for the Poseidon Salt Marsh Restoration Site



DUDEK

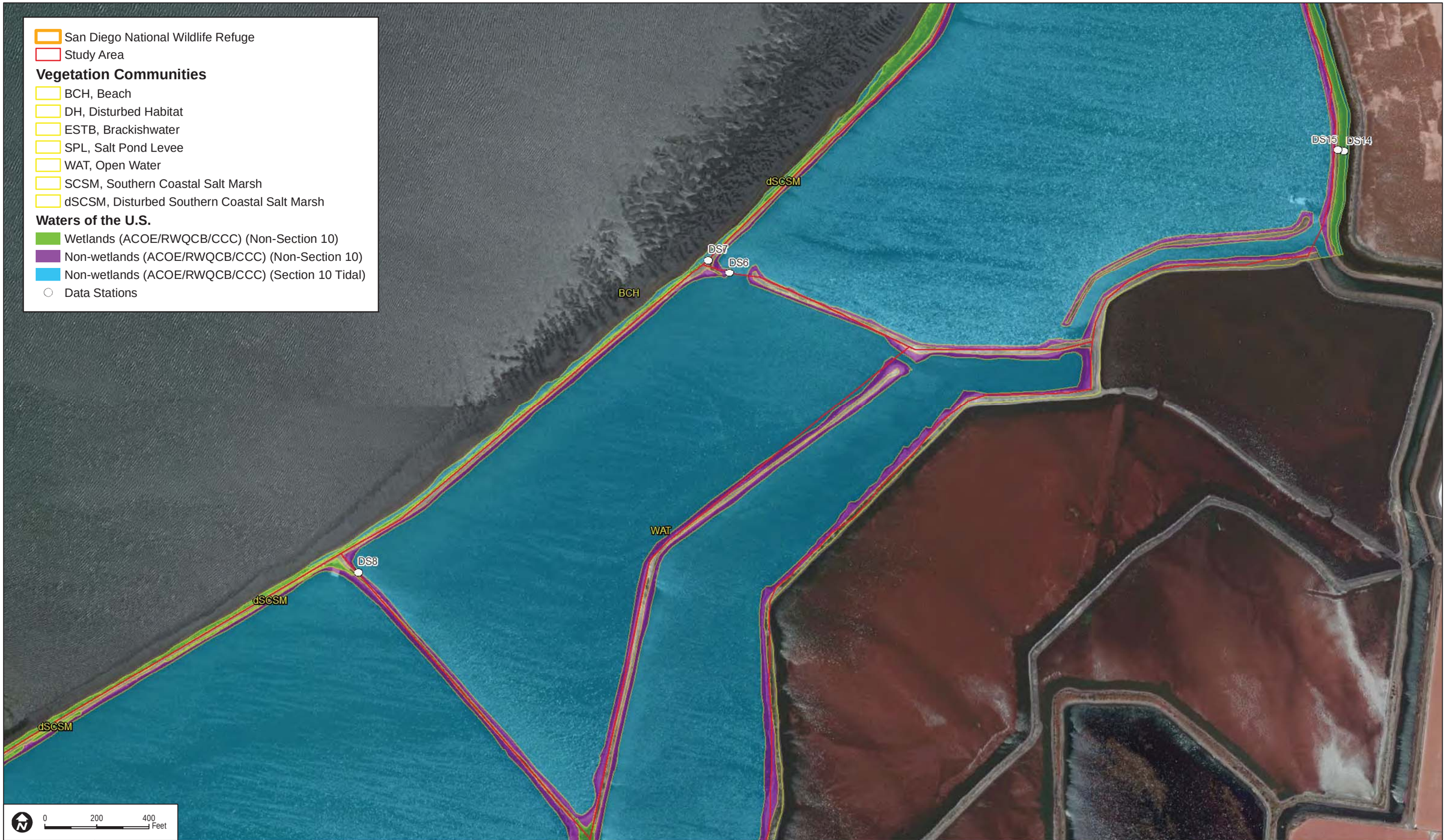
6758-01

SOURCE: NAIP 2009

FIGURE 3a

Vegetation Communities with Jurisdictional Delineation

Preliminary Jurisdictional Wetland Delineation on Salt Ponds 12-15 for the Poseidon Salt Marsh Restoration Site



DUDEK

6758-01

SOURCE: NAIP 2009

FIGURE 3b

Vegetation Communities with Jurisdictional Delineation

Preliminary Jurisdictional Wetland Delineation on Salt Ponds 12-15 for the Poseidon Salt Marsh Restoration Site



DUDEK

6758-01

SOURCE: NAIP 2009

FIGURE 3c

Vegetation Communities with Jurisdictional Delineation

Preliminary Jurisdictional Wetland Delineation on Salt Ponds 12-15 for the Poseidon Salt Marsh Restoration Site

APPENDIX F

Site 3 Access Routes Study Area – Preliminary Jurisdictional Determination Form

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

District Office: Los Angeles District | File/ORM #: SPL-2011-00743 | PJD Date: May 27, 2014

State: CA | City/County: Chula Vista/ San Diego

Nearest Waterbody: Otay River and San Diego Bay

Location: TRS, LatLong or UTM: longitude 117°5'46.02" W and latitude 32°35'29.95" N

Name/ Address of Person Requesting PJD: Stan Williams (Poseidon Resources)
5780 Fleet St. Ste. 140
Carlsbad, CA 92008

Identify (Estimate) Amount of Waters in the Review Area:

Non-Wetland Waters: 1,000 linear ft | 50 width | 4.85 acres | Stream Flow: Perennial

Wetlands: 3.04 acre(s) | Cowardin Class: Estuarine

Name of Any Water Bodies on the Site Identified as Section 10 Waters:
Tidal: Palomar Channel, salt ponds, San Diego Bay
Non-Tidal:

☐ Office (Desk) Determination
☑ Field Determination: Date of Field Trip: May 27, 2014

SUPPORTING DATA: Data reviewed for preliminary JD (check all that apply - checked items should be included in case file and, where checked and requested, appropriately reference sources below):

- ☑ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: Dudek JD Report
- ☑ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  - ☐ Office concurs with data sheets/delineation report.
  - ☐ Office does not concur with data sheets/delineation report.
- ☐ Data sheets prepared by the Corps
- ☐ Corps navigable waters' study:
- ☐ U.S. Geological Survey Hydrologic Atlas:
  - ☐ USGS NHD data.
  - ☐ USGS 8 and 12 digit HUC maps.
- ☐ U.S. Geological Survey map(s). Cite quad name:
- ☑ USDA Natural Resources Conservation Service Soil Survey. Citation: Websoil Survey: websoilsurvey.nrcs.usda.gov
- ☑ National wetlands inventory map(s). Cite name: NWI website: www.fws.gov/wetlands
- ☐ State/Local wetland inventory map(s):
- ☐ FEMA/FIRM maps:
- ☐ 100-year Floodplain Elevation is:
- ☑ Photographs: ☑ Aerial (Name & Date): Bing 2014
  ☑ Other (Name & Date): Field photos in JD report; May 27, 2014
- ☐ Previous determination(s). File no. and date of response letter:
- ☑ Other information (please specify): Historic T Sheet Section 10

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

Signature and Date of Regulatory Project Manager (REQUIRED)

Signature and Date of Person Requesting Preliminary JD (REQUIRED, unless obtaining the signature is impracticable)

EXPLANATION OF PRELIMINARY AND APPROVED JURISDICTIONAL DETERMINATIONS:

1. The Corps of Engineers believes that there may be jurisdictional waters of the United States on the subject site, and the permit applicant or other affected party who requested this preliminary JD is hereby advised of his or her option to request and obtain an approved jurisdictional determination (JD) for that site. Nevertheless, the permit applicant or other person who requested this preliminary JD has declined to exercise the option to obtain an approved JD in this instance and at this time.

2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "preconstruction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an approved JD for the activity, the permit applicant is hereby made aware of the following: (1) the permit applicant has elected to seek a permit authorization based on a preliminary JD, which does not make an official determination of jurisdictional waters; (2) that the applicant has the option to request an approved JD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an approved JD could possibly result in less compensatory mitigation being required or different special conditions; (3) that the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) that the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) that undertaking any activity in reliance upon the subject permit authorization without requesting an approved JD constitutes the applicant's acceptance of the use of the preliminary JD, but that either form of JD will be processed as soon as is practicable; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a preliminary JD constitutes agreement that all wetlands and other water bodies on the site affected in any way by that activity are jurisdictional waters of the United States, and precludes any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an approved JD or a preliminary JD, that JD will be processed as soon as is practicable. Further, an approved JD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331, and that in any administrative appeal, jurisdictional issues can be raised (see 33 C.F.R. 331.5(a)(2)). If, during that administrative appeal, it becomes necessary to make an official determination whether CWA jurisdiction exists over a site, or to provide an official delineation of jurisdictional waters on the site, the Corps will provide an approved JD to accomplish that result, as soon as is practicable.

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

This preliminary JD finds that there *"may be"* waters of the United States on the subject project site, and identifies all aquatic features on the site that could be affected by the proposed activity, based on the following information:

Appendix A - Sites

District Office	Los Angeles District	File/ORM #	SPL-2011-0000743	PJD Date:	May 27, 2014
State	CA	City/County	Chula Vista/ San Diego	Person Requestinq PJD	Stan Williams (Poseidon Resources)

Site Number	Latitude	Longitude	Cowardin Class	Est. Amount of Aquatic Resource in Review Area	Class of Aquatic Resource
1	32°35'40" N	117°5'33" W	Riverine	0.85 Acres	Non-Section 10 wetland
2	32°35'14" N	117°6'14" W	Estuarine	0.07	Non-Section 10 non-wetlanc
3	32°36'18" N	117°5'49" W	Estuarine	0.14	Section 10 tidal
4	32°36'46" N	117°5'58" W	Estuarine	0.76	Non-Section 10 non-wetlanc
5	32°36'16" N	117°5'50" W	Estuarine	3.88	Section 10 tidal
6	32°36'18" N	117°5'47" W	Estuarine	2.19	Non-Section 10 wetland

Notes:

Site #1 = Freshwater marsh on Otay River and salt marsh in tributary channel upstream of tidal influence
Site #2 = Non-wetlands within Salt Pond 20
Site #3 = Palomar Street channel brackish water tidal channel
Site #4 = Salt pond levee (levee slope on the salt pond side of the salt pond levees)
Site #5 = Open water in salt ponds and in San Diego Bay at tie-in point for restoration site
Site #6 = Southern coastal salt marsh along Palomar Street channel

APPENDIX C

California Gnatcatcher Survey Report

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

June 23, 2011 6758-01

U.S. Fish and Wildlife Service
Attention: Recovery Permit Coordinator
6010 Hidden Valley Road
Carlsbad, California 92009

Subject: ***2011 Focused Presence-Absence California Gnatcatcher Survey Report for the Poseidon Desalination Project Mitigation Site, City of San Diego, California. Permit No. TE-781084***

Dear Recovery Permit Coordinator:

This report documents the results of three protocol-level presence/absence surveys for the coastal California gnatcatcher (*Polioptila californica californica;* CAGN), which were conducted at the approximately 100-acre Poseidon Desalination Project Mitigation site by a Dudek biologist in March and April 2011. The surveys were conducted in all areas of suitable habitat.

The CAGN is a federally listed threatened species and a California Department of Fish and Game species of special concern. It is closely associated with coastal sage scrub habitat and typically occurs below 950 feet elevation and on slopes less than 40% (Atwood 1990), but CAGN have been observed at elevations greater than 2,000 feet. The species is threatened primarily by loss, degradation, and fragmentation of coastal sage scrub habitat and is also impacted by brown-headed cowbird (*Molothrus ater*; cowbird) nest parasitism.

LOCATION AND EXISTING CONDITIONS

The proposed Poseidon Desalination Project mitigation site occupies approximately 100 acres of the South Bay unit of the San Diego Bay National Wildlife Refuge in the City of San Diego (City). The site is located north of Palm Avenue, south of the Salt Works, west of Interstate 5, and east of the developed area of Imperial Beach (Figures 1 and 2). The property is situated centrally within the U.S. Geological Survey 7.5-minute Imperial Beach quadrangle, T18S, R2W; Section 21 (Figure 2).

Land use within the approximately 100-acre mitigation site is currently as a national wildlife refuge that is owned and managed by the U.S. Fish and Wildlife Service (USFWS). Thus, there is no development on site however there is passive recreational use by pedestrians and bike-riders as well as bird watchers. Some of the property appears to have been used for agriculture

in the past due to the presence of weeds and lack of native plant species over a portion of the site. Surrounding land use includes undeveloped refuge lands to the east and south, the salt works to the north, and residential development to the west. Topography at the site is very flat and low elevation, just above sea level and some portions are at or below mean sea level and affected by tidal flows.

According to Bowman (1973), the project site supports predominantly three different soil types: Grangeville fine sandy loam, Visalia gravelly sandy loam, and riverwash. The Grangeville series consists of poorly drained, very deep fine sandy loams derived from granitic alluvium. These soils are on alluvial fans and alluvial plains. The Visalia series consists of moderately well drained, very deep sandy loams derived from granitic alluvium. These soils also are on alluvial fans and food plains. Riverwash occurs in intermittent stream channels. The material is typically sandy, gravelly or cobbly. It is excessively drained and rapidly permeable. Many areas are barren of vegetation or support scattered sycamores, coast live oaks, and sparse shrubs and forbs occur in patches.

VEGETATION COMMUNITIES

Based on species composition and general physiognomy, nine vegetation communities (or habitat types) were identified within the Poseidon Desalination Project Mitigation Site: *Isocoma* scrub, mulefat scrub, coastal and valley freshwater marsh, southern coastal salt marsh, cismontane alkali marsh, brackishwater channel, non-vegetated channel, saltpan/mudflat, and eucalyptus woodland. In addition, one land cover is located on site: disturbed habitat. The suitable habitat for the California gnatcatcher, *Isocoma* scrub and mulefat scrub, is described below, the acreages are presented in Table 1, and the configuration of the vegetation communities are shown in Figure 3.

The *Isocoma* scrub is dominated by coast goldenbush (*Isocoma menziesii*). The stands of *Isocoma* scrub vegetation community form a sparse to open shrub layer. The overall height varies from 0–3 feet tall and overall vegetation shrub cover is approximately 50%. The understory also contains cactus including *Opuntia littoralis.*

The mulefat scrub vegetation community is composed of fragmented patches of a continuous shrub layer where mulefat (*Baccharis salicifolia*) dominates. There are several patches of the vegetation community especially scattered in the eastern portion of the site. The vegetation community is virtually a monotypic stand that is tall (6 feet or taller) and dense.

Table 1
Vegetation Communities and Land Cover Types

Vegetation Community/Land Cover Type	Acreage
Isocoma Scrub	12.34
Mulefat Scrub	0.75
Coastal and Valley Freshwater Marsh	0.33
Southern Coastal Salt Marsh	6.17
Cismontane Alkali Marsh	1.32
Saltpan/Mudflats	6.60
Brackishwater Channel or Floodway	3.31
Non-vegetated Channel or Floodway	4.65
Eucalyptus Woodland	0.75
Disturbed Habitat	64.07
Grand Total	**100.29**

METHODS

Surveys were conducted under the authorization of permit TE-781084 (Dr. Anita M. Hayworth) according to the schedule provided in Table 2. The survey followed the most current protocol established by the U.S. Fish and Wildlife Service, *Coastal California Gnatcatcher (Polioptila californica californica) Presence/Absence Survey Protocol, July 28, 1997* (USFWS 1997).

Suitable habitat within the project was surveyed three times for the CAGN and included the *Isocoma* scrub and mulefat scrub habitats. Although these habitat types are not typically occupied by the gnatcatcher, the structure of the habitat is potentially suitable and the species is known to periodically forage in mulefat scrub. The route selected ensured complete coverage of all suitable habitat within the study area (Figure 3). A topographic map of the site (scale 1 inch = 100 feet) overlain with vegetation polygons was used for the survey. Weather conditions during surveys are provided in Table 2. Binoculars (10×50) were used to aid in detecting and identifying bird species. Taped gnatcatcher vocalizations were played frequently in order to elicit a response from the species, if present. The tape was played approximately every 50–100 feet within suitable habitat. If a gnatcatcher was to be detected, playing of the tape would cease in order to avoid harassment and the gnatcatcher location would be recorded on the site map.

Table 2
Schedule for California Gnatcatcher Survey

Date	Hours	Personnel	Focus	Conditions
3/16/2011	0800–1000	A.Hayworth	California gnatcatcher	58 F, clear, 0–1 mph wind
4/4/2011	00730–0930	A.Hayworth	California gnatcatcher	58–63 F, overcast, 0–1 mph wind
4/25/2011	0700–0900	A.Hayworth	California gnatcatcher	58–61 F; overcast; 0–1 mph wind

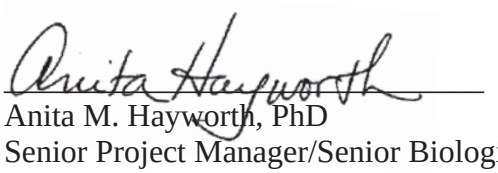
F = degrees Fahrenheit
mph = miles per hour

RESULTS

No California gnatcatchers were observed on site. The habitat is marginal in that it is not composed of the plant species typically used by the gnatcatcher. In addition, the habitat appears to have been planted or hydroseeded based on the composition. The habitat is relatively isolated from other patches of typical coastal sage scrub in the region however if the species dispersed to the Refuge, the habitat could be potentially suitable for occupation. Thirty species of birds were observed during the surveys of the site. A full list of bird species observed during the focused California gnatcatcher survey is provided in Appendix A.

I certify that the information in this survey report and attached exhibits fully and accurately represents my work. Please feel free to contact me at 760.479.4239 with questions or if you require additional information.

Sincerely,



Anita M. Hayworth, PhD
Senior Project Manager/Senior Biologist

Att: Figure 1, Regional Map
Figure 2, Vicinity Map
Figure 3, Biological Resources and Survey Route
Appendix A, Avian Species Observed or Detected During the Focused Survey

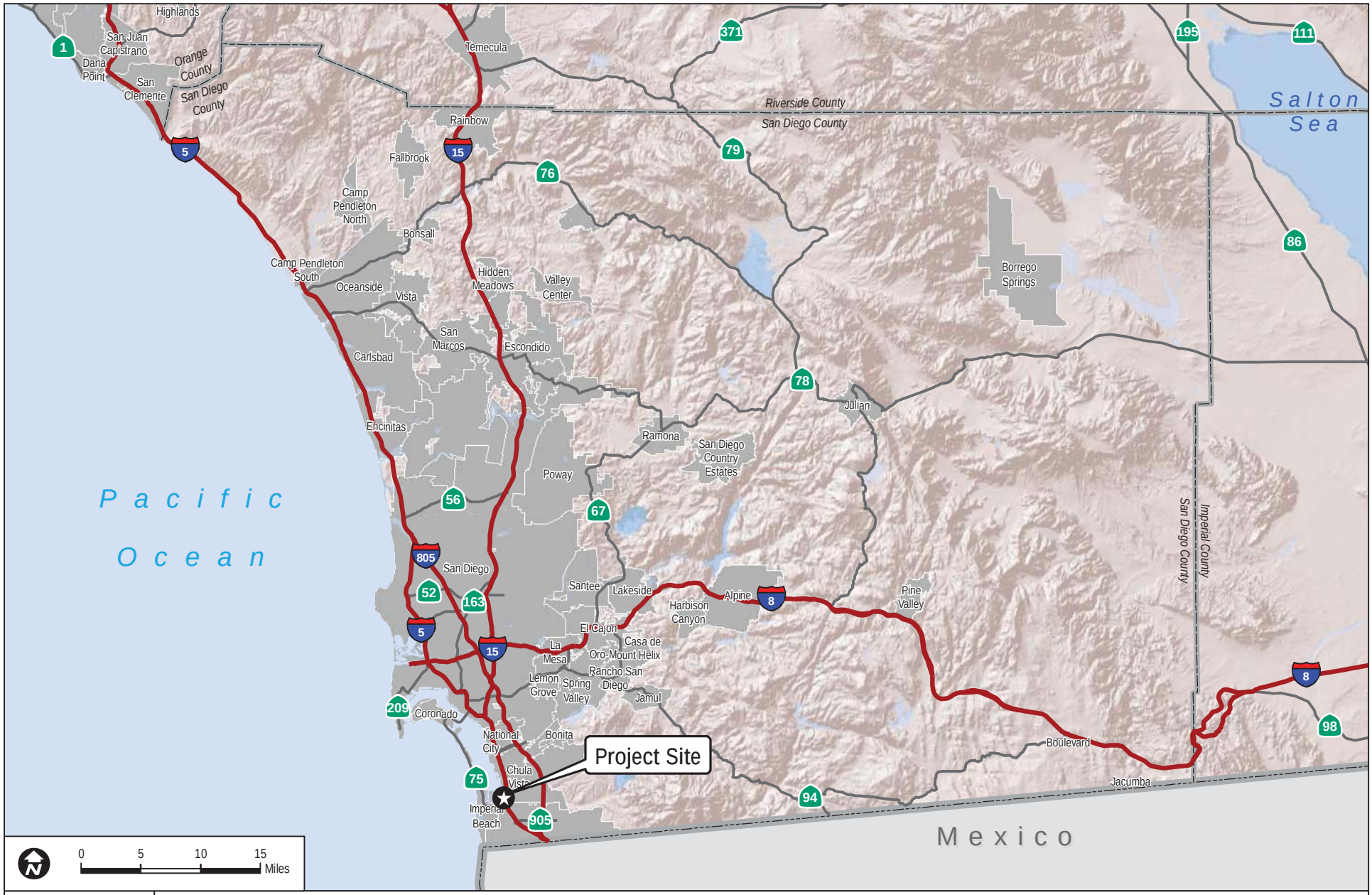
cc: Stan Williams, Poseidon
Brian Collins, USFWS
Joe Monaco, Dudek

REFERENCES

Atwood, J.L. 1990. *Status review of the California gnatcatcher (Polioptila california).* Unpublished technical report, Manomet Bird Observatory, Manomet, Massachusetts. 79 pp.

Bowman, R.H. 1973. Soil Survey, San Diego Area, California, Part 1. United States Department of the Agriculture. 104 pp. + appendices.

USFWS. 1997. *Coastal California Gnatcatcher (Polioptila californica californica) Presence/Absence Survey Guidelines, July 28, 1997.*



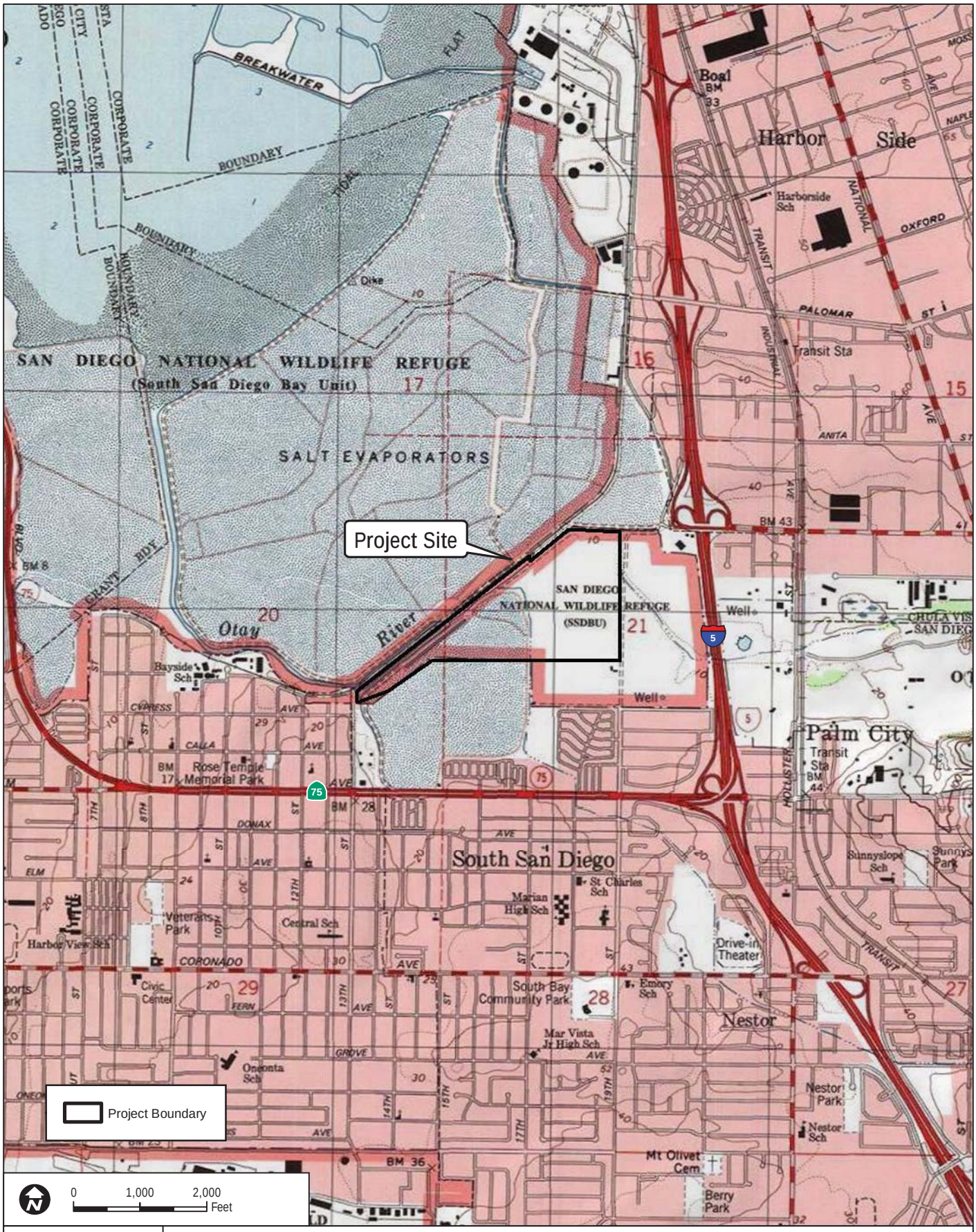
DUDEK

6758-01

FIGURE 1

Regional Map

Carlsbad Desalination Project Mitigation Site - Focused Survey for California Gnatcatcher



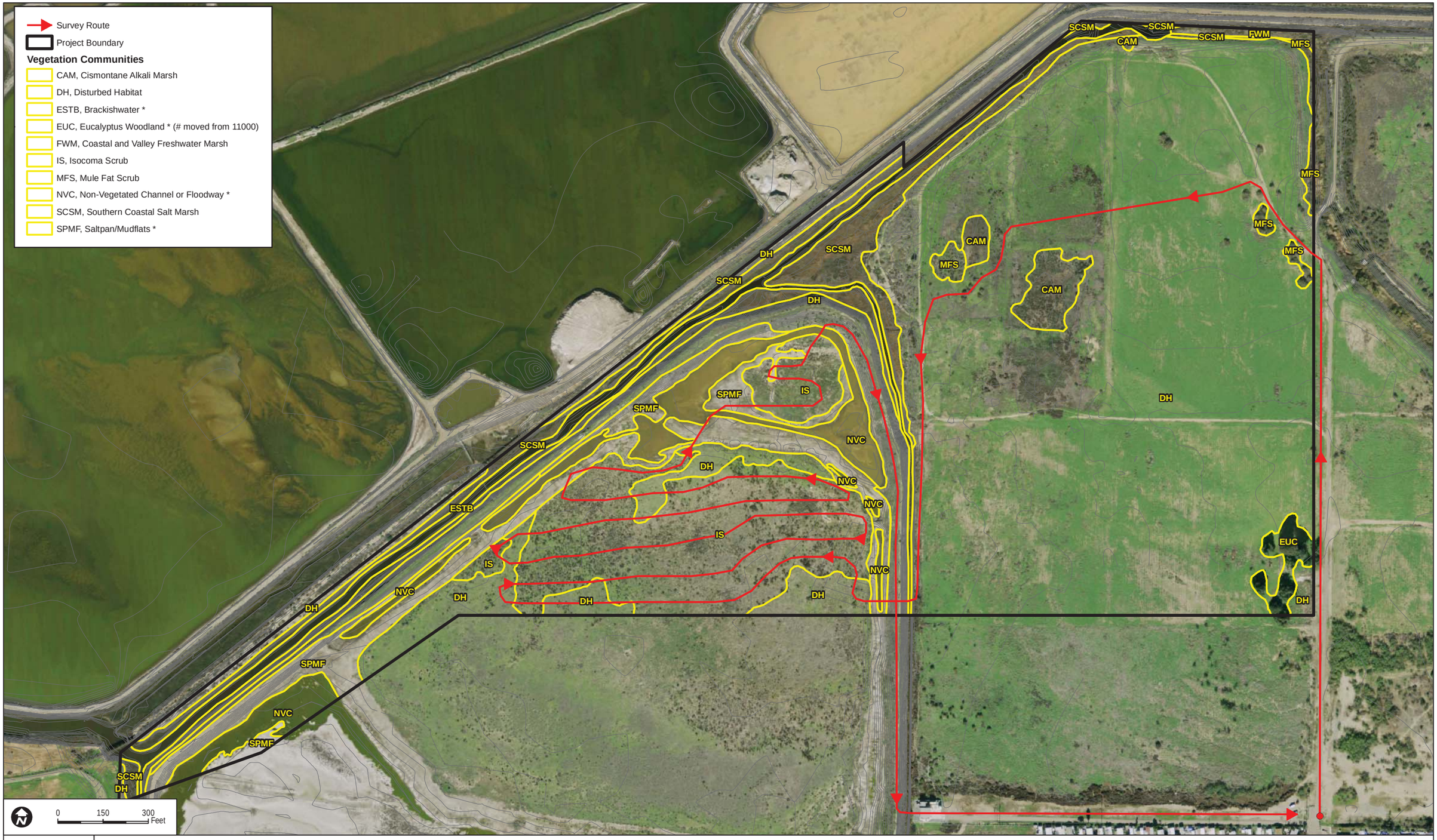
DUDEK

6758-01

SOURCE: USGS 7.5-Minute Series Quadrangle, USA Topographic Maps Service, Imperial Beach Quadrangle.

FIGURE 2
Vicinity Map

Carlsbad Desalination Project Mitigation Site - Focused Survey for California Gnatcatcher



DUDEK

6758-01

SOURCE: Digital Globe 2008

FIGURE 3

Existing Conditions and Survey Route

Carlsbad Desalination Project Mitigation Site - Focused Survey for California Gnatcatcher

APPENDIX A

Avian Species Observed or Detected During the Focused Survey

APPENDIX A
Avian Species Observed or Detected During the Focused Survey

BIRDS

***ACCIPITRIDAE* – HAWKS, KITES, EAGLES, AND ALLIES**

Buteo jamaicensis – red-tailed hawk
Circus cyaneus – northern harrier

***FALCONIDAE* – FALCONS**

Falco columbarius – merlin
Falco sparverius – American kestrel

***STRIGIDAE* – TRUE OWLS**

Asio flammeus – short-eared owl

***COLUMBIDAE* – PIGEONS AND DOVES**

Zenaida macroura – mourning dove

***APODIDAE* – SWIFTS**

Chaetura vauxi – Vaux's swift

***TROCHILIDAE* – HUMMINGBIRDS**

Calypte anna – Anna's hummingbird

***ALCEDINIDAE* – KINGFISHERS**

Ceryle alcyon – belted kingfisher

***TYRANNIDAE* – TYRANT FLYCATCHERS**

Sayornis nigricans – black phoebe
Tyrannus vociferans – Cassin's kingbird

***HIRUNDINIDAE* – SWALLOWS**

Hirundo rustica – barn swallow
Petrochelidon pyrrhonota – cliff swallow
Stelgidopteryx serripennis – northern rough-winged swallow
Tachycineta bicolor – tree swallow

***ALAUDIDAE* – LARKS**

Eremophila alpestris – horned lark

***CORVIDAE* – CROWS AND JAYS**

Corvus brachyrhynchos – American crow
Corvus corax – common raven

***AEGITHALIDAE* – LONG-TAILED TITS AND BUSHTITS**

Psaltriparus minimus – bushtit

***MIMIDAE* – MOCKINGBIRDS AND THRASHERS**

Mimus polyglottos – northern mockingbird

***PARULIDAE* – WOOD-WARBLERS**

Dendroica coronata – yellow-rumped warbler
Geothlypis trichas – common yellowthroat
Vermivora celata – orange-crowned warbler

***EMBERIZIDAE* – EMBERIZIDS**

Melospiza melodia – song sparrow
Melozone crissalis – California towhee
Zonotrichia leucophrys – white-crowned sparrow

***ICTERIDAE* – BLACKBIRDS**

Agelaius phoeniceus – red-winged blackbird
Sturnella neglecta – western meadowlark

***FRINGILLIDAE* – FRINGILLINE AND CARDUELINE FINCHES AND ALLIES**

Carpodacus mexicanus – house finch
Spinus psaltria – lesser goldfinch

APPENDIX D

Focused Survey for Light-Footed Clapper Rail

Konecny Biological Services
Biological Consulting, Research, Conservation

November 12, 2012

US Fish and Wildlife Service
Attn: Recovery Permit Coordinator
6010 Hidden Valley Road, Suite 100
Carlsbad, CA 92011

Re: Results of a Focused Survey for the Light-footed Clapper Rail at the Poseidon Mitigation Site, South San Diego Bay, San Diego County, California, 2011.

Dear Recovery Permit Coordinator:

This letter report presents the results of a focused survey for the light-footed clapper rail (*Rallus longirostris levipes*) at the Poseidon Mitigation Site in south San Diego Bay, San Diego County, California. The light-footed clapper rail is listed as an endangered species by the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (CDFG).

Surveys for the light-footed clapper rail were conducted by wildlife biologist Mr. John Konecny. The surveys were conducted in accordance with the recommendations provided to the USFWS by the Clapper Rail Study Team (2009). This activity is authorized by Konecny Biological Services's (KBS) USFWS section 10(a) permit number TE837308-5, and a CDFG Memorandum of Understanding.

INTRODUCTION

The light-footed clapper rail is a slender, tawny-breasted bird with grayish edges on brown centered back feathers, olive wing coverts, vertical white bars on the flanks, a white stripe over the eye, and a partially orange bill. Light-footed clapper rail occurred historically along the coast of southern California from Carpinteria Marsh in Santa Barbara County south to San Quintín, Baja California, Mexico (Grinnell and Miller 1944, USFWS 1994).

The light-footed clapper rail is a permanent resident of coastal salt marsh traversed by tidal sloughs, usually characterized by cordgrass (*Spartina foliosa*) and pickleweed (*Salicornia* spp.) (Grinnell and Miller 1944, USFWS 1994). Light-footed clapper rails have also nested in freshwater marsh characterized by cattails (*Typha* sp.) and bulrush (*Scirpus* sp.) at Buena Vista, Agua Hedionda, Batiquitos, San Elijo, and San Dieguito Lagoons in San Diego County (Zembal *et al* 2011); and in spiny rush (*Juncus acutus*) at Naval Air Station (NAS) Point Mugu. There is very limited evidence for inter-marsh movement by light-footed clapper rails.

Light-footed clapper rails forage primarily on crustaceans when present. They will also feed on mollusks, small fish, aquatic insects, grasshoppers, small vertebrates, and in some cases, seeds (Eddleman and Conway 1998). Clapper rails forage within emergent vegetation or along the ecotone between mudflats and marsh (Zembal and Fancher 1988). Light-footed clapper rails forage for crabs in the central drains of tidal creeks at low tide. Surface gleaning and shallow probing compose approximately 90% of foraging time. They very irregularly probe deep into the substrate (Zembal and Fancher 1988).

Populations of light-footed clapper rails have undergone decline in the United States due to the rail's limited distribution and destruction and degradation of coastal salt marsh habitat. The statewide light-footed clapper rail population in 2011 was reported to be 441 pairs in 21 marshes (Zembal *et al* 2011), and represents the second highest count since the statewide census began in 1980. The 2011 total is 17 %

1501 East Grand Avenue #2403, Escondido, California, 92027
Tel (760) 489-5276 E-mail jkonecny@cox.net

higher than the 2010 count, and is only two pairs lower than the all time high count in 2007. Fifty-six percent of these pairs were found in two coastal salt marsh complexes at Upper Newport Bay and the Tijuana Marsh National Wildlife Refuge (NWR). Five other marshes at NAS Point Mugu, Batiquitos Lagoon, San Elijo Lagoon, Seal Beach NWR, and Kendall-Frost Marsh in Mission Bay, had between 15 and 43 pairs, representing an additional 34% of the state total. The remaining 12 marshes had between one and seven pairs.

Zembal and Massey (1986) have shown that paired light-footed clapper rails can be detected "clappering" throughout the year, but have a bimodal peak in vocalizing during mid-February to mid-April and again in September to October. The initial peak in vocalizing corresponds to the onset of breeding season. In contrast to "clappering", single male and female "kekking" is highly seasonal, almost exclusively occurring between February and June.

PROJECT LOCATION

The Poseidon Mitigation Site is located at the extreme southern end of San Diego Bay, east of the City of Imperial Beach, California (Figure 1). The site is bordered on the north by the Otay River and the Bayshore Bikeway, and lies west of Interstate-5, and north of State Route 75. Specifically, the Poseidon Mitigation Site is located within Township 18 South, Range 2 West, and in Section 21 of the U.S. Geological Survey Imperial Beach, CA-BCN 7.5-minute quadrangle.

PROJECT SITE DESCRIPTION

The Poseidon Mitigation Site is located within the southern end of the San Diego National Wildlife Refuge. Western Salt and its salt evaporation facility is situated to the north and the industrialized South San Diego is located immediately to the south. The majority of the site is ruderal with non-native vegetation, especially in the southern portion of the site. The Otay River runs just north and northeast and has a dense patch of cattail and bulrush just outside the northeast corner of the site. Southern coastal saltmarsh, characterized by alkali-heath (*Frankenia salina*) is present within the channel of the Otay River, and there are patches of coastal goldenbush (*Isocoma veneta* var. *vernonioides*) scattered throughout southern half of the site, and a band of goldenbush is present along the border with the Otay River. A small tributary of the Otay River extends southward, on the western edge of the site. Elevation of the site is approximately 10-feet (4-meters) above mean sea level.

METHODS

Six focused light-footed clapper rail survey events were conducted at least seven days apart over all appropriate marsh habitat at the Poseidon Mitigation Site between March 27th and May 1st, 2011. Dawn surveys were conducted on April 10th, April 17th, and April 24th. Dusk surveys were conducted on March 27th, April 24th, and May 1st. Each survey lasted approximately one and one-half hours. The surveys were conducted in accordance with the recommendations provided to the USFWS by the Clapper Rail Study Team (2009). A summary of the environmental conditions on the six survey dates is provided in Table 1 below.

Table 1. Summary of Weather Conditions During Six Light-footed Clapper Rail Surveys for the Poseidon Mitigation Site in South San Diego Bay, San Diego County, California, 2011.

Survey #	Date	Surveyor (Species)*	Time	Weather Conditions
1	03/27/2011	JK (LFCR)	1650-1815	10% overcast, 65-61^{o}F, wind 7-10 mph
2	04/03/2011	JK (LFCR)	1645-1815	0% overcast, 62-59^{o}F, wind 5-12 mph

3	04/10/2011	JK, (LFCR)	0645-0815	100% overcast, 60-63°F, wind 5-7 mph
4	04/17/2011	JK (LFCR)	0625-0800	100% overcast, 61-63°F, wind 5-7 mph
5	04/24/2011	JK (LFCR)	0630-0800	100% overcast, 64-65°F, wind 7-10 mph
6	05/01/2011	JK (LFCR)	1840-1910	20% overcast, 63-60°F, wind 9-14 mph

* JK-John Konecny; LFCR-Light-footed Clapper Rail

The surveys were conducted by walking the bike path on the northern boundary of the Poseidon Mitigation Site and stopping at stations approximately 100-feet (30-meters) apart and listening for vocalizing light-footed clapper rails. The site was also accessed from the south end, off Saturn Boulevard. If rails were not detected passively, a digital call-prompt of the light-footed clapper rail "dueting" was played with an iPod and amplified speakers at 30-second intervals. A response was listened for approximately ten minutes before proceeding to the next survey station.

RESULTS and DISCUSSION

One pair of light-footed clapper rails was detected just outside of the project boundary in the northeast corner (Figure 2). The pair responded to a call prompt with a duet on the evening of April 3, 2011. The pair was also detected passively on April 17th and 24th. No other light-footed clapper rails were detected within the Poseidon Mitigation Site. Rail habitat does exist through the reach of the Otay River on the northern border of the site but it is of relatively low quality for rails, being short and sparser.

Described as "formerly common in all coastal marshes" by Grinnell and Miller (1944), the light-footed clapper rail has never been a common bird species in the Otay River. Since the light-footed clapper rail range-wide survey was initiated in 1980, there have been one or two light-footed clapper rail pairs in the Otay River dating back to 1995. These pairs were usually located in the cattail patch by the bikeway crossing of the river. Four or five pairs of light-footed clapper rails were in the area in the early 1980's.

The light-footed clapper rail will likely continue to inhabit the freshwater or brackish water marsh in this reach of the Otay River and the numbers may continue to fluctuate depending on the reproductive success of the pair that was identified in 2011. Coastal salt marsh should be incorporated into the design of the mitigation site. With proper planning, a small but sustainable population of light-footed clapper rails may colonize the area.

CERTIFICATION

I certify that the information in this survey report and attached exhibits fully and accurately represent my work. The results of focused surveys for listed species are typically considered valid for one year by the USFWS and CDFG. If you have any questions or require additional information, please call me at (760) 489-5276.

Sincerely,

John K. Konecny
Wildlife Biologist
TE837308-5

REFERENCES CITED

Clapper Rail Study Team. 2009. Survey Guidelines to Determine Presence/Absence of the Light-footed Clapper Rail in Southern California; Recommendations of the Clapper Rail Study Team (John Konecny, Richard Zembal, Susan Hoffman). Draft Recommendations Provided to the Fish and Wildlife Service. 2pp.

Eddleman, W.R., and C.J. Conway. 1998. Clapper Rail (Rallus longirostris). In The Birds of North America, No.340 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA. 32 pp.

Grinnell, J., and A.H. Miller. 1944. The Distribution of the Birds of California. Cooper Ornithological Club. Berkeley, California.

U.S. Fish and Wildlife Service. 1994. Light-footed Clapper Rail. Unpublished two-page pamphlet, prepared by R. Zembal.

Zembal, R., S. Hoffman, and J. Konecny. 2011. Status and Distribution of the Light-footed Clapper Rail in California, 2011 Season. Report to California Department of Fish and Game, for the Clapper Rail Recovery Fund. 20pp.

Zembal, R. and B. W. Massey. 1986. Seasonality of Vocalizations by Light-footed Clapper Rails. J. Field Ornithol., 58(1):41-48.

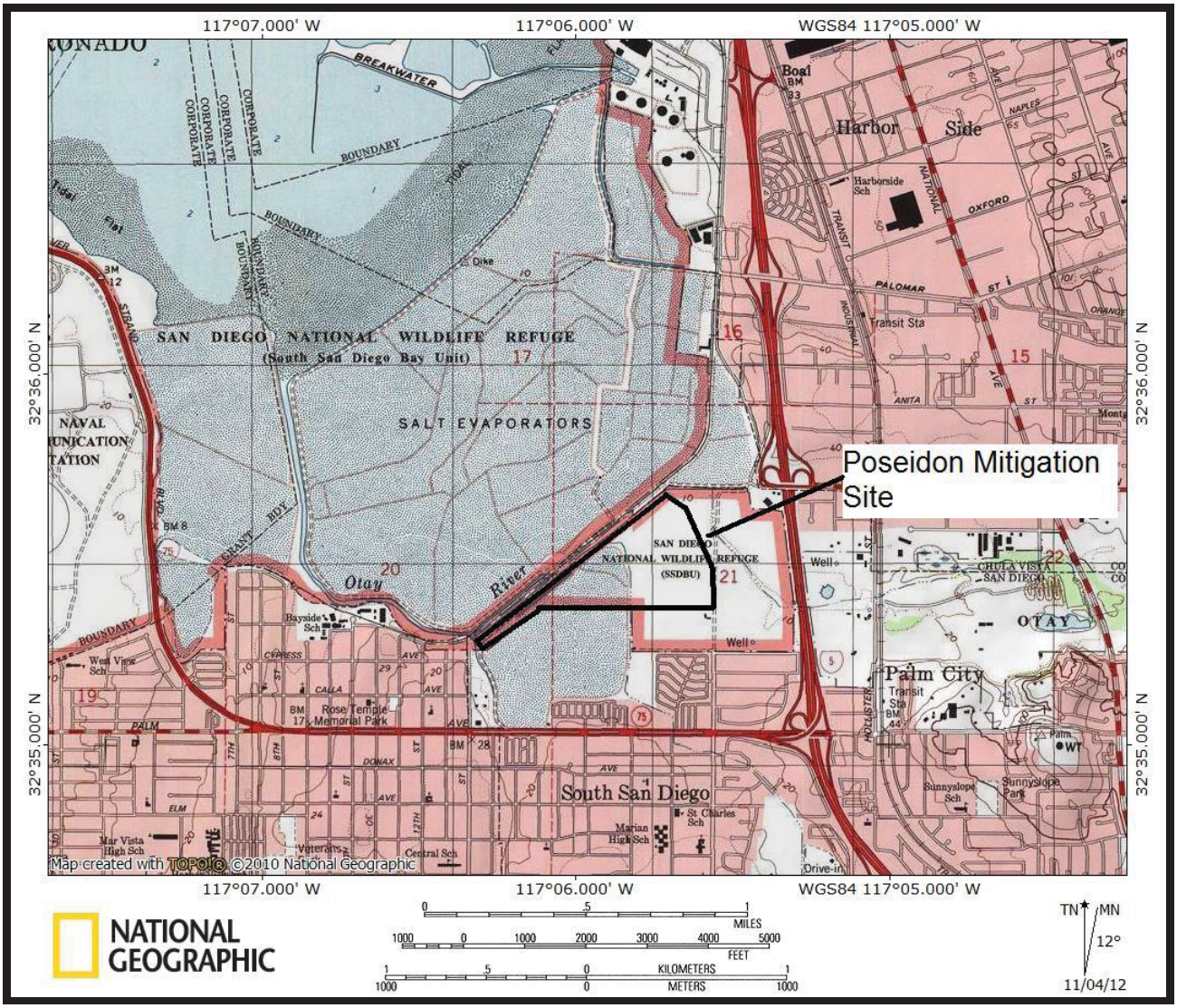


Figure 1. **Location of the Light-footed Clapper Rail Survey Area (black polygon) for the Poseidon Mitigation Site, South San Diego Bay, San Diego County, California, 2011.**



Figure 2. **Location of the Light-footed Clapper Rail Pair (Red P) Detected at the Poseidon Mitigation Site, South San Diego Bay, San Diego County, California, 2011. Project Boundary Shown in Yellow.**

APPENDIX E

CRAM Report

CALIFORNIA RAPID ASSESSMENT METHOD REPORT
for the
Otay River Estuary Restoration Project
San Diego County, California

Prepared for:

Poseidon Resources
5780 Fleet Street, Suite 140
Carlsbad, California 92008
Contact: Stan Williams
Phone: 408.799.3852

Prepared by:

DUDEK
605 Third Street
Encinitas, California 92024

JANUARY 2016

Printed on 30% post-consumer recycled material.

TABLE OF CONTENTS

Section **Page No.**

1 INTRODUCTION 1
1.1 California Rapid Assessment Method (CRAM) 2
1.2 Goals of the Assessment 3
2 PROJECT AREA DESCRIPTION 9
2.1 Project Location 9
2.2 Watersheds 9
2.3 Soils 10
2.4 Vegetation 10
3 METHODOLOGY 13
4 RESULTS 15
4.1 Classification of AAs within the Project Area 15
4.2 Prediction of Post Project Functions and Services 15
4.3 Pre-construction CRAM Scores 16
4.2.1 Otay River Floodplain Site 16
4.2.2 Pond 15 Site 27
4.3 Post-construction CRAM Scores 28
4.3.1 Otay River Floodplain Site – Post-construction 28
4.2.2 Pond 15 Site – Post-construction 29
6 DISCUSSION OF RESULTS 33
7 CONCLUSIONS 35
8 LITERATURE CITED 37

APPENDIX

A CRAM Field Forms

TABLE OF CONTENTS (CONTINUED)

Page No.

FIGURES

1 Regional Map 5
2 Vicinity Map 7
3a Pond 20 Assessment Area 17
3b Pond 15 Assessment Area 19
4 Site Photographs 21
5a Pond 20 Proposed Project Assessment Area 23
5b Pond 15 Proposed Project Assessment Area 25

TABLES

1 CRAM Attributes and Metrics 3
2 Otay River Floodplain Site Land Covers and Vegetation Communities 10
3 Pond 15 Land Covers and Vegetation Communities 11
4 Comparison of Average CRAM Attribute Scores between the Pre-construction Conditions and the Post-construction Conditions 33

CHARTS

1 Final Attribute Scores for Pre-construction Conditions 28
2 Projected Attribute Scores for Post-construction Conditions 31

1 INTRODUCTION

This document presents the results of an assessment of the baseline ecological conditions and the predicted post-project conditions of the wetland and riparian resources at the proposed Otay River Estuary Restoration Project (ORERP or Project) (Figures 1 and 2).

The proposed ORERP is a partnership between Poseidon Resources (Poseidon), the U.S. Fish and Wildlife Service (Service or USFWS), and San Diego Bay National Wildlife Refuge (Refuge). The purpose of ORERP is to create, restore, and enhance coastal wetlands to benefit native fish, wildlife, and plant species and to provide habitat for migratory seabirds, shorebirds and salt marsh-dependent species.

This proposed Project would occur at two distinct and non-contiguous sites within the South San Diego Bay Unit of the Refuge and would be consistent with the goals and objectives of the Service's San Diego Bay National Wildlife Refuge Comprehensive Conservation Plan (CCP) (USFWS 2006). The proposed project would also follow the terms and conditions of the permits issued by the California Coastal Commission (CCC) and San Diego Regional Water Quality Control Board (Regional Board) for Poseidon's Carlsbad Desalination Project.

When completed the creation and restoration of tidal influenced estuarine, and salt marsh habitats within the Refuge by Poseidon would benefit many species of fish found in south San Diego Bay by providing new and expanded nursery and feeding areas. While avoiding and minimizing impacts to existing seabird and shorebird nesting areas, the proposed project would provide additional and enhanced foraging and nesting habitats for federal and state listed birds. These include species such as the endangered light-footed Ridgway's rail (*Rallus obsoletus levipes*), endangered California least tern (*Sternula antillarum browni*), and threatened western snowy plover (*Charadrius alexandrinus nivosus*) and a diversity of migratory seabirds and shorebirds.

To evaluate the ecological condition of the wetlands and riparian resources that would be affected by the proposed Project, Dudek conducted assessments within the two main components of the Project, including Pond 20 and Pond 15. A total of two Assessment Areas (AAs) were evaluated. The assessment was completed using the most recent version of CRAM, version 6.1 (CWMW 2013). The baseline data collected during this assessment was used as comparative data to evaluate the habitat restoration areas associated with the Project relative to Project goals.

It is important to note that, in this case, a comparison is not being made to the Carlsbad Desalination Project that is mitigating at this site. This is because there were no impacts to wetlands or waters at the desalination plant project site. As part of the Coastal Development Permit (CDP No. E-06-013) for Poseidon's proposal to construct and operate the desalination

facility in Carlsbad, the Commission required Poseidon to prepare a Marine Life Mitigation Plan (MLMP) to address the impacts to be caused by the facility's use of estuarine water and its entrainment of marine organisms. Implementation of the required mitigation to satisfy the MLMP is planned to occur at the Otay River Floodplain Site and at Pond 15. Project construction would result in temporary impacts to jurisdictional waters and wetlands. Therefore, the U.S. Army Corps of Engineers (ACOE) requested the preparation of a functional assessment to characterize the effects of the project on the functions and services of the existing resources to be temporarily impacted.

1.1 California Rapid Assessment Method (CRAM)

The State of California and Federal agencies that comprise the California Wetlands Monitoring Workgroup[1] are promoting the use of rapid assessment methods as a core tool to evaluate wetland resource condition. Dudek evaluated the ecological condition of the Project area utilizing the California Rapid Assessment Method (CRAM; CWMW 2013), which is the most widely used wetland rapid assessment method in the state (www.cramwetlands.org).

The CRAM was developed as a rapid, scientifically defensible, and repeatable assessment methodology that can be used routinely to assess and monitor the condition of wetlands and riparian habitats. The assessment method is a diagnostic tool that can be used to assess the condition of a wetland or riparian site using visual indicators in the field. CRAM identifies six major wetland classes (or types), four of which have sub-types: riverine (confined and non-confined); depressional (individual vernal pools, vernal pool systems, and other depressional wetlands); estuarine (perennial saline, perennial non-saline, and seasonal); playas; slope wetland (seeps and springs, and wet meadows); and lacustrine. AAs are established within each wetland class separately and can represent a portion or encompass the entire wetland community. Each wetland class has a particular set of narrative descriptions that are used to assist in scoring an established AA. Visual indicators are used to choose the best-fit description of habitat condition for a variety of metrics/submetrics within four universal attributes: Buffer and Landscape Context, Hydrology, Physical Structure, and Biotic Structure. Table 1 presents the attributes and metrics/submetrics developed for CRAM that reflect the common, visible characteristics of all wetlands in all regions of California, based on the conceptual models of wetland form and function (CWMW 2013).

[1] The California Wetlands Monitoring Workgroup is a subcommittee of the California Water Quality Monitoring Council (Senate Bill 1070).

Table 1
CRAM Attributes and Metrics

Attributes		Metrics	
Buffer and Landscape Context		Aquatic Area Abundance	
		Buffer	Submetric A: Percent of AA with Buffer
			Submetric B: Average Buffer Width
			Submetric C: Buffer Condition
Hydrology		Water Source	
		Hydroperiod or Channel Stability	
		Hydrologic Connectivity	
Structure	Physical	Structural Patch Richness	
		Topographic Complexity	
	Biotic	Plant Community	Submetric A: Number of Plant Layers Present or Native Species Richness (vernal pools only)
			Submetric B: Number of Co-Dominant Species
			Submetric C: Percent Invasion
		Horizontal Interspersion and Zonation	
		Vertical Biotic Structure	

Source: CWMW 2013.

Letter scores ranging from A to D are assigned to each metric/submetric to reflect alternative states of function. For each metric/submetric, the letter score is converted into the corresponding numeric score: A=12, B=9, C=6, and D=3. The metric/submetric scores are combined to calculate an attribute score, and the attribute scores are combined to calculate an overall AA score. The attribute scores and overall AA scores have a maximum value of 100 and a minimum value of 25. The scores are intended to represent the condition of an AA relative to its best possible condition. CRAM also provides guidelines for identifying the stressors that might account for any low site scores.

CRAM is supported by a website (www.cramwetlands.org) that provides access to an electronic version of the entire manual and training materials. The website also contains downloadable CRAM software and access to the CRAM database, which can be used to upload, view, and retrieve statewide CRAM results.

1.2 Goals of the Assessment

The purpose of the Project is to mitigate impacts from the Carlsbad Desalination Plant through restoring coastal wetlands to benefit native fish, wildlife, and plant species and to provide habitat for migratory seabirds, shorebirds and salt marsh-dependent species. The purpose of this assessment is to determine the functional condition of vegetated resources within the Project area

prior to implementation of the proposed Project relative to anticipated functional condition of restored vegetated resources. This assessment will be used as a tool to compare the ecological baseline conditions of the vegetated resources with the post-Project conditions for the habitat restoration areas.

The three primary goals of this assessment include:

- Assess vegetated jurisdictional resources conditions and identify related stressors;
- Compare existing vegetated jurisdictional resources conditions within the ORERP area to post-construction conditions; and
- Support the application for resource agency permits.

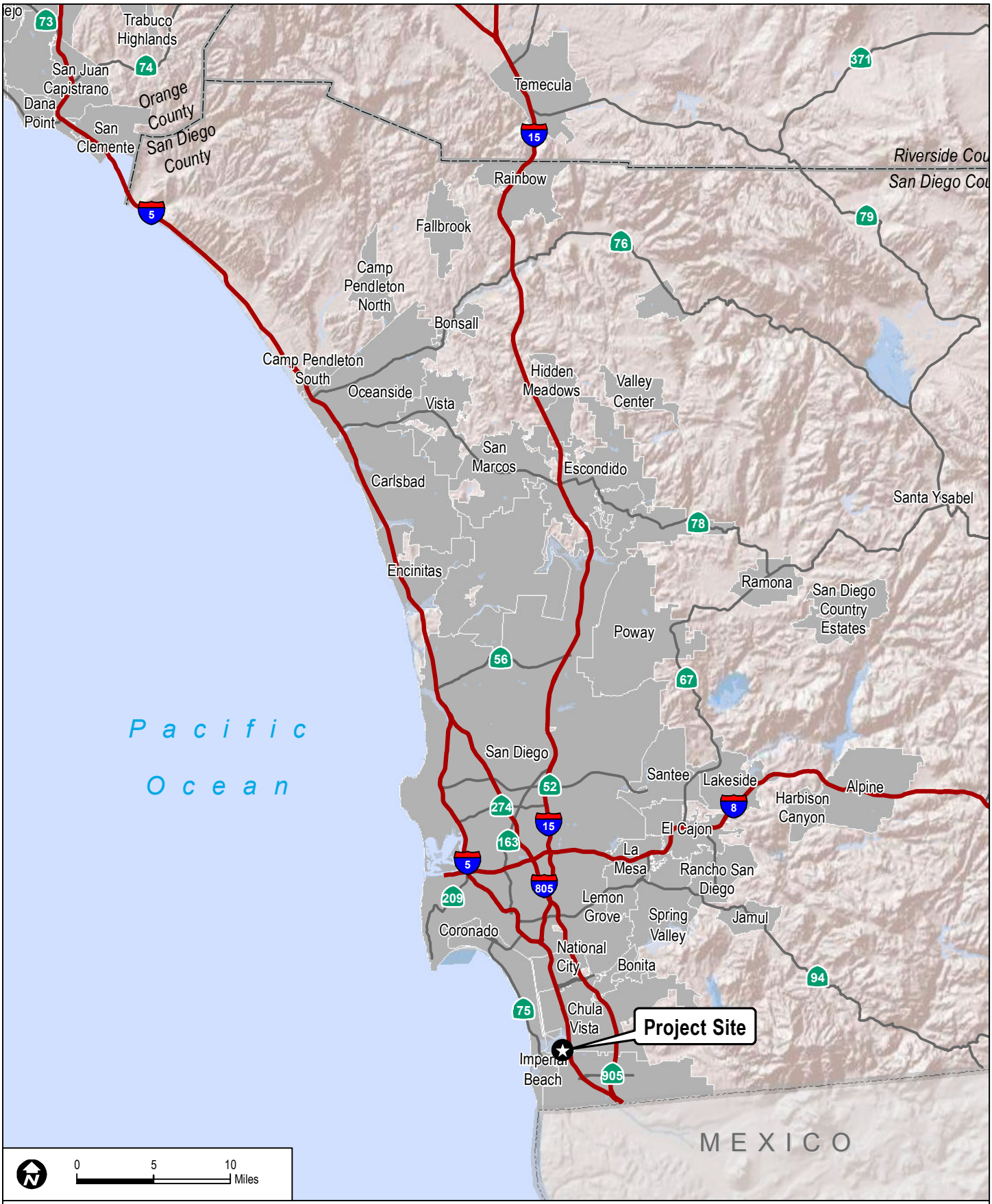


FIGURE 1

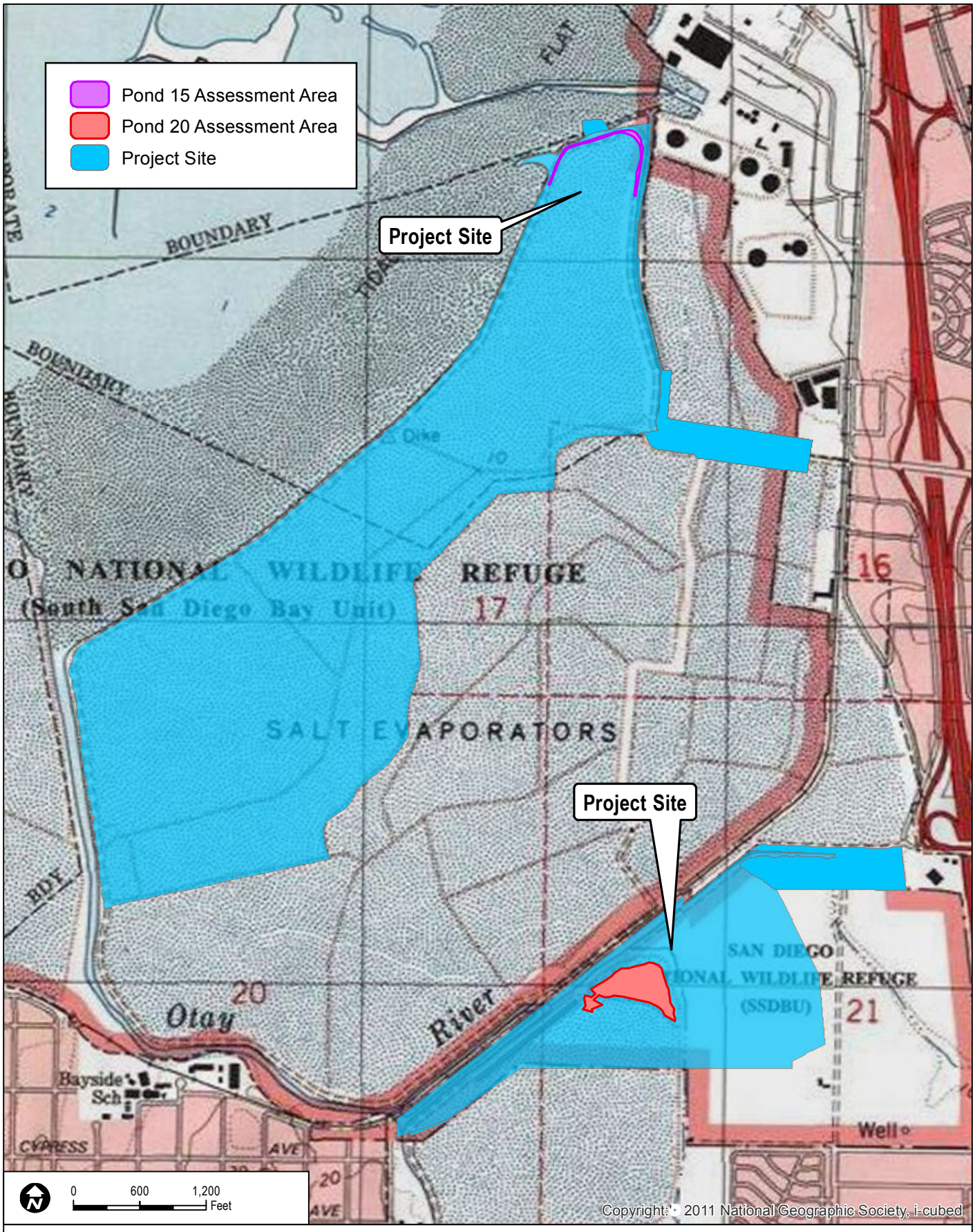
Regional Map

DUDEK

California Rapid Assessment Method Report for the Otay River Estuary Restoration Project

Document Path: Z:\Projects\j675801\MAPDOC\MAPS\CRAM Figs\CRAM Fig1_Regional.mxd

INTENTIONALLY LEFT BLANK



SOURCE: USGS 7.5-Minute Series Quadrangle, USA Topographic Maps Service, Imperial Beach Quadrangle.

DUDEK

FIGURE 2
Vicinity Map

California Rapid Assessment Method Report for the Otay River Estuary Restoration Project

Document Path: Z:\Projects\jj675801\MAPDOC\MAPS\CRAM Figs\CRAM Fig2_Vicinity.mxd

INTENTIONALLY LEFT BLANK

2 PROJECT AREA DESCRIPTION

2.1 Project Location

The ORERP site is located at the south end of San Diego Bay, San Diego County, California, within the boundaries of the South San Diego Bay Unit of the San Diego Bay NWR, and is composed of two separate sites: the Otay River Floodplain Site and the Pond 15 Site (see Figures 1 and 2). The first site is an approximately 78-acre area of primarily disturbed uplands and a portion of Pond 20 within the Otay River Floodplain (hereafter referred to as the Otay River Floodplain Site). The Otay River Floodplain Site would be restored to estuarine, intertidal, and upland transition habitats. The second site, a 90-acre active solar salt pond (hereafter referred to as the Pond 15 Site) would be restored to subtidal and intertidal habitats.

2.2 Watersheds

The ORERP is located within the Otay River Watershed in San Diego County, California. The 145-square-mile watershed is situated between the Sweetwater and Tijuana River Watersheds. The Otay River originates in the Cleveland National Forest along Dulzera Creek, with several tributaries including Hollenbeck Canyon Creek, Jamul Creek, and Proctor Valley Creek. Watershed flows are cut off by two reservoirs that are a part of the City of San Diego Water Supply System: the Upper Otay Reservoir and the Lower Otay Reservoir. The Otay River floodway runs westward approximately 11 miles through primarily undeveloped lands from Savage Dam to San Diego Bay. Tributaries in this section of the river include O'Neal Canyon Creek, Poggi Canyon Creek, Salt Creek, Johnson Canyon, Wolf Canyon, and Dennery Canyon.

The Otay River conveys flows from the I-5 bridge through the Otay River Floodplain and estuarine portion of the Otay River. On the west side of I-5, the river channel, which was modified more than 100 years ago, turns northwest toward South Bay Saltworks, then westward along the perimeter of Ponds 48, 20, and 22. After confluence with Nestor Creek, the Otay River continues along the northern edge of the Otay River Floodplain Site, and along the western side of Ponds 23 and 12 until discharging into the San Diego Bay.

Hydraulic conditions along the Otay River are affected by a combination of tidal exchange with San Diego Bay and watershed flows from the Otay River. Tidal influence extends from San Diego Bay toward the floodplain near Pond 48 at the northeastern corner of the Otay River Floodplain Site. However, neither the Pond 15 site nor the Otay River Floodplain Site are directly connected to the San Diego Bay. Pond 15 is an evaporator pond, and water levels are managed by a series of levees and a tide gate. Pond 20 at the Otay River Floodplain Site is disconnected from the San Diego Bay due to berms surrounding the old evaporator pond.

However, surface elevations in the bottom of Pond 20 are low enough to result in seasonal ponding due to the configuration of the perimeter berms surrounding the old pond that do not allow for a water outlet, and an elevated groundwater level.

2.3 Soils

In general, the Otay River floodplain is characterized by soft Alluvial/Bay Deposits under 3 to 5 feet of uncompacted fill soils. The Otay River Floodplain Site is almost entirely composed of Grangeville fine sandy loam at slopes ranging from 0% to 2%. This type of soil is often found in alluvial fans and has a high capacity to transmit water. The soil is considered fertile, with a very high water capacity and a low possibility of erosion. The eastern edge of the site is composed of Visalia gravelly sandy loam ranging from 2% to 5% slope. Visalia gravelly sandy loam is also commonly found in alluvial fans and has a high capacity for transmitting water. However, this soil only contains a moderate available water capacity compared to the soil on the majority of the site. Additionally, the open space area to the east of the Otay River Floodplain Site contains areas of Riverwash and Tujunga sand, both of which are common in floodplains. These soils have high water transmitting capabilities and only moderate available water capacity (NRCS 2011).

2.4 Vegetation

The Otay River Floodplain Site consists mostly of disturbed and native upland habitat, habitat undergoing restoration in the eastern portion of the study area, unvegetated former salt pond, and salt marsh habitat associated with the Otay River and Nestor Creek tidal channels. Historically, some of the upland areas within the Otay River Floodplain Site supported riparian and coastal salt marsh habitat (USFWS 2006). Over time, portions of these former wetland areas were converted to upland due to the channelization of the Otay River, construction of solar salt ponds, and past agricultural activity. The Otay River Floodplain Site includes ten vegetation communities or land covers as listed in Table 2.

Table 2
Otay River Floodplain Site Land Covers and Vegetation Communities

Unvegetated Land Covers and Non-native Communities
Brackishwater
Developed Land
Disturbed Habitat
Former salt pond bottom and borrow area

Table 2
Otay River Floodplain Site Land Covers and Vegetation Communities

Native Communities
Coastal and Valley Freshwater Marsh
Cismontane alkali marsh
Isocoma scrub
Mulefat scrub
Otay River Floodplain Restoration
Southern coastal salt marsh

Source: Dudek 2015

The Pond 15 Site consists of predominantly open water (3-5 feet deep), including the brines contained in the salt ponds, as well as areas mapped as disturbed habitat on the salt pond levees, and small areas of beach and southern coastal salt marsh. Prior to diking for salt production, the entire area within the Pond 15 Site was composed of intertidal mudflat.

The Pond 15 Site is part of a larger South Bay Saltworks operation that currently produces salt for commercial purposes using solar radiation to evaporate water from seawater and concentrate and eventually crystallize the salts through a sequential evaporation technique. The salt evaporation ponds are separated from the adjacent San Diego Bay and tidal channels by levees that surround the ponds. These levees reach a maximum elevation of approximately 8 feet, slightly greater than the highest observed water level (7.71 feet; North American Vertical Datum (NAVD88)). The Pond 15 Site includes the six vegetation communities or land covers listed in Table 3.

Table 3
Pond 15 Land Covers and Vegetation Communities

Unvegetated Land Covers and Non-native Communities
Beach
Disturbed habitat
Open water
Salt pond levee
Native Communities
Southern coastal salt marsh
Disturbed southern coastal salt marsh

Source: Dudek 2015

INTENTIONALLY LEFT BLANK

3 METHODOLOGY

Prior to visiting the Project area, Dudek assembled background information about the management and history of the Project area's wetlands and waters. Background information gathered included USGS topographic maps, National Wetland Inventory maps, road maps, soil maps, aerial photography, and Project-specific information from the *Results of a Preliminary Jurisdictional Wetland Delineation Report for the Otay River Estuary Restoration Project (ORERP), South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge* (Dudek 2015).

CRAM was not designed for use in the assessment of subtidal habitats and intertidal areas with less than 5% vegetated cover of emergent marsh (CWMW 2009). Thus, much of the Project area composed of open water and mud flats could not be assessed using CRAM. However, the functions and services of these areas before and after the proposed Project were evaluated separately in the Poseidon Mitigation Credit Analysis Marine Life Mitigation Plan – Integrated Restoration Plan (WRA 2013).

Each AA and associated wetlands or waters were classified according to the definitions presented in the CRAM User's Manual, version 6.1. The wetlands or waters were classified based on their general ecological character and first-hand knowledge of biologists who previously assessed the property. Dudek determined the boundary and estimated size of each AA. The AAs included the appropriate portion of each wetlands or waters for assessment using CRAM. Each AA consisted of only one wetland class with enough hydrologic and ecological integrity that could allow detection of changes in the condition of the AA due to identified stressors or management actions apart from natural disturbances or other sources of variability in wetland condition.

During the initial office assessment, background information was collected for each potential AA location and base maps were prepared to evaluate the AAs relative to the surrounding land cover/use. Preliminary scores were developed for some metrics based on the information gathered and recorded in the appropriate datasheets (Appendix A).

Following the background analysis, a site visit was conducted on December 2, 2015, by Dudek biologist Andrew Thomson. The field portion of the CRAM assessment consisted of finding and confirming the boundaries of the AAs, and scoring the AAs based on the condition metrics and stressor checklist. All relevant CRAM datasheets were completed according to the CRAM User's Manual (CWMW 2013).

INTENTIONALLY LEFT BLANK

4 RESULTS

4.1 Classification of AAs within the Project Area

Two wetland classification sub-types as defined in CRAM were identified within the Project area: riverine (non-confined) and estuarine. However, the areas classified as riverine will not be subject to permanent impacts, and thus were not evaluated in this assessment.

Estuarine systems, as defined by CRAM, consist of aquatic (i.e., sub-tidal) and semi-aquatic (intertidal) environments that are strongly influenced by mixtures of ocean water and upland runoff due to tidal processes operating through an ocean inlet (CWMW 2013). Estuaries are mostly enclosed by land, with natural or unnatural inlets. Sources of freshwater consist of rivers, streams, lakes and reservoirs, point discharges, and storm drains (CWMW 2013). An estuarine wetland consists of the vegetated marsh plain, natural levees, shell beds, submerged plant beds, and other habitat elements created or supported by tidal processes and associated with tidal channels (CWMW 2013). While the wetlands assessed in this study are not classic estuarine systems with natural tidal influence, they are systems that were historically estuarine that have been degraded or altered. Further, the goal of the restoration program is to return the degraded or altered areas to functioning tidal estuarine systems, which will allow comparison of existing conditions with post-construction conditions. Therefore the estuarine module of CRAM was determined to be the most appropriate module for this analysis.

Two estuarine AAs were established for assessment. Figures 3a and 3b provide a depiction of the locations of the AAs. Representative photos are contained in Figure 4. The AAs were assigned an AA boundary based on the AA parameters in CRAM.

4.2 Prediction of Post Project Functions and Services

The purpose of predicting post Project functions and services is to determine the ecological condition of representative jurisdictional areas within the Project area relative to the conditions that are expected after the Project is completed. Dudek used the same version of the CRAM (version 6.1) for both the existing conditions and post-Project conditions.

Dudek evaluated the estuarine areas in the context of the proposed design concept for the Project. The boundary of the AA at the Pond 20 location within the Otay River Floodplain Site remained unchanged in the post-Project analysis (Figure 5a). However, while the general location remained the same, the boundary of the AA at the Pond 15 location was updated based on the projected restoration design and the CRAM criteria for establishing boundaries of an AA (Figure 5b).

Dudek made several assumptions to conduct the post-Project analysis. Dudek evaluated the site from the perspective of the functions and services expected or anticipated after the passage of several years (e.g., five years) following Project construction to allow for the establishment of vegetation in the Project area following the large-scale disturbances resulting from construction. Extensive areas are currently barren or open water, lacking any vegetation at all, and that condition is expected to change following Project construction. Additionally Dudek assumed that the hydrologic conditions (water source, hydroperiod and hydrologic connectivity) would be significantly altered between the pre-Project condition and the post-Project condition, by developing direct tidal connectivity.

4.3 Pre-construction CRAM Scores

The AAs within the Project area were analyzed for a suite of variables that pertain to common attributes that estuarine systems are expected to perform. The fieldwork consisted of locating and confirming the boundaries of each AA, and scoring the AAs based on the condition metrics and stressor checklist contained in CRAM v.6.1.

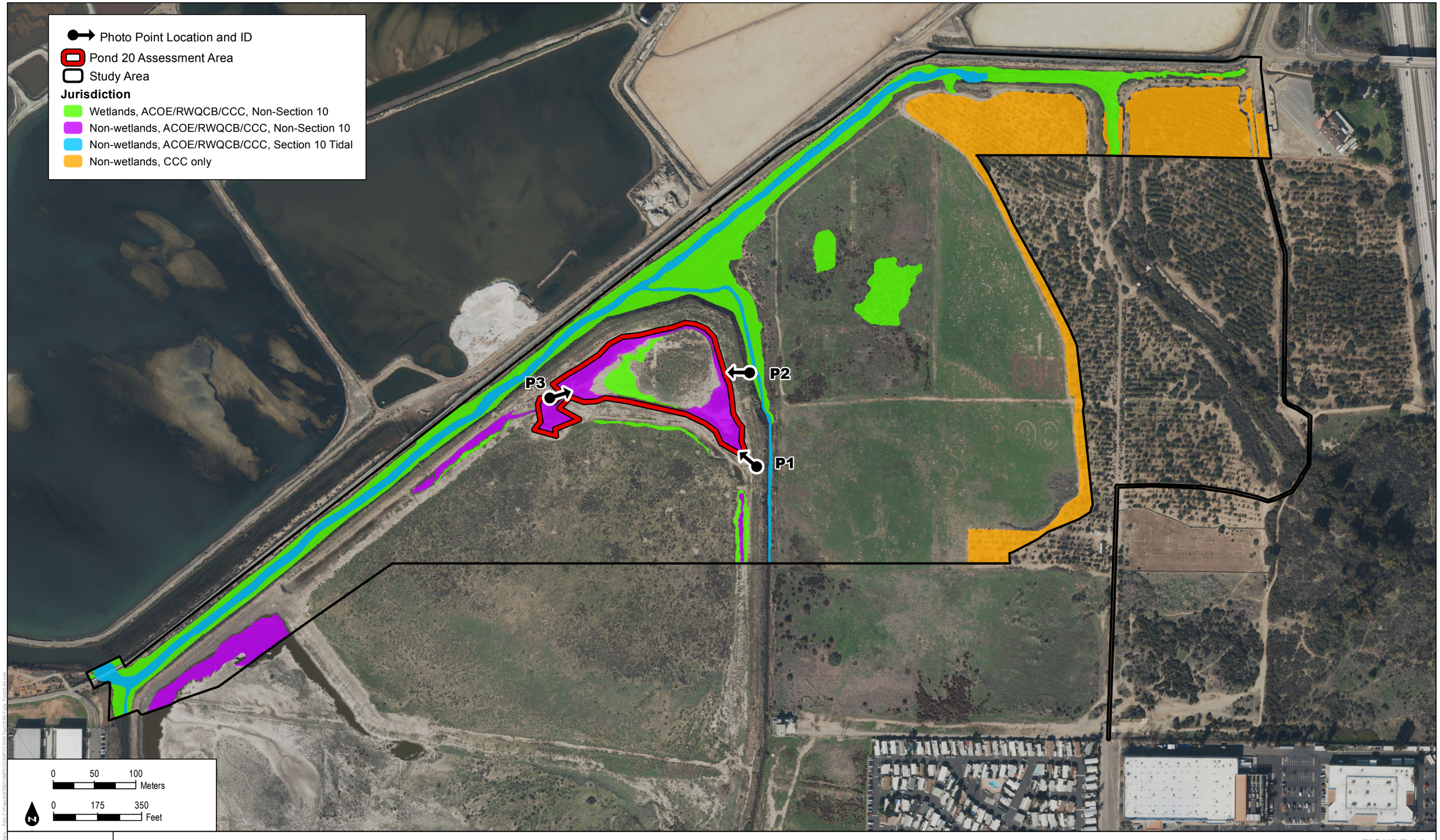
As previously introduced, each of the 14 metrics/submetrics evaluates a specific indicator of ecological condition. Comparisons can be made at the metric/submetric score level where distinctions among the scores are the clearest. The remainder of this section presents a summary of the results contained in the CRAM data sheets (Appendix A). Attribute scores are presented in Chart 1.

4.2.1 Otay River Floodplain Site

Buffer and Landscape Context: The AA at the Otay River Floodplain Site scored 65 for the Buffer and Landscape Context attribute. The entire AA has a buffer, but the aquatic area abundance, buffer width and buffer condition are diminished due to surrounding land use associated with the Bayshore Bikeway, unnatural berms surrounding Pond 20, and historic agricultural uses nearby.

Hydrology: The Hydrology attribute scored 42. All metrics (Water Source, Hydroperiod, and Hydrologic Connectivity) scored low due to the constructed berms surrounding the AA that affect a potential tidal connection. The hydrology at the site is due to a combination of urban runoff and groundwater (elevated water table), rather than tidal inundation.

Physical Structure: The Physical Structure attribute (including Structural Patch Richness and Topographic Complexity metrics) scored low (38) due to a general lack of structural patch types and low topographic complexity as a consequence of the constructed salt pond setting (i.e., dredged pond area and surrounding berms).



SOURCE: Aerial-SANDAG Imagery 2014

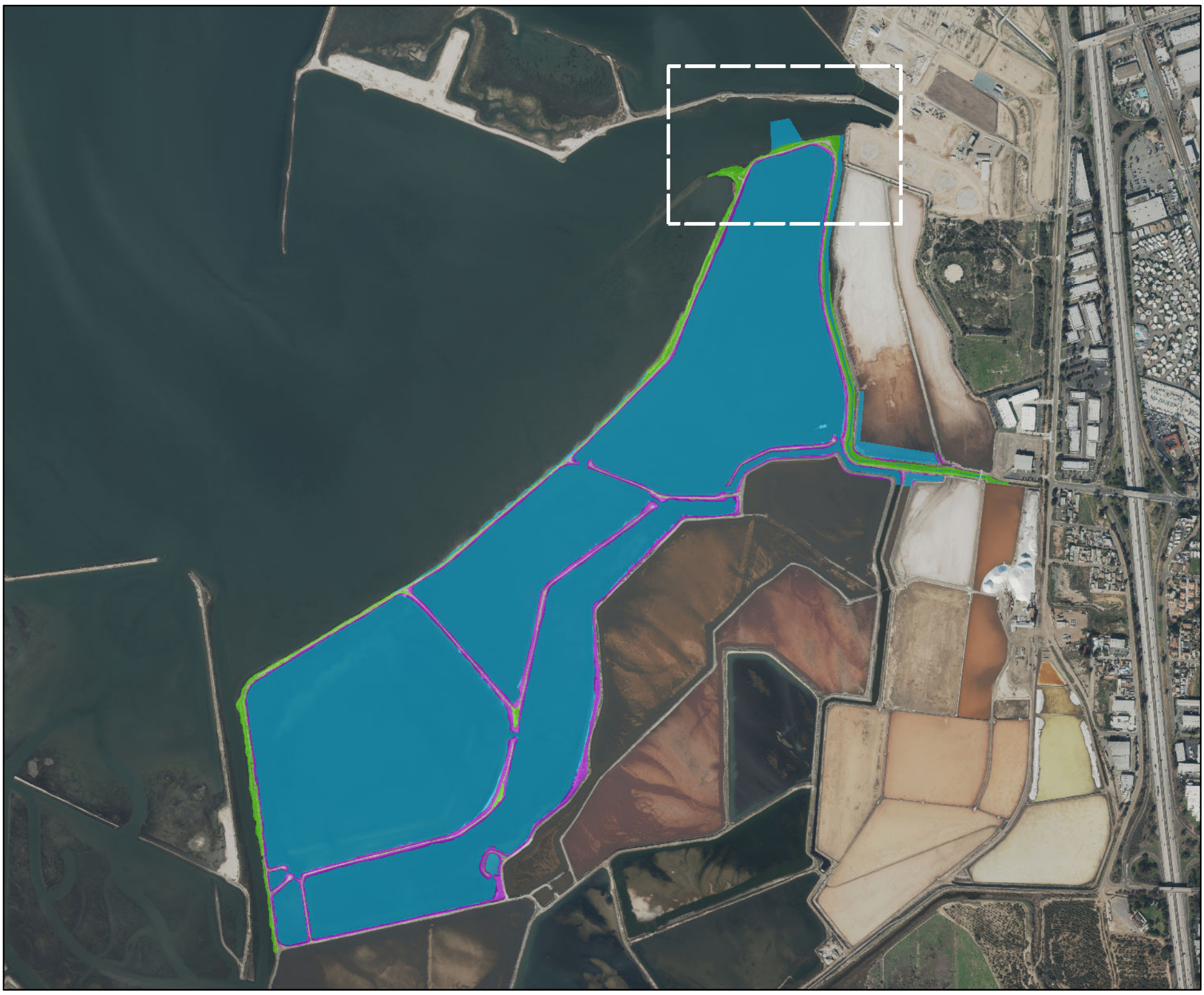
DUDEK

FIGURE 3A

Pond 20 Assessment Area

California Rapid Assessment Method Report for the Otay River Estuary Restoration Project

INTENTIONALLY LEFT BLANK





SOURCE: Aerial-SANDAG Imagery 2014

FIGURE 3B

Pond 15 Assessment Area

DUDEK

California Rapid Assessment Method Report for the Otay River Estuary Restoration Project

Date: 1/26/2016 Last saved by: Item Path: Z:\Projects\6675\01\MAPDOC\MAPS\CRAM Figs\CRAM Fig3b Pond15 AA.mxd

INTENTIONALLY LEFT BLANK



Photo 1: Representative view of Pond 20 Assessment Area



Photo 2: View of Pond 20 Assessment Area from the East



Photo 3: View of Pond 20 Assessment Area from the West



Photo 4: Representative view of Pond 15 Assessment Area

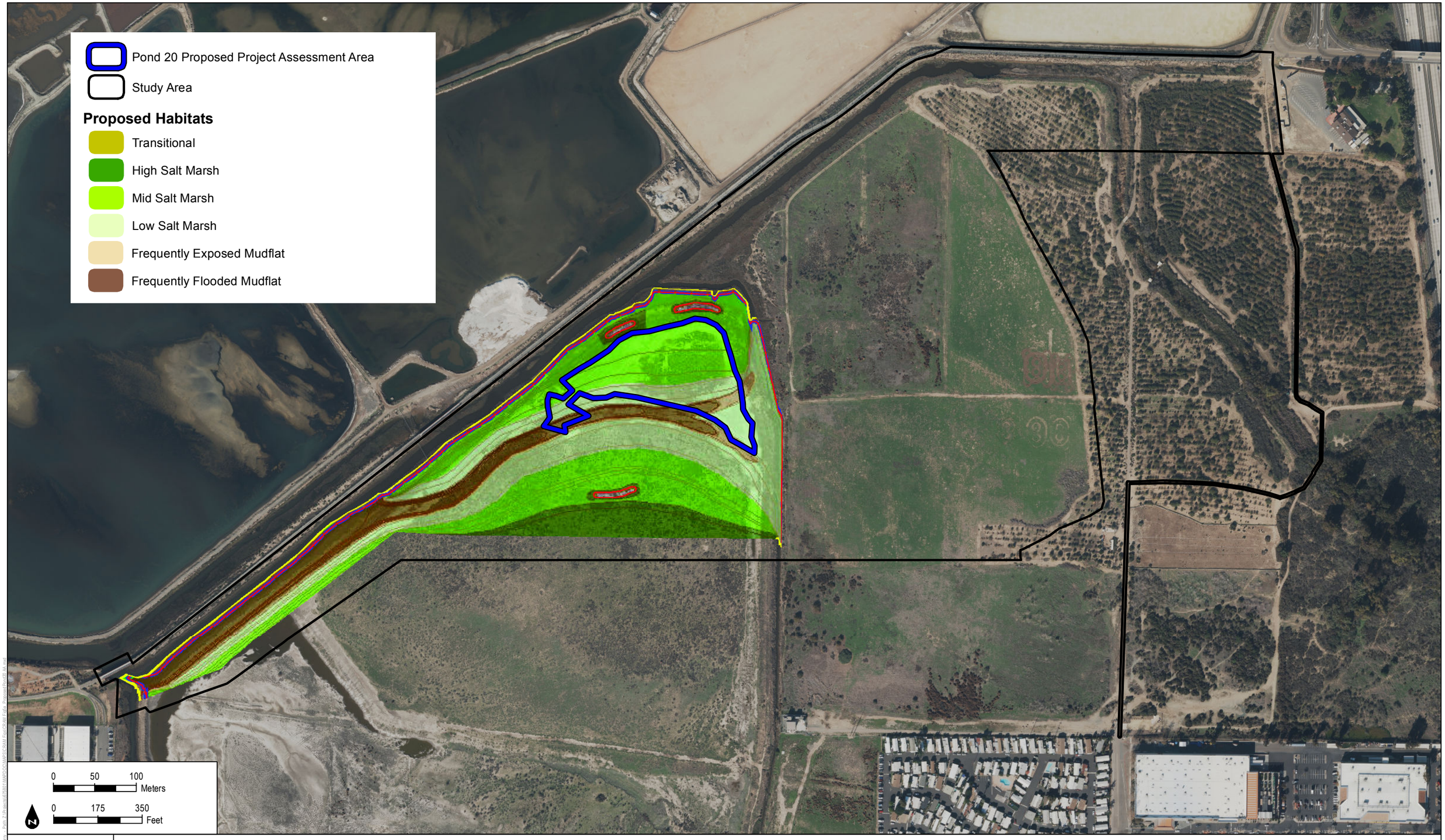


Photo 5: View of Pond 15 Assessment Area from the East



Photo 6: View of Pond 15 Assessment Area from the West

INTENTIONALLY LEFT BLANK



DUDEK

SOURCE: Aerial-SANDAG Imagery 2014

FIGURE 5A

Pond 20 Proposed Project Assessment Area

California Rapid Assessment Method Report for the Otay River Estuary Restoration Project

INTENTIONALLY LEFT BLANK



SOURCE: Aerial-SANDAG Imagery 2014

FIGURE 5B

Pond 15 Proposed Project Assessment Area

DUDEK

Date: 1/27/2016 - Last saved by: tberg - Path: Z:\Projects\6575\01\MAPS\CRAM Figs\CRAM Fig5b_ProposedPond15 AA.mxd

INTENTIONALLY LEFT BLANK

Biotic Structure: The AA is primarily unvegetated, and where there is vegetation, it is dominated by non-native species. The vegetation has little biotic structural diversity and very low horizontal interspersion, which is reflected in the scores for this category (28). The center island within the AA is vegetated with some sparse coast goldenbush shrubs, with primarily non-native slender-leaved iceplant (*Mesembryanthemum nodiflorum*) growing in the interstices and occasionally near seasonally ponded areas.

4.2.2 Pond 15 Site

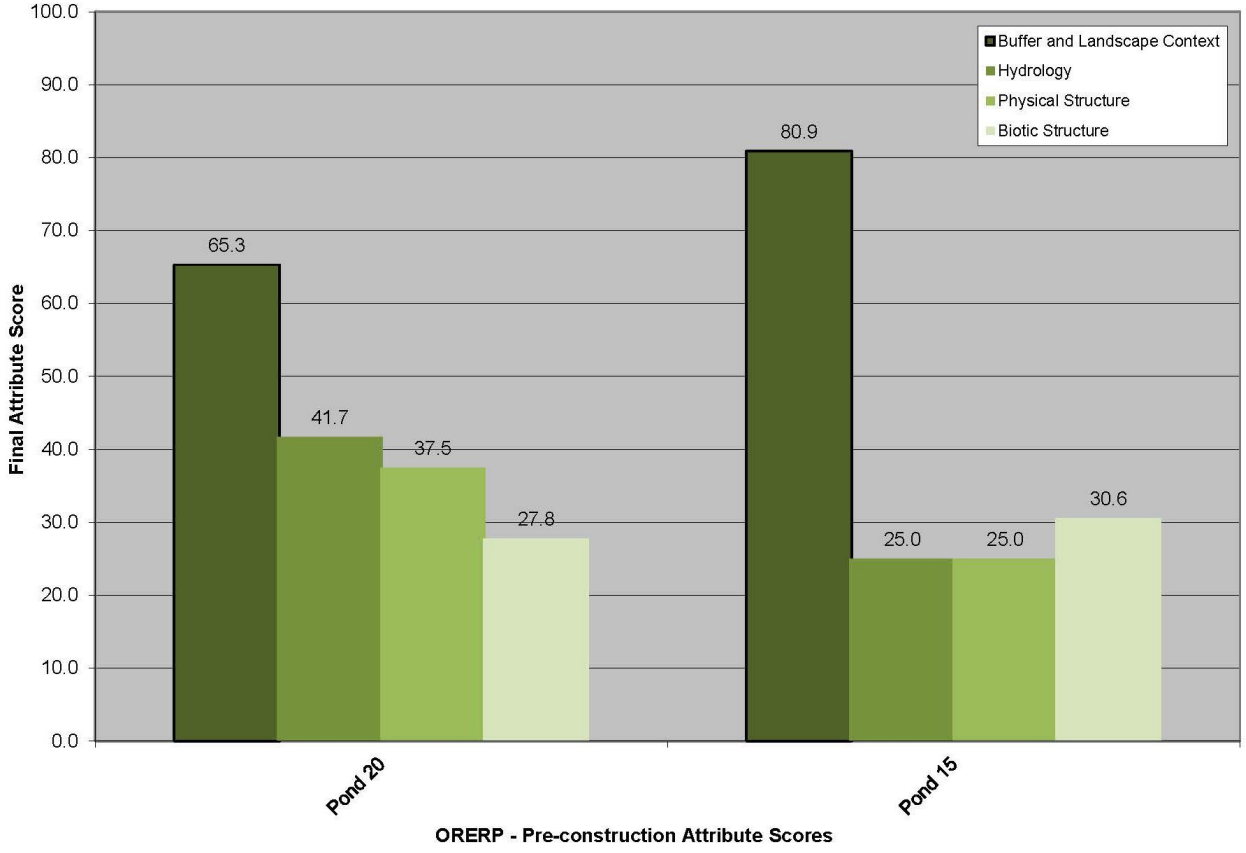
Buffer and Landscape Context: The AA at the Pond 15 Site scored 81 for the Buffer and Landscape Context attribute. The score was relatively high because the entire AA has a buffer, and the buffer extends well beyond the edge of the AA. The Buffer Width score was high due to the CRAM guidelines which allow for the extension of buffer measurements into open water in situations where there is buffer between the AA and the open water (as is the case at this AA). The overall score for Buffer and Landscape Context was slightly diminished due to surrounding land use associated with the salt pond operations and periodic maintenance of the perimeter berms.

Hydrology: The Hydrology attribute scored 25. All metrics (Water Source, Hydroperiod, and Hydrologic Connectivity) scored low due to the constructed berms surrounding the AA that affect a potential tidal connection. The hydrology at the site is due to manually operated tide gates that route water through the evaporative salt pond cycle, rather than natural tidal inundation. There are no freshwater sources from upstream, and no natural tidal connection that affect the hydrology of the AA.

Physical Structure: The Physical Structure attribute (including Structural Patch Richness and Topographic Complexity metrics) scored low (25) due to a general lack of structural patch types and low topographic complexity as a consequence of the constructed salt pond setting.

Biotic Structure: The AA is primarily unvegetated. There are a few small patches of vegetated land on the inside slope of the berm within the AA, dominated by non-native slender-leaved iceplant and native Watson's saltbush (Atriplex watsonii). Biotic structural diversity and horizontal interspersion are very low, which is reflected in the scores for this category (31).

Chart 1
Final Attribute Scores for Pre-construction Conditions



4.3 Post-construction CRAM Scores

The same 14 metrics/submetrics were evaluated based on the expected ecological condition post-construction after a period of approximately five years. The expected ecological condition is based on the preferred alternative identified as the Intertidal Alternative in the *Draft Final Restoration Plan for the Otay River Estuary Restoration Project* (Poseidon Water 2014). Attribute scores for the predicted post-Project condition are presented in Chart 2.

4.3.1 Otay River Floodplain Site – Post-construction

Buffer and Landscape Context: The AA at the Otay River Floodplain Site scored 78 for the Buffer and Landscape Context attribute. The entire AA would have a buffer, but the aquatic area abundance, buffer width and buffer condition would be slightly diminished due to surrounding

land use associated with the Bayshore Bikeway and historic agricultural uses nearby which are not expected to change as part of this Project.

Hydrology: The Hydrology attribute scored 67 in the post-Project condition. The Water Source metric stayed the same because it evaluates the upstream freshwater sources, which would not be altered as part of the Project design. However, incorporating tidal connectivity into the Project design would improve the Hydroperiod and Hydrologic Connectivity metrics. The Restoration Plan indicates that there would be some tidal muting at the lower end of the tidal range due to some expected deposition within the Otay River channel, but the site would experience two daily minima and maxima tides (Poseidon Water 2013).

Physical Structure: The Physical Structure attribute (including Structural Patch Richness and Topographic Complexity metrics) would be substantially increased due to the incorporation of topographic complexity (swales and channels) into the restoration design and as a consequence of structural patches expected to develop from the planned tidal inundation. The projected score for this attribute is 75, which slightly diminished from a perfect score due to the fact that the system is constructed and may not achieve complex microtopography or more than eight structural patch types as defined in CRAM.

Biotic Structure: The AA is expected to be primarily vegetated with native habitat in the post-Construction condition, with intervening tidal channels and mudflat. The Biotic Structure is expected to be substantially improved with the proposed restoration design, with an array of habitats corresponding to the elevational gradient from subtidal to upper salt marsh. The Biotic Structure attribute is expected to score approximately 89, with substantially increased Plant Community Metric conditions (e.g., number of plant layers, number of co-dominant species, and percent invasive species), as well as significantly improved interspersion/zonation and vertical structure of the vegetation. This is expected considering that the AA would go from being primarily unvegetated lacking any tidal flushing, to a functioning tidal system with large areas vegetated with salt marsh habitat.

4.2.2 Pond 15 Site – Post-construction

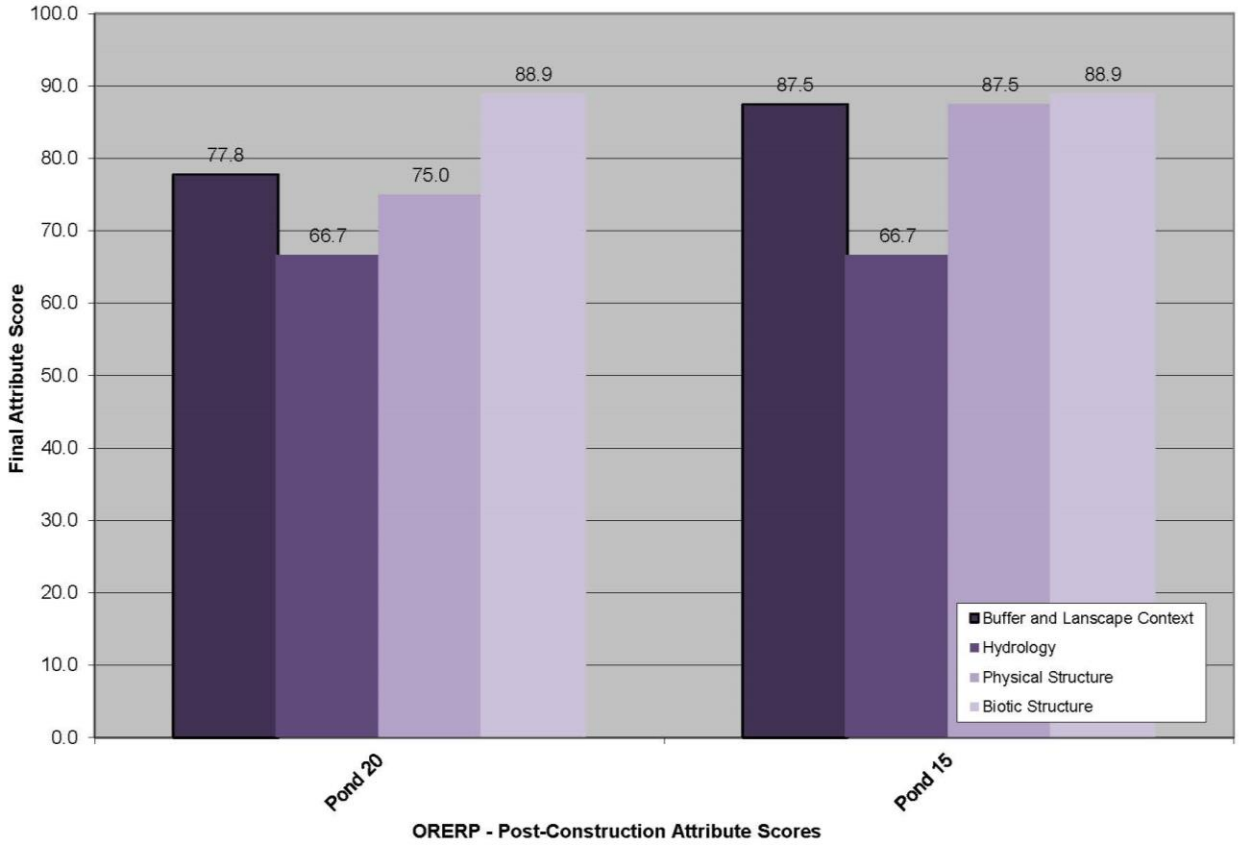
Buffer and Landscape Context: The AA at the Pond 15 Site would score approximately 88 for the Buffer and Landscape Context attribute in the post-construction condition. The score would remain relatively high because the entire AA would continue to have a buffer which would extend well beyond the edge of the AA. Additionally, the buffer conditions of the AA would be expected to improve with the proposed restoration design and maintenance program.

Hydrology: The Hydrology attribute scored 67 in the post-Project condition. The Water Source metric stayed the same because it evaluates the upstream freshwater sources, which would not be altered as part of the Project design. However, incorporating tidal connectivity into the Project design would improve the Hydroperiod and Hydrologic Connectivity metrics. The Restoration Plan indicates that the site would be constructed to experience a full tidal exchange (Poseidon Water 2013), which would substantially improve the hydroperiod. The hydrologic connectivity would also improve, but would be slightly diminished due to the levees that would remain in place surrounding much of the restoration area.

Physical Structure: The Physical Structure attribute (including Structural Patch Richness and Topographic Complexity metrics) would be substantially increased due to the incorporation of topographic complexity (swales and channels) into the restoration design and as a consequence of structural patches expected to develop from the planned tidal inundation. The projected score for this attribute is approximately 88, which slightly diminished from a perfect score due to the fact that the system is constructed and may not achieve complex microtopography as defined in CRAM.

Biotic Structure: The AA is expected to be primarily vegetated with native habitat in the post-construction condition, with intervening tidal channels and mudflat. The Biotic Structure is expected to be substantially improved with the proposed restoration design, with an array of habitats corresponding to the elevational gradient from subtidal to upper salt marsh. The Biotic Structure attribute is expected to score approximately 89, with substantially increased Plant Community Metric conditions (e.g., number of plant layers, number of co-dominant species, and percent invasive species), as well as significantly improved interspersion/zonation and vertical structure of the vegetation. This is expected considering that the AA would go from being a salt evaporator pond lacking any tidal flushing, to a functioning tidal system with large areas vegetated with salt marsh habitat.

Chart 2
Projected Attribute Scores for Post-construction Conditions



INTENTIONALLY LEFT BLANK

6 DISCUSSION OF RESULTS

In general, the CRAM analysis revealed that both the Otay River Floodplain Site (Pond 20) and Pond 15 are very similar in scoring trends, with relatively high Buffer and Landscape Context scores, and low Hydrology, Physical Structure, and Biotic Structure scores as assessed in the pre-construction condition. The sites were also expected to be similar in the post-construction condition, with high scores for all attributes, most notably the substantially higher Hydrology, Physical Structure, and Biotic Structure scores. The restoration design for the Project includes substantially altering the hydrologic regime and turning both sites into functioning tidally influenced habitat. Implementation of the Project will significantly improve ecological functions and conditions with the establishment of large areas of lower, mid- and upper salt marsh as a mosaic of vegetation associated with tidal channels and mudflats.

Table 4 shows side-by-side comparisons for the CRAM metric scores for both the pre-construction conditions and the post-construction conditions. In no metric are the functions and services expected to decline as a result of implementing the Project. The overall AA score is expected to improve from approximately 43 to 77 (34 point increase) at the Otay River Floodplain Site (Pond 20), and from approximately 40 to 83 (43 point increase) at the Pond 15 site.

Table 4
Comparison of Average CRAM Attribute Scores between the Pre-construction Conditions and the Post-construction Conditions

Buffer and Landscape Context	Pond 20 *Pre-construction*	Pond 20 *Post-construction*	Pond 20 Delta	Pond 15 *Pre-construction*	Pond 15 *Post-construction*	Pond 15 Delta
Aquatic Area Abundance	6	9	3	9	9	0
Percent AA with Buffer	12	12	0	12	12	0
Average Buffer Width	9	9	0	12	12	0
Buffer Condition	9	9	0	9	12	3
Raw Score	*15.7*	*18.7*	*3.0*	*19.4*	*21.0*	*1.6*
Final Score	*65.3*	*77.8*	*12.5*	*80.9*	*87.5*	*6.6*
Hydrology						
Water Source	6	6	0	3	3	0
Hydroperiod/Stability	3	9	6	3	12	9
Hydrologic Connectivity	6	9	3	3	9	6
Raw Score	*15.0*	*24.0*	*9.0*	*9.0*	*24.0*	*15.0*
Final Score	*41.7*	*66.7*	*25.0*	*25.0*	*66.7*	*41.7*

Table 4
Comparison of Average CRAM Attribute Scores between the Pre-construction Conditions and the Post-construction Conditions

Buffer and Landscape Context	Pond 20 *Pre-construction*	Pond 20 *Post-construction*	Pond 20 Delta	Pond 15 *Pre-construction*	Pond 15 *Post-construction*	Pond 15 Delta
Physical Structure						
Patch Richness	6	9	3	3	12	9
Topographic Complexity	3	9	6	3	9	6
Raw Score	*9.0*	*18.0*	*9.0*	*6.0*	*21.0*	*15.0*
Final Score	*37.5*	*75.0*	*37.5*	*25.0*	*87.5*	*62.5*
Biotic Structure						
Number of Plant Layers	6	9	3	6	9	3
Co-Dominant Species	3	12	9	6	12	6
Percent Invasion	3	12	9	3	12	9
Plant Community Metric	4.0	11.0	7.0	5.0	11.0	6.0
Interspersion/Zonation	3	9	6	3	9	6
Vertical Structure	3	12	9	3	12	9
Raw Score	*10.0*	*32.0*	*22.0*	*11.0*	*32.0*	*21.0*
Final Score	*27.8*	*88.9*	*61.1*	*30.6*	*88.9*	*58.3*
Overall AA Score	**43.1**	**77.1**	**34.0**	**40.4**	**82.7**	**42.3**

The balance of functions and services related to wildlife are carefully evaluated in the Poseidon Mitigation Credit Analysis Marine Life Mitigation Plan – Integrated Restoration Plan (WRA 2013). The restored areas are expected to be densely populated by a large diversity and high abundance of fishes, birds, and macro-invertebrates indicative of highly functioning intertidal marshes that eventually export productivity to the bay-wide system rather than act as a sink (WRA 2013).

7 CONCLUSIONS

This assessment provides the baseline conditions of the vegetated wetlands and waters that will be impacted by the proposed Project and a comparison to the predicted conditions after Project construction. As previously noted, a comparison is not being made to the Carlsbad Desalination Project that is mitigating at this site. Project construction would result in temporary impacts to jurisdictional waters and wetlands, and therefore, the U.S. Army Corps of Engineers (ACOE) requested the preparation of a functional assessment to characterize the effects of the project on the functions and services of the existing resources to be temporarily impacted.

Based on the results of the pre-construction and post-construction condition assessment, Dudek believes the proposed Project will compensate for the temporary loss of functions and services. Results of the analysis indicate substantially improved functions and services of aquatic resources would result from the proposed design. Further, the ponds and associated islands and shorelines are anticipated to provide much greater biologic functions and services (including functions and services specific to wildlife not measured by CRAM) for the target wildlife species as described in the Restoration Plan compared to the current condition or future condition absent the Project.

The results of this CRAM analysis, coupled with the primary tenant of the Restoration Plan as a whole, which is to restore essential aquatic and salt marsh habitats, confirm that there will be a substantial improvement of functions and services of the wetlands and waters due to the implementation of the proposed Project.

INTENTIONALLY LEFT BLANK

8 LITERATURE CITED

California Wetlands Monitoring Workgroup (CWMW). 2009. *Using CRAM (California Rapid Assessment Method) to Assess Wetland Projects as an Element of Regulatory and Management Programs – Technical Bulletin.* October 13.

Dudek. 2015. *Results of a Preliminary Jurisdictional Wetland Delineation Report for the Otay River Estuary Restoration Project (ORERP), South San Diego Bay Unit of the San Diego Bay National Wildlife Refuge* March 10.

California Wetlands Monitoring Workgroup (CWMW). 2013. *California Rapid Assessment Method (CRAM) for Wetlands – Perennial Estuarine Wetlands Field Book.* Ver. 6.1. Accessed online at http://www.cramwetlands.org/. January.

Poseidon Water. 2014. *Draft Final Restoration Plan for the Otay River Estuary Restoration Project*. Prepared for the California Coastal Commission. May

USDA-NRCS (U.S. Department of Agriculture–Natural Resources Conservation Service). 2009. "Web Soil Survey." Accessed August 24, 2011. http://websoilsurvey.nrcs.usda.gov/app/.

USFWS (U.S. Fish and Wildlife Service). 2006. *San Diego Bay National Wildlife Refuge (NWR) Final Comprehensive Conservation Plan (CCP) and Environmental Impact Statement (EIS).* Adopted September 29, 2006.

WRA. 2013. *Poseidon Mitigation Credit Analysis Marine Life Mitigation Plan – Integrated Restoration Plan.* Technical Memorandum. Prepared for Poseidon Resources. March.

INTENTIONALLY LEFT BLANK

APPENDIX A

CRAM Field Forms

Basic Information Sheet: Perennial Estuarine Wetlands

Assessment Area Name:	POND 20A - EXISTING
Project Name:	ORERP
Assessment Area ID #:	P20AE
Project Site ID #:	OREPP
Date:	DEC 2, 2015

Assessment Team Members for This AA

Andy Thomson

Center of AA:

Latitude: **Longitude:**

Wetland Sub-type:

☑ Perennial Saline ☐ Perennial Non-saline

AA Category:

☑ Restoration ☑ Mitigation ☐ Impacted ☐ Ambient ☐ Reference ☐ Training

☐ Other:

What best describes the tidal stage over the course of the time spent in the field?
Note: It is recommended that the assessment be conducted during low tide.

☐ high tide ☐ low tide N/A – AA is not tidal due to berms

Photo Identification Numbers and Description:

	Photo ID No.	Description	Latitude	Longitude	Datum
1		North			
2		South			
3		East			
4		West			
5					
6					
7					
8					
9					
10					

Site Location Description:

12/2/15
7:30 AM – 12:00 PM
SUNNY, CLEAR. LIGHT BREEZE (0-6 MPH)
TEMP 55-65°F

Comments:

Scoring Sheet: Perennial Estuarine Wetlands

AA Name: POND 20A Existing			Date: DEC 2, 2015
Attribute 1: Buffer and Landscape Context (pp. 8-14)			**Comments**
Aquatic Area Abundance (D)	Alpha. C	Numeric 6	See attached Figure
Buffer (based on sub-metrics A-C)			
Buffer submetric A: Percent of AA with Buffer	Alpha. A	Numeric 12	
Buffer submetric B: Average Buffer Width	B	9	* 189 m is just below cutoff between B and A.
Buffer submetric C: Buffer Condition	B	9	Intermediate native/non-native veg. w/low impact human visitation
Raw Attribute Score = D+[C x (A x B)$^{1/3}$]$^{1/2}$			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 2: Hydrology Attribute (pp. 15-19)			
Water Source	Alpha. C	Numeric 6	Combination of urban runoff and groundwater (no tidal connection)
Hydroperiod	D	3	surrounded by artificial berms ↓
Hydrologic Connectivity	C	6	50-90% limited by berms.
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Attribute 3: Physical Structure Attribute (pp. 20-25)			
Structural Patch Richness	Alpha. C	Numeric 6	
Topographic Complexity	D	3	
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 4: Biotic Structure Attribute (pp. 26-34)			
Plant Community Composition (based on sub-metrics A-C)			
Plant Community submetric A: Number of plant layers	Alpha. C	Numeric 6	
Plant Community submetric B: Number of Co-dominant species	D	3	
Plant Community submetric C: Percent Invasion	D	3	
Plant Community Composition *(numeric average of submetrics A-C)*			
Horizontal Interspersion	D	3	
Vertical Biotic Structure	D	3	
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Overall AA Score (average of four final Attribute Scores)			

Worksheet for Aquatic Area Abundance Metric for Estuarine Wetlands

Percentage of Transect Lines that Contains an Aquatic Feature of Any Kind	
Segment Direction	Percentage of Transect Length That is an Aquatic Feature
North	390
South	0
East	130
West	370
Average Percentage of Transect Length that is an Aquatic Feature	890/2000 = 44.5%

Percent of AA with Buffer Worksheet.

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

See attached Figure.

Percent of AA with Buffer: 100 %

Worksheet for calculating average buffer width of AA

Line	Buffer Width (m)
A	110
B	250
C	250
D	250
E	250
F	250
G	90
H	65
Average Buffer Width ***Round to the nearest integer***	1515/8 = 189 m

Structural Patch Type Worksheet for Estuarine Wetlands

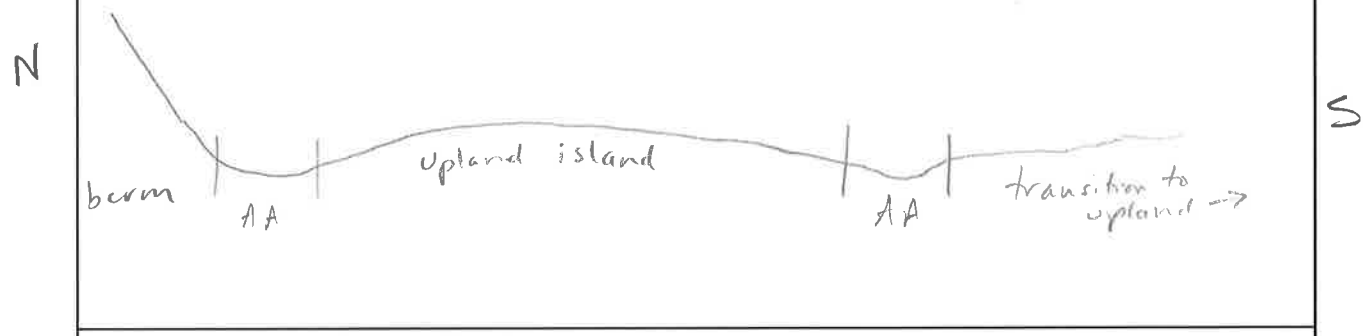
Circle each type of patch that is observed in the AA and enter the total number of observed patches in the worksheet below.

STRUCTURAL PATCH TYPE (circle for presence)	Estuarine	
Minimum Patch Size	**3 m^2**	
Abundant wrackline or organic debris in channel, on floodplain, or across depressional wetland plain	1	
Animal mounds and burrows	1	
Bank slumps or undercut banks in channels or along shoreline	1	
Debris jams	1	
Filamentous macroalgae or algal mats	1	
Large Woody Debris	1	
Non-vegetated flats or bare ground (sandflats, mudflats, gravel flats, etc.)	(1)	- hypersaline
Pannes or pools on floodplain	(1)	
Plant hummocks and/or sediment mounds	(1)	- Artificial
Point bars and in-channel bars	1	
Pools or depressions in channels (wet or dry channels)	(1)	- Artificial
Secondary channels	1	
Shellfish beds (living)	1	
Soil cracks	1	
Standing snags (at least 3 m tall)	1	
Submerged vegetation	1	
Total Possible	**16**	
No. Observed Patch Types (enter here and use in Table 14 below)	4	

Worksheet for AA Topographic Complexity

At two locations in the AA, make a sketch of the profile from the AA boundary to AA boundary. Try to capture the major channels, slopes and intervening micro-topographic relief. Based on these sketches and the profiles in Figure 8, choose a description in Table 16 that best describes the overall topographic complexity of the AA.

North to South



~~East to West~~ West → East



Plant Community Metric Worksheet: Co-dominant species richness
(A dominant species represents ≥10% *relative* cover)

Special Note:

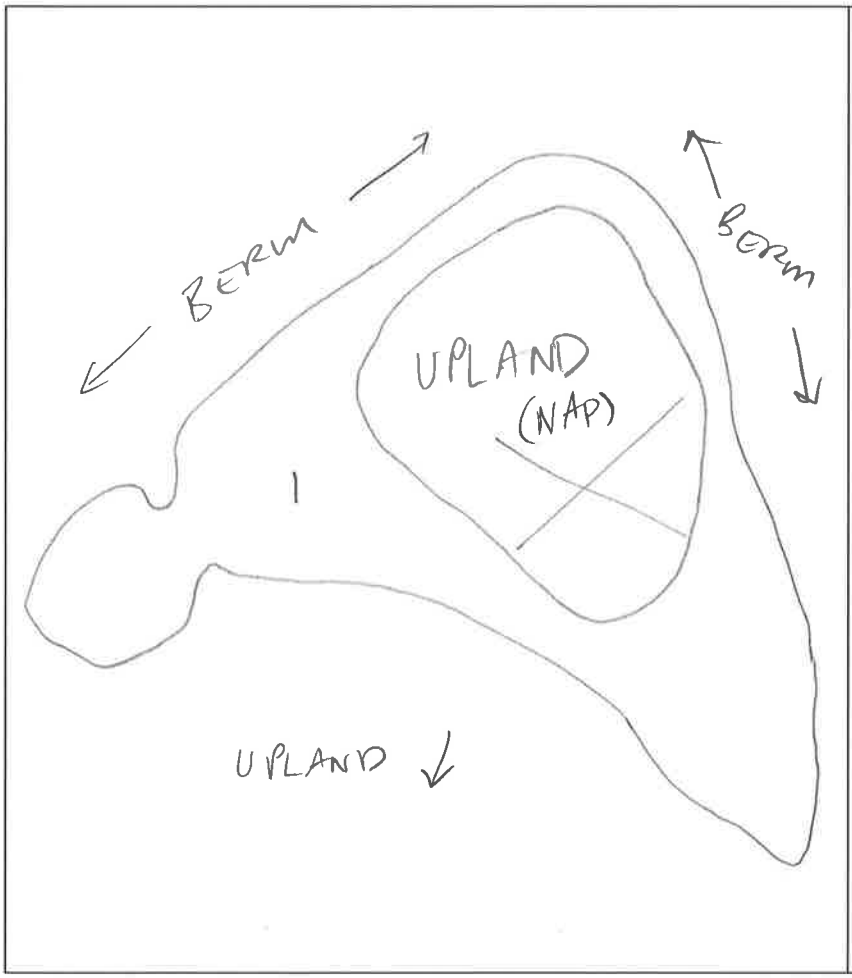
** Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

Floating or Canopy-forming	Invasive?	Short (<0.3 m)	Invasive?	
		~~Amblyopappus pusillus~~	y	<10%
		~~Mesembryanthemum crystl.~~	y	<10%
		Mesembr. nodiflorum	y	
Medium (0.3 – 0.75 m)	**Invasive?**	**Tall (0.75 – 1.5 m)**	**Invasive?**	
Very Tall (>1.5 m)	**Invasive?**			
		Total number of co-dominant species for all layers combined (enter here and use in Table 18)	1	
		Percent Invasion *Round to the nearest whole number (integer)* (enter here and use in Table 18)	100%	

NOTE: AA is mostly unvegetated. Short layer is ~5%, and is composed almost entirely of Mes. nod.

Horizontal Interspersion Complexity Worksheet.

Use the spaces below to make a quick sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign the zones names and record them on the right. Each zone should comprise as least 5% of the AA. Based on the sketch, choose a single profile from Figure 10 that best represents the AA overall.



Assigned zones:

1) salt panne/mud flat
2)
3)
4)
5)
6)

Table 21: Wetland disturbances and conversions.

Has a major disturbance occurred at this wetland?	(Yes)	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	(other)
If yes, then how severe is the disturbance?	(likely to affect site next 5 or more years)	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	seasonal estuarine	
	(perennial saline estuarine)	perennial non-saline estuarine	wet meadow	
	lacustrine	seep or spring	playa	

NOTE: site was dredged to create salt evaporation pond.

Stressor Checklist Worksheet

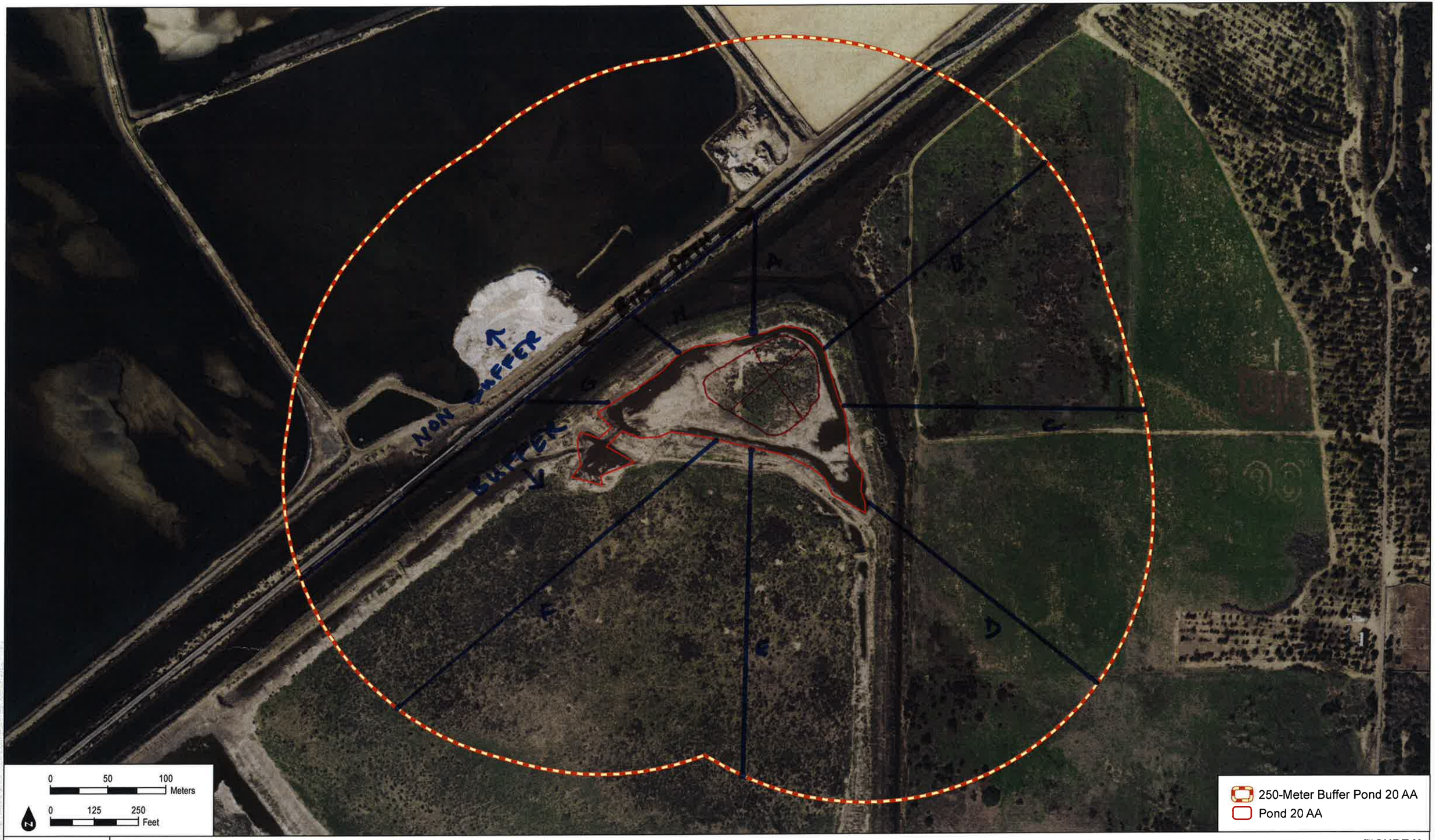
HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	✓	✓
Flow diversions or unnatural inflows	✓	✓
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)	✓	✓
Weir/drop structure, tide gates		
Dredged inlet/channel	✓	✓
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees	✓	✓
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)		
Actively managed hydrology		
Comments		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**		
Plowing/Discing **(N/A for restoration areas)**		
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)	✓	✓
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)		
Bacteria and pathogens impaired (PS or Non-PS pollution)		
Trash or refuse	✓	✓
Comments		

? likely

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)		
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control		
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources		
Lack of treatment of invasive plants adjacent to AA or buffer	✓	✓
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Significant negative effect on AA
Urban residential	✓	✓
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)	✓	✓
Dryland farming		
Intensive row-crop agriculture		
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor		
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments Bayshore bikeway passes through 500 m study area.		



DUDEK

SOURCE: Aerial-SANDAG Imagery 2014

Otay River Estuary Restoration Project CRAM

FIGURE X

250-Meter Buffer Pond 20 AA

EXISTING



DUDEK

SOURCE: Aerial-SANDAG Imagery 2014

Otay River Estuary Restoration Project CRAM

FIGURE X

500-Meter Buffer Pond 20 AA

EXISTING

Basic Information Sheet: Perennial Estuarine Wetlands

Assessment Area Name: POND 20 A - FUTURE

Project Name: ORERP

Assessment Area ID #: P20AF

Project Site ID #: ORERP **Date:** DEC 2, 2015

Assessment Team Members for This AA

ACT

Center of AA:

Latitude: **Longitude:**

Wetland Sub-type:

☑ Perennial Saline ☐ Perennial Non-saline

AA Category:

☑ Restoration ☑ Mitigation ☐ Impacted ☐ Ambient ☐ Reference ☐ Training

☐ Other:

What best describes the tidal stage over the course of the time spent in the field?
Note: It is recommended that the assessment be conducted during low tide.

☐ high tide ☐ low tide N/A

Photo Identification Numbers and Description:

	Photo ID No.	Description	Latitude	Longitude	Datum
1	N/A	North			
2		South			
3		East			
4		West			
5					
6					
7					
8					
9					
10					

Site Location Description:

Comments:

Scoring Sheet: Perennial Estuarine Wetlands

AA Name: POND 20A - FUTURE			Date: DEC. 2, 2015
Attribute 1: Buffer and Landscape Context (pp. 8-14)			**Comments**
Aquatic Area Abundance (D)	Alpha. B	Numeric 9	Increase to south of AA
Buffer (based on sub-metrics A-C)			
Buffer submetric A: Percent of AA with Buffer	A	12	Same as existing cond.
Buffer submetric B: Average Buffer Width	B	9	Same as existing cond.
Buffer submetric C: Buffer Condition	B	9	Improved, but not to 'A' rating due to agric fields
Raw Attribute Score = D+[C x (A x B)½]½			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 2: Hydrology Attribute (pp. 15-19)			
Water Source	Alpha. C	Numeric 6	Upstream freshwater source will not change (tidal hydrol. is not considered)
Hydroperiod	B	12	Full tidal exchange expected
Hydrologic Connectivity	B	9	Improved with removal of northern berm, but some perimeter levees will remain.
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Attribute 3: Physical Structure Attribute (pp. 20-25)			
Structural Patch Richness	Alpha. B	Numeric 9	6 patch types
Topographic Complexity	B	9	Moderate topog. complexity
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 4: Biotic Structure Attribute (pp. 26-34)			
Plant Community Composition (based on sub-metrics A-C)			
Plant Community submetric A: Number of plant layers	Alpha. B	Numeric 9	3 plant layers
Plant Community submetric B: Number of Co-dominant species	A	12	6 codominant spp.
Plant Community submetric C: Percent Invasion	A	12	
Plant Community Composition *(numeric average of submetrics A-C)*			
Horizontal Interspersion	B	9	3 zones
Vertical Biotic Structure	A	12	Mostly densely vegetated
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Overall AA Score (average of four final Attribute Scores)			

Worksheet for Aquatic Area Abundance Metric for Estuarine Wetlands

Percentage of Transect Lines that Contains an Aquatic Feature of Any Kind	
Segment Direction	Percentage of Transect Length That is an Aquatic Feature
North	390
South (Increases w/ restoration)	220
East	130
West	370
Average Percentage of Transect Length that is an Aquatic Feature	1110/4 = 278m

Percent of AA with Buffer Worksheet.

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

See attached Figure

Percent of AA with Buffer: 100 %

Worksheet for calculating average buffer width of AA

Line	Buffer Width (m)
A	110
B	250
C	250
D	250
E	250
F	250
G	90
H	65
Average Buffer Width ***Round to the nearest integer***	1515/8 = 189 m

Structural Patch Type Worksheet for Estuarine Wetlands

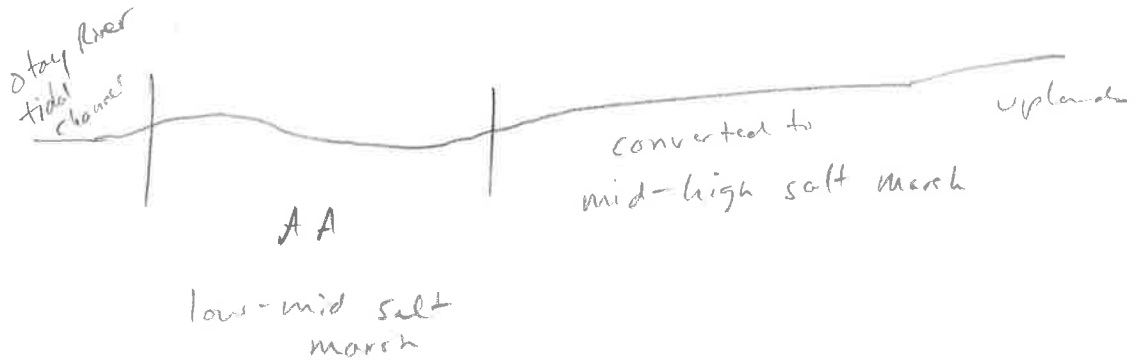
Circle each type of patch that is observed in the AA and enter the total number of observed patches in the worksheet below.

STRUCTURAL PATCH TYPE (circle for presence)	Estuarine
Minimum Patch Size	**3 m^2**
Abundant wrackline or organic debris in channel, on floodplain, or across depressional wetland plain	(1)
Animal mounds and burrows	(1)
Bank slumps or undercut banks in channels or along shoreline	1
Debris jams	1
Filamentous macroalgae or algal mats	1
Large Woody Debris	1
Non-vegetated flats or bare ground (sandflats, mudflats, gravel flats, etc.)	(1)
Pannes or pools on floodplain	1
Plant hummocks and/or sediment mounds	1
Point bars and in-channel bars	1
Pools or depressions in channels (wet or dry channels)	(1)
Secondary channels	(1)
Shellfish beds (living)	1
Soil cracks	(1)
Standing snags (at least 3 m tall)	1
Submerged vegetation	1
Total Possible	**16**
No. Observed Patch Types (enter here and use in Table 14 below)	6

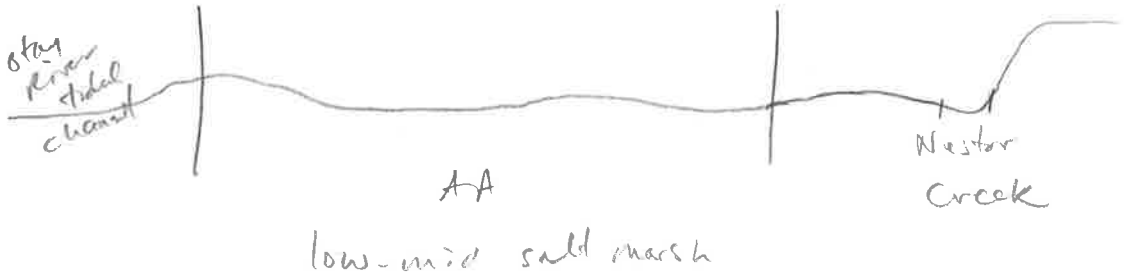
Worksheet for AA Topographic Complexity

At two locations in the AA, make a sketch of the profile from the AA boundary to AA boundary. Try to capture the major channels, slopes and intervening micro-topographic relief. Based on these sketches and the profiles in Figure 8, choose a description in Table 16 that best describes the overall topographic complexity of the AA.

North to South



~~East to West~~ West to East



Plant Community Metric Worksheet: Co-dominant species richness
(A dominant species represents ≥10% *relative* cover)

Special Note:

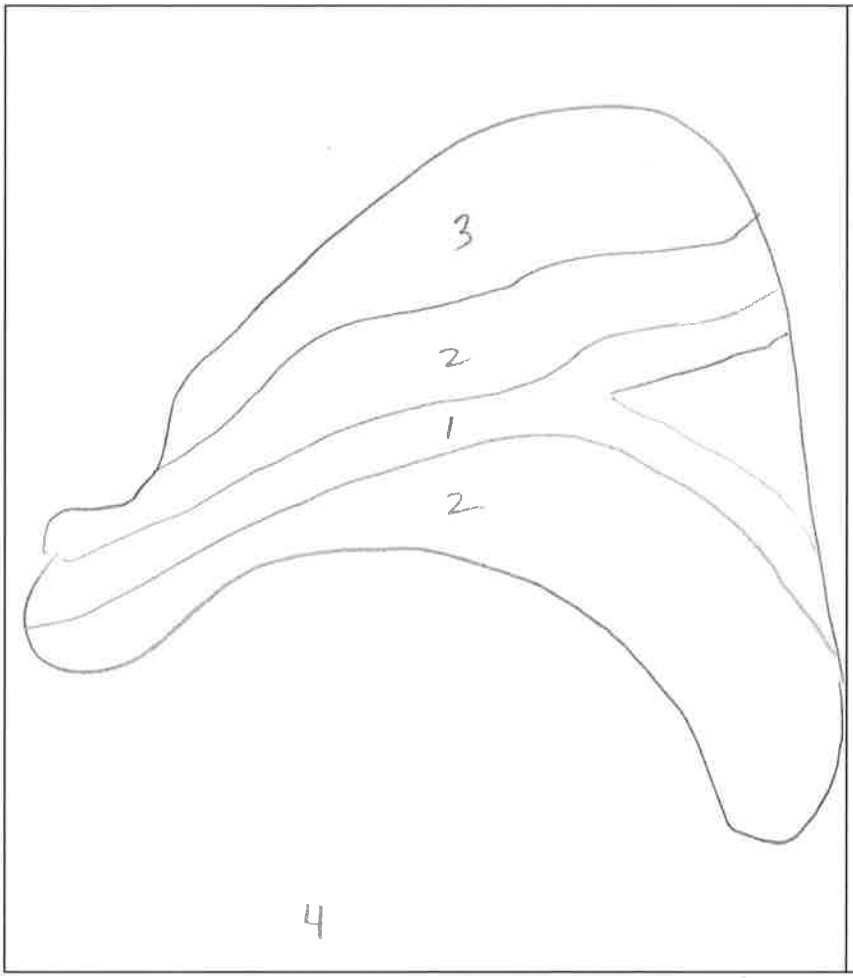
** Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

Floating or Canopy-forming	Invasive?	Short (<0.3 m) 12"	Invasive?
		Salic. brigelowii	N
		Batis maritima	N
		Jaumea carnosa	N
Medium (0.3 – 0.75 m) 12-30"	**Invasive?**	**Tall (0.75 – 1.5 m)** 30-60"	**Invasive?**
		Spartina foliosa	N
Suaeda esteroa	N		
Sarcocornia pacifica	N		
Very Tall (>1.5 m)	**Invasive?**		
		Total number of co-dominant species for all layers combined (enter here and use in Table 18)	6
		Percent Invasion *Round to the nearest whole number (integer)* (enter here and use in Table 18)	0

NOTE: FOR LOW-MID MARSH. PROJECT ALSO INCLUDES HIGH MARSH, BUT IT IS NOT WITHIN AA BOUNDARY.

Horizontal Interspersion Complexity Worksheet.

Use the spaces below to make a quick sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign the zones names and record them on the right. Each zone should comprise as least 5% of the AA. Based on the sketch, choose a single profile from Figure 10 that best represents the AA overall.



Assigned zones:

1) Tidal channel (brackishwater/mudflat)
2) Low salt marsh (cordgrass)
3) Mid salt marsh (pickleweed)
4) High salt marsh (saltgrass/frankenia)
5)
6)

Table 21: Wetland disturbances and conversions.

Has a major disturbance occurred at this wetland?	(Yes)	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	(other)
If yes, then how severe is the disturbance?	(likely to affect site next 5 or more years)	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	(depressional)	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	seasonal estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	lacustrine	seep or spring	playa	

Restored to tidal salt marsh.

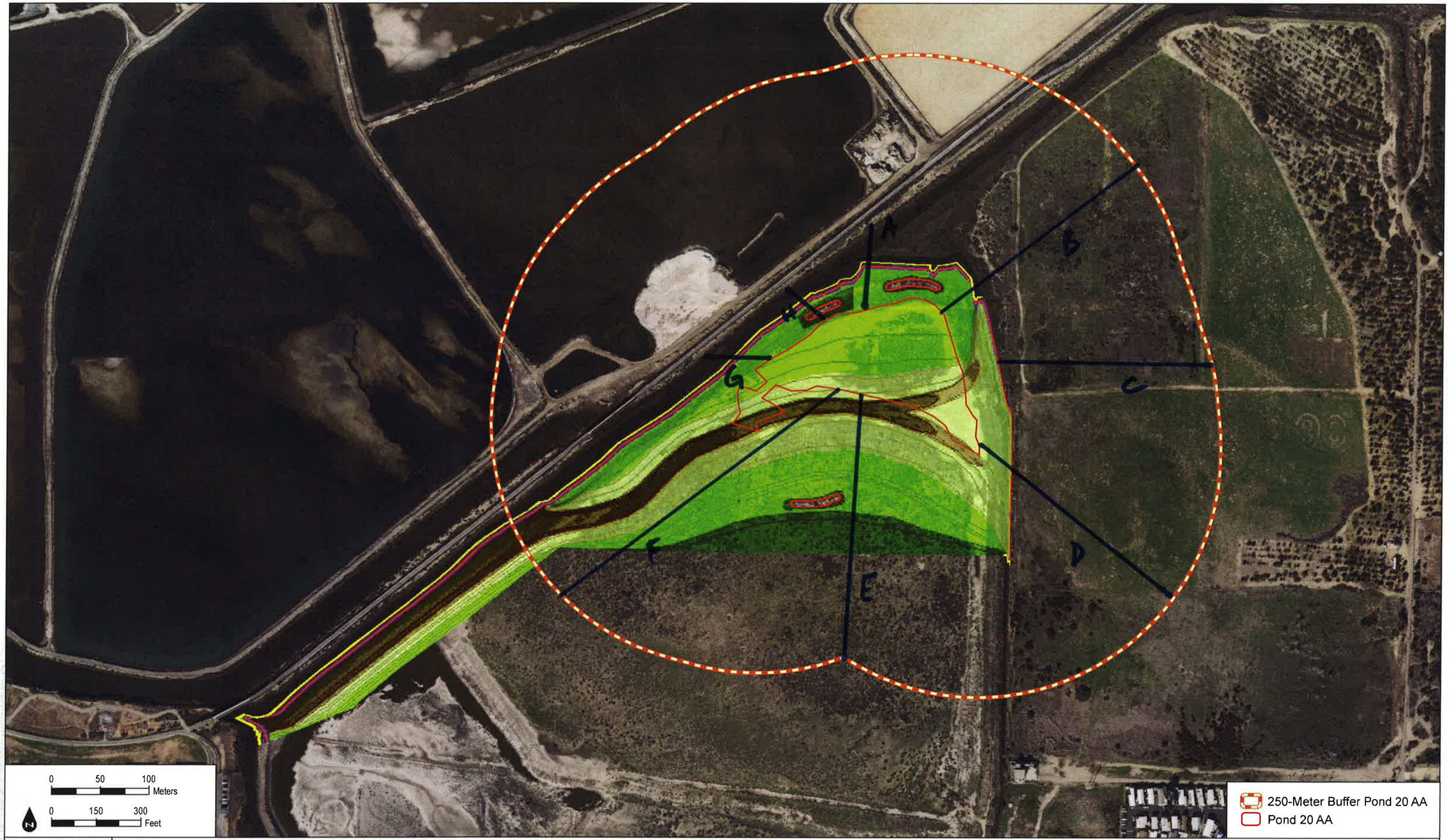
Stressor Checklist Worksheet

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)	✓	✓
Flow diversions or unnatural inflows	✓	✓
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)	✓	✓
Weir/drop structure, tide gates		
Dredged inlet/channel	✓	✓
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees	✓	✓
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)		
Actively managed hydrology		
Comments		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**		
Plowing/Discing **(N/A for restoration areas)**		
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)		
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)		
Bacteria and pathogens impaired (PS or Non-PS pollution)		
Trash or refuse		
Comments		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)		
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control		
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources		
Lack of treatment of invasive plants adjacent to AA or buffer		
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Significant negative effect on AA
Urban residential	✓	✓
Industrial/commercial		
Military training/Air traffic		
Dams (or other major flow regulation or disruption)	✓	✓
Dryland farming		
Intensive row-crop agriculture		
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor		
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		



SOURCE: Aerial-SANDAG Imagery 2014

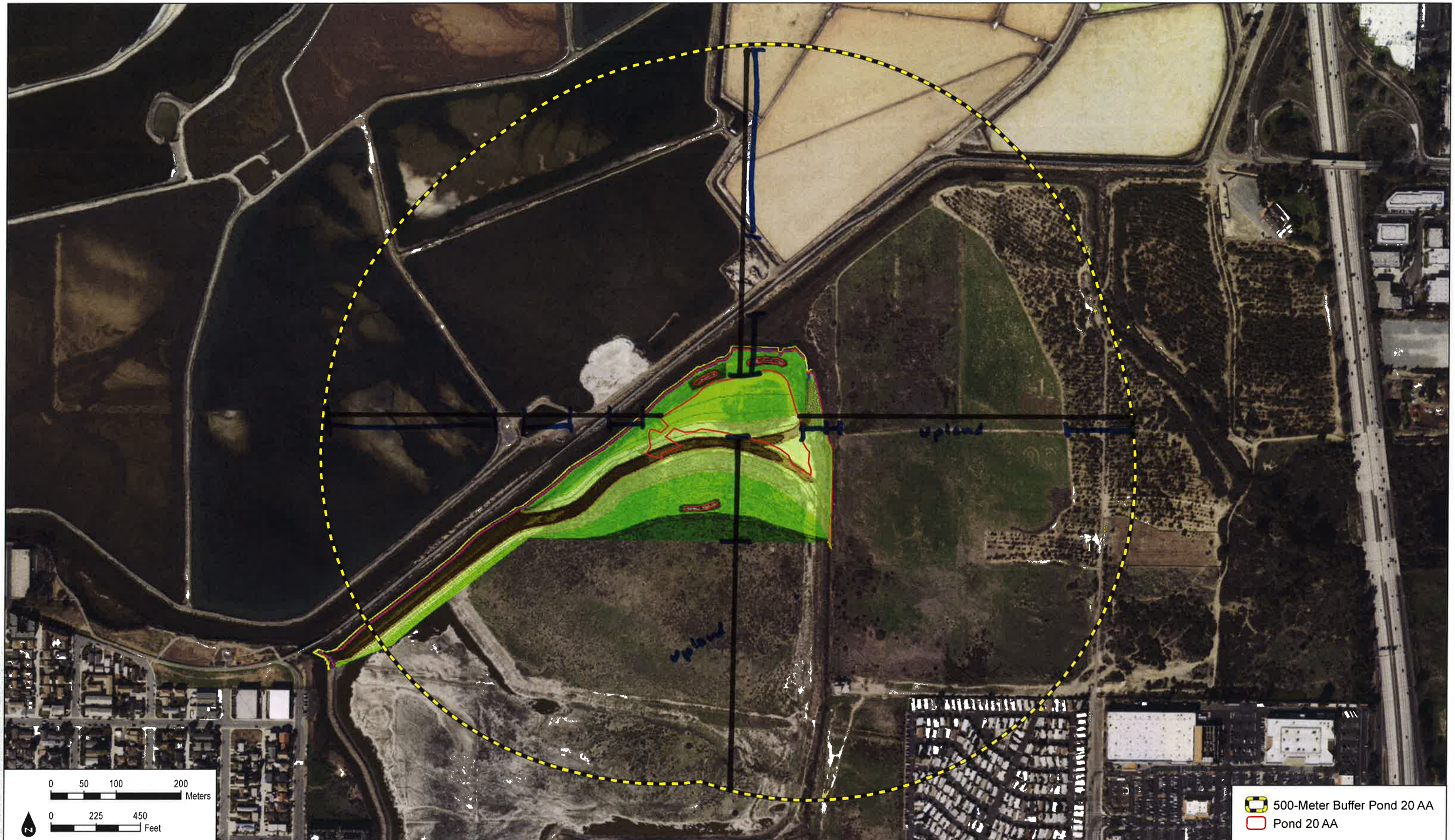
DUDEK

FIGURE X

250-Meter Buffer Pond 20 AA

Otay River Estuary Restoration Project CRAM

FUTURE



DUDEK

SOURCE: Aerial-SANDAG Imagery 2014

Otay River Estuary Restoration Project CRAM

FIGURE X

500-Meter Buffer Pond 20 AA

FUTURE

Basic Information Sheet: Perennial Estuarine Wetlands

Assessment Area Name:	POND 15 - EXISTING
Project Name:	ORERP
Assessment Area ID #:	P15E
Project Site ID #:	ORERP
Date:	DEC 2, 2015

Assessment Team Members for This AA

Andy Thomson

Center of AA:

Latitude: **Longitude:**

Wetland Sub-type:

☑ Perennial Saline ☐ Perennial Non-saline

AA Category:

☑ Restoration ☑ Mitigation ☐ Impacted ☐ Ambient ☐ Reference ☐ Training

☐ Other:

What best describes the tidal stage over the course of the time spent in the field?
Note: It is recommended that the assessment be conducted during low tide.

☐ high tide ☐ low tide N/A - AA is not tidal due to berms

Photo Identification Numbers and Description:

	Photo ID No.	Description	Latitude	Longitude	Datum
1		North			
2		South			
3		East			
4		West			
5					
6					
7					
8					
9					
10					

Site Location Description:

Comments:

Scoring Sheet: Perennial Estuarine Wetlands

AA Name: POND 15 - EXISTING			Date: DEC 2, 2015
Attribute 1: Buffer and Landscape Context (pp. 8-14)			**Comments**
Aquatic Area Abundance (D)	Alpha. B	Numeric 9	See attached figure
Buffer (based on sub-metrics A-C)			
Buffer submetric A: Percent of AA with Buffer	Alpha. A	Numeric 12	perimeter levee and access road does not break buffer.
Buffer submetric B: Average Buffer Width	A	12	
Buffer submetric C: Buffer Condition	B	9	Includes levee and adjacent wetlands up to open water.
Raw Attribute Score = $D+[C \times (A \times B)^{1/2}]^{1/2}$			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 2: Hydrology Attribute (pp. 15-19)			
	Alpha.	Numeric	
Water Source	D	3	This metric only considers freshwater sources from upstream, which are eliminated
Hydroperiod	D	3	Salt pond managed by tide gates
Hydrologic Connectivity	D	3	AA is bounded by levee
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Attribute 3: Physical Structure Attribute (pp. 20-25)			
	Alpha.	Numeric	
Structural Patch Richness	D	3	
Topographic Complexity	D	3	Little or no micro topog
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 4: Biotic Structure Attribute (pp. 26-34)			
Plant Community Composition (based on sub-metrics A-C)			
	Alpha.	Numeric	
Plant Community submetric A: Number of plant layers	C	6	1 short layer
Plant Community submetric B: Number of Co-dominant species	C	6	2 co-dom species
Plant Community submetric C: Percent Invasion	D	3	Short layer dominated by Mesem. nodif. (exotic)
Plant Community Composition *(numeric average of submetrics A-C)*			
Horizontal Interspersion	D	3	
Vertical Biotic Structure	D	3	
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Overall AA Score (average of four final Attribute Scores)			

Worksheet for Aquatic Area Abundance Metric for Estuarine Wetlands

Percentage of Transect Lines that Contains an Aquatic Feature of Any Kind	
Segment Direction	Percentage of Transect Length That is an Aquatic Feature
North	465/500 93%
South	500/500 100%
East	35/500 7%
West	500/500 100%
Average Percentage of Transect Length that is an Aquatic Feature	1500/2000 = 0.75 (75%)

Percent of AA with Buffer Worksheet.

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

See attached figure

Percent of AA with Buffer: 100 % Area of AA adjacent to open water is considered buffer neutral.

Worksheet for calculating average buffer width of AA

Line	Buffer Width (m)
A	250
B	250
C	250
D	250
E	220m
F	35m
G	250
H	250
Average Buffer Width *Round to the nearest integer*	1755/8 = 219m

Structural Patch Type Worksheet for Estuarine Wetlands

Circle each type of patch that is observed in the AA and enter the total number of observed patches in the worksheet below.

STRUCTURAL PATCH TYPE (circle for presence)	Estuarine	
Minimum Patch Size	**3 m^2**	
Abundant wrackline or organic debris in channel, on floodplain, or across depressional wetland plain	~~1~~	
Animal mounds and burrows	~~1~~	
Bank slumps or undercut banks in channels or along shoreline	~~1~~	
Debris jams	~~1~~	
Filamentous macroalgae or algal mats	~~1~~	
Large Woody Debris	(1)	wood planks / boards
Non-vegetated flats or bare ground (sandflats, mudflats, gravel flats, etc.)	(1)	
Pannes or pools on floodplain	~~1~~	
Plant hummocks and/or sediment mounds	~~1~~	
Point bars and in-channel bars	~~1~~	
Pools or depressions in channels (wet or dry channels)	~~1~~	
Secondary channels	~~1~~	
Shellfish beds (living)	~~1~~	dead (scattered shells from dredging)
Soil cracks	1	
Standing snags (at least 3 m tall)	~~1~~	
Submerged vegetation	~~1~~	
Total Possible	**16**	
No. Observed Patch Types (enter here and use in Table 14 below)	2	

Worksheet for AA Topographic Complexity

At two locations in the AA, make a sketch of the profile from the AA boundary to AA boundary. Try to capture the major channels, slopes and intervening micro-topographic relief. Based on these sketches and the profiles in Figure 8, choose a description in Table 16 that best describes the overall topographic complexity of the AA.

North to South

N



S

East to West W → E

W



E

Plant Community Metric Worksheet: Co-dominant species richness
(A dominant species represents ≥10% *relative* cover)

Special Note:

** Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

Floating or Canopy-forming	Invasive?	Short (<0.3 m) <12"	Invasive?
		Mesemb. nod.	Y
		Atriplex watsonii	N
		~~Frankenia salina~~	~~N~~
Medium (0.3 – 0.75 m) 12-30"	**Invasive?**	**Tall (0.75 – 1.5 m) 30-60"**	**Invasive?**
~~Sarcocornia pacifica~~	~~N~~		
Very Tall (>1.5 m) >60"	**Invasive?**		
		Total number of co-dominant species for all layers combined (enter here and use in Table 18)	2
		Percent Invasion *Round to the nearest whole number (integer)* (enter here and use in Table 18)	50%

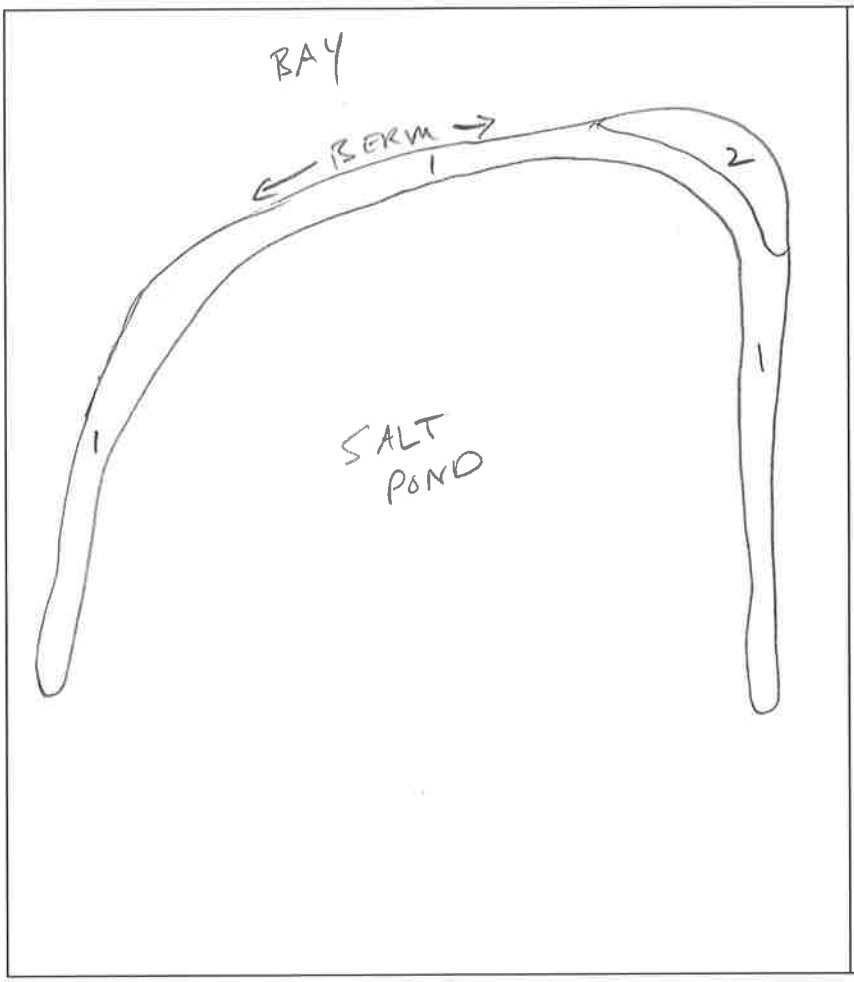
NOT A Co-Dom (<10% of short layer)

<5% NOT A LAYER

NOTE: AA is mostly unvegetated. Co-dominant spp determined in vegetated portion of AA which is approx 5% of AA.

Horizontal Interspersion Complexity Worksheet.

Use the spaces below to make a quick sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign the zones names and record them on the right. Each zone should comprise as least 5% of the AA. Based on the sketch, choose a single profile from Figure 10 that best represents the AA overall.



Assigned zones:

1) BEACH
2) SALT MARSH
3)
4)
5)
6)

Table 21: Wetland disturbances and conversions.

Has a major disturbance occurred at this wetland?	(Yes)	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	(other)
If yes, then how severe is the disturbance?	likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	seasonal estuarine	
	(perennial saline estuarine)	perennial non-saline estuarine	wet meadow	
	lacustrine	seep or spring	playa	

NOTE: site is an active salt evaporation pond.

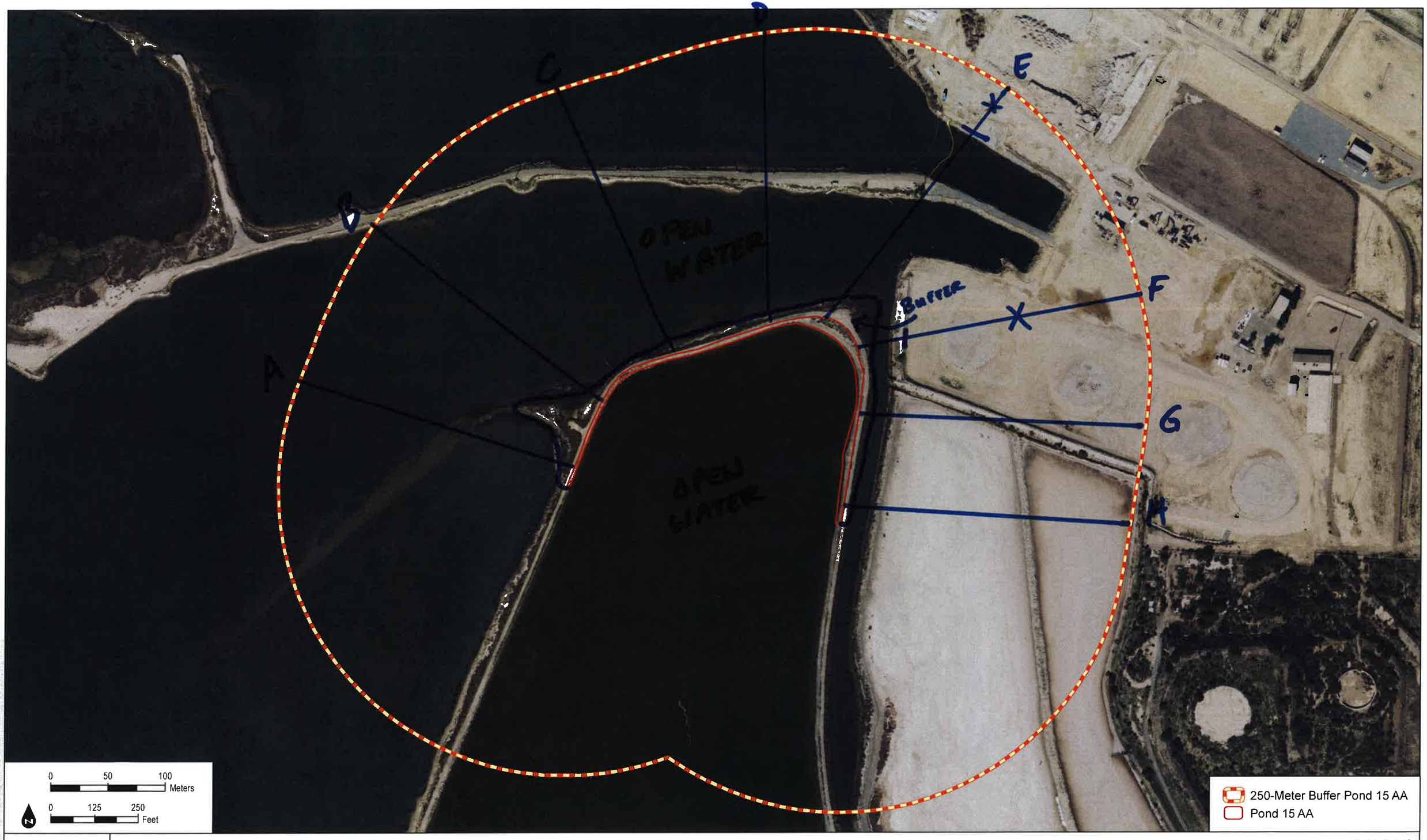
Stressor Checklist Worksheet

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)		
Flow diversions or unnatural inflows	✓	✓
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)		
Weir/drop structure, tide gates	✓	✓
Dredged inlet/channel	✓	✓
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees	✓	✓
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)		
Actively managed hydrology	✓	✓
Comments		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**		
Plowing/Discing **(N/A for restoration areas)**		
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)		
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)		
Bacteria and pathogens impaired (PS or Non-PS pollution)		
Trash or refuse		
Comments		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)		
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control		
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources		
Lack of treatment of invasive plants adjacent to AA or buffer		
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Significant negative effect on AA
Urban residential		
Industrial/commercial	✓	✓
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture		
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor		
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		



SOURCE: Aerial-SANDAG Imagery 2014

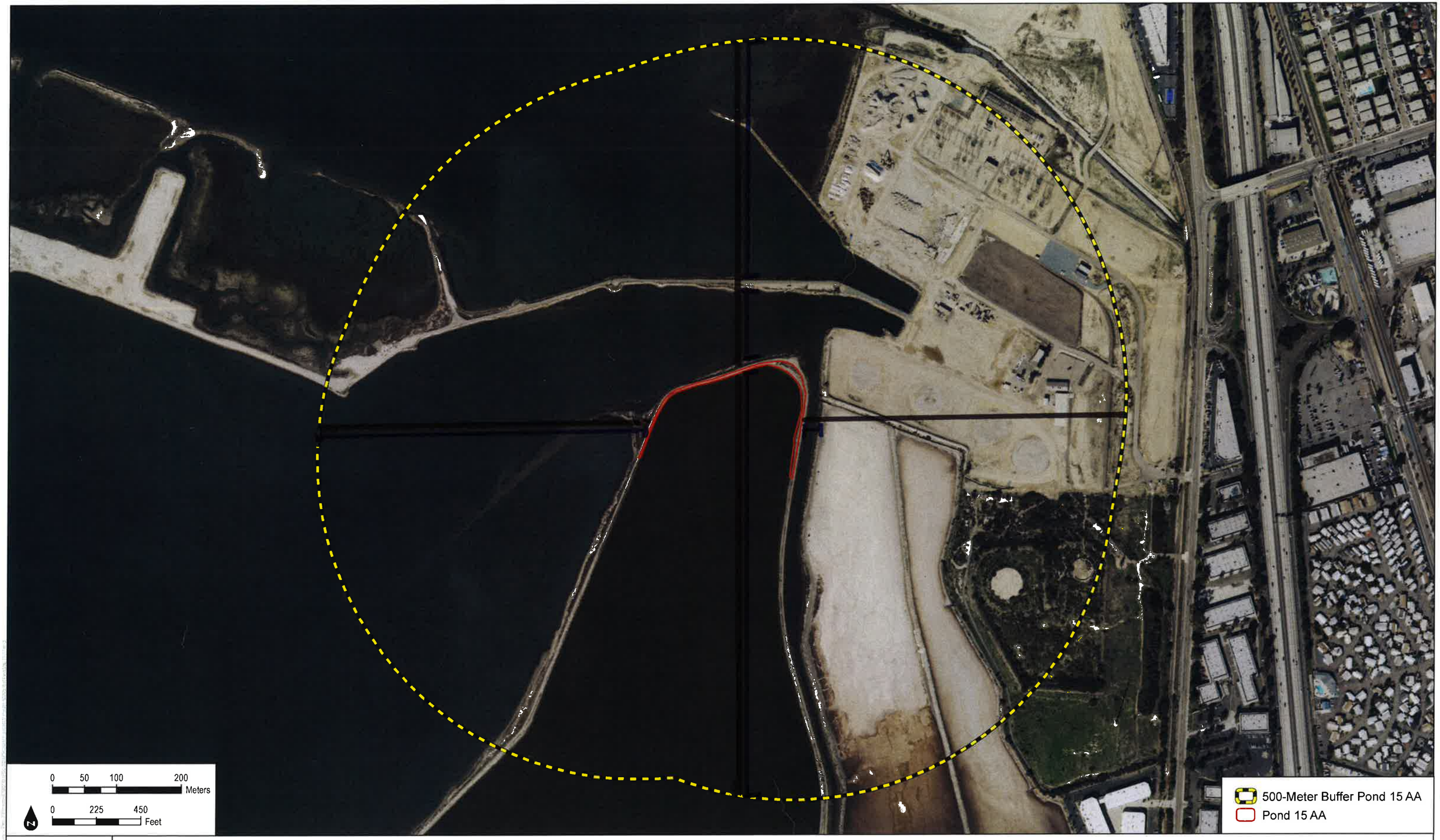
DUDEK

Otay River Estuary Restoration Project CRAM

FIGURE X

250-Meter Buffer Pond 15 AA

EXISTING



DUDEK

SOURCE: Aerial-SANDAG Imagery 2014

Otay River Estuary Restoration Project CRAM

FIGURE X

500-Meter Buffer Pond 15 AA

EXISTING

Basic Information Sheet: Perennial Estuarine Wetlands

Assessment Area Name:	POND 15 - FUTURE
Project Name:	ORERP
Assessment Area ID #:	P26F
Project Site ID #:	ORERP
Date:	DEC. 2, 2015

Assessment Team Members for This AA

ACT

Center of AA:

Latitude: **Longitude:**

Wetland Sub-type:

☑ Perennial Saline ☐ Perennial Non-saline

AA Category:

☑ Restoration ☑ Mitigation ☐ Impacted ☐ Ambient ☐ Reference ☐ Training

☐ Other:

What best describes the tidal stage over the course of the time spent in the field?
Note: It is recommended that the assessment be conducted during low tide.

☐ high tide ☐ low tide N/A

Photo Identification Numbers and Description:

	Photo ID No.	Description	Latitude	Longitude	Datum
1		North			
2		South			
3		East			
4		West			
5					
6					
7					
8					
9					
10					

Site Location Description:

Comments:

Scoring Sheet: Perennial Estuarine Wetlands

AA Name: POND 15 - FUTURE			Date: 12/2/15
Attribute 1: Buffer and Landscape Context (pp. 8-14)			**Comments**
Aquatic Area Abundance (D)	Alpha. B	Numeric 9	see attached figure
Buffer (based on sub-metrics A-C)			
Buffer submetric A: Percent of AA with Buffer	Alpha. A	Numeric 12	see attached figure
Buffer submetric B: Average Buffer Width	A	12	see attached figure
Buffer submetric C: Buffer Condition	A	12	Most of buffer will be in new pond restoration area.
Raw Attribute Score = D+[C x (A x B)½]½			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 2: Hydrology Attribute (pp. 15-19)			
Water Source	Alpha. D	Numeric 3	No upstream freshwater source - separated from Palomar channel by levee.
Hydroperiod	B	9	Expect slightly muted tidal prism with opening
Hydrologic Connectivity	B	9	some levees will remain
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Attribute 3: Physical Structure Attribute (pp. 20-25)			
Structural Patch Richness	Alpha. A	Numeric 12	
Topographic Complexity	B	9	see worksheet on p.6
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/24) x 100**
Attribute 4: Biotic Structure Attribute (pp. 26-34)			
Plant Community Composition (based on sub-metrics A-C)			
Plant Community submetric A: Number of plant layers	Alpha. B	Numeric 9	
Plant Community submetric B: Number of Co-dominant species	A	12	
Plant Community submetric C: Percent Invasion	A	12	
Plant Community Composition *(numeric average of submetrics A-C)*			
Horizontal Interspersion	B	9	
Vertical Biotic Structure	A	12	
Raw Attribute Score = sum of numeric scores			**Final Attribute Score = (Raw Score/36) x 100**
Overall AA Score (average of four final Attribute Scores)			

Worksheet for Aquatic Area Abundance Metric for Estuarine Wetlands

Percentage of Transect Lines that Contains an Aquatic Feature of Any Kind	
Segment Direction	Percentage of Transect Length That is an Aquatic Feature
North	465/500 93%
South	480/500 96%
East	35/500 7%
West	460/500 92%
Average Percentage of Transect Length that is an Aquatic Feature	1440/2000 = .72 (72%)

Percent of AA with Buffer Worksheet.

In the space provided below make a quick sketch of the AA, or perform the assessment directly on the aerial imagery; indicate where buffer is present, estimate the percentage of the AA perimeter providing buffer functions, and record the estimate amount in the space provided.

See attached figure

Percent of AA with Buffer: 100 % Area adjacent to open water is "neutral"

Worksheet for calculating average buffer width of AA

Line	Buffer Width (m)
A	250
B	220
C	35
D	250
E	250
F	250
G	250
H	250
Average Buffer Width ***Round to the nearest integer***	1755/8 = 219m

Structural Patch Type Worksheet for Estuarine Wetlands

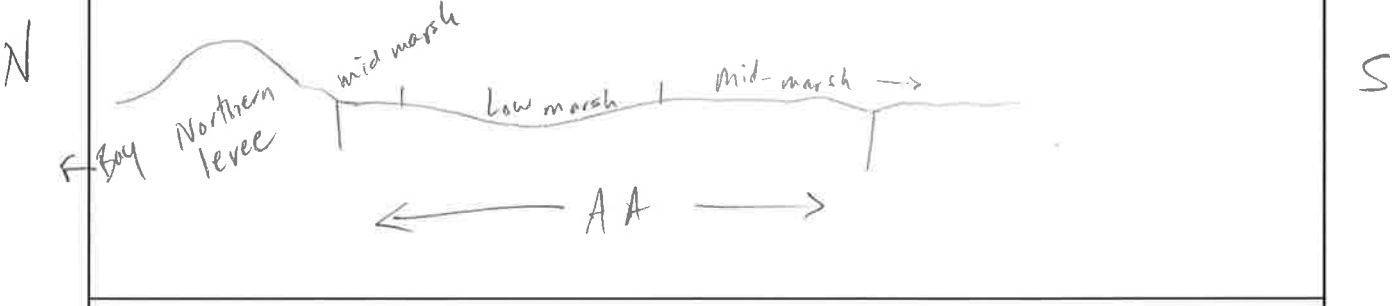
Circle each type of patch that is observed in the AA and enter the total number of observed patches in the worksheet below.

STRUCTURAL PATCH TYPE (circle for presence)	Estuarine
Minimum Patch Size	**3 m^2**
Abundant wrackline or organic debris in channel, on floodplain, or across depressional wetland plain	(1)
Animal mounds and burrows	(1)
Bank slumps or undercut banks in channels or along shoreline	(1)
Debris jams	1
Filamentous macroalgae or algal mats	1
Large Woody Debris	(1)
Non-vegetated flats or bare ground (sandflats, mudflats, gravel flats, etc.)	(1)
Pannes or pools on floodplain	(1)
Plant hummocks and/or sediment mounds	(1)
Point bars and in-channel bars	1
Pools or depressions in channels (wet or dry channels)	1
Secondary channels	1
Shellfish beds (living)	(1)
Soil cracks	(1)
Standing snags (at least 3 m tall)	1
Submerged vegetation	1
Total Possible	**16**
No. Observed Patch Types (enter here and use in Table 14 below)	9

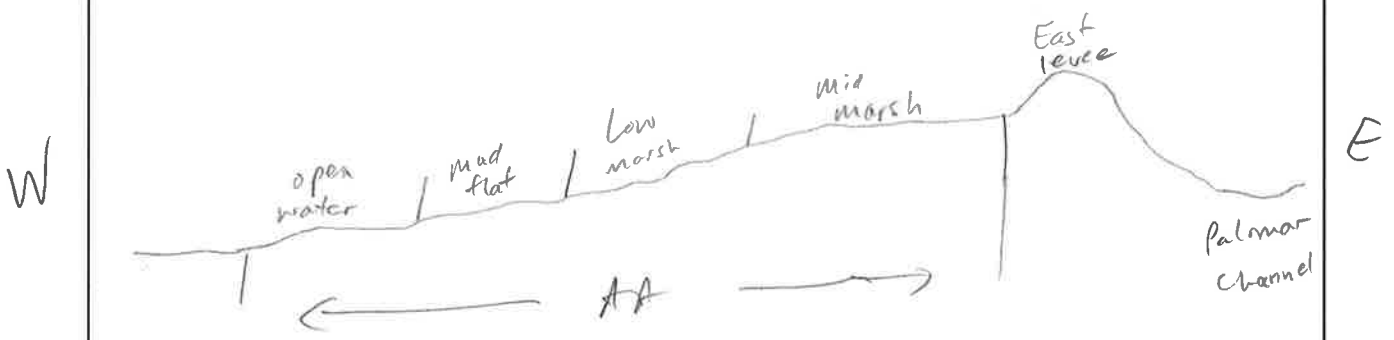
Worksheet for AA Topographic Complexity

At two locations in the AA, make a sketch of the profile from the AA boundary to AA boundary. Try to capture the major channels, slopes and intervening micro-topographic relief. Based on these sketches and the profiles in Figure 8, choose a description in Table 16 that best describes the overall topographic complexity of the AA.

North to South



East to West



* Assumes micro-channels will form and function to drain during ebb tide.

Plant Community Metric Worksheet: Co-dominant species richness
(A dominant species represents ≥10% *relative* cover)

Special Note:

** Combine the counts of co-dominant species from all layers to identify the total species count. Each plant species is only counted once when calculating the Number of Co-dominant Species and Percent Invasion submetric scores, regardless of the numbers of layers in which it occurs.*

Floating or Canopy-forming	Invasive?	Short (<0.3 m) <12"	Invasive?
		Salic. bigelovii	N
		Batis marit.	N
		Jaumea carnosa	N
Medium (0.3 – 0.75 m) 12-30"	**Invasive?**	**Tall (0.75 – 1.5 m) 30-60"**	**Invasive?**
Suaeda esteroa	N	Spartina foliosa	N
Sarcocornia pacifica	N		
Very Tall (>1.5 m) >60"	**Invasive?**		
		Total number of co-dominant species for all layers combined (enter here and use in Table 18)	6
		Percent Invasion *Round to the nearest whole number (integer)* (enter here and use in Table 18)	0

Table 20 from Restoration Plan:

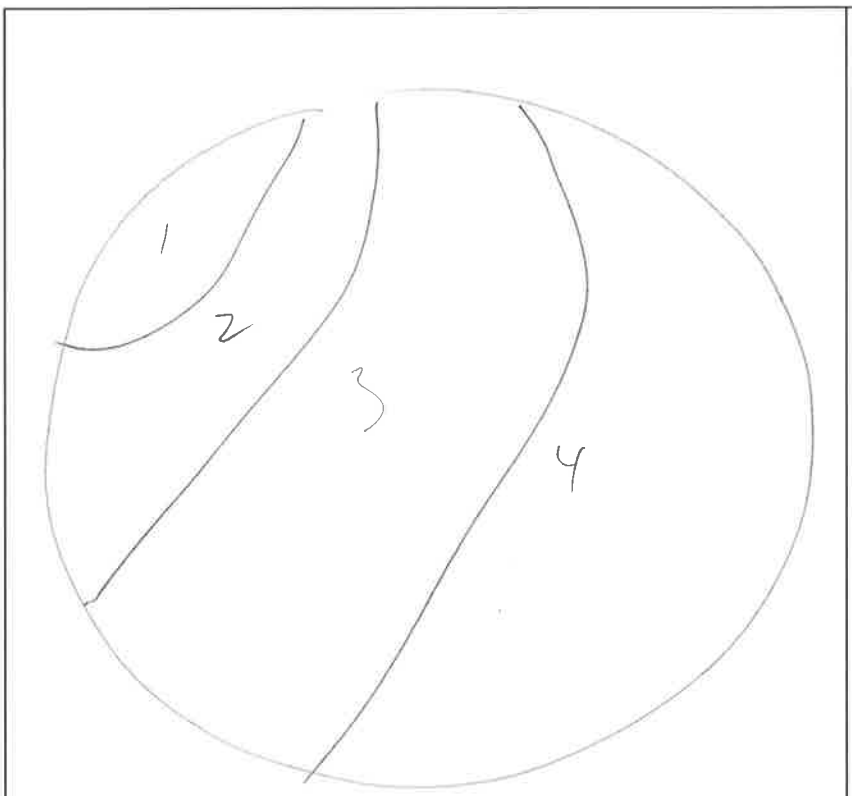
AA includes low and middle salt marsh zones

- Low salt marsh – Spartina foliosa (Salix big & Sarc pac from seed)
- Mid salt marsh – Batis marit, Jaumea carn., Suaeda est
- High salt marsh – Dist spi, Frank. sal, Mon. lit, Arthro sub, Limcal

Note: High marsh is not within AA boundary.

Horizontal Interspersion Complexity Worksheet.

Use the spaces below to make a quick sketch of the AA in plan view, outlining the major plant zones (this should take no longer than 10 minutes). Assign the zones names and record them on the right. Each zone should comprise as least 5% of the AA. Based on the sketch, choose a single profile from Figure 10 that best represents the AA overall.



Assigned zones:

1) open water - tidal channel
2) mud flat
3) low salt marsh
4) mid salt marsh
5)
6)

Table 21: Wetland disturbances and conversions.

Has a major disturbance occurred at this wetland?	Yes	No		
If yes, was it a flood, fire, landslide, or other?	flood	fire	landslide	other
If yes, then how severe is the disturbance?	likely to affect site next 5 or more years	likely to affect site next 3-5 years	likely to affect site next 1-2 years	
Has this wetland been converted from another type? If yes, then what was the previous type?	depressional	vernal pool	vernal pool system	
	non-confined riverine	confined riverine	seasonal estuarine	
	perennial saline estuarine	perennial non-saline estuarine	wet meadow	
	lacustrine	seep or spring	playa	

8 salt pond → salt marsh restoration

Stressor Checklist Worksheet

HYDROLOGY ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Point Source (PS) discharges (POTW, other non-stormwater discharge)		
Non-point Source (Non-PS) discharges (urban runoff, farm drainage)		
Flow diversions or unnatural inflows	✓	✓
Dams (reservoirs, detention basins, recharge basins)		
Flow obstructions (culverts, paved stream crossings)		
Weir/drop structure, tide gates		
Dredged inlet/channel	✓	✓
Engineered channel (riprap, armored channel bank, bed)		
Dike/levees	✓	✓
Groundwater extraction		
Ditches (borrow, agricultural drainage, mosquito control, etc.)		
Actively managed hydrology		
Comments		

PHYSICAL STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Filling or dumping of sediment or soils **(N/A for restoration areas)**		
Grading/ compaction **(N/A for restoration areas)**		
Plowing/Discing **(N/A for restoration areas)**		
Resource extraction (sediment, gravel, oil and/or gas)		
Vegetation management		
Excessive sediment or organic debris from watershed		
Excessive runoff from watershed		
Nutrient impaired (PS or Non-PS pollution)		
Heavy metal impaired (PS or Non-PS pollution)		
Pesticides or trace organics impaired (PS or Non-PS pollution)		
Bacteria and pathogens impaired (PS or Non-PS pollution)		
Trash or refuse		
Comments		

BIOTIC STRUCTURE ATTRIBUTE (WITHIN 50 M OF AA)	Present	Significant negative effect on AA
Mowing, grazing, excessive herbivory (within AA)		
Excessive human visitation		
Predation and habitat destruction by non-native vertebrates (e.g., *Virginia opossum* and domestic predators, such as feral pets)		
Tree cutting/sapling removal		
Removal of woody debris		
Treatment of non-native and nuisance plant species		
Pesticide application or vector control		
Biological resource extraction or stocking (fisheries, aquaculture)		
Excessive organic debris in matrix (for vernal pools)		
Lack of vegetation management to conserve natural resources		
Lack of treatment of invasive plants adjacent to AA or buffer		
Comments		

BUFFER AND LANDSCAPE CONTEXT ATTRIBUTE (WITHIN 500 M OF AA)	Present	Significant negative effect on AA
Urban residential		
Industrial/commercial	✓	
Military training/Air traffic		
Dams (or other major flow regulation or disruption)		
Dryland farming		
Intensive row-crop agriculture		
Orchards/nurseries		
Commercial feedlots		
Dairies		
Ranching (enclosed livestock grazing or horse paddock or feedlot)		
Transportation corridor		
Rangeland (livestock rangeland also managed for native vegetation)		
Sports fields and urban parklands (golf courses, soccer fields, etc.)		
Passive recreation (bird-watching, hiking, etc.)		
Active recreation (off-road vehicles, mountain biking, hunting, fishing)		
Physical resource extraction (rock, sediment, oil/gas)		
Biological resource extraction (aquaculture, commercial fisheries)		
Comments		



DUDEK

SOURCE: Aerial-SANDAG Imagery 2014

FIGURE X

250-Meter Buffer Pond 15 AA

Otay River Estuary Restoration Project CRAM

FUTURE



DUDEK

SOURCE: Aerial-SANDAG Imagery 2014

FIGURE X

500-Meter Buffer Pond 15 AA

Otay River Estuary Restoration Project CRAM

FUTURE

APPENDIX K

Cultural Resources Report
(CONFIDENTIAL)

APPENDIX L

Utility Investigation Report

OTAY RIVER ESTUARY RESTORATION PROJECT

EXISTING UTILITY INVESTIGATION

FINAL REPORT

Prepared For:

Poseidon Water LLC
5780 Fleet Street, Suite 140
Carlsbad, CA 92008

Contact: Stan Williams

Prepared By:

Everest International Consultants, Inc.
444 West Ocean Boulevard, Suite 1104
Long Beach, CA 90802

Contact: David Cannon

Project Number: P2164

August 2015

TABLE OF CONTENTS

1. INTRODUCTION 2

2. GAS AND OIL PIPELINES 4

3. POWER LINES AND STRUCTURES 11

4. COMMUNICATIONS 14

5. WATER LINES AND STORM DRAINS 19

5.1 Storm Drains 19

5.2 Water Lines 21

6. SEWER 21

7. SALT WORKS AND WILDLIFE REFUGE UTILITIES 24

8. SUMMARY AND NOTES 28

LIST OF FIGURES

Figure 1. Study Area 2

Figure 2a. Approximate Locations of Existing Gas and Oil Pipelines (1 of 2) 5

Figure 3. Close-up of Existing SDG&E Gas Pipelines, Regulator, and other Utilities near the Intersection of Bay Boulevard and Stella Street (Adapted from p.93 SDG&E Maps) 8

Figure 4. Close-up of Existing SDG&E Gas Pipelines, Regulator, and other Utilities at the Intersection of Saturn Boulevard and Louret Avenue (Adapted from p.84 SDG&E Maps) 9

Figure 5. Close-up of Existing SDG&E Gas Pipelines, Regulator, and other Utilities near the Intersection of Main Street and W. Frontage Road (Adapted from p.86 of SDG&E Maps) 10

Figure 6. Approximate Locations of Existing Power Utilities (1 of 2) 12

Figure 7. Approximate Locations of Existing Power Utilities (2 of 2) 13

Figure 8. Photos showing Overhead Power Lines and Gas Manhole along the Undeveloped Road North of Saturn Boulevard in ORF 14

Figure 9a. Approximate Locations of Existing Communications Utilities (1 of 2) 15

Figure 9b. Approximate Locations of Existing Communications Utilities (2 of 2) 16

Figure 10. Northernmost Extent of Available Cox Communications Utilities Map, Showing Area around West Frontage Road and Interstate-5 18

Figure 11. Existing Water Lines and Storm Drains 20

Figure 12. Approximate Locations of Existing Sewer Utilities 22

Figure 13. Existing Salt Works and SDWR Utilities in Study Area 25

Figure 14. Details of Existing Salt Works Utilities 26

Figure 15. Existing CMP Culverts Providing Hydraulic Connectivity at the Channel Crossing Located North of Pond 30 27

LIST OF TABLES

Table 1. List of Utility Agencies in Study Area Provided by DigAlert 3

1. INTRODUCTION

This report documents the utility investigation conducted by Everest International Consultants (Everest) for the Otay River Estuary Restoration Project in 2015. The area included in this effort consists of the area within the Otay River Estuary Restoration Project Area Boundary (the Otay River Floodplain (ORF) and Pond 15), as well as the construction impact area. These areas, collectively defined as the study area in this document, are shown in **Figure 1**. Public utility services and facilities that may exist in the study area include gas and oil, power/electric, communications, storm drains, water lines, and sanitary sewer lines and structures.



Figure 1. Study Area

In April 2015, Everest contacted 8-1-1 Underground Service Alert (DigAlert) with a request for information on potential utilities within the study area. The DigAlert research generated a list of the agencies that have existing underground utility facilities in the study area. Responsive agencies on the DigAlert list include AT&T Distribution, Cox Communications of South San Diego, and the City of San Diego; the remaining agencies that may have relevant utilities information include the California American Water Company, City of Chula Vista, City of Imperial Beach, and San Diego Gas & Electric (SDG&E) Gas Mapping & Records. **Table 1** lists the utility agencies provided by DigAlert and summarizes the status of response for each agency. In addition to the information obtained from these agencies, Everest staff also gathered information from other sources, including as-built drawings, the SDNWR CCP 2006[1], and other information provided by U.S. Fish and Wildlife Service (USFWS). The following sections summarize utility information obtained from the responsive agencies and other available sources.

Table 1. List of Utility Agencies in Study Area Provided by DigAlert

LIST OF UTILITY AGENCIES PROVIDED BY DIGALERT	RESPONSE STATUS *
AT&T Distribution	Information received
California American Water Company (CAWC)	CAWC representative's phone reply indicated that their facilities are likely not in the study area. Maps if needed have to be obtained in person at CAWC's office.
City of Chula Vista	No response
City of Imperial Beach	Email response received indicating that formal request with the City's Clerk is required. Request will be initiated if necessary.
City of San Diego	Information received
Cox Communications (South SD)	Information received
SDG&E Gas Mapping & Records	Information received

** Response as of July 2015*

[1] U.S. Fish and Wildlife Service. San Diego Bay National Wildlife Refuge, Sweetwater Marsh and South San Diego Bay Units, "Final Comprehensive Conservation Plan and Environmental Impact Statement." August 2006.

2. GAS AND OIL PIPELINES

Information for existing gas lines within the study area was extracted from City of San Diego, Metropolitan Wastewater Department drawings[2]; San Diego Gas & Electric (SDG&E) maps[3], and corroborated with information in the SDNWR CCP 2006[4]. The existing gas utilities in the study area are shown in **Figures 2a and 2b**. Underground gas lines are found along sections of Saturn Boulevard, Louret Avenue, Bay Boulevard, Ada Street, Stella Street, Palomar Street, Pacific Avenue, and Dorothy Street[5].

Along Bay Boulevard, there are 8-inch and 3-inch/2-inch underground SDG&E gas pipelines. The 3-inch/2-inch pipeline changes from three to two inches in diameter at a point just north of the intersection of Bay Boulevard with Stella Street and continues north as a 2-inch line from that point; at this location, there is also a regulator joining the 3-inch/2-inch gas pipeline with the 8-inch pipeline (see **Figure 3**). It is not clear how far the 8-inch and 3-inch/2-inch pipelines may extend north beyond the intersection of Bay Boulevard with Palomar Street, and south beyond the intersection of Bay Boulevard with Anita Street. The 3-inch/2-inch pipeline has five offshoots that are smaller in size, ranging from one to two inches in diameter. These offshoots include two 2-inch, one 1.5-inch, and two 1-inch pipelines (see **Figure 2A**). Of the two 2-inch offshoots, one joins with Pacific Avenue and continues onto Dorothy Street[4] for an unspecified distance, and another juts out westward toward the bay from Bay Boulevard. The 1.5-inch offshoot travels eastward on Ada Street from its intersection with Bay Boulevard. It is not clear how far east the 1.5-inch offshoot pipeline may extend. The two 1-inch offshoots travel eastward along Stella Street and Palomar Street, from their intersections with Bay Boulevard. Residential gas hookup lines, typically less than 1-inch in diameter, that branch off from the offshoots to the 3-inch pipeline are not shown in the figure for clarity.

[2] City of San Diego, Metropolitan Wastewater Department. "Otay River Pump Station, Conveyance, and Fiber Optic Systems, Volume 2, Part C-Drawings", May 2002.

[3] Maps received from SDG&E, 7/9/2015.

[4] U.S. Fish and Wildlife Service. San Diego Bay National Wildlife Refuge, Sweetwater Marsh and South San Diego Bay Units, "Final Comprehensive Conservation Plan and Environmental Impact Statement, Volume I", p. 3-111 to 3-118, August 2006.

[5] The SDG&E map showing the Dorothy Street pipeline appears to erroneously label Dorothy Street as Elise Street.

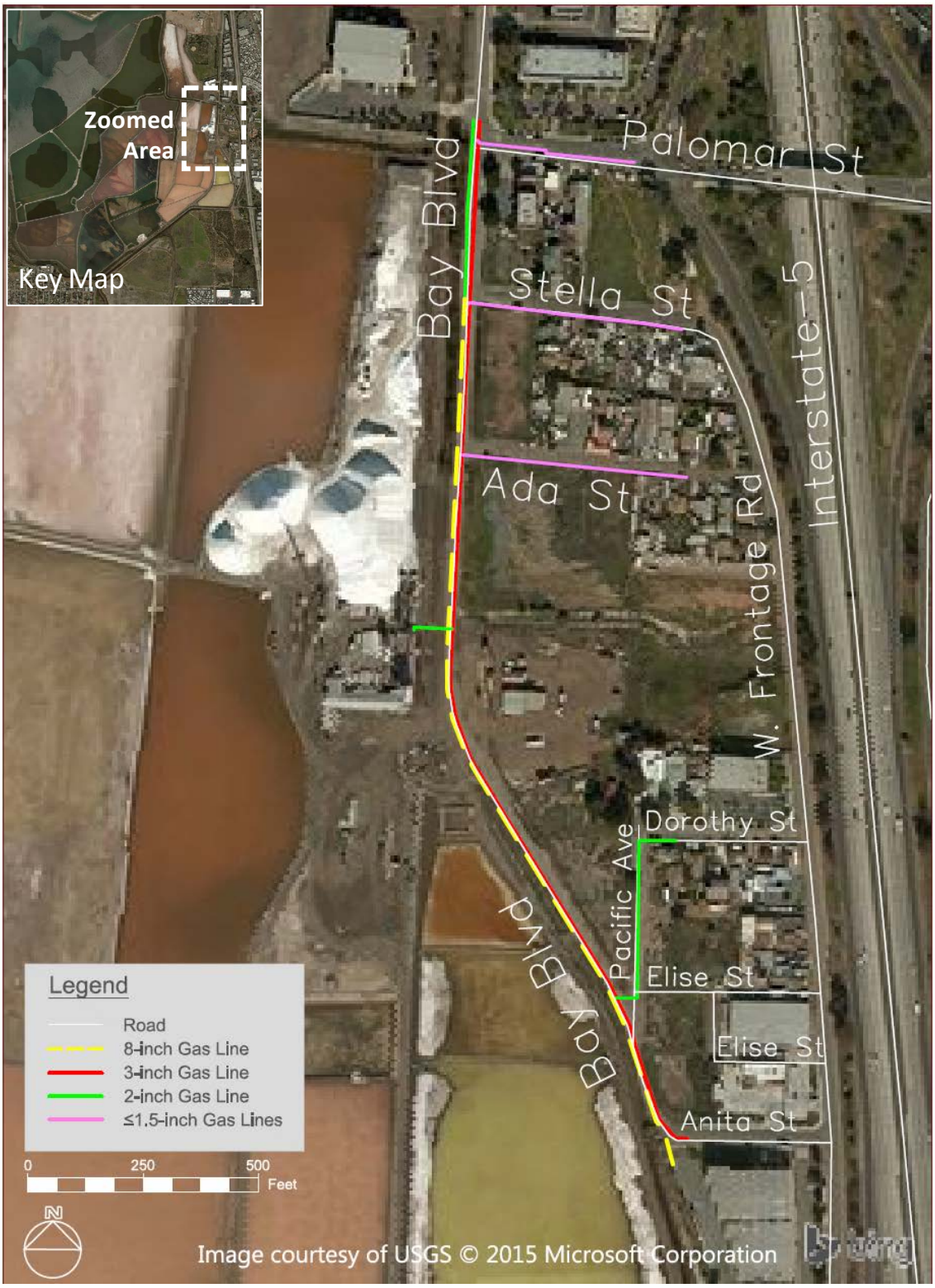


Figure 2a. Approximate Locations of Existing Gas and Oil Pipelines (1 of 2)

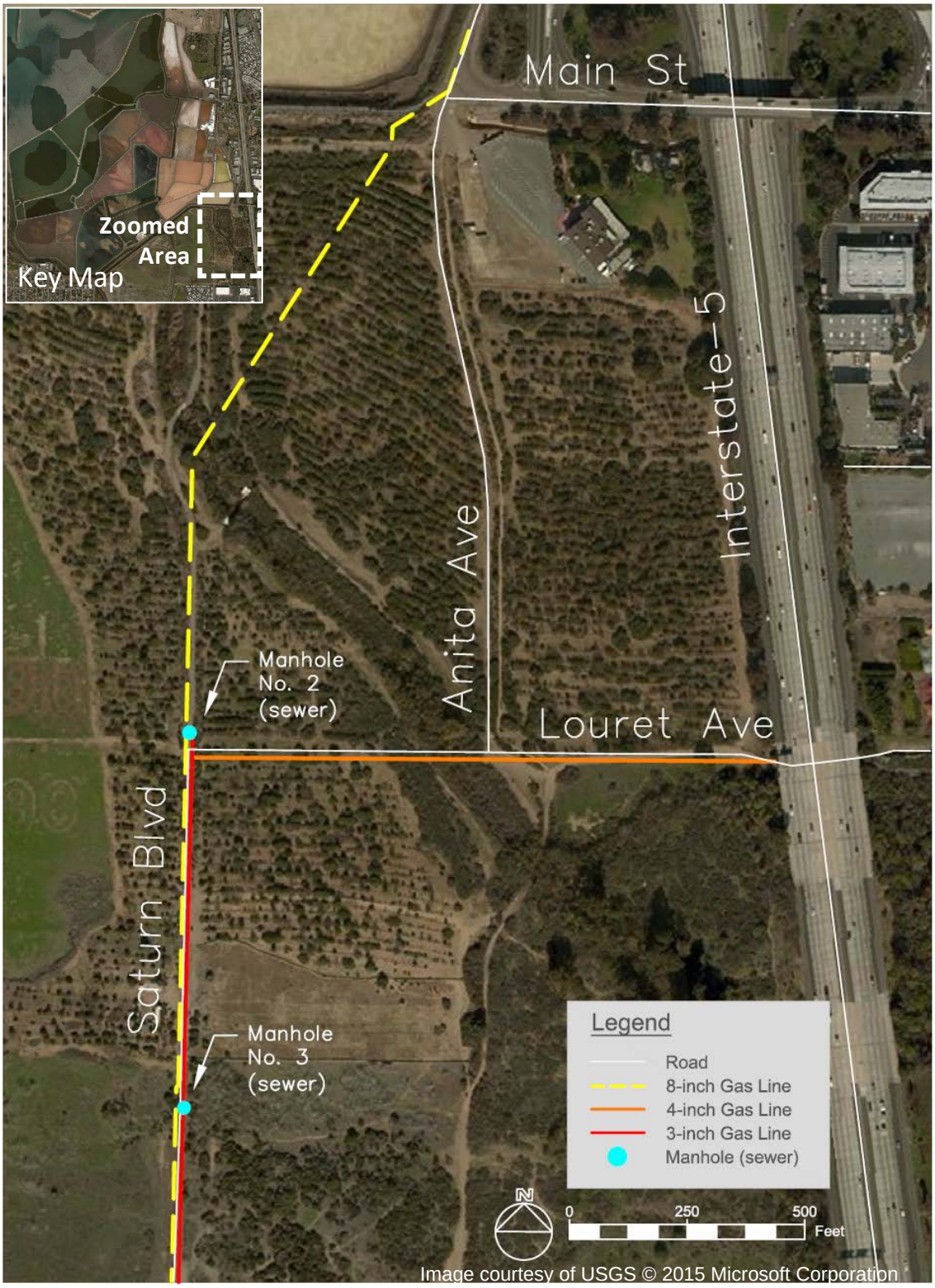


Figure 2b. Approximate Locations of Existing Gas and Oil Pipelines (2 of 2)

There are also 8-inch and 3-inch underground SDG&E gas pipelines along Saturn Boulevard. On Saturn Boulevard, the 8-inch line makes a small southwest deviation from its course just north of Manhole No. 3, approximately 28 feet in length, and continues on south afterwards. The 8-inch line makes another deviation at a point a few hundred feet north of the intersection of Saturn Boulevard and Louret Avenue; this deviation has an 18-foot section oriented in a northwest-southeast direction and a 62-foot section oriented in a northeast-southwest direction. The 3-inch line intersects and splits off from a 4-inch line (described below) at the intersection of Saturn Boulevard and Louret Avenue, and then travels south along Saturn Boulevard and parallel to the 8-inch line (see **Figure 4**). From Saturn Boulevard, the 8-inch gas line appears to extend northeast towards and beyond Main Street. A drawing from the City of San Diego Metropolitan Wastewater Department shows that the section of 8-inch gas line extending northeast from Saturn Boulevard to Main Street runs parallel to two sewer lines; however, the SDG&E maps shows the same 8-inch gas line section oriented at a slightly greater angle from true north, which means the gas line would run alongside but no longer parallel to the two sewer lines (page 86, SDG&E 20153). **Figure 2B** shows an approximation of the SDG&E version of this pipeline section, as SDG&E is likely the definitive source on the utilities under its jurisdiction.

Based on the SDG&E maps, a 2-inch gas pipeline appears to branch off from the 8-inch gas pipeline described above, approximately where the 8-inch pipeline meets Main Street—just south of the intersection of Main Street with West Frontage Road (see **Figure 5**). It is not clear how far east this 2-inch pipeline may extend.

There is a 4-inch underground gas line, also owned/operated by SDG&E, within Louret Avenue that connects with both the 8-inch and 3-inch lines at the intersection of Saturn Boulevard and Louret Avenue (see **Figure 4**); the map shows an elevation of roughly 11 feet (vertical datum unknown) for this pipeline at this intersection. It is not known how far the pipeline extends eastwards beyond the intersection of Louret Avenue with Anita Avenue.

Detailed maps of the SDG&E gas utilities were provided by SDG&E[6]; these maps provide pipeline length measurements, connection locations, and additional details not pictured in the figures in this document. Information about oil utilities, and further information about gas pipelines was not available at the time that this report was prepared.

[6] Pages 81-86 and 89-93 of the 96-page map book provided by SDG&E 7/9/2015.

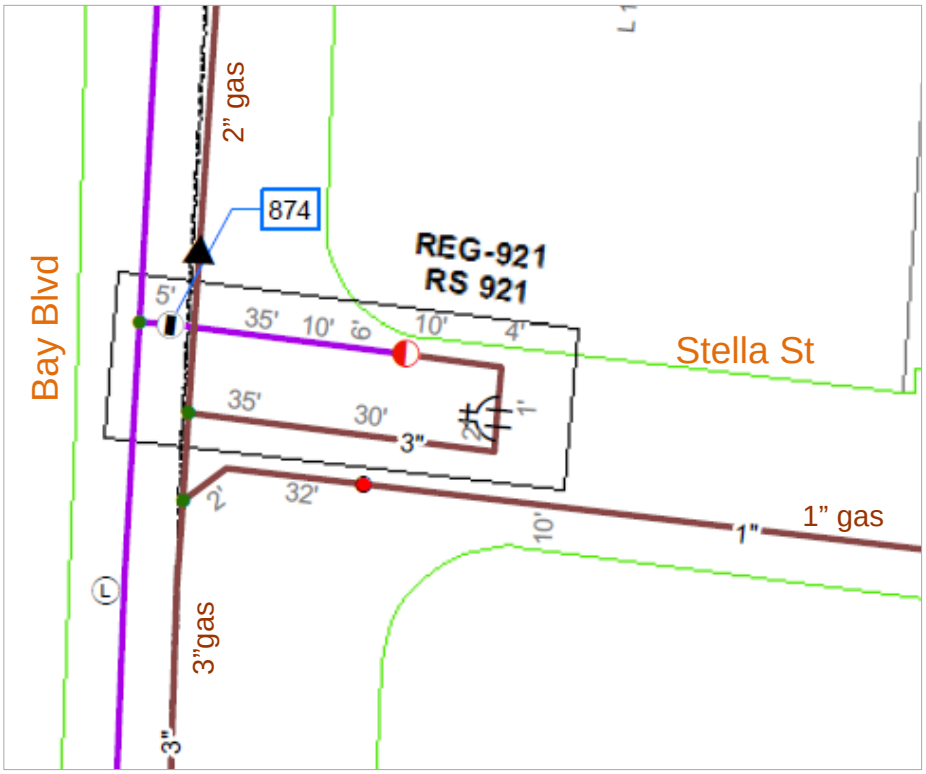


Figure 3. Close-up of Existing SDG&E Gas Pipelines, Regulator, and other Utilities near the Intersection of Bay Boulevard and Stella Street (Adapted from p.93 SDG&E Maps)

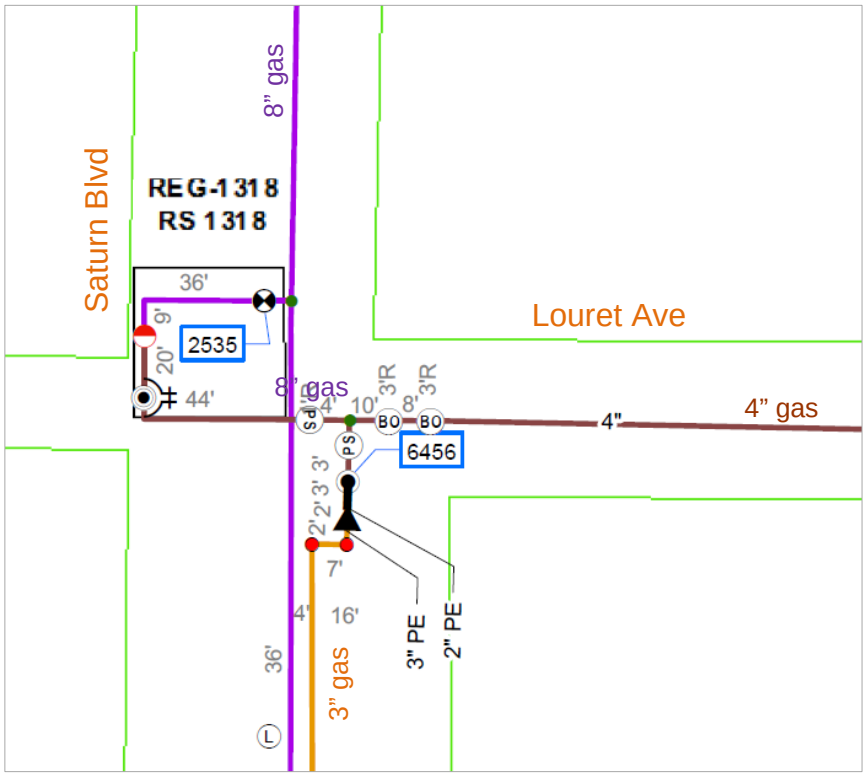


Figure 4. Close-up of Existing SDG&E Gas Pipelines, Regulator, and other Utilities at the Intersection of Saturn Boulevard and Louret Avenue (Adapted from p.84 SDG&E Maps)

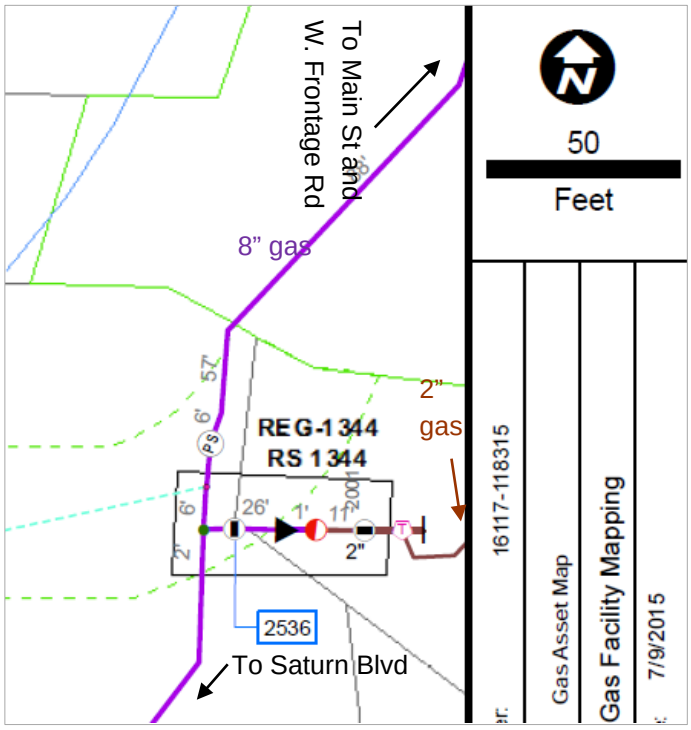


Figure 5. Close-up of Existing SDG&E Gas Pipelines, Regulator, and other Utilities near the Intersection of Main Street and W. Frontage Road (Adapted from p.86 of SDG&E Maps)

3. POWER LINES AND STRUCTURES

Information for existing power lines and structures was obtained from City of San Diego, Metropolitan Wastewater Department drawings[7]; San Diego Gas & Electric (SDG&E) maps[8], and corroborated with both information in an available SDNWR CCP 2206[9] and from Google Earth aerial images. The existing power utilities in the study area are shown in **Figures 6 and 7**. Underground and overhead power utilities are found along Saturn Boulevard, Louret Avenue, Bay Boulevard, West Frontage Road, Stella Street, Ada Street, Dorothy Street, Anita Street, and Palomar Street. Additional power poles and lines may be scattered throughout the study area but are not detailed in this document.

Saturn Boulevard contains an underground 3-inch PVC electrical transmission conduit (Sch. 80, 69 kV/128kV) that continues onto Louret Avenue, and appears to terminate at the intersection of Louret Avenue and Anita Avenue. This conduit appears to be bundled with a communications cable (fiber optic conduit). A short offshoot of the electrical conduit juts out westward from Saturn Avenue, adjacent to and south of the intersection between Saturn Boulevard and Louret Avenue; this offshoot connects to an associated meter pedestal which lies adjacent to and southwest of the intersection between Saturn Boulevard and Louret Avenue.

Power poles (PP) line the sides of Saturn Boulevard, Bay Boulevard, West Frontage Road and are scattered along smaller side streets. Approximate locations of the power poles were estimated based on drawings from the City of San Diego, maps from SDG&E, and corroborated using Google Earth aerial images. Overhead power lines joining these poles were approximated based on the power pole locations and using Google Earth aerial images. **Figure 8** shows two photographs of the power poles and overhead lines.

Two 3-inch underground power lines run parallel along West Frontage road and branch off onto Anita Street. Some additional sections of underground power line are shown on **Figure 6**, though the sections that lie within private property are omitted from this report.

[7] City of San Diego, Metropolitan Wastewater Department. “Otay River Pump Station, Conveyance, and Fiber Optic Systems, Volume 2, Part C-Drawings”, May 2002.

[8] Maps received from SDG&E, 7/14/2015.

[9] U.S. Fish and Wildlife Service. San Diego Bay National Wildlife Refuge, Sweetwater Marsh and South San Diego Bay Units, “Final Comprehensive Conservation Plan and Environmental Impact Statement, Volume I”, p. 3-111 to 3-118, August 2006.



Figure 6. Approximate Locations of Existing Power Utilities (1 of 2)

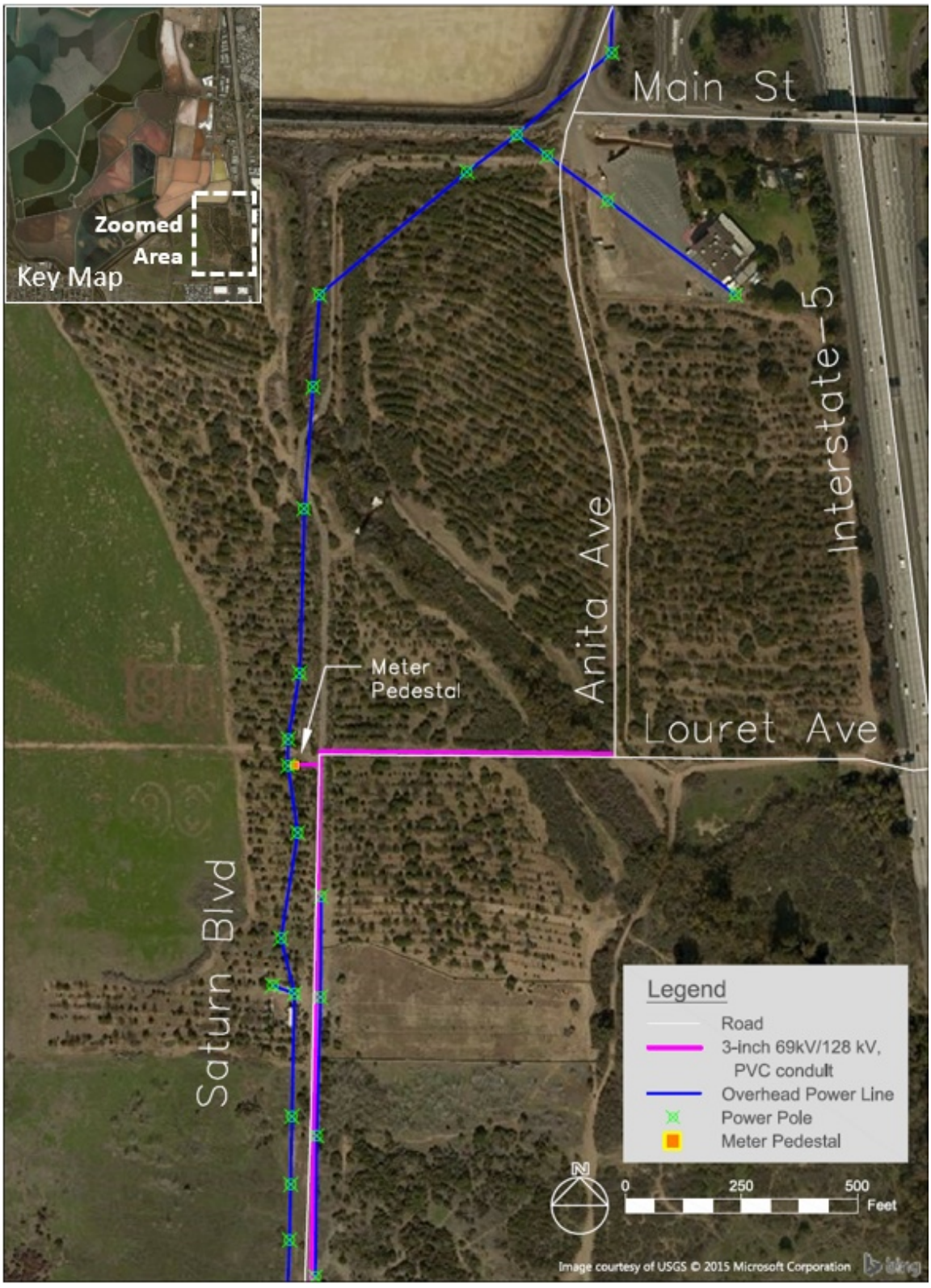


Figure 7. Approximate Locations of Existing Power Utilities (2 of 2)



Photos taken during Site Visit on 4/22/2015

Figure 8. Photos showing Overhead Power Lines and Gas Manhole along the Undeveloped Road North of Saturn Boulevard in ORF

Detailed maps of the SDG&E power utilities were provided by SDG&E[10]; these maps provide power line length measurements, connection locations, power ratios, and additional details not pictured in the figures in this document. Further information about power utilities was not available at the time that this report was prepared.

4. COMMUNICATIONS

Information for existing communications utilities within the study area was obtained from City of San Diego, Metropolitan Wastewater Department drawings[11] and Cox Communications maps[12]. The existing communications utilities in the study area are shown in **Figures 9a and 9b**. Communications utilities are found along and adjacent to sections of Saturn Boulevard, West Frontage Road, and Bay Boulevard.

[10] Map pages provided by SDG&E 7/14/2015.

[11] City of San Diego, Metropolitan Wastewater Department. "Otay River Pump Station, Conveyance, and Fiber Optic Systems, Volume 2, Part C-Drawings", May 2002.

[12] Cox Communications. "Cox_Cable_SOUTH SD BAY MAP SCALE 1 to 2000." Received April 2015.



Figure 9a. Approximate Locations of Existing Communications Utilities (1 of 2)

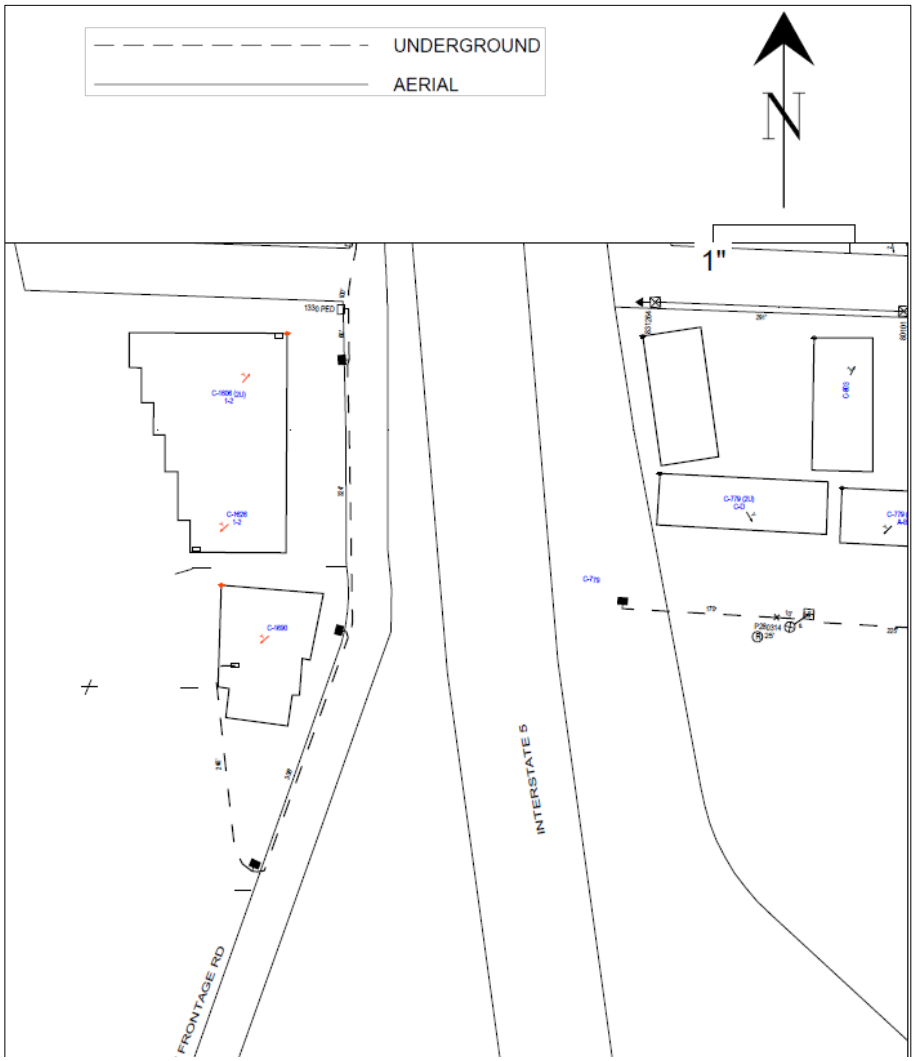


Figure 9b. Approximate Locations of Existing Communications Utilities (2 of 2)

A 2-inch underground fiber optic conduit (Sch. 80) runs parallel with gravity sewer line along Saturn Boulevard from Boundary Avenue to Louret Avenue, and on Louret Avenue, where it appears to terminate at the intersection of Louret Avenue and Anita Avenue. The reference drawings[7] indicate the minimum cover over this 2-inch line is 3 feet. A fiber optic pull box, Pull Box No. 2, is located on Saturn Boulevard, adjacent to (and south of) the intersection between Saturn Boulevard and Louret Avenue.

An underground Cox Communications line runs northwards from a building several hundred feet south of the intersection between West Frontage Road and Anita Street. The line appears to head south for a couple hundred feet, connect to what appears to be a utilities box, and curve northwards along West Frontage Road (on the western side of the road) (see **Figure 10**). The line is connected to additional utilities boxes along West Frontage Road (also see **Figure 10**). It is unclear how far north the line continues since the reference map does not show the entire area of interest. There is another stretch of Cox Communications line that runs through Bay Boulevard (along the eastern side of the road), from a point just south of its intersection with Palomar Street northwards to a point that lies beyond the northeastern extent of the study area; this line includes a short offshoot from Bay Boulevard that juts west towards a cluster of buildings at a point roughly 300 feet north of the intersection between Bay Boulevard and Palomar Street.

Further information about communication utilities was not available at the time that this report was prepared.



Source: Cox Communications

Figure 10. Northernmost Extent of Available Cox Communications Utilities Map, Showing Area around West Frontage Road and Interstate-5

5. WATER LINES AND STORM DRAINS

Information for existing water lines and storm drain utilities within the study area was obtained from City of San Diego, Metropolitan Wastewater Department drawings[13] and GIS data[14]; a survey CAD file prepared for the SDNWR CCP 2006[15]; and corroborated with information obtained in the SDNWR CCP 2006 report[16]. The existing water lines and storm drains in the study area are shown in **Figure 11**.

5.1 Storm Drains

Along Saturn Boulevard is a 24-inch underground storm drain pipeline. This pipeline has an invert elevation (IE) of 6.49 feet (NAVD88) near the intersection of Louret Avenue and Saturn Boulevard, and an IE of 7.42 feet (NAVD88) farther south on Saturn Boulevard, roughly 350 feet north of the intersection between Saturn Boulevard and Boundary Avenue. This pipeline appears to have an offshoot that juts off to the west from a point approximately 350 feet north of the intersection between Saturn Boulevard and Boundary Avenue. It is unclear how far west the line may or may not extend. Associated with the storm drain pipelines are drainage structures (mostly manholes) that are scattered throughout the study area, primarily along Saturn Boulevard.

Based on a qualitative description in the SDNWR CCP, the City of Imperial Beach maintains five storm drain outlets that affect the waters within the Refuge. Out of these five storm drain outlets, the only outlet that appears to be within or adjacent to the study area is a 36-inch underground reinforced concrete pipe that empties into the Otay River channel between 12th Street and Florence Street.

[13] City of San Diego, Metropolitan Wastewater Department. "Otay River Pump Station, Conveyance, and Fiber Optic Systems, Volume 2, Part C-Drawings", May 2002.

[14] Via http://www.sandiego.gov/publicutilities/customerservices/gis.shtml

[15] Survey conducted by Ducks Unlimited in 2000 for U.S. Fish and Wildlife Service for the preparation of San Diego Bay National Wildlife Refuge, Sweetwater Marsh and South San Diego Bay Units, "Final Comprehensive Conservation Plan and Environmental Impact Statement".

[16] U.S. Fish and Wildlife Service. San Diego Bay National Wildlife Refuge, Sweetwater Marsh and South San Diego Bay Units, "Final Comprehensive Conservation Plan and Environmental Impact Statement, Volume I", p. 3-111 to 3-118, August 2006.

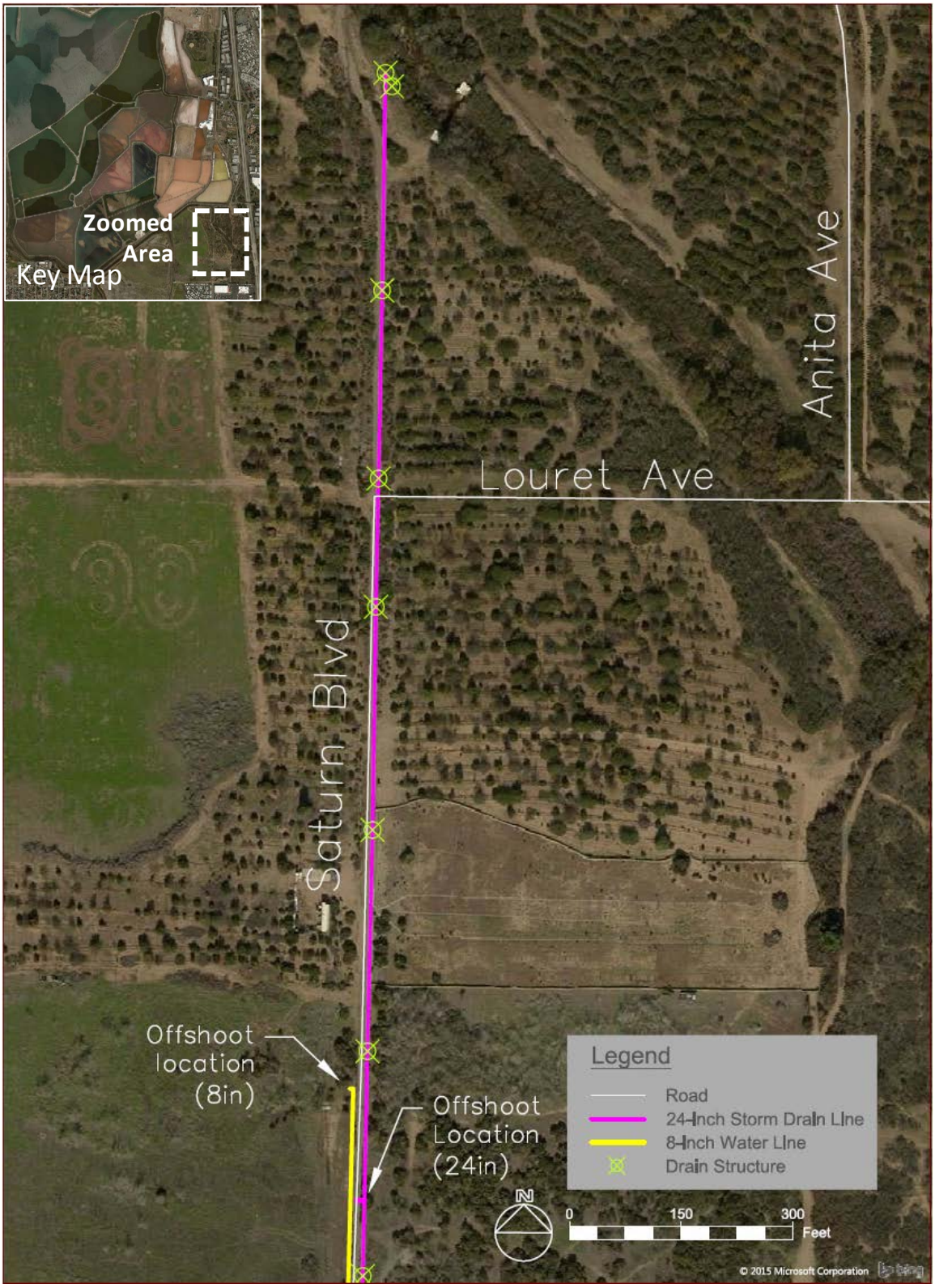


Figure 11. Existing Water Lines and Storm Drains

5.2 Water Lines

Water utilities are found along and adjacent to Saturn Boulevard, and scattered throughout the study area. As shown in **Figure 11**, there is an 8-inch underground water line that also lies along Saturn Boulevard. This 8-inch water line appears to terminate roughly 800 feet south of Louret Avenue, and is owned/operated by the California American Water Company. This pipeline appears to have an offshoot that juts off west from the northern end.

The California American Water Company was contacted in April 2015 and again in June 2015, during which time we were notified that the requested maps and information can only be viewed in-person at their office. As another option, California American Water Company staff may potentially be available to meet a work crew at the job site. Further information about water utilities was not available at the time that this report was prepared.

6. SEWER

Information for existing sanitary sewer utilities within the study area was obtained from the City of San Diego, Metropolitan Wastewater Department drawings[17] and GIS data[18]; a historic map from the San Diego National Wildlife Refuge Complex[19]; and corroborated with information in SDNWR CCP 2006[20]. The existing sewer utilities in the study area are shown in **Figure 12**. Sewer utilities are found along and adjacent to Saturn Boulevard, Louret Avenue, Anita Avenue, and other parts of the study area.

Along Saturn Boulevard is the underground 54-inch South Metro Interceptor pipeline. When this pipeline nears the Otay River, it turns northeast and continues toward and beyond Main Street. Wrapping around the eastern side of the Salt Works and Ponds, this pipeline continues northward along Bay Boulevard. There are also two short pipeline offshoots from Bay Boulevard, which jut eastward from the Bay Boulevard section between Palomar Street and Anita Street.

[17] City of San Diego, Metropolitan Wastewater Department. “Otay River Pump Station, Conveyance, and Fiber Optic Systems, Volume 2, Part C-Drawings”, May 2002.

[18] Via http://www.sandiego.gov/publicutilities/customerservices/gis.shtml

[19] Victoria Touchstone, San Diego National Wildlife Refuge Complex. “old palm sewage site.pdf”, received June 2015.

[20] U.S. Fish and Wildlife Service. San Diego Bay National Wildlife Refuge, Sweetwater Marsh and South San Diego Bay Units, “Final Comprehensive Conservation Plan and Environmental Impact Statement, Volume I”, p. 3-111 to 3-118, August 2006.

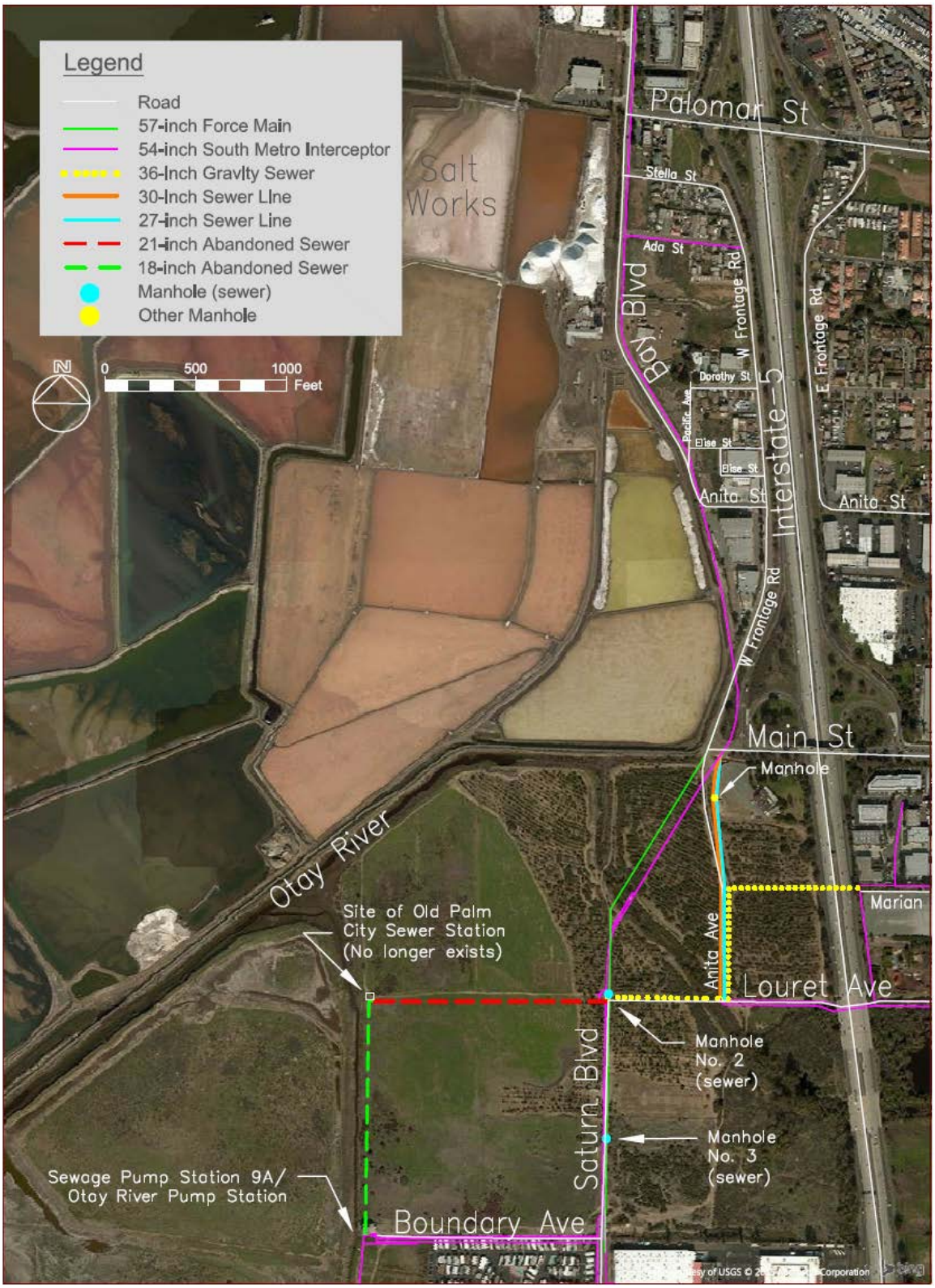


Figure 12. Approximate Locations of Existing Sewer Utilities

A 57-inch underground force main runs parallel to and alongside the 54-inch South Metro Interceptor on Saturn Boulevard, from south of the intersection between Saturn Boulevard and Boundary Avenue, and continuing toward and beyond Main Street. It is not clear how far north the pipeline extends.

A 36-inch underground PVC gravity pipeline extends westward from the intersection of Louret Avenue and Anita Avenue until it intersects with Saturn Boulevard—where it passes under Manhole No. 2, then turns south, continues along Saturn Boulevard from Louret Avenue towards Boundary Avenue—passing under Manhole No. 3 on Saturn Boulevard, and continuing onto Boundary Avenue and appearing to terminate at the Sewage Pump Station 9A/Otay River Pump Station. Manhole No. 2 lies at the intersection of Saturn Boulevard and Louret Avenue, and has a 7-foot diameter, rim EL of 12.38 feet, and an IE of -5.54 feet (vertical datum unknown). Manhole No. 3 has a 5-foot diameter[21], a rim EL of 13 feet, and an IE of -6.44 feet (vertical datum unknown). The 36-inch gravity pipeline slopes downward at -0.11% as it travels south from the Otay River. Additionally, the pipeline extends north on Anita Avenue from the intersection of Anita Avenue and Louret Avenue, enters a diversion structure at Marian Avenue, then travels north as a 30-inch sewer line, paralleling a 27-inch sewer pipeline owned and maintained by the Montgomery Sanitation District.

Based on a qualitative description in the U.S. Fish and Wildlife Service report, the underground 27-inch pipeline that is owned and maintained by the Montgomery Sanitation District extends along Anita Avenue, from Louret Avenue and continuing north within an easement through Refuge property and on towards Main Street.

Also extending along Anita Avenue from Louret Avenue and continuing north beyond Main Street is a 30-inch underground pipeline. A manhole appears to be located between this sewer line and the parallel 27-inch sewer line at a location just south of the intersection of Anita Avenue and Main Street. It is unclear which pipeline(s) to which this manhole is connected.

Just north of the intersection of Louret Avenue with Saturn Boulevard, there is a short underground pipeline offshoot from the 54-inch Saturn Boulevard pipeline which is comprised of a northeast-southwest section of 24-inch pipeline and a north-south section of 21-inch pipeline.

[21] Per San Diego Regional Standard Drawings (SDRSD)

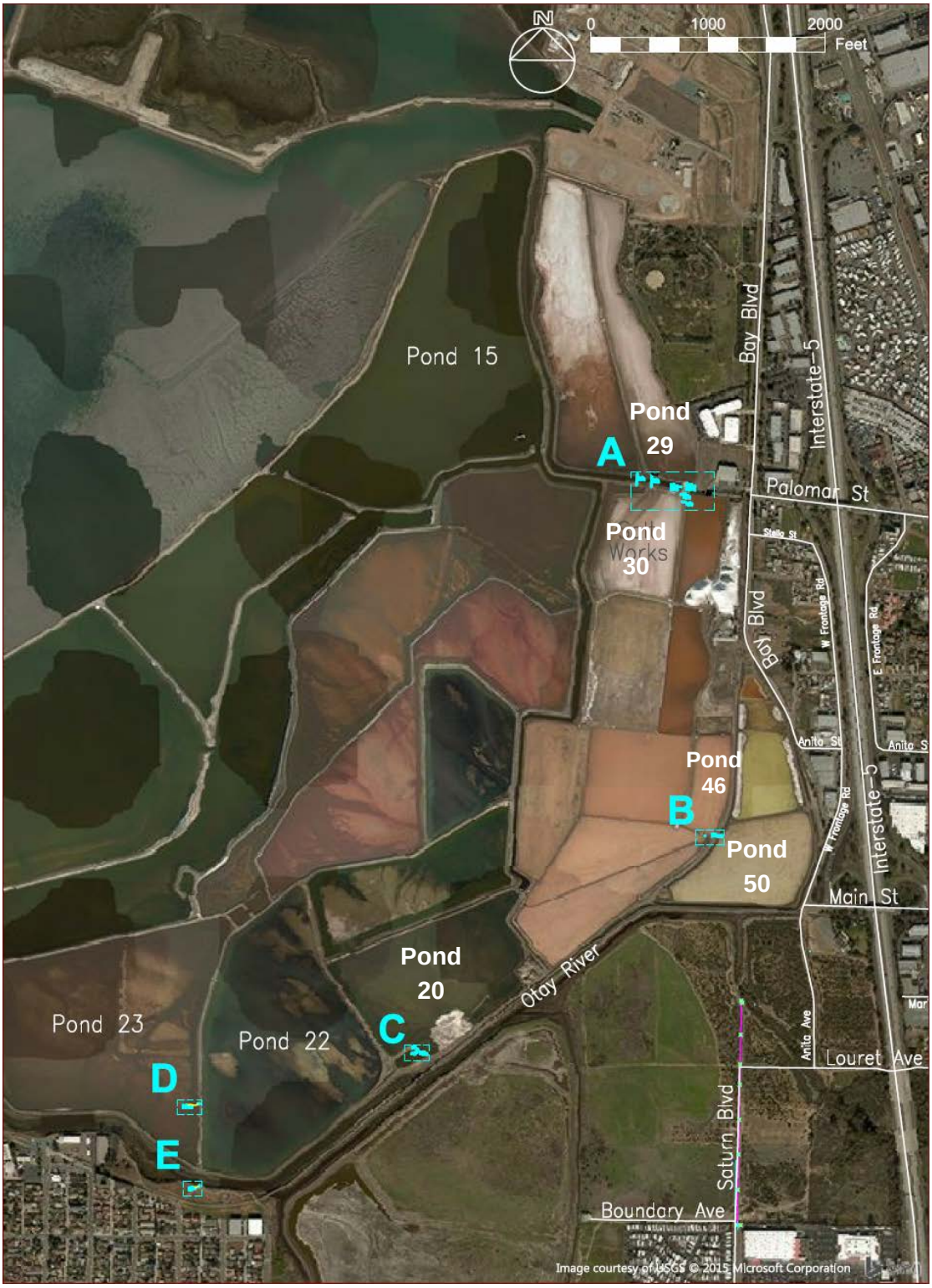
Based on the historic San Diego National Wildlife Refuge Complex map and a qualitative description in the U.S. Fish and Wildlife Service report, an abandoned 18-inch pipeline extends north through Refuge property from the Otay River pump station to the site of the old Palm City sewer pump station (approximate location of the pipeline and pump station shown in **Figure 12**). Also based on the same sources, another abandoned pipeline (21-inch) extends east from the old Palm City sewer pump station through Refuge property to Saturn Boulevard (also shown in **Figure 12**).

Further information about sewer utilities was not available at the time that this report was prepared.

7. SALT WORKS AND WILDLIFE REFUGE UTILITIES

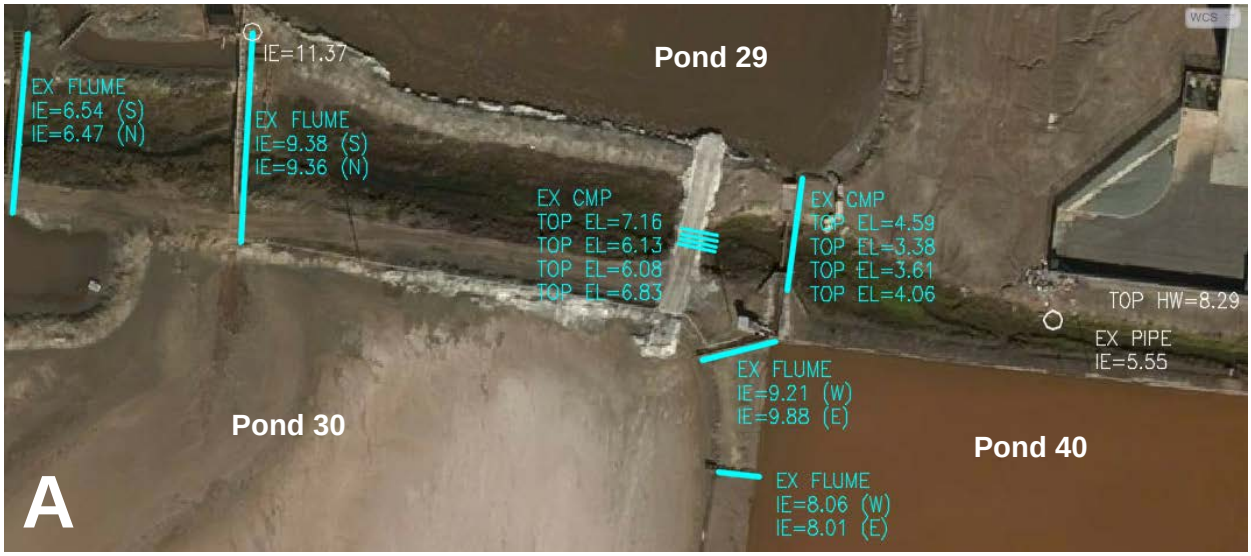
Information for existing Salt Works and San Diego Bay Wildlife Refuge (SDWR) utilities within the study area was obtained from a survey CAD file showing existing features[22]. The existing Salt Works and SDWR utilities in the study area are shown in **Figures 13 to 15**.

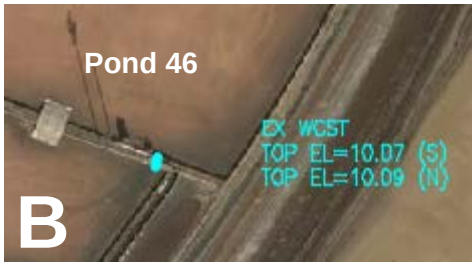
[22] Survey conducted by Ducks Unlimited in 2000 for U.S. Fish and Wildlife Service for the preparation of San Diego Bay National Wildlife Refuge, Sweetwater Marsh and South San Diego Bay Units, "Final Comprehensive Conservation Plan and Environmental Impact Statement".

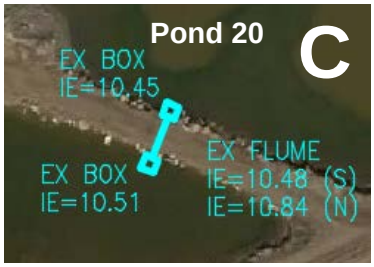


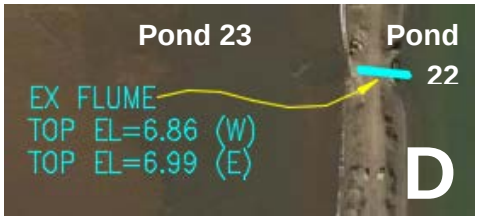
Note: See Figure 14 for enlarged details.

Figure 13. Existing Salt Works and SDWR Utilities in Study Area











Notes:

1. *See Figure 13 for Locations A to E.*
2. *Vertical measurements are in feet, NAVD88.*
3. *Abbreviations:*

CMP = Corrugated Metal Pipe
E = East;
EL= elevation
EX = Existing
IE = Invert Elevation
N = North
RCP = Reinforced Concrete Pipe
HW = Headwall
S = South
W = West
WCST = Welded Carbon Steel Tube

Figure 14. Details of Existing Salt Works Utilities

As shown in **Figure 14**, there is a 36-inch underground reinforced concrete pipe adjacent to the southwest corner of Pond 22 (Location E). This storm drain has an outlet into the Otay River, with a top elevation of the headwall at 9.56 ft, NAVD88 and invert elevations of 9.56 and 5.39 feet (NAVD88), respectively.

A flume on the western face of Pond 22 spans Pond 22 and Pond 23. The top elevation (EL) of the western end at Pond 23 is 6.86 feet (NAVD88), and the top EL of the eastern end at Pond 22 is 6.99 feet (NAVD88).

There is a flume adjacent to the easternmost point of Pond 22. The flume appears to join a very small pond with a larger pond. The northern end has an invert elevation of 10.84 feet, and the southern end an invert elevation of 10.48 feet. Additionally, there are associated structures/boxes—one on each end of the flume—that have invert elevations of 10.45 and 10.51 feet (NAVD88) for the northern and southern ends, respectively.

On the western side of the Salt Works, there is another utility structure. The top ELs of this WCST structure are 10.09 and 10.07 feet (NAVD88) for the northern and southern ends, respectively.

At the northern end of the Salt Works, there are several structures including flumes and pipes.

Figure 14 A shows a series of four culvert pipes providing hydraulic connectivity at the channel crossing (light-colored) north of Pond 30, only two of the pipes were visible from the photo taken during a site visit conducted on April 22, 2015 (**Figure 15**).



Figure 15. Existing CMP Culverts Providing Hydraulic Connectivity at the Channel Crossing Located North of Pond 30

8. SUMMARY AND NOTES

- Based on information obtained from the responsive agencies and other available sources, most of the known utilities within the study area are situated in and along the Saturn Boulevard right-of-way, with additional utilities located along Bay Boulevard and West Frontage Road, which may be in the path of the Project construction traffic.
- Additional utilities were observed outside the project area from available sources. This information is not included in this report.
- Utility information documented here represents current condition of the utility facilities found in currently available records. Coordination with the Underground Utilities Alert (DigAlert) and utilities agencies, and utilities investigation updates should be conducted during final engineering design and construction.

APPENDIX M

Air Quality/Greenhouse Gas Output Files

Alternative B – Intertidal

ORERP - Alt B - Intertidal Truck Haul

San Diego Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	110.00	53.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	110.00	51.00
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	60.00	27.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00
tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00

tblGrading	MaterialExported	0.00	130,000.00
tblGrading	MaterialExported	0.00	130,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	PhaseName		Dewatering Pond 15
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	3.50
tblTripsAndVMT	HaulingTripLength	20.00	3.50
tblTripsAndVMT	HaulingTripNumber	16,250.00	28,167.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	28,167.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripNumber	0.00	20.00

tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30

tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	18.0438	172.9631	169.9022	0.1961	26.9161	7.5440	34.4601	13.9294	6.9708	20.9003	0.0000	19,363.3301	19,363.3301	3.9682	0.0000	19,446.6617
2018	14.6186	143.2142	148.9192	0.1758	27.9508	6.0793	34.0284	14.1700	5.5929	19.7613	0.0000	17,359.1862	17,359.1862	3.8282	0.0000	17,439.5774
2019	10.5050	115.3185	88.4897	0.1296	25.5597	5.2989	30.8586	13.4879	4.8750	18.3629	0.0000	12,703.5655	12,703.5655	3.7830	0.0000	12,783.0084
Total	**43.1674**	**431.4958**	**407.3110**	**0.5015**	**80.4266**	**18.9222**	**99.3472**	**41.5873**	**17.4387**	**59.0245**	**0.0000**	**49,426.0818**	**49,426.0818**	**11.5793**	**0.0000**	**49,669.2474**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	8.4899	89.4989	139.4257	0.1961	11.9066	3.3232	15.2298	5.8138	3.3022	9.1160	0.0000	19,363.3301	19,363.3301	3.9682	0.0000	19,446.6617
2018	6.6115	78.4823	129.0325	0.1758	12.9413	2.9093	15.8490	6.0543	2.8910	8.9438	0.0000	17,359.1862	17,359.1862	3.8282	0.0000	17,439.5774
2019	3.2725	60.5324	73.4487	0.1296	10.2998	2.7059	13.0057	5.3498	2.7039	8.0538	0.0000	12,703.5655	12,703.5655	3.7830	0.0000	12,783.0084
Total	**18.3739**	**228.5137**	**341.9068**	**0.5015**	**35.1477**	**8.9384**	**44.0845**	**17.2179**	**8.8971**	**26.1136**	**0.0000**	**49,426.0818**	**49,426.0818**	**11.5793**	**0.0000**	**49,669.2474**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**57.44**	**47.04**	**16.06**	**0.00**	**56.30**	**52.76**	**55.63**	**58.60**	**48.98**	**55.76**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	
9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2019	12/31/2019	6	104	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36

Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48
Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42
Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40

Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	28,167.00	10.80	7.30	3.50	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	28,167.00	10.80	7.30	3.50	LD_Mix	HDT_Mix	HHDT
Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000

Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806		890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**		**890.0494**	**890.0494**	**0.1159**		**892.4832**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806	0.0000	890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**890.0494**	**890.0494**	**0.1159**		**892.4832**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6057	0.0000	24.6057	13.3043	0.0000	13.3043			0.0000			0.0000
Off-Road	12.4921	142.3947	99.7062	0.1200		6.9021	6.9021		6.3499	6.3499		12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**12.4921**	**142.3947**	**99.7062**	**0.1200**	**24.6057**	**6.9021**	**31.5078**	**13.3043**	**6.3499**	**19.6542**		**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.1663	16.8442	52.6262	0.0393	1.0375	0.1700	1.2075	0.2784	0.1563	0.4347		3,826.8409	3,826.8409	0.0374		3,827.6264
Vendor	0.5293	4.1644	6.8064	0.0113	0.3186	0.0603	0.3789	0.0909	0.0555	0.1464		1,117.2186	1,117.2186	8.5900e-003		1,117.3990
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**3.8635**	**21.2177**	**61.3885**	**0.0555**	**1.7669**	**0.2333**	**2.0001**	**0.4783**	**0.2145**	**0.6928**		**5,336.1335**	**5,336.1335**	**0.0661**		**5,337.5222**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.5962	0.0000	9.5962	5.1887	0.0000	5.1887			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.5962**	**2.6813**	**12.2775**	**5.1887**	**2.6813**	**7.8700**	**0.0000**	**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.1663	16.8442	52.6262	0.0393	1.0375	0.1700	1.2075	0.2784	0.1563	0.4347		3,826.8409	3,826.8409	0.0374		3,827.6264
Vendor	0.5293	4.1644	6.8064	0.0113	0.3186	0.0603	0.3789	0.0909	0.0555	0.1464		1,117.2186	1,117.2186	8.5900e-003		1,117.3990
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**3.8635**	**21.2177**	**61.3885**	**0.0555**	**1.7669**	**0.2333**	**2.0001**	**0.4783**	**0.2145**	**0.6928**		**5,336.1335**	**5,336.1335**	**0.0661**		**5,337.5222**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6057	0.0000	24.6057	13.3043	0.0000	13.3043			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6057**	**5.8513**	**30.4570**	**13.3043**	**5.3832**	**18.6875**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.9958	15.4526	51.0292	0.0392	2.6157	0.1675	2.7832	0.6658	0.1540	0.8198		3,761.0794	3,761.0794	0.0379		3,761.8755
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**3.6446**	**19.4032**	**59.3122**	**0.0554**	**3.3450**	**0.2264**	**3.5715**	**0.8656**	**0.2082**	**1.0738**		**5,236.4408**	**5,236.4408**	**0.0651**		**5,237.8073**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.5962	0.0000	9.5962	5.1887	0.0000	5.1887			0.0000			0.0000

Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.5962**	**2.6813**	**12.2775**	**5.1887**	**2.6813**	**7.8700**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.9958	15.4526	51.0292	0.0392	2.6157	0.1675	2.7832	0.6658	0.1540	0.8198		3,761.0794	3,761.0794	0.0379		3,761.8755
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**3.6446**	**19.4032**	**59.3122**	**0.0554**	**3.3450**	**0.2264**	**3.5715**	**0.8656**	**0.2082**	**1.0738**		**5,236.4408**	**5,236.4408**	**0.0651**		**5,237.8073**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6107	0.0000	24.6107	13.3049	0.0000	13.3049			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6107**	**5.8513**	**30.4620**	**13.3049**	**5.3832**	**18.6881**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.0246	15.6011	51.5199	0.0396	0.8306	0.1691	0.9997	0.2279	0.1555	0.3833		3,797.2436	3,797.2436	0.0383		3,798.0474
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**3.6734**	**19.5518**	**59.8028**	**0.0558**	**1.5599**	**0.2280**	**1.7879**	**0.4277**	**0.2097**	**0.6374**		**5,272.6051**	**5,272.6051**	**0.0654**		**5,273.9792**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.5982	0.0000	9.5982	5.1889	0.0000	5.1889			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.5982**	**2.6813**	**12.2794**	**5.1889**	**2.6813**	**7.8702**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	3.0246	15.6011	51.5199	0.0396	0.8306	0.1691	0.9997	0.2279	0.1555	0.3833		3,797.2436	3,797.2436	0.0383		3,798.0474
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**3.6734**	**19.5518**	**59.8028**	**0.0558**	**1.5599**	**0.2280**	**1.7879**	**0.4277**	**0.2097**	**0.6374**		**5,272.6051**	**5,272.6051**	**0.0654**		**5,273.9792**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

3.12 Pond 15 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					25.0163	0.0000	25.0163	13.3411	0.0000	13.3411			0.0000			0.0000
Off-Road	10.1706	113.7167	84.2707	0.1200		5.2743	5.2743		4.8523	4.8523		11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**10.1706**	**113.7167**	**84.2707**	**0.1200**	**25.0163**	**5.2743**	**30.2906**	**13.3411**	**4.8523**	**18.1935**		**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.7564	0.0000	9.7564	5.2030	0.0000	5.2030			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.7564**	**2.6813**	**12.4376**	**5.2030**	**2.6813**	**7.8843**	**0.0000**	**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt B - Intertidal Truck Haul

San Diego Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	110.00	53.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	110.00	51.00
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	60.00	27.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00
tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00

tblGrading	MaterialExported	0.00	130,000.00
tblGrading	MaterialExported	0.00	130,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	PhaseName		Dewatering Pond 15
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	3.50
tblTripsAndVMT	HaulingTripLength	20.00	3.50
tblTripsAndVMT	HaulingTripNumber	16,250.00	28,167.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	28,167.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripNumber	0.00	20.00

tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30

tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	17.3834	172.4109	152.0240	0.1970	26.9161	7.5408	34.4568	13.9294	6.9678	20.8973	0.0000	19,473.1448	19,473.1448	3.9659	0.0000	19,556.4293
2018	14.0415	142.7681	131.9918	0.1764	27.9508	6.0764	34.0255	14.1700	5.5902	19.7587	0.0000	17,438.5843	17,438.5843	3.8259	0.0000	17,518.9283
2019	10.4738	115.2677	87.8552	0.1300	25.5597	5.2987	30.8584	13.4879	4.8748	18.3627	0.0000	12,730.6987	12,730.6987	3.7829	0.0000	12,810.1394
Total	**41.8987**	**430.4467**	**371.8710**	**0.5034**	**80.4266**	**18.9158**	**99.3408**	**41.5873**	**17.4328**	**59.0186**	**0.0000**	**49,642.4278**	**49,642.4278**	**11.5747**	**0.0000**	**49,885.4971**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	7.8295	88.9467	121.5475	0.1970	11.9066	3.3200	15.2266	5.8138	3.2992	9.1130	0.0000	19,473.1448	19,473.1448	3.9659	0.0000	19,556.4293
2018	6.0345	78.0362	112.1051	0.1764	12.9413	2.9064	15.8461	6.0543	2.8883	8.9411	0.0000	17,438.5843	17,438.5843	3.8259	0.0000	17,518.9283
2019	3.2413	60.4816	72.8142	0.1300	10.2998	2.7057	13.0055	5.3498	2.7037	8.0536	0.0000	12,730.6987	12,730.6987	3.7829	0.0000	12,810.1394
Total	**17.1052**	**227.4646**	**306.4668**	**0.5034**	**35.1477**	**8.9320**	**44.0781**	**17.2179**	**8.8912**	**26.1077**	**0.0000**	**49,642.4278**	**49,642.4278**	**11.5747**	**0.0000**	**49,885.4970**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**59.17**	**47.16**	**17.59**	**0.00**	**56.30**	**52.78**	**55.63**	**58.60**	**49.00**	**55.76**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	
9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2019	12/31/2019	6	104	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36

Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48
Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42
Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40

Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	28,167.00	10.80	7.30	3.50	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	28,167.00	10.80	7.30	3.50	LD_Mix	HDT_Mix	HHDT
Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000

Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806		890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**		**890.0494**	**890.0494**	**0.1159**		**892.4832**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806	0.0000	890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**890.0494**	**890.0494**	**0.1159**		**892.4832**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6057	0.0000	24.6057	13.3043	0.0000	13.3043			0.0000			0.0000
Off-Road	12.4921	142.3947	99.7062	0.1200		6.9021	6.9021		6.3499	6.3499		12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**12.4921**	**142.3947**	**99.7062**	**0.1200**	**24.6057**	**6.9021**	**31.5078**	**13.3043**	**6.3499**	**19.6542**		**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.6235	16.4739	37.1557	0.0395	1.0375	0.1676	1.2051	0.2784	0.1540	0.4325		3,873.5190	3,873.5190	0.0355		3,874.2641
Vendor	0.4590	4.0680	5.0119	0.0114	0.3186	0.0597	0.3783	0.0909	0.0549	0.1458		1,125.8779	1,125.8779	8.3600e-003		1,126.0535
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**3.2414**	**20.7284**	**44.1907**	**0.0561**	**1.7669**	**0.2303**	**1.9971**	**0.4783**	**0.2117**	**0.6900**		**5,416.9055**	**5,416.9055**	**0.0640**		**5,418.2491**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.5962	0.0000	9.5962	5.1887	0.0000	5.1887			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.5962**	**2.6813**	**12.2775**	**5.1887**	**2.6813**	**7.8700**	**0.0000**	**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.6235	16.4739	37.1557	0.0395	1.0375	0.1676	1.2051	0.2784	0.1540	0.4325		3,873.5190	3,873.5190	0.0355		3,874.2641
Vendor	0.4590	4.0680	5.0119	0.0114	0.3186	0.0597	0.3783	0.0909	0.0549	0.1458		1,125.8779	1,125.8779	8.3600e-003		1,126.0535
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**3.2414**	**20.7284**	**44.1907**	**0.0561**	**1.7669**	**0.2303**	**1.9971**	**0.4783**	**0.2117**	**0.6900**		**5,416.9055**	**5,416.9055**	**0.0640**		**5,418.2491**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6057	0.0000	24.6057	13.3043	0.0000	13.3043			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6057**	**5.8513**	**30.4570**	**13.3043**	**5.3832**	**18.6875**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.4955	15.1157	35.9177	0.0394	2.6157	0.1651	2.7809	0.6658	0.1518	0.8176		3,807.0047	3,807.0047	0.0359		3,807.7589
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**3.0723**	**18.9603**	**42.5300**	**0.0560**	**3.3450**	**0.2235**	**3.5685**	**0.8656**	**0.2056**	**1.0712**		**5,315.3974**	**5,315.3974**	**0.0629**		**5,316.7171**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.5962	0.0000	9.5962	5.1887	0.0000	5.1887			0.0000			0.0000

Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.5962**	**2.6813**	**12.2775**	**5.1887**	**2.6813**	**7.8700**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.4955	15.1157	35.9177	0.0394	2.6157	0.1651	2.7809	0.6658	0.1518	0.8176		3,807.0047	3,807.0047	0.0359		3,807.7589
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**3.0723**	**18.9603**	**42.5300**	**0.0560**	**3.3450**	**0.2235**	**3.5685**	**0.8656**	**0.2056**	**1.0712**		**5,315.3974**	**5,315.3974**	**0.0629**		**5,316.7171**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6107	0.0000	24.6107	13.3049	0.0000	13.3049			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6107**	**5.8513**	**30.4620**	**13.3049**	**5.3832**	**18.6881**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.5195	15.2610	36.2631	0.0398	0.8306	0.1667	0.9973	0.2279	0.1533	0.3812		3,843.6105	3,843.6105	0.0363		3,844.3720
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**3.0963**	**19.1057**	**42.8754**	**0.0564**	**1.5599**	**0.2251**	**1.7850**	**0.4277**	**0.2070**	**0.6347**		**5,352.0032**	**5,352.0032**	**0.0632**		**5,353.3301**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.5982	0.0000	9.5982	5.1889	0.0000	5.1889			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.5982**	**2.6813**	**12.2794**	**5.1889**	**2.6813**	**7.8702**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	2.5195	15.2610	36.2631	0.0398	0.8306	0.1667	0.9973	0.2279	0.1533	0.3812		3,843.6105	3,843.6105	0.0363		3,844.3720
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**3.0963**	**19.1057**	**42.8754**	**0.0564**	**1.5599**	**0.2251**	**1.7850**	**0.4277**	**0.2070**	**0.6347**		**5,352.0032**	**5,352.0032**	**0.0632**		**5,353.3301**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

3.12 Pond 15 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					25.0163	0.0000	25.0163	13.3411	0.0000	13.3411			0.0000			0.0000
Off-Road	10.1706	113.7167	84.2707	0.1200		5.2743	5.2743		4.8523	4.8523		11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**10.1706**	**113.7167**	**84.2707**	**0.1200**	**25.0163**	**5.2743**	**30.2906**	**13.3411**	**4.8523**	**18.1935**		**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.7564	0.0000	9.7564	5.2030	0.0000	5.2030			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.7564**	**2.6813**	**12.4376**	**5.2030**	**2.6813**	**7.8843**	**0.0000**	**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

ORERP - Alt B - Intertidal Truck Haul

San Diego Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	110.00	53.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	110.00	51.00
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	60.00	27.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00
tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00

tblGrading	MaterialExported	0.00	130,000.00
tblGrading	MaterialExported	0.00	130,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	PhaseName		Dewatering Pond 15
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	3.50
tblTripsAndVMT	HaulingTripLength	20.00	3.50
tblTripsAndVMT	HaulingTripNumber	16,250.00	28,167.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	28,167.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripNumber	0.00	20.00

tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30

tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.6600	6.5638	6.2964	7.3900e-003	1.3804	0.2845	1.6649	0.7225	0.2621	0.9846	0.0000	666.7576	666.7576	0.1377	0.0000	669.6491
2018	0.9618	9.4310	9.4888	0.0118	2.7085	0.3987	3.1073	1.4272	0.3668	1.7941	0.0000	1,052.6096	1,052.6096	0.2279	0.0000	1,057.3955
2019	0.5574	6.0597	4.7442	7.1200e-003	1.3492	0.2765	1.6257	0.7068	0.2544	0.9612	0.0000	628.5146	628.5146	0.1792	0.0000	632.2778
Total	**2.1791**	**22.0544**	**20.5294**	**0.0263**	**5.4381**	**0.9597**	**6.3978**	**2.8566**	**0.8833**	**3.7399**	**0.0000**	**2,347.8818**	**2,347.8818**	**0.5448**	**0.0000**	**2,359.3224**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.2874	3.3087	5.1078	7.3900e-003	0.5924	0.1199	0.7123	0.2964	0.1190	0.4155	0.0000	666.7571	666.7571	0.1377	0.0000	669.6485
2018	0.4373	5.1910	8.1862	0.0118	1.1399	0.1911	1.3310	0.5791	0.1899	0.7690	0.0000	1,052.6087	1,052.6087	0.2279	0.0000	1,057.3947
2019	0.1813	3.2108	3.9621	7.1200e-003	0.5557	0.1417	0.6973	0.2836	0.1415	0.4251	0.0000	628.5140	628.5140	0.1792	0.0000	632.2771
Total	**0.9060**	**11.7105**	**17.2561**	**0.0263**	**2.2880**	**0.4526**	**2.7406**	**1.1592**	**0.4504**	**1.6096**	**0.0000**	**2,347.8798**	**2,347.8798**	**0.5448**	**0.0000**	**2,359.3203**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**58.42**	**46.90**	**15.94**	**0.00**	**57.93**	**52.84**	**57.16**	**59.42**	**49.01**	**56.96**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	
9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2019	12/31/2019	6	104	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36

Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48
Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42
Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40

Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	28,167.00	10.80	7.30	3.50	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	28,167.00	10.80	7.30	3.50	LD_Mix	HDT_Mix	HHDT
Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Clean Paved Roads

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5200e-003	0.0463	0.0685	1.3000e-004	3.4500e-003	6.6000e-004	4.1100e-003	9.9000e-004	6.1000e-004	1.6000e-003	0.0000	11.2413	11.2413	8.0000e-005	0.0000	11.2431
Worker	4.1200e-003	5.4600e-003	0.0516	1.3000e-004	0.0106	8.0000e-005	0.0107	2.8200e-003	7.0000e-005	2.9000e-003	0.0000	9.5193	9.5193	4.8000e-004	0.0000	9.5294
Total	**9.6400e-003**	**0.0518**	**0.1201**	**2.6000e-004**	**0.0141**	**7.4000e-004**	**0.0148**	**3.8100e-003**	**6.8000e-004**	**4.5000e-003**	**0.0000**	**20.7606**	**20.7606**	**5.6000e-004**	**0.0000**	**20.7725**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5200e-003	0.0463	0.0685	1.3000e-004	3.4500e-003	6.6000e-004	4.1100e-003	9.9000e-004	6.1000e-004	1.6000e-003	0.0000	11.2413	11.2413	8.0000e-005	0.0000	11.2431
Worker	4.1200e-003	5.4600e-003	0.0516	1.3000e-004	0.0106	8.0000e-005	0.0107	2.8200e-003	7.0000e-005	2.9000e-003	0.0000	9.5193	9.5193	4.8000e-004	0.0000	9.5294
Total	**9.6400e-003**	**0.0518**	**0.1201**	**2.6000e-004**	**0.0141**	**7.4000e-004**	**0.0148**	**3.8100e-003**	**6.8000e-004**	**4.5000e-003**	**0.0000**	**20.7606**	**20.7606**	**5.6000e-004**	**0.0000**	**20.7725**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0176	0.1000	0.0542	1.5000e-004		5.1400e-003	5.1400e-003		5.1400e-003	5.1400e-003	0.0000	10.9004	10.9004	1.4200e-003	0.0000	10.9302
Total	**0.0176**	**0.1000**	**0.0542**	**1.5000e-004**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**10.9004**	**10.9004**	**1.4200e-003**	**0.0000**	**10.9302**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8100e-003	0.0236	0.0349	6.0000e-005	1.7600e-003	3.4000e-004	2.0900e-003	5.0000e-004	3.1000e-004	8.1000e-004	0.0000	5.7267	5.7267	4.0000e-005	0.0000	5.7276
Worker	2.1000e-003	2.7800e-003	0.0263	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4800e-003	0.0000	4.8494	4.8494	2.5000e-004	0.0000	4.8546
Total	**4.9100e-003**	**0.0264**	**0.0612**	**1.3000e-004**	**7.1700e-003**	**3.8000e-004**	**7.5400e-003**	**1.9400e-003**	**3.5000e-004**	**2.2900e-003**	**0.0000**	**10.5761**	**10.5761**	**2.9000e-004**	**0.0000**	**10.5822**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0176	0.1000	0.0542	1.5000e-004		5.1400e-003	5.1400e-003		5.1400e-003	5.1400e-003	0.0000	10.9004	10.9004	1.4200e-003	0.0000	10.9302
Total	**0.0176**	**0.1000**	**0.0542**	**1.5000e-004**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**10.9004**	**10.9004**	**1.4200e-003**	**0.0000**	**10.9302**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8100e-003	0.0236	0.0349	6.0000e-005	1.7600e-003	3.4000e-004	2.0900e-003	5.0000e-004	3.1000e-004	8.1000e-004	0.0000	5.7267	5.7267	4.0000e-005	0.0000	5.7276
Worker	2.1000e-003	2.7800e-003	0.0263	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4800e-003	0.0000	4.8494	4.8494	2.5000e-004	0.0000	4.8546
Total	**4.9100e-003**	**0.0264**	**0.0612**	**1.3000e-004**	**7.1700e-003**	**3.8000e-004**	**7.5400e-003**	**1.9400e-003**	**3.5000e-004**	**2.2900e-003**	**0.0000**	**10.5761**	**10.5761**	**2.9000e-004**	**0.0000**	**10.5822**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2918	0.0000	1.2918	0.6985	0.0000	0.6985	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4872	5.5534	3.8885	4.6800e-003		0.2692	0.2692		0.2477	0.2477	0.0000	434.4535	434.4535	0.1331	0.0000	437.2490
Total	**0.4872**	**5.5534**	**3.8885**	**4.6800e-003**	**1.2918**	**0.2692**	**1.5610**	**0.6985**	**0.2477**	**0.9461**	**0.0000**	**434.4535**	**434.4535**	**0.1331**	**0.0000**	**437.2490**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.1151	0.6608	1.8544	1.5400e-003	0.0396	6.5700e-003	0.0461	0.0106	6.0400e-003	0.0167	0.0000	136.3523	136.3523	1.2800e-003	0.0000	136.3792
Vendor	0.0195	0.1635	0.2421	4.4000e-004	0.0122	2.3400e-003	0.0145	3.4800e-003	2.1500e-003	5.6400e-003	0.0000	39.7051	39.7051	3.0000e-004	0.0000	39.7114
Worker	6.0600e-003	8.0300e-003	0.0759	1.9000e-004	0.0156	1.2000e-004	0.0158	4.1600e-003	1.1000e-004	4.2600e-003	0.0000	14.0095	14.0095	7.1000e-004	0.0000	14.0245
Total	**0.1407**	**0.8323**	**2.1724**	**2.1700e-003**	**0.0674**	**9.0300e-003**	**0.0764**	**0.0183**	**8.3000e-003**	**0.0266**	**0.0000**	**190.0669**	**190.0669**	**2.2900e-003**	**0.0000**	**190.1151**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5038	0.0000	0.5038	0.2724	0.0000	0.2724	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1146	2.2983	2.7000	4.6800e-003		0.1046	0.1046		0.1046	0.1046	0.0000	434.4530	434.4530	0.1331	0.0000	437.2485
Total	**0.1146**	**2.2983**	**2.7000**	**4.6800e-003**	**0.5038**	**0.1046**	**0.6084**	**0.2724**	**0.1046**	**0.3770**	**0.0000**	**434.4530**	**434.4530**	**0.1331**	**0.0000**	**437.2485**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.1151	0.6608	1.8544	1.5400e-003	0.0396	6.5700e-003	0.0461	0.0106	6.0400e-003	0.0167	0.0000	136.3523	136.3523	1.2800e-003	0.0000	136.3792
Vendor	0.0195	0.1635	0.2421	4.4000e-004	0.0122	2.3400e-003	0.0145	3.4800e-003	2.1500e-003	5.6400e-003	0.0000	39.7051	39.7051	3.0000e-004	0.0000	39.7114
Worker	6.0600e-003	8.0300e-003	0.0759	1.9000e-004	0.0156	1.2000e-004	0.0158	4.1600e-003	1.1000e-004	4.2600e-003	0.0000	14.0095	14.0095	7.1000e-004	0.0000	14.0245
Total	**0.1407**	**0.8323**	**2.1724**	**2.1700e-003**	**0.0674**	**9.0300e-003**	**0.0764**	**0.0183**	**8.3000e-003**	**0.0266**	**0.0000**	**190.0669**	**190.0669**	**2.2900e-003**	**0.0000**	**190.1151**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2918	0.0000	1.2918	0.6985	0.0000	0.6985	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1478	1.6694	1.2031	1.6200e-003		0.0790	0.0790		0.0727	0.0727	0.0000	148.0243	148.0243	0.0461	0.0000	148.9920
Total	**0.1478**	**1.6694**	**1.2031**	**1.6200e-003**	**1.2918**	**0.0790**	**1.3708**	**0.6985**	**0.0727**	**0.7712**	**0.0000**	**148.0243**	**148.0243**	**0.0461**	**0.0000**	**148.9920**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0378	0.2098	0.6218	5.3000e-004	0.0344	2.2400e-003	0.0367	8.7700e-003	2.0600e-003	0.0108	0.0000	46.3881	46.3881	4.5000e-004	0.0000	46.3976
Vendor	6.3400e-003	0.0511	0.0801	1.5000e-004	4.2200e-003	7.5000e-004	4.9700e-003	1.2100e-003	6.9000e-004	1.9000e-003	0.0000	13.5080	13.5080	1.0000e-004	0.0000	13.5101
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**0.0460**	**0.2635**	**0.7256**	**7.5000e-004**	**0.0441**	**3.0300e-003**	**0.0471**	**0.0114**	**2.7900e-003**	**0.0142**	**0.0000**	**64.5634**	**64.5634**	**7.8000e-004**	**0.0000**	**64.5799**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5038	0.0000	0.5038	0.2724	0.0000	0.2724	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Off-Road	0.0397	0.7956	0.9346	1.6200e-003		0.0362	0.0362		0.0362	0.0362	0.0000	148.0241	148.0241	0.0461	0.0000	148.9918
Total	**0.0397**	**0.7956**	**0.9346**	**1.6200e-003**	**0.5038**	**0.0362**	**0.5400**	**0.2724**	**0.0362**	**0.3086**	**0.0000**	**148.0241**	**148.0241**	**0.0461**	**0.0000**	**148.9918**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0378	0.2098	0.6218	5.3000e-004	0.0344	2.2400e-003	0.0367	8.7700e-003	2.0600e-003	0.0108	0.0000	46.3881	46.3881	4.5000e-004	0.0000	46.3976
Vendor	6.3400e-003	0.0511	0.0801	1.5000e-004	4.2200e-003	7.5000e-004	4.9700e-003	1.2100e-003	6.9000e-004	1.9000e-003	0.0000	13.5080	13.5080	1.0000e-004	0.0000	13.5101
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**0.0460**	**0.2635**	**0.7256**	**7.5000e-004**	**0.0441**	**3.0300e-003**	**0.0471**	**0.0114**	**2.7900e-003**	**0.0142**	**0.0000**	**64.5634**	**64.5634**	**7.8000e-004**	**0.0000**	**64.5799**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3500e-003	0.0189	0.0297	6.0000e-005	1.5600e-003	2.8000e-004	1.8400e-003	4.5000e-004	2.6000e-004	7.0000e-004	0.0000	5.0030	5.0030	4.0000e-005	0.0000	5.0037
Worker	1.6900e-003	2.2500e-003	0.0211	6.0000e-005	4.8100e-003	4.0000e-005	4.8500e-003	1.2800e-003	3.0000e-005	1.3100e-003	0.0000	4.1488	4.1488	2.0000e-004	0.0000	4.1530
Total	**4.0400e-003**	**0.0212**	**0.0508**	**1.2000e-004**	**6.3700e-003**	**3.2000e-004**	**6.6900e-003**	**1.7300e-003**	**2.9000e-004**	**2.0100e-003**	**0.0000**	**9.1517**	**9.1517**	**2.4000e-004**	**0.0000**	**9.1568**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3500e-003	0.0189	0.0297	6.0000e-005	1.5600e-003	2.8000e-004	1.8400e-003	4.5000e-004	2.6000e-004	7.0000e-004	0.0000	5.0030	5.0030	4.0000e-005	0.0000	5.0037
Worker	1.6900e-003	2.2500e-003	0.0211	6.0000e-005	4.8100e-003	4.0000e-005	4.8500e-003	1.2800e-003	3.0000e-005	1.3100e-003	0.0000	4.1488	4.1488	2.0000e-004	0.0000	4.1530
Total	**4.0400e-003**	**0.0212**	**0.0508**	**1.2000e-004**	**6.3700e-003**	**3.2000e-004**	**6.6900e-003**	**1.7300e-003**	**2.9000e-004**	**2.0100e-003**	**0.0000**	**9.1517**	**9.1517**	**2.4000e-004**	**0.0000**	**9.1568**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0116					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0116**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0116					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0116**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6400e-003	0.0213	0.0334	6.0000e-005	1.7600e-003	3.1000e-004	2.0700e-003	5.0000e-004	2.9000e-004	7.9000e-004	0.0000	5.6283	5.6283	4.0000e-005	0.0000	5.6292
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**4.5500e-003**	**0.0238**	**0.0572**	**1.3000e-004**	**7.1700e-003**	**3.5000e-004**	**7.5200e-003**	**1.9400e-003**	**3.3000e-004**	**2.2600e-003**	**0.0000**	**10.2957**	**10.2957**	**2.7000e-004**	**0.0000**	**10.3014**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6400e-003	0.0213	0.0334	6.0000e-005	1.7600e-003	3.1000e-004	2.0700e-003	5.0000e-004	2.9000e-004	7.9000e-004	0.0000	5.6283	5.6283	4.0000e-005	0.0000	5.6292
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**4.5500e-003**	**0.0238**	**0.0572**	**1.3000e-004**	**7.1700e-003**	**3.5000e-004**	**7.5200e-003**	**1.9400e-003**	**3.3000e-004**	**2.2600e-003**	**0.0000**	**10.2957**	**10.2957**	**2.7000e-004**	**0.0000**	**10.3014**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2798	0.0000	1.2798	0.6919	0.0000	0.6919	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.5692	6.4305	4.6341	6.2400e-003		0.3043	0.3043		0.2799	0.2799	0.0000	570.1676	570.1676	0.1775	0.0000	573.8951
Total	**0.5692**	**6.4305**	**4.6341**	**6.2400e-003**	**1.2798**	**0.3043**	**1.5840**	**0.6919**	**0.2799**	**0.9718**	**0.0000**	**570.1676**	**570.1676**	**0.1775**	**0.0000**	**573.8951**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.1469	0.8160	2.4180	2.0700e-003	0.0423	8.7200e-003	0.0510	0.0116	8.0200e-003	0.0197	0.0000	180.3983	180.3983	1.7500e-003	0.0000	180.4351
Vendor	0.0244	0.1968	0.3086	5.9000e-004	0.0162	2.9000e-003	0.0191	4.6400e-003	2.6600e-003	7.3100e-003	0.0000	52.0307	52.0307	3.9000e-004	0.0000	52.0389
Worker	7.3400e-003	9.7700e-003	0.0916	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.9779	17.9779	8.8000e-004	0.0000	17.9965
Total	**0.1786**	**1.0226**	**2.8181**	**2.9200e-003**	**0.0794**	**0.0118**	**0.0912**	**0.0218**	**0.0108**	**0.0326**	**0.0000**	**250.4069**	**250.4069**	**3.0200e-003**	**0.0000**	**250.4704**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4991	0.0000	0.4991	0.2698	0.0000	0.2698	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1528	3.0644	3.5999	6.2400e-003		0.1394	0.1394		0.1394	0.1394	0.0000	570.1669	570.1669	0.1775	0.0000	573.8945
Total	**0.1528**	**3.0644**	**3.5999**	**6.2400e-003**	**0.4991**	**0.1394**	**0.6385**	**0.2698**	**0.1394**	**0.4093**	**0.0000**	**570.1669**	**570.1669**	**0.1775**	**0.0000**	**573.8945**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.1469	0.8160	2.4180	2.0700e-003	0.0423	8.7200e-003	0.0510	0.0116	8.0200e-003	0.0197	0.0000	180.3983	180.3983	1.7500e-003	0.0000	180.4351
Vendor	0.0244	0.1968	0.3086	5.9000e-004	0.0162	2.9000e-003	0.0191	4.6400e-003	2.6600e-003	7.3100e-003	0.0000	52.0307	52.0307	3.9000e-004	0.0000	52.0389
Worker	7.3400e-003	9.7700e-003	0.0916	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.9779	17.9779	8.8000e-004	0.0000	17.9965
Total	**0.1786**	**1.0226**	**2.8181**	**2.9200e-003**	**0.0794**	**0.0118**	**0.0912**	**0.0218**	**0.0108**	**0.0326**	**0.0000**	**250.4069**	**250.4069**	**3.0200e-003**	**0.0000**	**250.4704**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.6600e-003	0.0366	0.0602	1.2000e-004	3.3200e-003	5.5000e-004	3.8700e-003	9.5000e-004	5.1000e-004	1.4500e-003	0.0000	10.4481	10.4481	8.0000e-005	0.0000	10.4497
Worker	3.3400e-003	4.4300e-003	0.0413	1.3000e-004	0.0102	7.0000e-005	0.0103	2.7200e-003	7.0000e-005	2.7900e-003	0.0000	8.4972	8.4972	4.1000e-004	0.0000	8.5057
Total	**8.0000e-003**	**0.0410**	**0.1015**	**2.5000e-004**	**0.0135**	**6.2000e-004**	**0.0142**	**3.6700e-003**	**5.8000e-004**	**4.2400e-003**	**0.0000**	**18.9452**	**18.9452**	**4.9000e-004**	**0.0000**	**18.9554**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.6600e-003	0.0366	0.0602	1.2000e-004	3.3200e-003	5.5000e-004	3.8700e-003	9.5000e-004	5.1000e-004	1.4500e-003	0.0000	10.4481	10.4481	8.0000e-005	0.0000	10.4497
Worker	3.3400e-003	4.4300e-003	0.0413	1.3000e-004	0.0102	7.0000e-005	0.0103	2.7200e-003	7.0000e-005	2.7900e-003	0.0000	8.4972	8.4972	4.1000e-004	0.0000	8.5057
Total	**8.0000e-003**	**0.0410**	**0.1015**	**2.5000e-004**	**0.0135**	**6.2000e-004**	**0.0142**	**3.6700e-003**	**5.8000e-004**	**4.2400e-003**	**0.0000**	**18.9452**	**18.9452**	**4.9000e-004**	**0.0000**	**18.9554**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4700e-003	0.0194	0.0319	6.0000e-005	1.7600e-003	2.9000e-004	2.0500e-003	5.0000e-004	2.7000e-004	7.7000e-004	0.0000	5.5313	5.5313	4.0000e-005	0.0000	5.5322
Worker	1.7700e-003	2.3400e-003	0.0219	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.4985	4.4985	2.2000e-004	0.0000	4.5030
Total	**4.2400e-003**	**0.0217**	**0.0537**	**1.3000e-004**	**7.1700e-003**	**3.3000e-004**	**7.5000e-003**	**1.9400e-003**	**3.1000e-004**	**2.2400e-003**	**0.0000**	**10.0298**	**10.0298**	**2.6000e-004**	**0.0000**	**10.0352**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4700e-003	0.0194	0.0319	6.0000e-005	1.7600e-003	2.9000e-004	2.0500e-003	5.0000e-004	2.7000e-004	7.7000e-004	0.0000	5.5313	5.5313	4.0000e-005	0.0000	5.5322
Worker	1.7700e-003	2.3400e-003	0.0219	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.4985	4.4985	2.2000e-004	0.0000	4.5030
Total	**4.2400e-003**	**0.0217**	**0.0537**	**1.3000e-004**	**7.1700e-003**	**3.3000e-004**	**7.5000e-003**	**1.9400e-003**	**3.1000e-004**	**2.2400e-003**	**0.0000**	**10.0298**	**10.0298**	**2.6000e-004**	**0.0000**	**10.0352**

3.12 Pond 15 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.3009	0.0000	1.3009	0.6937	0.0000	0.6937	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.5289	5.9133	4.3821	6.2400e-003		0.2743	0.2743		0.2523	0.2523	0.0000	560.9061	560.9061	0.1775	0.0000	564.6329
Total	**0.5289**	**5.9133**	**4.3821**	**6.2400e-003**	**1.3009**	**0.2743**	**1.5751**	**0.6937**	**0.2523**	**0.9461**	**0.0000**	**560.9061**	**560.9061**	**0.1775**	**0.0000**	**564.6329**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.5000e-003	0.0746	0.1227	2.5000e-004	6.7600e-003	1.1200e-003	7.8900e-003	1.9400e-003	1.0300e-003	2.9700e-003	0.0000	21.3059	21.3059	1.6000e-004	0.0000	21.3092
Worker	6.8100e-003	9.0300e-003	0.0842	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.3275	17.3275	8.3000e-004	0.0000	17.3450
Total	**0.0163**	**0.0837**	**0.2069**	**5.1000e-004**	**0.0276**	**1.2700e-003**	**0.0289**	**7.4800e-003**	**1.1700e-003**	**8.6500e-003**	**0.0000**	**38.6334**	**38.6334**	**9.9000e-004**	**0.0000**	**38.6542**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5073	0.0000	0.5073	0.2706	0.0000	0.2706	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1528	3.0644	3.5999	6.2400e-003		0.1394	0.1394		0.1394	0.1394	0.0000	560.9055	560.9055	0.1775	0.0000	564.6322
Total	**0.1528**	**3.0644**	**3.5999**	**6.2400e-003**	**0.5073**	**0.1394**	**0.6468**	**0.2706**	**0.1394**	**0.4100**	**0.0000**	**560.9055**	**560.9055**	**0.1775**	**0.0000**	**564.6322**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.5000e-003	0.0746	0.1227	2.5000e-004	6.7600e-003	1.1200e-003	7.8900e-003	1.9400e-003	1.0300e-003	2.9700e-003	0.0000	21.3059	21.3059	1.6000e-004	0.0000	21.3092
Worker	6.8100e-003	9.0300e-003	0.0842	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.3275	17.3275	8.3000e-004	0.0000	17.3450
Total	**0.0163**	**0.0837**	**0.2069**	**5.1000e-004**	**0.0276**	**1.2700e-003**	**0.0289**	**7.4800e-003**	**1.1700e-003**	**8.6500e-003**	**0.0000**	**38.6334**	**38.6334**	**9.9000e-004**	**0.0000**	**38.6542**

ORERP - Alt B - Intertidal Conveyor Option

San Diego Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	110.00	53.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	110.00	51.00
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	60.00	27.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00
tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00

tblGrading	MaterialExported	0.00	155,000.00
tblGrading	MaterialExported	0.00	155,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Dewatering Pond 15
tblOffRoadEquipment	PhaseName		Earthwork 1
tblOffRoadEquipment	PhaseName		Earthwork 2
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30

tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00

tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	14.8775	156.1189	117.2760	0.1568	25.9120	7.3741	33.2861	13.6561	6.8146	20.4707	0.0000	15,536.4892	15,536.4892	3.9308	0.0000	15,619.0353
2018	11.5939	127.6131	97.3993	0.1363	25.3738	5.9102	31.2840	13.5099	5.4374	18.9473	0.0000	13,561.9426	13,561.9426	3.7899	0.0000	13,641.5300
2019	10.5050	115.3185	88.4897	0.1296	25.5597	5.2989	30.8586	13.4879	4.8750	18.3629	0.0000	12,703.5655	12,703.5655	3.7830	0.0000	12,783.0084
Total	**36.9764**	**399.0505**	**303.1650**	**0.4227**	**76.8456**	**18.5832**	**95.4287**	**40.6539**	**17.1270**	**57.7808**	**0.0000**	**41,801.9974**	**41,801.9974**	**11.5036**	**0.0000**	**42,043.5736**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Year	lb/day										lb/day					
2017	5.3236	72.6548	86.7995	0.1568	10.8821	3.1533	14.0354	5.5373	3.1460	8.6833	0.0000	15,536.4892	15,536.4892	3.9308	0.0000	15,619.0353
2018	3.5869	62.8812	77.5126	0.1363	10.3407	2.7402	13.0809	5.3908	2.7355	8.1263	0.0000	13,561.9426	13,561.9426	3.7899	0.0000	13,641.5299
2019	3.2725	60.5324	73.4487	0.1296	10.2998	2.7059	13.0057	5.3498	2.7039	8.0538	0.0000	12,703.5655	12,703.5655	3.7830	0.0000	12,783.0084
Total	**12.1830**	**196.0684**	**237.7608**	**0.4227**	**31.5226**	**8.5994**	**40.1219**	**16.2779**	**8.5854**	**24.8633**	**0.0000**	**41,801.9973**	**41,801.9973**	**11.5036**	**0.0000**	**42,043.5736**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**67.05**	**50.87**	**21.57**	**0.00**	**58.98**	**53.73**	**57.96**	**59.96**	**49.87**	**56.97**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	
9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2019	12/31/2019	6	104	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36
Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48
Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42

Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40
Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Earthwork 1	Pumps	1	8.00	1000	0.74
Earthwork 2	Pumps	1	8.00	1000	0.74

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806		890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**		**890.0494**	**890.0494**	**0.1159**		**892.4832**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806	0.0000	890.0494	890.0494	0.1159		892.4832

Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**890.0494**	**890.0494**	**0.1159**		**892.4832**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	12.4921	142.3947	99.7062	0.1200		6.9021	6.9021		6.3499	6.3499		12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**12.4921**	**142.3947**	**99.7062**	**0.1200**	**24.6392**	**6.9021**	**31.5413**	**13.3094**	**6.3499**	**19.6593**		**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5293	4.1644	6.8064	0.0113	0.3186	0.0603	0.3789	0.0909	0.0555	0.1464		1,117.2186	1,117.2186	8.5900e-003		1,117.3990
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.6972**	**4.3735**	**8.7623**	**0.0162**	**0.7294**	**0.0633**	**0.7927**	**0.1999**	**0.0582**	**0.2581**		**1,509.2926**	**1,509.2926**	**0.0287**		**1,509.8958**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5293	4.1644	6.8064	0.0113	0.3186	0.0603	0.3789	0.0909	0.0555	0.1464		1,117.2186	1,117.2186	8.5900e-003		1,117.3990
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.6972**	**4.3735**	**8.7623**	**0.0162**	**0.7294**	**0.0633**	**0.7927**	**0.1999**	**0.0582**	**0.2581**		**1,509.2926**	**1,509.2926**	**0.0287**		**1,509.8958**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6392**	**5.8513**	**30.4904**	**13.3094**	**5.3832**	**18.6926**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6445	0.0000	24.6445	13.3101	0.0000	13.3101			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6445**	**5.8513**	**30.4957**	**13.3101**	**5.3832**	**18.6932**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6114	0.0000	9.6114	5.1909	0.0000	5.1909			0.0000			0.0000

Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6114**	**2.6813**	**12.2926**	**5.1909**	**2.6813**	**7.8722**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

3.12 Pond 15 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					25.0163	0.0000	25.0163	13.3411	0.0000	13.3411			0.0000			0.0000
Off-Road	10.1706	113.7167	84.2707	0.1200		5.2743	5.2743		4.8523	4.8523		11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**10.1706**	**113.7167**	**84.2707**	**0.1200**	**25.0163**	**5.2743**	**30.2906**	**13.3411**	**4.8523**	**18.1935**		**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.7564	0.0000	9.7564	5.2030	0.0000	5.2030			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.7564**	**2.6813**	**12.4376**	**5.2030**	**2.6813**	**7.8843**	**0.0000**	**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt B - Intertidal Conveyor Option

San Diego Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	110.00	53.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	110.00	51.00
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	60.00	27.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00
tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00

tblGrading	MaterialExported	0.00	155,000.00
tblGrading	MaterialExported	0.00	155,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Dewatering Pond 15
tblOffRoadEquipment	PhaseName		Earthwork 1
tblOffRoadEquipment	PhaseName		Earthwork 2
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30

tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00

tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	14.7599	155.9369	114.8683	0.1575	25.9120	7.3732	33.2852	13.6561	6.8138	20.4699	0.0000	15,599.6259	15,599.6259	3.9304	0.0000	15,682.1652
2018	11.5220	127.5071	95.7287	0.1366	25.3738	5.9096	31.2834	13.5099	5.4369	18.9468	0.0000	13,594.9739	13,594.9739	3.7896	0.0000	13,674.5563
2019	10.4738	115.2677	87.8552	0.1300	25.5597	5.2987	30.8584	13.4879	4.8748	18.3627	0.0000	12,730.6987	12,730.6987	3.7829	0.0000	12,810.1394
Total	**36.7557**	**398.7117**	**298.4522**	**0.4241**	**76.8456**	**18.5815**	**95.4271**	**40.6539**	**17.1255**	**57.7793**	**0.0000**	**41,925.2984**	**41,925.2984**	**11.5030**	**0.0000**	**42,166.8610**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Year	lb/day										lb/day					
2017	5.2060	72.4728	84.3918	0.1575	10.8821	3.1524	14.0345	5.5373	3.1452	8.6825	0.0000	15,599.6259	15,599.6259	3.9304	0.0000	15,682.1652
2018	3.5150	62.7752	75.8420	0.1366	10.3407	2.7397	13.0803	5.3908	2.7350	8.1257	0.0000	13,594.9739	13,594.9739	3.7896	0.0000	13,674.5563
2019	3.2413	60.4816	72.8142	0.1300	10.2998	2.7057	13.0055	5.3498	2.7037	8.0536	0.0000	12,730.6987	12,730.6987	3.7829	0.0000	12,810.1394
Total	**11.9622**	**195.7296**	**233.0481**	**0.4241**	**31.5226**	**8.5977**	**40.1203**	**16.2779**	**8.5839**	**24.8618**	**0.0000**	**41,925.2984**	**41,925.2984**	**11.5030**	**0.0000**	**42,166.8610**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**67.45**	**50.91**	**21.91**	**0.00**	**58.98**	**53.73**	**57.96**	**59.96**	**49.88**	**56.97**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	
9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2019	12/31/2019	6	104	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36
Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48
Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42

Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40
Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Earthwork 1	Pumps	1	8.00	1000	0.74
Earthwork 2	Pumps	1	8.00	1000	0.74

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806		890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**		**890.0494**	**890.0494**	**0.1159**		**892.4832**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806	0.0000	890.0494	890.0494	0.1159		892.4832

Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**890.0494**	**890.0494**	**0.1159**		**892.4832**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	12.4921	142.3947	99.7062	0.1200		6.9021	6.9021		6.3499	6.3499		12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**12.4921**	**142.3947**	**99.7062**	**0.1200**	**24.6392**	**6.9021**	**31.5413**	**13.3094**	**6.3499**	**19.6593**		**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4590	4.0680	5.0119	0.0114	0.3186	0.0597	0.3783	0.0909	0.0549	0.1458		1,125.8779	1,125.8779	8.3600e-003		1,126.0535
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.6178**	**4.2544**	**7.0351**	**0.0166**	**0.7294**	**0.0627**	**0.7921**	**0.1999**	**0.0577**	**0.2575**		**1,543.3866**	**1,543.3866**	**0.0285**		**1,543.9850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4590	4.0680	5.0119	0.0114	0.3186	0.0597	0.3783	0.0909	0.0549	0.1458		1,125.8779	1,125.8779	8.3600e-003		1,126.0535
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.6178**	**4.2544**	**7.0351**	**0.0166**	**0.7294**	**0.0627**	**0.7921**	**0.1999**	**0.0577**	**0.2575**		**1,543.3866**	**1,543.3866**	**0.0285**		**1,543.9850**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6392**	**5.8513**	**30.4904**	**13.3094**	**5.3832**	**18.6926**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6445	0.0000	24.6445	13.3101	0.0000	13.3101			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6445**	**5.8513**	**30.4957**	**13.3101**	**5.3832**	**18.6932**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6114	0.0000	9.6114	5.1909	0.0000	5.1909			0.0000			0.0000

Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6114**	**2.6813**	**12.2926**	**5.1909**	**2.6813**	**7.8722**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

3.12 Pond 15 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					25.0163	0.0000	25.0163	13.3411	0.0000	13.3411			0.0000			0.0000
Off-Road	10.1706	113.7167	84.2707	0.1200		5.2743	5.2743		4.8523	4.8523		11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**10.1706**	**113.7167**	**84.2707**	**0.1200**	**25.0163**	**5.2743**	**30.2906**	**13.3411**	**4.8523**	**18.1935**		**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.7564	0.0000	9.7564	5.2030	0.0000	5.2030			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.7564**	**2.6813**	**12.4376**	**5.2030**	**2.6813**	**7.8843**	**0.0000**	**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

ORERP - Alt B - Intertidal Conveyor Option - Annual Equipment

San Diego Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	110.00	53.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	110.00	51.00
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	60.00	27.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00
tblGrading	AcresOfGrading	420.00	34.00

tblGrading	AcresOfGrading	416.00	34.00
tblGrading	MaterialExported	0.00	155,000.00
tblGrading	MaterialExported	0.00	155,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Dewatering Pond 15
tblOffRoadEquipment	PhaseName		Earthwork 1
tblOffRoadEquipment	PhaseName		Earthwork 2
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30

tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00

tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.5448	5.9030	4.4421	5.8500e-003	1.3426	0.2779	1.6205	0.7121	0.2561	0.9682	0.0000	530.4053	530.4053	0.1364	0.0000	533.2698
2018	0.7771	8.4051	6.4491	9.1800e-003	2.6353	0.3878	3.0231	1.4074	0.3567	1.7641	0.0000	825.8232	825.8232	0.2257	0.0000	830.5629
2019	0.5574	6.0597	4.7442	7.1200e-003	1.3492	0.2765	1.6257	0.7068	0.2544	0.9612	0.0000	628.5146	628.5146	0.1792	0.0000	632.2778
Total	**1.8793**	**20.3678**	**15.6353**	**0.0222**	**5.3271**	**0.9421**	**6.2693**	**2.8263**	**0.8672**	**3.6935**	**0.0000**	**1,984.7431**	**1,984.7431**	**0.5413**	**0.0000**	**1,996.1105**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Year	tons/yr										MT/yr					
2017	0.1722	2.6479	3.2535	5.8500e-003	0.5536	0.1133	0.6668	0.2859	0.1130	0.3989	0.0000	530.4048	530.4048	0.1364	0.0000	533.2693
2018	0.2526	4.1652	5.1465	9.1800e-003	1.0645	0.1801	1.2447	0.5589	0.1798	0.7387	0.0000	825.8223	825.8223	0.2257	0.0000	830.5620
2019	0.1813	3.2108	3.9621	7.1200e-003	0.5557	0.1417	0.6973	0.2836	0.1415	0.4251	0.0000	628.5140	628.5140	0.1792	0.0000	632.2771
Total	**0.6062**	**10.0239**	**12.3620**	**0.0222**	**2.1737**	**0.4351**	**2.6088**	**1.1285**	**0.4343**	**1.5627**	**0.0000**	**1,984.7411**	**1,984.7411**	**0.5413**	**0.0000**	**1,996.1084**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**67.75**	**50.79**	**20.94**	**0.00**	**59.20**	**53.82**	**58.39**	**60.07**	**49.92**	**57.69**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	
9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2019	12/31/2019	6	104	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36
Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48
Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42

Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40
Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Earthwork 1	Pumps	1	8.00	1000	0.74
Earthwork 2	Pumps	1	8.00	1000	0.74

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5200e-003	0.0463	0.0685	1.3000e-004	3.4500e-003	6.6000e-004	4.1100e-003	9.9000e-004	6.1000e-004	1.6000e-003	0.0000	11.2413	11.2413	8.0000e-005	0.0000	11.2431
Worker	4.1200e-003	5.4600e-003	0.0516	1.3000e-004	0.0106	8.0000e-005	0.0107	2.8200e-003	7.0000e-005	2.9000e-003	0.0000	9.5193	9.5193	4.8000e-004	0.0000	9.5294
Total	**9.6400e-003**	**0.0518**	**0.1201**	**2.6000e-004**	**0.0141**	**7.4000e-004**	**0.0148**	**3.8100e-003**	**6.8000e-004**	**4.5000e-003**	**0.0000**	**20.7606**	**20.7606**	**5.6000e-004**	**0.0000**	**20.7725**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5200e-003	0.0463	0.0685	1.3000e-004	3.4500e-003	6.6000e-004	4.1100e-003	9.9000e-004	6.1000e-004	1.6000e-003	0.0000	11.2413	11.2413	8.0000e-005	0.0000	11.2431
Worker	4.1200e-003	5.4600e-003	0.0516	1.3000e-004	0.0106	8.0000e-005	0.0107	2.8200e-003	7.0000e-005	2.9000e-003	0.0000	9.5193	9.5193	4.8000e-004	0.0000	9.5294
Total	**9.6400e-003**	**0.0518**	**0.1201**	**2.6000e-004**	**0.0141**	**7.4000e-004**	**0.0148**	**3.8100e-003**	**6.8000e-004**	**4.5000e-003**	**0.0000**	**20.7606**	**20.7606**	**5.6000e-004**	**0.0000**	**20.7725**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0176	0.1000	0.0542	1.5000e-004		5.1400e-003	5.1400e-003		5.1400e-003	5.1400e-003	0.0000	10.9004	10.9004	1.4200e-003	0.0000	10.9302
Total	**0.0176**	**0.1000**	**0.0542**	**1.5000e-004**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**10.9004**	**10.9004**	**1.4200e-003**	**0.0000**	**10.9302**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8100e-003	0.0236	0.0349	6.0000e-005	1.7600e-003	3.4000e-004	2.0900e-003	5.0000e-004	3.1000e-004	8.1000e-004	0.0000	5.7267	5.7267	4.0000e-005	0.0000	5.7276
Worker	2.1000e-003	2.7800e-003	0.0263	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4800e-003	0.0000	4.8494	4.8494	2.5000e-004	0.0000	4.8546
Total	**4.9100e-003**	**0.0264**	**0.0612**	**1.3000e-004**	**7.1700e-003**	**3.8000e-004**	**7.5400e-003**	**1.9400e-003**	**3.5000e-004**	**2.2900e-003**	**0.0000**	**10.5761**	**10.5761**	**2.9000e-004**	**0.0000**	**10.5822**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0176	0.1000	0.0542	1.5000e-004		5.1400e-003	5.1400e-003		5.1400e-003	5.1400e-003	0.0000	10.9004	10.9004	1.4200e-003	0.0000	10.9302

Total	**0.0176**	**0.1000**	**0.0542**	**1.5000e-004**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**10.9004**	**10.9004**	**1.4200e-003**	**0.0000**	**10.9302**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8100e-003	0.0236	0.0349	6.0000e-005	1.7600e-003	3.4000e-004	2.0900e-003	5.0000e-004	3.1000e-004	8.1000e-004	0.0000	5.7267	5.7267	4.0000e-005	0.0000	5.7276
Worker	2.1000e-003	2.7800e-003	0.0263	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4800e-003	0.0000	4.8494	4.8494	2.5000e-004	0.0000	4.8546
Total	**4.9100e-003**	**0.0264**	**0.0612**	**1.3000e-004**	**7.1700e-003**	**3.8000e-004**	**7.5400e-003**	**1.9400e-003**	**3.5000e-004**	**2.2900e-003**	**0.0000**	**10.5761**	**10.5761**	**2.9000e-004**	**0.0000**	**10.5822**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2936	0.0000	1.2936	0.6987	0.0000	0.6987	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4872	5.5534	3.8885	4.6800e-003		0.2692	0.2692		0.2477	0.2477	0.0000	434.4535	434.4535	0.1331	0.0000	437.2490
Total	**0.4872**	**5.5534**	**3.8885**	**4.6800e-003**	**1.2936**	**0.2692**	**1.5627**	**0.6987**	**0.2477**	**0.9464**	**0.0000**	**434.4535**	**434.4535**	**0.1331**	**0.0000**	**437.2490**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0195	0.1635	0.2421	4.4000e-004	0.0122	2.3400e-003	0.0145	3.4800e-003	2.1500e-003	5.6400e-003	0.0000	39.7051	39.7051	3.0000e-004	0.0000	39.7114
Worker	6.0600e-003	8.0300e-003	0.0759	1.9000e-004	0.0156	1.2000e-004	0.0158	4.1600e-003	1.1000e-004	4.2600e-003	0.0000	14.0095	14.0095	7.1000e-004	0.0000	14.0245
Total	**0.0256**	**0.1715**	**0.3180**	**6.3000e-004**	**0.0278**	**2.4600e-003**	**0.0303**	**7.6400e-003**	**2.2600e-003**	**9.9000e-003**	**0.0000**	**53.7146**	**53.7146**	**1.0100e-003**	**0.0000**	**53.7359**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5045	0.0000	0.5045	0.2725	0.0000	0.2725	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1146	2.2983	2.7000	4.6800e-003		0.1046	0.1046		0.1046	0.1046	0.0000	434.4530	434.4530	0.1331	0.0000	437.2485
Total	**0.1146**	**2.2983**	**2.7000**	**4.6800e-003**	**0.5045**	**0.1046**	**0.6091**	**0.2725**	**0.1046**	**0.3771**	**0.0000**	**434.4530**	**434.4530**	**0.1331**	**0.0000**	**437.2485**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0195	0.1635	0.2421	4.4000e-004	0.0122	2.3400e-003	0.0145	3.4800e-003	2.1500e-003	5.6400e-003	0.0000	39.7051	39.7051	3.0000e-004	0.0000	39.7114
Worker	6.0600e-003	8.0300e-003	0.0759	1.9000e-004	0.0156	1.2000e-004	0.0158	4.1600e-003	1.1000e-004	4.2600e-003	0.0000	14.0095	14.0095	7.1000e-004	0.0000	14.0245
Total	**0.0256**	**0.1715**	**0.3180**	**6.3000e-004**	**0.0278**	**2.4600e-003**	**0.0303**	**7.6400e-003**	**2.2600e-003**	**9.9000e-003**	**0.0000**	**53.7146**	**53.7146**	**1.0100e-003**	**0.0000**	**53.7359**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2936	0.0000	1.2936	0.6987	0.0000	0.6987	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1478	1.6694	1.2031	1.6200e-003		0.0790	0.0790		0.0727	0.0727	0.0000	148.0243	148.0243	0.0461	0.0000	148.9920
Total	**0.1478**	**1.6694**	**1.2031**	**1.6200e-003**	**1.2936**	**0.0790**	**1.3726**	**0.6987**	**0.0727**	**0.7714**	**0.0000**	**148.0243**	**148.0243**	**0.0461**	**0.0000**	**148.9920**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.3400e-003	0.0511	0.0801	1.5000e-004	4.2200e-003	7.5000e-004	4.9700e-003	1.2100e-003	6.9000e-004	1.9000e-003	0.0000	13.5080	13.5080	1.0000e-004	0.0000	13.5101
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**8.2500e-003**	**0.0536**	**0.1039**	**2.2000e-004**	**9.6300e-003**	**7.9000e-004**	**0.0104**	**2.6500e-003**	**7.3000e-004**	**3.3700e-003**	**0.0000**	**18.1753**	**18.1753**	**3.3000e-004**	**0.0000**	**18.1823**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5045	0.0000	0.5045	0.2725	0.0000	0.2725	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0397	0.7956	0.9346	1.6200e-003		0.0362	0.0362		0.0362	0.0362	0.0000	148.0241	148.0241	0.0461	0.0000	148.9918
Total	**0.0397**	**0.7956**	**0.9346**	**1.6200e-003**	**0.5045**	**0.0362**	**0.5407**	**0.2725**	**0.0362**	**0.3087**	**0.0000**	**148.0241**	**148.0241**	**0.0461**	**0.0000**	**148.9918**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.3400e-003	0.0511	0.0801	1.5000e-004	4.2200e-003	7.5000e-004	4.9700e-003	1.2100e-003	6.9000e-004	1.9000e-003	0.0000	13.5080	13.5080	1.0000e-004	0.0000	13.5101
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**8.2500e-003**	**0.0536**	**0.1039**	**2.2000e-004**	**9.6300e-003**	**7.9000e-004**	**0.0104**	**2.6500e-003**	**7.3000e-004**	**3.3700e-003**	**0.0000**	**18.1753**	**18.1753**	**3.3000e-004**	**0.0000**	**18.1823**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3500e-003	0.0189	0.0297	6.0000e-005	1.5600e-003	2.8000e-004	1.8400e-003	4.5000e-004	2.6000e-004	7.0000e-004	0.0000	5.0030	5.0030	4.0000e-005	0.0000	5.0037
Worker	1.6900e-003	2.2500e-003	0.0211	6.0000e-005	4.8100e-003	4.0000e-005	4.8500e-003	1.2800e-003	3.0000e-005	1.3100e-003	0.0000	4.1488	4.1488	2.0000e-004	0.0000	4.1530
Total	**4.0400e-003**	**0.0212**	**0.0508**	**1.2000e-004**	**6.3700e-003**	**3.2000e-004**	**6.6900e-003**	**1.7300e-003**	**2.9000e-004**	**2.0100e-003**	**0.0000**	**9.1517**	**9.1517**	**2.4000e-004**	**0.0000**	**9.1568**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3500e-003	0.0189	0.0297	6.0000e-005	1.5600e-003	2.8000e-004	1.8400e-003	4.5000e-004	2.6000e-004	7.0000e-004	0.0000	5.0030	5.0030	4.0000e-005	0.0000	5.0037
Worker	1.6900e-003	2.2500e-003	0.0211	6.0000e-005	4.8100e-003	4.0000e-005	4.8500e-003	1.2800e-003	3.0000e-005	1.3100e-003	0.0000	4.1488	4.1488	2.0000e-004	0.0000	4.1530
Total	**4.0400e-003**	**0.0212**	**0.0508**	**1.2000e-004**	**6.3700e-003**	**3.2000e-004**	**6.6900e-003**	**1.7300e-003**	**2.9000e-004**	**2.0100e-003**	**0.0000**	**9.1517**	**9.1517**	**2.4000e-004**	**0.0000**	**9.1568**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0116					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0116**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0116					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0116**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6400e-003	0.0213	0.0334	6.0000e-005	1.7600e-003	3.1000e-004	2.0700e-003	5.0000e-004	2.9000e-004	7.9000e-004	0.0000	5.6283	5.6283	4.0000e-005	0.0000	5.6292
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**4.5500e-003**	**0.0238**	**0.0572**	**1.3000e-004**	**7.1700e-003**	**3.5000e-004**	**7.5200e-003**	**1.9400e-003**	**3.3000e-004**	**2.2600e-003**	**0.0000**	**10.2957**	**10.2957**	**2.7000e-004**	**0.0000**	**10.3014**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6400e-003	0.0213	0.0334	6.0000e-005	1.7600e-003	3.1000e-004	2.0700e-003	5.0000e-004	2.9000e-004	7.9000e-004	0.0000	5.6283	5.6283	4.0000e-005	0.0000	5.6292
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**4.5500e-003**	**0.0238**	**0.0572**	**1.3000e-004**	**7.1700e-003**	**3.5000e-004**	**7.5200e-003**	**1.9400e-003**	**3.3000e-004**	**2.2600e-003**	**0.0000**	**10.2957**	**10.2957**	**2.7000e-004**	**0.0000**	**10.3014**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2815	0.0000	1.2815	0.6921	0.0000	0.6921	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.5692	6.4305	4.6341	6.2400e-003		0.3043	0.3043		0.2799	0.2799	0.0000	570.1676	570.1676	0.1775	0.0000	573.8951
Total	**0.5692**	**6.4305**	**4.6341**	**6.2400e-003**	**1.2815**	**0.3043**	**1.5858**	**0.6921**	**0.2799**	**0.9720**	**0.0000**	**570.1676**	**570.1676**	**0.1775**	**0.0000**	**573.8951**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0244	0.1968	0.3086	5.9000e-004	0.0162	2.9000e-003	0.0191	4.6400e-003	2.6600e-003	7.3100e-003	0.0000	52.0307	52.0307	3.9000e-004	0.0000	52.0389
Worker	7.3400e-003	9.7700e-003	0.0916	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.9779	17.9779	8.8000e-004	0.0000	17.9965
Total	**0.0317**	**0.2066**	**0.4001**	**8.5000e-004**	**0.0371**	**3.0500e-003**	**0.0401**	**0.0102**	**2.8000e-003**	**0.0130**	**0.0000**	**70.0086**	**70.0086**	**1.2700e-003**	**0.0000**	**70.0354**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4998	0.0000	0.4998	0.2699	0.0000	0.2699	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Off-Road	0.1528	3.0644	3.5999	6.2400e-003		0.1394	0.1394		0.1394	0.1394	0.0000	570.1669	570.1669	0.1775	0.0000	573.8945
Total	**0.1528**	**3.0644**	**3.5999**	**6.2400e-003**	**0.4998**	**0.1394**	**0.6392**	**0.2699**	**0.1394**	**0.4094**	**0.0000**	**570.1669**	**570.1669**	**0.1775**	**0.0000**	**573.8945**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0244	0.1968	0.3086	5.9000e-004	0.0162	2.9000e-003	0.0191	4.6400e-003	2.6600e-003	7.3100e-003	0.0000	52.0307	52.0307	3.9000e-004	0.0000	52.0389
Worker	7.3400e-003	9.7700e-003	0.0916	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.9779	17.9779	8.8000e-004	0.0000	17.9965
Total	**0.0317**	**0.2066**	**0.4001**	**8.5000e-004**	**0.0371**	**3.0500e-003**	**0.0401**	**0.0102**	**2.8000e-003**	**0.0130**	**0.0000**	**70.0086**	**70.0086**	**1.2700e-003**	**0.0000**	**70.0354**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.6600e-003	0.0366	0.0602	1.2000e-004	3.3200e-003	5.5000e-004	3.8700e-003	9.5000e-004	5.1000e-004	1.4500e-003	0.0000	10.4481	10.4481	8.0000e-005	0.0000	10.4497
Worker	3.3400e-003	4.4300e-003	0.0413	1.3000e-004	0.0102	7.0000e-005	0.0103	2.7200e-003	7.0000e-005	2.7900e-003	0.0000	8.4972	8.4972	4.1000e-004	0.0000	8.5057
Total	**8.0000e-003**	**0.0410**	**0.1015**	**2.5000e-004**	**0.0135**	**6.2000e-004**	**0.0142**	**3.6700e-003**	**5.8000e-004**	**4.2400e-003**	**0.0000**	**18.9452**	**18.9452**	**4.9000e-004**	**0.0000**	**18.9554**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.6600e-003	0.0366	0.0602	1.2000e-004	3.3200e-003	5.5000e-004	3.8700e-003	9.5000e-004	5.1000e-004	1.4500e-003	0.0000	10.4481	10.4481	8.0000e-005	0.0000	10.4497
Worker	3.3400e-003	4.4300e-003	0.0413	1.3000e-004	0.0102	7.0000e-005	0.0103	2.7200e-003	7.0000e-005	2.7900e-003	0.0000	8.4972	8.4972	4.1000e-004	0.0000	8.5057
Total	**8.0000e-003**	**0.0410**	**0.1015**	**2.5000e-004**	**0.0135**	**6.2000e-004**	**0.0142**	**3.6700e-003**	**5.8000e-004**	**4.2400e-003**	**0.0000**	**18.9452**	**18.9452**	**4.9000e-004**	**0.0000**	**18.9554**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4700e-003	0.0194	0.0319	6.0000e-005	1.7600e-003	2.9000e-004	2.0500e-003	5.0000e-004	2.7000e-004	7.7000e-004	0.0000	5.5313	5.5313	4.0000e-005	0.0000	5.5322
Worker	1.7700e-003	2.3400e-003	0.0219	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.4985	4.4985	2.2000e-004	0.0000	4.5030
Total	**4.2400e-003**	**0.0217**	**0.0537**	**1.3000e-004**	**7.1700e-003**	**3.3000e-004**	**7.5000e-003**	**1.9400e-003**	**3.1000e-004**	**2.2400e-003**	**0.0000**	**10.0298**	**10.0298**	**2.6000e-004**	**0.0000**	**10.0352**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4700e-003	0.0194	0.0319	6.0000e-005	1.7600e-003	2.9000e-004	2.0500e-003	5.0000e-004	2.7000e-004	7.7000e-004	0.0000	5.5313	5.5313	4.0000e-005	0.0000	5.5322
Worker	1.7700e-003	2.3400e-003	0.0219	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.4985	4.4985	2.2000e-004	0.0000	4.5030
Total	**4.2400e-003**	**0.0217**	**0.0537**	**1.3000e-004**	**7.1700e-003**	**3.3000e-004**	**7.5000e-003**	**1.9400e-003**	**3.1000e-004**	**2.2400e-003**	**0.0000**	**10.0298**	**10.0298**	**2.6000e-004**	**0.0000**	**10.0352**

3.12 Pond 15 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.3009	0.0000	1.3009	0.6937	0.0000	0.6937	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.5289	5.9133	4.3821	6.2400e-003		0.2743	0.2743		0.2523	0.2523	0.0000	560.9061	560.9061	0.1775	0.0000	564.6329
Total	**0.5289**	**5.9133**	**4.3821**	**6.2400e-003**	**1.3009**	**0.2743**	**1.5751**	**0.6937**	**0.2523**	**0.9461**	**0.0000**	**560.9061**	**560.9061**	**0.1775**	**0.0000**	**564.6329**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.5000e-003	0.0746	0.1227	2.5000e-004	6.7600e-003	1.1200e-003	7.8900e-003	1.9400e-003	1.0300e-003	2.9700e-003	0.0000	21.3059	21.3059	1.6000e-004	0.0000	21.3092
Worker	6.8100e-003	9.0300e-003	0.0842	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.3275	17.3275	8.3000e-004	0.0000	17.3450
Total	**0.0163**	**0.0837**	**0.2069**	**5.1000e-004**	**0.0276**	**1.2700e-003**	**0.0289**	**7.4800e-003**	**1.1700e-003**	**8.6500e-003**	**0.0000**	**38.6334**	**38.6334**	**9.9000e-004**	**0.0000**	**38.6542**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5073	0.0000	0.5073	0.2706	0.0000	0.2706	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1528	3.0644	3.5999	6.2400e-003		0.1394	0.1394		0.1394	0.1394	0.0000	560.9055	560.9055	0.1775	0.0000	564.6322
Total	**0.1528**	**3.0644**	**3.5999**	**6.2400e-003**	**0.5073**	**0.1394**	**0.6468**	**0.2706**	**0.1394**	**0.4100**	**0.0000**	**560.9055**	**560.9055**	**0.1775**	**0.0000**	**564.6322**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.5000e-003	0.0746	0.1227	2.5000e-004	6.7600e-003	1.1200e-003	7.8900e-003	1.9400e-003	1.0300e-003	2.9700e-003	0.0000	21.3059	21.3059	1.6000e-004	0.0000	21.3092
Worker	6.8100e-003	9.0300e-003	0.0842	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.3275	17.3275	8.3000e-004	0.0000	17.3450
Total	**0.0163**	**0.0837**	**0.2069**	**5.1000e-004**	**0.0276**	**1.2700e-003**	**0.0289**	**7.4800e-003**	**1.1700e-003**	**8.6500e-003**	**0.0000**	**38.6334**	**38.6334**	**9.9000e-004**	**0.0000**	**38.6542**

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt B - Intertidal Conveyor Option - Generator Only

San Diego Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	542.77	**CH4 Intensity (lb/MWhr)**	0.022	**N2O Intensity (lb/MWhr)**	0.005

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Intensity factor adjusted for 32.2% RPS for 2014 SDG&E

Table Name	Column Name	Default Value	New Value
tblEnergyUse	LightingElect	3.25	0.00
tblEnergyUse	NT24E	4.27	5,605.40
tblEnergyUse	NT24NG	7.25	0.00
tblEnergyUse	T24E	1.48	0.00
tblEnergyUse	T24NG	4.54	0.00
tblLandUse	LotAcreage	0.02	91.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.022
tblProjectCharacteristics	CO2IntensityFactor	720.49	542.77

tblProjectCharacteristics	N2OIntensityFactor	0.006	0.005
tblProjectCharacteristics	OperationalYear	2014	2020

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	5.6054e+006	1,380.0289	0.0559	0.0127	1,385.1446
Total		**1,380.0289**	**0.0559**	**0.0127**	**1,385.1446**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	5.6054e+006	1,380.0289	0.0559	0.0127	1,385.1446
Total		**1,380.0289**	**0.0559**	**0.0127**	**1,385.1446**

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt B - Intertidal Pipeline Option

San Diego Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	110.00	53.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	110.00	51.00
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	60.00	27.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	1/1/2020	12/31/2020
tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	9/1/2019	9/1/2020
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00

tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00
tblGrading	MaterialExported	0.00	155,000.00
tblGrading	MaterialExported	0.00	155,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Dewatering Pond 15
tblOffRoadEquipment	PhaseName		Earthwork 1
tblOffRoadEquipment	PhaseName		Earthwork 2
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30

tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00

tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	14.8775	156.1189	117.2760	0.1568	25.9120	7.3741	33.2861	13.6561	6.8146	20.4707	0.0000	15,536.4892	15,536.4892	3.9308	0.0000	15,619.0353
2018	11.5939	127.6131	97.3993	0.1363	25.3738	5.9102	31.2840	13.5099	5.4374	18.9473	0.0000	13,561.9426	13,561.9426	3.7899	0.0000	13,641.5300
2019	0.3344	1.6018	4.2190	9.5900e-003	0.5435	0.0246	0.5681	0.1468	0.0227	0.1695	0.0000	813.3120	813.3120	0.0210	0.0000	813.7539
2020	9.7480	105.0507	83.3542	0.1296	25.3215	4.7553	30.0768	13.3609	4.3749	17.7358	0.0000	12,418.9157	12,418.9157	3.7816	0.0000	12,498.3299
Total	**36.5538**	**390.3845**	**302.2484**	**0.4323**	**77.1508**	**18.0642**	**95.2149**	**40.6736**	**16.6495**	**57.3231**	**0.0000**	**42,330.6595**	**42,330.6595**	**11.5233**	**0.0000**	**42,572.6490**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	5.3236	72.6548	86.7995	0.1568	10.8821	3.1533	14.0354	5.5373	3.1460	8.6833	0.0000	15,536.4892	15,536.4892	3.9308	0.0000	15,619.0353
2018	3.5869	62.8812	77.5126	0.1363	10.3407	2.7402	13.0809	5.3908	2.7355	8.1263	0.0000	13,561.9426	13,561.9426	3.7899	0.0000	13,641.5299
2019	0.3344	1.6018	4.2190	9.5900e-003	0.5435	0.0246	0.5681	0.1468	0.0227	0.1695	0.0000	813.3120	813.3120	0.0210	0.0000	813.7539
2020	3.2541	60.3091	73.2561	0.1296	10.2069	2.7036	12.9105	5.3003	2.7019	8.0021	0.0000	12,418.9157	12,418.9157	3.7816	0.0000	12,498.3299
Total	**12.4989**	**197.4469**	**241.7872**	**0.4323**	**31.9731**	**8.6217**	**40.5948**	**16.3752**	**8.6059**	**24.9811**	**0.0000**	**42,330.6595**	**42,330.6595**	**11.5233**	**0.0000**	**42,572.6490**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**65.81**	**49.42**	**20.00**	**0.00**	**58.56**	**52.27**	**57.37**	**59.74**	**48.31**	**56.42**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	
9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	

11	Pond 15 Grading	Grading	9/1/2020	12/31/2020	6	105	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36
Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48
Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42

Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42
Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40
Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Earthwork 1	Pumps	1	8.00	1000	0.74
Earthwork 2	Pumps	1	8.00	1000	0.74

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829

Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806		890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**		**890.0494**	**890.0494**	**0.1159**		**892.4832**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806	0.0000	890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**890.0494**	**890.0494**	**0.1159**		**892.4832**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	12.4921	142.3947	99.7062	0.1200		6.9021	6.9021		6.3499	6.3499		12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**12.4921**	**142.3947**	**99.7062**	**0.1200**	**24.6392**	**6.9021**	**31.5413**	**13.3094**	**6.3499**	**19.6593**		**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5293	4.1644	6.8064	0.0113	0.3186	0.0603	0.3789	0.0909	0.0555	0.1464		1,117.2186	1,117.2186	8.5900e-003		1,117.3990
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.6972**	**4.3735**	**8.7623**	**0.0162**	**0.7294**	**0.0633**	**0.7927**	**0.1999**	**0.0582**	**0.2581**		**1,509.2926**	**1,509.2926**	**0.0287**		**1,509.8958**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day											lb/day				
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5293	4.1644	6.8064	0.0113	0.3186	0.0603	0.3789	0.0909	0.0555	0.1464		1,117.2186	1,117.2186	8.5900e-003		1,117.3990
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.6972**	**4.3735**	**8.7623**	**0.0162**	**0.7294**	**0.0633**	**0.7927**	**0.1999**	**0.0582**	**0.2581**		**1,509.2926**	**1,509.2926**	**0.0287**		**1,509.8958**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6392**	**5.8513**	**30.4904**	**13.3094**	**5.3832**	**18.6926**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412

Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day											lb/day				
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412

Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6445	0.0000	24.6445	13.3101	0.0000	13.3101			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6445**	**5.8513**	**30.4957**	**13.3101**	**5.3832**	**18.6932**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Fugitive Dust					9.6114	0.0000	9.6114	5.1909	0.0000	5.1909			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6114**	**2.6813**	**12.2926**	**5.1909**	**2.6813**	**7.8722**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day											lb/day				
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

3.12 Pond 15 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.7780	0.0000	24.7780	13.2141	0.0000	13.2141			0.0000			0.0000
Off-Road	9.4321	103.6722	79.3277	0.1201		4.7330	4.7330		4.3543	4.3543		11,630.5497	11,630.5497	3.7616		11,709.5424
Total	**9.4321**	**103.6722**	**79.3277**	**0.1201**	**24.7780**	**4.7330**	**29.5110**	**13.2141**	**4.3543**	**17.5684**		**11,630.5497**	**11,630.5497**	**3.7616**		**11,709.5424**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1821	1.2138	2.5106	4.7000e-003	0.1327	0.0194	0.1522	0.0379	0.0179	0.0557		439.3301	439.3301	3.3200e-003		439.3999
Worker	0.1339	0.1648	1.5159	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1117		349.0359	349.0359	0.0168		349.3876
Total	**0.3159**	**1.3785**	**4.0264**	**9.5800e-003**	**0.5435**	**0.0223**	**0.5658**	**0.1468**	**0.0206**	**0.1674**		**788.3660**	**788.3660**	**0.0201**		**788.7875**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6634	0.0000	9.6634	5.1535	0.0000	5.1535			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	11,630.5497	11,630.5497	3.7616		11,709.5424
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6634**	**2.6813**	**12.3447**	**5.1535**	**2.6813**	**7.8348**	**0.0000**	**11,630.5497**	**11,630.5497**	**3.7616**		**11,709.5424**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day											lb/day				
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1821	1.2138	2.5106	4.7000e-003	0.1327	0.0194	0.1522	0.0379	0.0179	0.0557		439.3301	439.3301	3.3200e-003		439.3999
Worker	0.1339	0.1648	1.5159	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1117		349.0359	349.0359	0.0168		349.3876
Total	**0.3159**	**1.3785**	**4.0264**	**9.5800e-003**	**0.5435**	**0.0223**	**0.5658**	**0.1468**	**0.0206**	**0.1674**		**788.3660**	**788.3660**	**0.0201**		**788.7875**

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt B - Intertidal Pipeline Option

San Diego Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	110.00	53.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	110.00	51.00
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	60.00	27.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	1/1/2020	12/31/2020
tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	9/1/2019	9/1/2020
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00

tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00
tblGrading	MaterialExported	0.00	155,000.00
tblGrading	MaterialExported	0.00	155,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Dewatering Pond 15
tblOffRoadEquipment	PhaseName		Earthwork 1
tblOffRoadEquipment	PhaseName		Earthwork 2
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30

tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00

tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	14.7599	155.9369	114.8683	0.1575	25.9120	7.3732	33.2852	13.6561	6.8138	20.4699	0.0000	15,599.6259	15,599.6259	3.9304	0.0000	15,682.1652
2018	11.5220	127.5071	95.7287	0.1366	25.3738	5.9096	31.2834	13.5099	5.4369	18.9468	0.0000	13,594.9739	13,594.9739	3.7896	0.0000	13,674.5563
2019	0.3032	1.5510	3.5846	9.9400e-003	0.5435	0.0244	0.5679	0.1468	0.0225	0.1693	0.0000	840.4452	840.4452	0.0209	0.0000	840.8850
2020	9.7190	105.0066	82.7358	0.1300	25.3215	4.7551	30.0766	13.3609	4.3747	17.7356	0.0000	12,445.0445	12,445.0445	3.7815	0.0000	12,524.4565
Total	**36.3040**	**390.0017**	**296.9173**	**0.4341**	**77.1508**	**18.0624**	**95.2131**	**40.6736**	**16.6479**	**57.3215**	**0.0000**	**42,480.0894**	**42,480.0894**	**11.5226**	**0.0000**	**42,722.0630**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	5.2060	72.4728	84.3918	0.1575	10.8821	3.1524	14.0345	5.5373	3.1452	8.6825	0.0000	15,599.6259	15,599.6259	3.9304	0.0000	15,682.1652
2018	3.5150	62.7752	75.8420	0.1366	10.3407	2.7397	13.0803	5.3908	2.7350	8.1257	0.0000	13,594.9739	13,594.9739	3.7896	0.0000	13,674.5563
2019	0.3032	1.5510	3.5846	9.9400e-003	0.5435	0.0244	0.5679	0.1468	0.0225	0.1693	0.0000	840.4452	840.4452	0.0209	0.0000	840.8850
2020	3.2250	60.2650	72.6377	0.1300	10.2069	2.7034	12.9103	5.3003	2.7017	8.0020	0.0000	12,445.0445	12,445.0445	3.7815	0.0000	12,524.4565
Total	**12.2491**	**197.0641**	**236.4561**	**0.4341**	**31.9731**	**8.6199**	**40.5930**	**16.3752**	**8.6043**	**24.9795**	**0.0000**	**42,480.0893**	**42,480.0893**	**11.5226**	**0.0000**	**42,722.0630**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**66.26**	**49.47**	**20.36**	**0.00**	**58.56**	**52.28**	**57.37**	**59.74**	**48.32**	**56.42**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	

9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2020	12/31/2020	6	105	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36
Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48

Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42
Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40
Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Earthwork 1	Pumps	1	8.00	1000	0.74
Earthwork 2	Pumps	1	8.00	1000	0.74

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT

Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806		890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**		**890.0494**	**890.0494**	**0.1159**		**892.4832**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806	0.0000	890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**890.0494**	**890.0494**	**0.1159**		**892.4832**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	12.4921	142.3947	99.7062	0.1200		6.9021	6.9021		6.3499	6.3499		12,279.5654	12,279.5654	3.7624		12,358.5766

Total	**12.4921**	**142.3947**	**99.7062**	**0.1200**	**24.6392**	**6.9021**	**31.5413**	**13.3094**	**6.3499**	**19.6593**		**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4590	4.0680	5.0119	0.0114	0.3186	0.0597	0.3783	0.0909	0.0549	0.1458		1,125.8779	1,125.8779	8.3600e-003		1,126.0535
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.6178**	**4.2544**	**7.0351**	**0.0166**	**0.7294**	**0.0627**	**0.7921**	**0.1999**	**0.0577**	**0.2575**		**1,543.3866**	**1,543.3866**	**0.0285**		**1,543.9850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4590	4.0680	5.0119	0.0114	0.3186	0.0597	0.3783	0.0909	0.0549	0.1458		1,125.8779	1,125.8779	8.3600e-003		1,126.0535
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.6178**	**4.2544**	**7.0351**	**0.0166**	**0.7294**	**0.0627**	**0.7921**	**0.1999**	**0.0577**	**0.2575**		**1,543.3866**	**1,543.3866**	**0.0285**		**1,543.9850**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6392**	**5.8513**	**30.4904**	**13.3094**	**5.3832**	**18.6926**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000

Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6445	0.0000	24.6445	13.3101	0.0000	13.3101			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6445**	**5.8513**	**30.4957**	**13.3101**	**5.3832**	**18.6932**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6114	0.0000	9.6114	5.1909	0.0000	5.1909			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6114**	**2.6813**	**12.2926**	**5.1909**	**2.6813**	**7.8722**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

3.12 Pond 15 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.7780	0.0000	24.7780	13.2141	0.0000	13.2141			0.0000			0.0000

Off-Road	9.4321	103.6722	79.3277	0.1201		4.7330	4.7330		4.3543	4.3543		11,630.5497	11,630.5497	3.7616		11,709.5424
Total	**9.4321**	**103.6722**	**79.3277**	**0.1201**	**24.7780**	**4.7330**	**29.5110**	**13.2141**	**4.3543**	**17.5684**		**11,630.5497**	**11,630.5497**	**3.7616**		**11,709.5424**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1595	1.1875	1.8225	4.7300e-003	0.1327	0.0193	0.1520	0.0379	0.0177	0.0556		442.7617	442.7617	3.2200e-003		442.8294
Worker	0.1274	0.1469	1.5856	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1117		371.7330	371.7330	0.0168		372.0848
Total	**0.2869**	**1.3345**	**3.4081**	**9.9300e-003**	**0.5435**	**0.0222**	**0.5656**	**0.1468**	**0.0204**	**0.1672**		**814.4948**	**814.4948**	**0.0200**		**814.9141**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6634	0.0000	9.6634	5.1535	0.0000	5.1535			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	11,630.5497	11,630.5497	3.7616		11,709.5424
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6634**	**2.6813**	**12.3447**	**5.1535**	**2.6813**	**7.8348**	**0.0000**	**11,630.5497**	**11,630.5497**	**3.7616**		**11,709.5424**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1595	1.1875	1.8225	4.7300e-003	0.1327	0.0193	0.1520	0.0379	0.0177	0.0556		442.7617	442.7617	3.2200e-003		442.8294
Worker	0.1274	0.1469	1.5856	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1117		371.7330	371.7330	0.0168		372.0848
Total	**0.2869**	**1.3345**	**3.4081**	**9.9300e-003**	**0.5435**	**0.0222**	**0.5656**	**0.1468**	**0.0204**	**0.1672**		**814.4948**	**814.4948**	**0.0200**		**814.9141**

ORERP - Alt B - Intertidal Pipeline Option - Annual Equipment

San Diego Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	110.00	53.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	110.00	51.00
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	60.00	27.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	1/1/2020	12/31/2020
tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	9/1/2019	9/1/2020
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017

tblGrading	AcresOfGrading	416.00	91.00
tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00
tblGrading	MaterialExported	0.00	155,000.00
tblGrading	MaterialExported	0.00	155,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Dewatering Pond 15
tblOffRoadEquipment	PhaseName		Earthwork 1
tblOffRoadEquipment	PhaseName		Earthwork 2
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30

tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripNumber	0.00	50.00

tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.5448	5.9030	4.4421	5.8500e-003	1.3426	0.2779	1.6205	0.7121	0.2561	0.9682	0.0000	530.4053	530.4053	0.1364	0.0000	533.2698
2018	0.7771	8.4051	6.4491	9.1800e-003	2.6353	0.3878	3.0231	1.4074	0.3567	1.7641	0.0000	825.8232	825.8232	0.2257	0.0000	830.5629
2019	0.0122	0.0628	0.1552	3.8000e-004	0.0207	9.5000e-004	0.0217	5.6100e-003	8.8000e-004	6.4900e-003	0.0000	28.9751	28.9751	7.4000e-004	0.0000	28.9907
2020	0.5108	5.5155	4.3638	6.8100e-003	1.3287	0.2497	1.5784	0.7013	0.2297	0.9310	0.0000	591.7386	591.7386	0.1801	0.0000	595.5208
Total	**1.8449**	**19.8864**	**15.4102**	**0.0222**	**5.3274**	**0.9163**	**6.2436**	**2.8264**	**0.8434**	**3.6698**	**0.0000**	**1,976.9421**	**1,976.9421**	**0.5430**	**0.0000**	**1,988.3441**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.1722	2.6479	3.2535	5.8500e-003	0.5536	0.1133	0.6668	0.2859	0.1130	0.3989	0.0000	530.4048	530.4048	0.1364	0.0000	533.2693
2018	0.2526	4.1652	5.1465	9.1800e-003	1.0645	0.1801	1.2447	0.5589	0.1798	0.7387	0.0000	825.8223	825.8223	0.2257	0.0000	830.5620
2019	0.0122	0.0628	0.1552	3.8000e-004	0.0207	9.5000e-004	0.0217	5.6100e-003	8.8000e-004	6.4900e-003	0.0000	28.9751	28.9751	7.4000e-004	0.0000	28.9907
2020	0.1698	3.1665	3.8337	6.8100e-003	0.5352	0.1419	0.6771	0.2781	0.1418	0.4200	0.0000	591.7379	591.7379	0.1801	0.0000	595.5201
Total	**0.6069**	**10.0424**	**12.3888**	**0.0222**	**2.1740**	**0.4363**	**2.6103**	**1.1285**	**0.4355**	**1.5640**	**0.0000**	**1,976.9400**	**1,976.9400**	**0.5430**	**0.0000**	**1,988.3421**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**67.10**	**49.50**	**19.61**	**0.00**	**59.19**	**52.38**	**58.19**	**60.07**	**48.36**	**57.38**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	

9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2020	12/31/2020	6	105	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36
Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48

Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42
Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40
Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Earthwork 1	Pumps	1	8.00	1000	0.74
Earthwork 2	Pumps	1	8.00	1000	0.74

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT

Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Vendor	5.5200e-003	0.0463	0.0685	1.3000e-004	3.4500e-003	6.6000e-004	4.1100e-003	9.9000e-004	6.1000e-004	1.6000e-003	0.0000	11.2413	11.2413	8.0000e-005	0.0000	11.2431
Worker	4.1200e-003	5.4600e-003	0.0516	1.3000e-004	0.0106	8.0000e-005	0.0107	2.8200e-003	7.0000e-005	2.9000e-003	0.0000	9.5193	9.5193	4.8000e-004	0.0000	9.5294
Total	**9.6400e-003**	**0.0518**	**0.1201**	**2.6000e-004**	**0.0141**	**7.4000e-004**	**0.0148**	**3.8100e-003**	**6.8000e-004**	**4.5000e-003**	**0.0000**	**20.7606**	**20.7606**	**5.6000e-004**	**0.0000**	**20.7725**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5200e-003	0.0463	0.0685	1.3000e-004	3.4500e-003	6.6000e-004	4.1100e-003	9.9000e-004	6.1000e-004	1.6000e-003	0.0000	11.2413	11.2413	8.0000e-005	0.0000	11.2431
Worker	4.1200e-003	5.4600e-003	0.0516	1.3000e-004	0.0106	8.0000e-005	0.0107	2.8200e-003	7.0000e-005	2.9000e-003	0.0000	9.5193	9.5193	4.8000e-004	0.0000	9.5294
Total	**9.6400e-003**	**0.0518**	**0.1201**	**2.6000e-004**	**0.0141**	**7.4000e-004**	**0.0148**	**3.8100e-003**	**6.8000e-004**	**4.5000e-003**	**0.0000**	**20.7606**	**20.7606**	**5.6000e-004**	**0.0000**	**20.7725**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0176	0.1000	0.0542	1.5000e-004		5.1400e-003	5.1400e-003		5.1400e-003	5.1400e-003	0.0000	10.9004	10.9004	1.4200e-003	0.0000	10.9302
Total	**0.0176**	**0.1000**	**0.0542**	**1.5000e-004**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**10.9004**	**10.9004**	**1.4200e-003**	**0.0000**	**10.9302**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8100e-003	0.0236	0.0349	6.0000e-005	1.7600e-003	3.4000e-004	2.0900e-003	5.0000e-004	3.1000e-004	8.1000e-004	0.0000	5.7267	5.7267	4.0000e-005	0.0000	5.7276
Worker	2.1000e-003	2.7800e-003	0.0263	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4800e-003	0.0000	4.8494	4.8494	2.5000e-004	0.0000	4.8546
Total	**4.9100e-003**	**0.0264**	**0.0612**	**1.3000e-004**	**7.1700e-003**	**3.8000e-004**	**7.5400e-003**	**1.9400e-003**	**3.5000e-004**	**2.2900e-003**	**0.0000**	**10.5761**	**10.5761**	**2.9000e-004**	**0.0000**	**10.5822**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0176	0.1000	0.0542	1.5000e-004		5.1400e-003	5.1400e-003		5.1400e-003	5.1400e-003	0.0000	10.9004	10.9004	1.4200e-003	0.0000	10.9302
Total	**0.0176**	**0.1000**	**0.0542**	**1.5000e-004**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**10.9004**	**10.9004**	**1.4200e-003**	**0.0000**	**10.9302**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8100e-003	0.0236	0.0349	6.0000e-005	1.7600e-003	3.4000e-004	2.0900e-003	5.0000e-004	3.1000e-004	8.1000e-004	0.0000	5.7267	5.7267	4.0000e-005	0.0000	5.7276
Worker	2.1000e-003	2.7800e-003	0.0263	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4800e-003	0.0000	4.8494	4.8494	2.5000e-004	0.0000	4.8546
Total	**4.9100e-003**	**0.0264**	**0.0612**	**1.3000e-004**	**7.1700e-003**	**3.8000e-004**	**7.5400e-003**	**1.9400e-003**	**3.5000e-004**	**2.2900e-003**	**0.0000**	**10.5761**	**10.5761**	**2.9000e-004**	**0.0000**	**10.5822**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2936	0.0000	1.2936	0.6987	0.0000	0.6987	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4872	5.5534	3.8885	4.6800e-003		0.2692	0.2692		0.2477	0.2477	0.0000	434.4535	434.4535	0.1331	0.0000	437.2490

Total	**0.4872**	**5.5534**	**3.8885**	**4.6800e-003**	**1.2936**	**0.2692**	**1.5627**	**0.6987**	**0.2477**	**0.9464**	**0.0000**	**434.4535**	**434.4535**	**0.1331**	**0.0000**	**437.2490**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0195	0.1635	0.2421	4.4000e-004	0.0122	2.3400e-003	0.0145	3.4800e-003	2.1500e-003	5.6400e-003	0.0000	39.7051	39.7051	3.0000e-004	0.0000	39.7114
Worker	6.0600e-003	8.0300e-003	0.0759	1.9000e-004	0.0156	1.2000e-004	0.0158	4.1600e-003	1.1000e-004	4.2600e-003	0.0000	14.0095	14.0095	7.1000e-004	0.0000	14.0245
Total	**0.0256**	**0.1715**	**0.3180**	**6.3000e-004**	**0.0278**	**2.4600e-003**	**0.0303**	**7.6400e-003**	**2.2600e-003**	**9.9000e-003**	**0.0000**	**53.7146**	**53.7146**	**1.0100e-003**	**0.0000**	**53.7359**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5045	0.0000	0.5045	0.2725	0.0000	0.2725	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1146	2.2983	2.7000	4.6800e-003		0.1046	0.1046		0.1046	0.1046	0.0000	434.4530	434.4530	0.1331	0.0000	437.2485
Total	**0.1146**	**2.2983**	**2.7000**	**4.6800e-003**	**0.5045**	**0.1046**	**0.6091**	**0.2725**	**0.1046**	**0.3771**	**0.0000**	**434.4530**	**434.4530**	**0.1331**	**0.0000**	**437.2485**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0195	0.1635	0.2421	4.4000e-004	0.0122	2.3400e-003	0.0145	3.4800e-003	2.1500e-003	5.6400e-003	0.0000	39.7051	39.7051	3.0000e-004	0.0000	39.7114
Worker	6.0600e-003	8.0300e-003	0.0759	1.9000e-004	0.0156	1.2000e-004	0.0158	4.1600e-003	1.1000e-004	4.2600e-003	0.0000	14.0095	14.0095	7.1000e-004	0.0000	14.0245
Total	**0.0256**	**0.1715**	**0.3180**	**6.3000e-004**	**0.0278**	**2.4600e-003**	**0.0303**	**7.6400e-003**	**2.2600e-003**	**9.9000e-003**	**0.0000**	**53.7146**	**53.7146**	**1.0100e-003**	**0.0000**	**53.7359**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2936	0.0000	1.2936	0.6987	0.0000	0.6987	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1478	1.6694	1.2031	1.6200e-003		0.0790	0.0790		0.0727	0.0727	0.0000	148.0243	148.0243	0.0461	0.0000	148.9920
Total	**0.1478**	**1.6694**	**1.2031**	**1.6200e-003**	**1.2936**	**0.0790**	**1.3726**	**0.6987**	**0.0727**	**0.7714**	**0.0000**	**148.0243**	**148.0243**	**0.0461**	**0.0000**	**148.9920**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.3400e-003	0.0511	0.0801	1.5000e-004	4.2200e-003	7.5000e-004	4.9700e-003	1.2100e-003	6.9000e-004	1.9000e-003	0.0000	13.5080	13.5080	1.0000e-004	0.0000	13.5101
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**8.2500e-003**	**0.0536**	**0.1039**	**2.2000e-004**	**9.6300e-003**	**7.9000e-004**	**0.0104**	**2.6500e-003**	**7.3000e-004**	**3.3700e-003**	**0.0000**	**18.1753**	**18.1753**	**3.3000e-004**	**0.0000**	**18.1823**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5045	0.0000	0.5045	0.2725	0.0000	0.2725	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0397	0.7956	0.9346	1.6200e-003		0.0362	0.0362		0.0362	0.0362	0.0000	148.0241	148.0241	0.0461	0.0000	148.9918
Total	**0.0397**	**0.7956**	**0.9346**	**1.6200e-003**	**0.5045**	**0.0362**	**0.5407**	**0.2725**	**0.0362**	**0.3087**	**0.0000**	**148.0241**	**148.0241**	**0.0461**	**0.0000**	**148.9918**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.3400e-003	0.0511	0.0801	1.5000e-004	4.2200e-003	7.5000e-004	4.9700e-003	1.2100e-003	6.9000e-004	1.9000e-003	0.0000	13.5080	13.5080	1.0000e-004	0.0000	13.5101
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**8.2500e-003**	**0.0536**	**0.1039**	**2.2000e-004**	**9.6300e-003**	**7.9000e-004**	**0.0104**	**2.6500e-003**	**7.3000e-004**	**3.3700e-003**	**0.0000**	**18.1753**	**18.1753**	**3.3000e-004**	**0.0000**	**18.1823**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3500e-003	0.0189	0.0297	6.0000e-005	1.5600e-003	2.8000e-004	1.8400e-003	4.5000e-004	2.6000e-004	7.0000e-004	0.0000	5.0030	5.0030	4.0000e-005	0.0000	5.0037
Worker	1.6900e-003	2.2500e-003	0.0211	6.0000e-005	4.8100e-003	4.0000e-005	4.8500e-003	1.2800e-003	3.0000e-005	1.3100e-003	0.0000	4.1488	4.1488	2.0000e-004	0.0000	4.1530
Total	**4.0400e-003**	**0.0212**	**0.0508**	**1.2000e-004**	**6.3700e-003**	**3.2000e-004**	**6.6900e-003**	**1.7300e-003**	**2.9000e-004**	**2.0100e-003**	**0.0000**	**9.1517**	**9.1517**	**2.4000e-004**	**0.0000**	**9.1568**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3500e-003	0.0189	0.0297	6.0000e-005	1.5600e-003	2.8000e-004	1.8400e-003	4.5000e-004	2.6000e-004	7.0000e-004	0.0000	5.0030	5.0030	4.0000e-005	0.0000	5.0037
Worker	1.6900e-003	2.2500e-003	0.0211	6.0000e-005	4.8100e-003	4.0000e-005	4.8500e-003	1.2800e-003	3.0000e-005	1.3100e-003	0.0000	4.1488	4.1488	2.0000e-004	0.0000	4.1530
Total	**4.0400e-003**	**0.0212**	**0.0508**	**1.2000e-004**	**6.3700e-003**	**3.2000e-004**	**6.6900e-003**	**1.7300e-003**	**2.9000e-004**	**2.0100e-003**	**0.0000**	**9.1517**	**9.1517**	**2.4000e-004**	**0.0000**	**9.1568**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0116					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0116**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0116					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0116**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6400e-003	0.0213	0.0334	6.0000e-005	1.7600e-003	3.1000e-004	2.0700e-003	5.0000e-004	2.9000e-004	7.9000e-004	0.0000	5.6283	5.6283	4.0000e-005	0.0000	5.6292
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**4.5500e-003**	**0.0238**	**0.0572**	**1.3000e-004**	**7.1700e-003**	**3.5000e-004**	**7.5200e-003**	**1.9400e-003**	**3.3000e-004**	**2.2600e-003**	**0.0000**	**10.2957**	**10.2957**	**2.7000e-004**	**0.0000**	**10.3014**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6400e-003	0.0213	0.0334	6.0000e-005	1.7600e-003	3.1000e-004	2.0700e-003	5.0000e-004	2.9000e-004	7.9000e-004	0.0000	5.6283	5.6283	4.0000e-005	0.0000	5.6292
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**4.5500e-003**	**0.0238**	**0.0572**	**1.3000e-004**	**7.1700e-003**	**3.5000e-004**	**7.5200e-003**	**1.9400e-003**	**3.3000e-004**	**2.2600e-003**	**0.0000**	**10.2957**	**10.2957**	**2.7000e-004**	**0.0000**	**10.3014**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2815	0.0000	1.2815	0.6921	0.0000	0.6921	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.5692	6.4305	4.6341	6.2400e-003		0.3043	0.3043		0.2799	0.2799	0.0000	570.1676	570.1676	0.1775	0.0000	573.8951
Total	**0.5692**	**6.4305**	**4.6341**	**6.2400e-003**	**1.2815**	**0.3043**	**1.5858**	**0.6921**	**0.2799**	**0.9720**	**0.0000**	**570.1676**	**570.1676**	**0.1775**	**0.0000**	**573.8951**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0244	0.1968	0.3086	5.9000e-004	0.0162	2.9000e-003	0.0191	4.6400e-003	2.6600e-003	7.3100e-003	0.0000	52.0307	52.0307	3.9000e-004	0.0000	52.0389
Worker	7.3400e-003	9.7700e-003	0.0916	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.9779	17.9779	8.8000e-004	0.0000	17.9965
Total	**0.0317**	**0.2066**	**0.4001**	**8.5000e-004**	**0.0371**	**3.0500e-003**	**0.0401**	**0.0102**	**2.8000e-003**	**0.0130**	**0.0000**	**70.0086**	**70.0086**	**1.2700e-003**	**0.0000**	**70.0354**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4998	0.0000	0.4998	0.2699	0.0000	0.2699	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1528	3.0644	3.5999	6.2400e-003		0.1394	0.1394		0.1394	0.1394	0.0000	570.1669	570.1669	0.1775	0.0000	573.8945
Total	**0.1528**	**3.0644**	**3.5999**	**6.2400e-003**	**0.4998**	**0.1394**	**0.6392**	**0.2699**	**0.1394**	**0.4094**	**0.0000**	**570.1669**	**570.1669**	**0.1775**	**0.0000**	**573.8945**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0244	0.1968	0.3086	5.9000e-004	0.0162	2.9000e-003	0.0191	4.6400e-003	2.6600e-003	7.3100e-003	0.0000	52.0307	52.0307	3.9000e-004	0.0000	52.0389
Worker	7.3400e-003	9.7700e-003	0.0916	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.9779	17.9779	8.8000e-004	0.0000	17.9965
Total	**0.0317**	**0.2066**	**0.4001**	**8.5000e-004**	**0.0371**	**3.0500e-003**	**0.0401**	**0.0102**	**2.8000e-003**	**0.0130**	**0.0000**	**70.0086**	**70.0086**	**1.2700e-003**	**0.0000**	**70.0354**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.6600e-003	0.0366	0.0602	1.2000e-004	3.3200e-003	5.5000e-004	3.8700e-003	9.5000e-004	5.1000e-004	1.4500e-003	0.0000	10.4481	10.4481	8.0000e-005	0.0000	10.4497
Worker	3.3400e-003	4.4300e-003	0.0413	1.3000e-004	0.0102	7.0000e-005	0.0103	2.7200e-003	7.0000e-005	2.7900e-003	0.0000	8.4972	8.4972	4.1000e-004	0.0000	8.5057
Total	**8.0000e-003**	**0.0410**	**0.1015**	**2.5000e-004**	**0.0135**	**6.2000e-004**	**0.0142**	**3.6700e-003**	**5.8000e-004**	**4.2400e-003**	**0.0000**	**18.9452**	**18.9452**	**4.9000e-004**	**0.0000**	**18.9554**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.6600e-003	0.0366	0.0602	1.2000e-004	3.3200e-003	5.5000e-004	3.8700e-003	9.5000e-004	5.1000e-004	1.4500e-003	0.0000	10.4481	10.4481	8.0000e-005	0.0000	10.4497
Worker	3.3400e-003	4.4300e-003	0.0413	1.3000e-004	0.0102	7.0000e-005	0.0103	2.7200e-003	7.0000e-005	2.7900e-003	0.0000	8.4972	8.4972	4.1000e-004	0.0000	8.5057
Total	**8.0000e-003**	**0.0410**	**0.1015**	**2.5000e-004**	**0.0135**	**6.2000e-004**	**0.0142**	**3.6700e-003**	**5.8000e-004**	**4.2400e-003**	**0.0000**	**18.9452**	**18.9452**	**4.9000e-004**	**0.0000**	**18.9554**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4700e-003	0.0194	0.0319	6.0000e-005	1.7600e-003	2.9000e-004	2.0500e-003	5.0000e-004	2.7000e-004	7.7000e-004	0.0000	5.5313	5.5313	4.0000e-005	0.0000	5.5322
Worker	1.7700e-003	2.3400e-003	0.0219	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.4985	4.4985	2.2000e-004	0.0000	4.5030
Total	**4.2400e-003**	**0.0217**	**0.0537**	**1.3000e-004**	**7.1700e-003**	**3.3000e-004**	**7.5000e-003**	**1.9400e-003**	**3.1000e-004**	**2.2400e-003**	**0.0000**	**10.0298**	**10.0298**	**2.6000e-004**	**0.0000**	**10.0352**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4700e-003	0.0194	0.0319	6.0000e-005	1.7600e-003	2.9000e-004	2.0500e-003	5.0000e-004	2.7000e-004	7.7000e-004	0.0000	5.5313	5.5313	4.0000e-005	0.0000	5.5322
Worker	1.7700e-003	2.3400e-003	0.0219	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.4985	4.4985	2.2000e-004	0.0000	4.5030
Total	**4.2400e-003**	**0.0217**	**0.0537**	**1.3000e-004**	**7.1700e-003**	**3.3000e-004**	**7.5000e-003**	**1.9400e-003**	**3.1000e-004**	**2.2400e-003**	**0.0000**	**10.0298**	**10.0298**	**2.6000e-004**	**0.0000**	**10.0352**

3.12 Pond 15 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.3009	0.0000	1.3009	0.6937	0.0000	0.6937	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Off-Road	0.4952	5.4428	4.1647	6.3000e-003		0.2485	0.2485		0.2286	0.2286	0.0000	553.9305	553.9305	0.1792	0.0000	557.6927
Total	**0.4952**	**5.4428**	**4.1647**	**6.3000e-003**	**1.3009**	**0.2485**	**1.5493**	**0.6937**	**0.2286**	**0.9223**	**0.0000**	**553.9305**	**553.9305**	**0.1792**	**0.0000**	**557.6927**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.0600e-003	0.0642	0.1197	2.5000e-004	6.8300e-003	1.0100e-003	7.8400e-003	1.9500e-003	9.3000e-004	2.8900e-003	0.0000	21.0189	21.0189	1.6000e-004	0.0000	21.0221
Worker	6.5100e-003	8.5200e-003	0.0795	2.6000e-004	0.0211	1.5000e-004	0.0212	5.5900e-003	1.4000e-004	5.7400e-003	0.0000	16.7892	16.7892	8.0000e-004	0.0000	16.8059
Total	**0.0156**	**0.0727**	**0.1991**	**5.1000e-004**	**0.0279**	**1.1600e-003**	**0.0290**	**7.5400e-003**	**1.0700e-003**	**8.6300e-003**	**0.0000**	**37.8081**	**37.8081**	**9.6000e-004**	**0.0000**	**37.8281**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5073	0.0000	0.5073	0.2706	0.0000	0.2706	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1543	3.0939	3.6346	6.3000e-003		0.1408	0.1408		0.1408	0.1408	0.0000	553.9298	553.9298	0.1792	0.0000	557.6920
Total	**0.1543**	**3.0939**	**3.6346**	**6.3000e-003**	**0.5073**	**0.1408**	**0.6481**	**0.2706**	**0.1408**	**0.4113**	**0.0000**	**553.9298**	**553.9298**	**0.1792**	**0.0000**	**557.6920**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.0600e-003	0.0642	0.1197	2.5000e-004	6.8300e-003	1.0100e-003	7.8400e-003	1.9500e-003	9.3000e-004	2.8900e-003	0.0000	21.0189	21.0189	1.6000e-004	0.0000	21.0221
Worker	6.5100e-003	8.5200e-003	0.0795	2.6000e-004	0.0211	1.5000e-004	0.0212	5.5900e-003	1.4000e-004	5.7400e-003	0.0000	16.7892	16.7892	8.0000e-004	0.0000	16.8059
Total	**0.0156**	**0.0727**	**0.1991**	**5.1000e-004**	**0.0279**	**1.1600e-003**	**0.0290**	**7.5400e-003**	**1.0700e-003**	**8.6300e-003**	**0.0000**	**37.8081**	**37.8081**	**9.6000e-004**	**0.0000**	**37.8281**

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt B - Intertidal Pipeline Option - Generator Only

San Diego Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	542.77	**CH4 Intensity (lb/MWhr)**	0.022	**N2O Intensity (lb/MWhr)**	0.005

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Intensity factor adjusted for 32.2% RPS for 2014 SDG&E

Table Name	Column Name	Default Value	New Value
tblEnergyUse	LightingElect	3.25	0.00
tblEnergyUse	NT24E	4.27	5,605.40
tblEnergyUse	NT24NG	7.25	0.00
tblEnergyUse	T24E	1.48	0.00
tblEnergyUse	T24NG	4.54	0.00
tblLandUse	LotAcreage	0.02	91.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.022
tblProjectCharacteristics	CO2IntensityFactor	720.49	542.77

tblProjectCharacteristics	N2OIntensityFactor	0.006	0.005
tblProjectCharacteristics	OperationalYear	2014	2020

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	5.6054e+006	1,380.0289	0.0559	0.0127	1,385.1446
Total		**1,380.0289**	**0.0559**	**0.0127**	**1,385.1446**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	5.6054e+006	1,380.0289	0.0559	0.0127	1,385.1446
Total		**1,380.0289**	**0.0559**	**0.0127**	**1,385.1446**

Alternative C – Subtidal

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt C - Subtidal Truck Haul

San Diego Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	110.00	53.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	110.00	51.00
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	60.00	27.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00
tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00

tblGrading	MaterialExported	0.00	155,000.00
tblGrading	MaterialExported	0.00	155,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	PhaseName		Dewatering Pond 15
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	3.50
tblTripsAndVMT	HaulingTripLength	20.00	3.50
tblTripsAndVMT	HaulingTripNumber	16,250.00	33,550.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	33,550.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripNumber	0.00	20.00

tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30

tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	18.6490	176.1822	179.9596	0.2036	27.1478	7.5765	34.7243	13.9877	7.0007	20.9884	0.0000	20,094.6783	20,094.6783	3.9753	0.0000	20,178.1600
2018	15.1966	146.1958	158.7651	0.1834	28.4841	6.1116	34.5938	14.3023	5.6226	19.9231	0.0000	18,084.8780	18,084.8780	3.8355	0.0000	18,165.4228
2019	10.5050	115.3185	88.4897	0.1296	25.5597	5.2989	30.8586	13.4879	4.8750	18.3629	0.0000	12,703.5655	12,703.5655	3.7830	0.0000	12,783.0084
Total	**44.3505**	**437.6964**	**427.2144**	**0.5166**	**81.1917**	**18.9870**	**100.1767**	**41.7779**	**17.4983**	**59.2744**	**0.0000**	**50,883.1219**	**50,883.1219**	**11.5938**	**0.0000**	**51,126.5912**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	9.0950	92.7180	149.4831	0.2036	12.1179	3.3557	15.4736	5.8690	3.3321	9.2010	0.0000	20,094.6783	20,094.6783	3.9753	0.0000	20,178.1600
2018	7.1896	81.4639	138.8784	0.1834	13.4542	2.9416	16.3939	6.1835	2.9207	9.1025	0.0000	18,084.8780	18,084.8780	3.8355	0.0000	18,165.4228
2019	3.2725	60.5324	73.4487	0.1296	10.2998	2.7059	13.0057	5.3498	2.7039	8.0538	0.0000	12,703.5655	12,703.5655	3.7830	0.0000	12,783.0084
Total	**19.5571**	**234.7143**	**361.8102**	**0.5166**	**35.8719**	**9.0032**	**44.8732**	**17.4023**	**8.9567**	**26.3572**	**0.0000**	**50,883.1218**	**50,883.1218**	**11.5938**	**0.0000**	**51,126.5912**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**55.90**	**46.38**	**15.31**	**0.00**	**55.82**	**52.58**	**55.21**	**58.35**	**48.81**	**55.53**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	
9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2019	12/31/2019	6	104	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36

Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48
Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42
Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40

Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	33,550.00	10.80	7.30	3.50	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	33,550.00	10.80	7.30	3.50	LD_Mix	HDT_Mix	HHDT
Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000

Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806		890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**		**890.0494**	**890.0494**	**0.1159**		**892.4832**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806	0.0000	890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**890.0494**	**890.0494**	**0.1159**		**892.4832**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	12.4921	142.3947	99.7062	0.1200		6.9021	6.9021		6.3499	6.3499		12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**12.4921**	**142.3947**	**99.7062**	**0.1200**	**24.6392**	**6.9021**	**31.5413**	**13.3094**	**6.3499**	**19.6593**		**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.7714	20.0633	62.6836	0.0468	1.2358	0.2025	1.4382	0.3316	0.1861	0.5177		4,558.1891	4,558.1891	0.0446		4,559.1247
Vendor	0.5293	4.1644	6.8064	0.0113	0.3186	0.0603	0.3789	0.0909	0.0555	0.1464		1,117.2186	1,117.2186	8.5900e-003		1,117.3990
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**4.4686**	**24.4368**	**71.4459**	**0.0630**	**1.9651**	**0.2658**	**2.2309**	**0.5315**	**0.2444**	**0.7758**		**6,067.4817**	**6,067.4817**	**0.0733**		**6,069.0205**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.7714	20.0633	62.6836	0.0468	1.2358	0.2025	1.4382	0.3316	0.1861	0.5177		4,558.1891	4,558.1891	0.0446		4,559.1247
Vendor	0.5293	4.1644	6.8064	0.0113	0.3186	0.0603	0.3789	0.0909	0.0555	0.1464		1,117.2186	1,117.2186	8.5900e-003		1,117.3990
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**4.4686**	**24.4368**	**71.4459**	**0.0630**	**1.9651**	**0.2658**	**2.2309**	**0.5315**	**0.2444**	**0.7758**		**6,067.4817**	**6,067.4817**	**0.0733**		**6,069.0205**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6392**	**5.8513**	**30.4904**	**13.3094**	**5.3832**	**18.6926**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.5684	18.4057	60.7814	0.0467	3.1156	0.1995	3.3151	0.7930	0.1834	0.9765		4,479.8599	4,479.8599	0.0452		4,480.8082
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**4.2171**	**22.3563**	**69.0643**	**0.0629**	**3.8449**	**0.2584**	**4.1034**	**0.9929**	**0.2377**	**1.2305**		**5,955.2213**	**5,955.2213**	**0.0723**		**5,956.7400**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000

Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.5684	18.4057	60.7814	0.0467	3.1156	0.1995	3.3151	0.7930	0.1834	0.9765		4,479.8599	4,479.8599	0.0452		4,480.8082
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**4.2171**	**22.3563**	**69.0643**	**0.0629**	**3.8449**	**0.2584**	**4.1034**	**0.9929**	**0.2377**	**1.2305**		**5,955.2213**	**5,955.2213**	**0.0723**		**5,956.7400**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6445	0.0000	24.6445	13.3101	0.0000	13.3101			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6445**	**5.8513**	**30.4957**	**13.3101**	**5.3832**	**18.6932**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.6027	18.5827	61.3658	0.0471	0.9893	0.2014	1.1907	0.2714	0.1852	0.4566		4,522.9355	4,522.9355	0.0456		4,523.8929
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**4.2515**	**22.5333**	**69.6488**	**0.0633**	**1.7187**	**0.2603**	**1.9790**	**0.4712**	**0.2394**	**0.7107**		**5,998.2969**	**5,998.2969**	**0.0728**		**5,999.8246**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6114	0.0000	9.6114	5.1909	0.0000	5.1909			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6114**	**2.6813**	**12.2926**	**5.1909**	**2.6813**	**7.8722**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	3.6027	18.5827	61.3658	0.0471	0.9893	0.2014	1.1907	0.2714	0.1852	0.4566		4,522.9355	4,522.9355	0.0456		4,523.8929
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**4.2515**	**22.5333**	**69.6488**	**0.0633**	**1.7187**	**0.2603**	**1.9790**	**0.4712**	**0.2394**	**0.7107**		**5,998.2969**	**5,998.2969**	**0.0728**		**5,999.8246**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

3.12 Pond 15 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					25.0163	0.0000	25.0163	13.3411	0.0000	13.3411			0.0000			0.0000
Off-Road	10.1706	113.7167	84.2707	0.1200		5.2743	5.2743		4.8523	4.8523		11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**10.1706**	**113.7167**	**84.2707**	**0.1200**	**25.0163**	**5.2743**	**30.2906**	**13.3411**	**4.8523**	**18.1935**		**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.7564	0.0000	9.7564	5.2030	0.0000	5.2030			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.7564**	**2.6813**	**12.4376**	**5.2030**	**2.6813**	**7.8843**	**0.0000**	**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt C - Subtidal Truck Haul

San Diego Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	110.00	53.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	110.00	51.00
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	60.00	27.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00
tblGrading	AcresOfGrading	420.00	34.00

tblGrading	AcresOfGrading	416.00	34.00
tblGrading	MaterialExported	0.00	155,000.00
tblGrading	MaterialExported	0.00	155,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	PhaseName		Dewatering Pond 15
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	3.50
tblTripsAndVMT	HaulingTripLength	20.00	3.50
tblTripsAndVMT	HaulingTripNumber	16,250.00	33,550.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	33,550.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30

tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30

tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	17.8848	175.5592	159.1248	0.2046	27.1478	7.5728	34.7206	13.9877	6.9973	20.9850	0.0000	20,213.4137	20,213.4137	3.9727	0.0000	20,296.8406
2018	14.5230	145.6847	138.9220	0.1840	28.4841	6.1082	34.5904	14.3023	5.6195	19.9200	0.0000	18,173.1374	18,173.1374	3.8328	0.0000	18,253.6269
2019	10.4738	115.2677	87.8552	0.1300	25.5597	5.2987	30.8584	13.4879	4.8748	18.3627	0.0000	12,730.6987	12,730.6987	3.7829	0.0000	12,810.1394
Total	**42.8816**	**436.5116**	**385.9020**	**0.5186**	**81.1917**	**18.9797**	**100.1695**	**41.7779**	**17.4915**	**59.2677**	**0.0000**	**51,117.2497**	**51,117.2497**	**11.5884**	**0.0000**	**51,360.6069**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	8.3309	92.0951	128.6483	0.2046	12.1179	3.3520	15.4699	5.8690	3.3286	9.1976	0.0000	20,213.4137	20,213.4137	3.9727	0.0000	20,296.8405
2018	6.5160	80.9528	119.0353	0.1840	13.4542	2.9382	16.3906	6.1835	2.9176	9.0994	0.0000	18,173.1374	18,173.1374	3.8328	0.0000	18,253.6269
2019	3.2413	60.4816	72.8142	0.1300	10.2998	2.7057	13.0055	5.3498	2.7037	8.0536	0.0000	12,730.6987	12,730.6987	3.7829	0.0000	12,810.1394
Total	**18.0881**	**233.5295**	**320.4979**	**0.5186**	**35.8719**	**8.9959**	**44.8659**	**17.4023**	**8.9500**	**26.3505**	**0.0000**	**51,117.2497**	**51,117.2497**	**11.5884**	**0.0000**	**51,360.6068**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**57.82**	**46.50**	**16.95**	**0.00**	**55.82**	**52.60**	**55.21**	**58.35**	**48.83**	**55.54**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	
9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2019	12/31/2019	6	104	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42

Mobilization	Paving Equipment	0	8.00	130	0.36
Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48
Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42
Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41

Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40
Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	33,550.00	10.80	7.30	3.50	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	33,550.00	10.80	7.30	3.50	LD_Mix	HDT_Mix	HHDT
Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806		890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**		**890.0494**	**890.0494**	**0.1159**		**892.4832**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806	0.0000	890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**890.0494**	**890.0494**	**0.1159**		**892.4832**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	12.4921	142.3947	99.7062	0.1200		6.9021	6.9021		6.3499	6.3499		12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**12.4921**	**142.3947**	**99.7062**	**0.1200**	**24.6392**	**6.9021**	**31.5413**	**13.3094**	**6.3499**	**19.6593**		**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.1249	19.6223	44.2565	0.0471	1.2358	0.1996	1.4354	0.3316	0.1835	0.5151		4,613.7878	4,613.7878	0.0423		4,614.6754
Vendor	0.4590	4.0680	5.0119	0.0114	0.3186	0.0597	0.3783	0.0909	0.0549	0.1458		1,125.8779	1,125.8779	8.3600e-003		1,126.0535
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**3.7427**	**23.8767**	**51.2915**	**0.0637**	**1.9651**	**0.2623**	**2.2274**	**0.5315**	**0.2412**	**0.7726**		**6,157.1744**	**6,157.1744**	**0.0708**		**6,158.6603**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.1249	19.6223	44.2565	0.0471	1.2358	0.1996	1.4354	0.3316	0.1835	0.5151		4,613.7878	4,613.7878	0.0423		4,614.6754
Vendor	0.4590	4.0680	5.0119	0.0114	0.3186	0.0597	0.3783	0.0909	0.0549	0.1458		1,125.8779	1,125.8779	8.3600e-003		1,126.0535
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**3.7427**	**23.8767**	**51.2915**	**0.0637**	**1.9651**	**0.2623**	**2.2274**	**0.5315**	**0.2412**	**0.7726**		**6,157.1744**	**6,157.1744**	**0.0708**		**6,158.6603**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6392**	**5.8513**	**30.4904**	**13.3094**	**5.3832**	**18.6926**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.9724	18.0044	42.7820	0.0470	3.1156	0.1967	3.3123	0.7930	0.1809	0.9739		4,534.5619	4,534.5619	0.0428		4,535.4604
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**3.5493**	**21.8491**	**49.3943**	**0.0635**	**3.8449**	**0.2551**	**4.1000**	**0.9929**	**0.2346**	**1.2274**		**6,042.9547**	**6,042.9547**	**0.0697**		**6,044.4185**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000

Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	2.9724	18.0044	42.7820	0.0470	3.1156	0.1967	3.3123	0.7930	0.1809	0.9739		4,534.5619	4,534.5619	0.0428		4,535.4604
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**3.5493**	**21.8491**	**49.3943**	**0.0635**	**3.8449**	**0.2551**	**4.1000**	**0.9929**	**0.2346**	**1.2274**		**6,042.9547**	**6,042.9547**	**0.0697**		**6,044.4185**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6445	0.0000	24.6445	13.3101	0.0000	13.3101			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6445**	**5.8513**	**30.4957**	**13.3101**	**5.3832**	**18.6932**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.0010	18.1776	43.1933	0.0474	0.9893	0.1986	1.1879	0.2714	0.1826	0.4540		4,578.1635	4,578.1635	0.0432		4,579.0706
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**3.5778**	**22.0222**	**49.8057**	**0.0640**	**1.7187**	**0.2570**	**1.9756**	**0.4712**	**0.2363**	**0.7075**		**6,086.5562**	**6,086.5562**	**0.0701**		**6,088.0287**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6114	0.0000	9.6114	5.1909	0.0000	5.1909			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6114**	**2.6813**	**12.2926**	**5.1909**	**2.6813**	**7.8722**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	3.0010	18.1776	43.1933	0.0474	0.9893	0.1986	1.1879	0.2714	0.1826	0.4540		4,578.1635	4,578.1635	0.0432		4,579.0706
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**3.5778**	**22.0222**	**49.8057**	**0.0640**	**1.7187**	**0.2570**	**1.9756**	**0.4712**	**0.2363**	**0.7075**		**6,086.5562**	**6,086.5562**	**0.0701**		**6,088.0287**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

3.12 Pond 15 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					25.0163	0.0000	25.0163	13.3411	0.0000	13.3411			0.0000			0.0000
Off-Road	10.1706	113.7167	84.2707	0.1200		5.2743	5.2743		4.8523	4.8523		11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**10.1706**	**113.7167**	**84.2707**	**0.1200**	**25.0163**	**5.2743**	**30.2906**	**13.3411**	**4.8523**	**18.1935**		**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.7564	0.0000	9.7564	5.2030	0.0000	5.2030			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.7564**	**2.6813**	**12.4376**	**5.2030**	**2.6813**	**7.8843**	**0.0000**	**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt C - Subtidal Truck Haul

San Diego Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	110.00	53.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	110.00	51.00
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	60.00	27.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00
tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00

tblGrading	MaterialExported	0.00	155,000.00
tblGrading	MaterialExported	0.00	155,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	PhaseName		Dewatering Pond 15
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	3.50
tblTripsAndVMT	HaulingTripLength	20.00	3.50
tblTripsAndVMT	HaulingTripNumber	16,250.00	33,550.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	33,550.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripNumber	0.00	20.00

tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30

tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.6820	6.6901	6.6508	7.6800e-003	1.3898	0.2857	1.6755	0.7248	0.2633	0.9881	0.0000	692.8159	692.8159	0.1379	0.0000	695.7125
2018	0.9971	9.6270	10.0697	0.0123	2.7267	0.4008	3.1275	1.4317	0.3688	1.8004	0.0000	1,095.9508	1,095.9508	0.2283	0.0000	1,100.7456
2019	0.5574	6.0597	4.7442	7.1200e-003	1.3492	0.2765	1.6257	0.7068	0.2544	0.9612	0.0000	628.5146	628.5146	0.1792	0.0000	632.2778
Total	**2.2364**	**22.3768**	**21.4647**	**0.0271**	**5.4656**	**0.9630**	**6.4287**	**2.8633**	**0.8864**	**3.7497**	**0.0000**	**2,417.2813**	**2,417.2813**	**0.5455**	**0.0000**	**2,428.7359**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.3094	3.4350	5.4622	7.6800e-003	0.6007	0.1211	0.7218	0.2986	0.1202	0.4188	0.0000	692.8154	692.8154	0.1379	0.0000	695.7120
2018	0.4726	5.3871	8.7672	0.0123	1.1559	0.1932	1.3491	0.5832	0.1918	0.7750	0.0000	1,095.9499	1,095.9499	0.2283	0.0000	1,100.7447
2019	0.1813	3.2108	3.9621	7.1200e-003	0.5557	0.1417	0.6973	0.2836	0.1415	0.4251	0.0000	628.5140	628.5140	0.1792	0.0000	632.2771
Total	**0.9633**	**12.0328**	**18.1914**	**0.0271**	**2.3122**	**0.4560**	**2.7682**	**1.1654**	**0.4535**	**1.6189**	**0.0000**	**2,417.2793**	**2,417.2793**	**0.5455**	**0.0000**	**2,428.7338**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**56.93**	**46.23**	**15.25**	**0.00**	**57.69**	**52.65**	**56.94**	**59.30**	**48.84**	**56.83**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	
9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2019	12/31/2019	6	104	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36

Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48
Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42
Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40

Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	33,550.00	10.80	7.30	3.50	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	33,550.00	10.80	7.30	3.50	LD_Mix	HDT_Mix	HHDT
Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5200e-003	0.0463	0.0685	1.3000e-004	3.4500e-003	6.6000e-004	4.1100e-003	9.9000e-004	6.1000e-004	1.6000e-003	0.0000	11.2413	11.2413	8.0000e-005	0.0000	11.2431
Worker	4.1200e-003	5.4600e-003	0.0516	1.3000e-004	0.0106	8.0000e-005	0.0107	2.8200e-003	7.0000e-005	2.9000e-003	0.0000	9.5193	9.5193	4.8000e-004	0.0000	9.5294
Total	**9.6400e-003**	**0.0518**	**0.1201**	**2.6000e-004**	**0.0141**	**7.4000e-004**	**0.0148**	**3.8100e-003**	**6.8000e-004**	**4.5000e-003**	**0.0000**	**20.7606**	**20.7606**	**5.6000e-004**	**0.0000**	**20.7725**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5200e-003	0.0463	0.0685	1.3000e-004	3.4500e-003	6.6000e-004	4.1100e-003	9.9000e-004	6.1000e-004	1.6000e-003	0.0000	11.2413	11.2413	8.0000e-005	0.0000	11.2431
Worker	4.1200e-003	5.4600e-003	0.0516	1.3000e-004	0.0106	8.0000e-005	0.0107	2.8200e-003	7.0000e-005	2.9000e-003	0.0000	9.5193	9.5193	4.8000e-004	0.0000	9.5294
Total	**9.6400e-003**	**0.0518**	**0.1201**	**2.6000e-004**	**0.0141**	**7.4000e-004**	**0.0148**	**3.8100e-003**	**6.8000e-004**	**4.5000e-003**	**0.0000**	**20.7606**	**20.7606**	**5.6000e-004**	**0.0000**	**20.7725**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0176	0.1000	0.0542	1.5000e-004		5.1400e-003	5.1400e-003		5.1400e-003	5.1400e-003	0.0000	10.9004	10.9004	1.4200e-003	0.0000	10.9302
Total	**0.0176**	**0.1000**	**0.0542**	**1.5000e-004**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**10.9004**	**10.9004**	**1.4200e-003**	**0.0000**	**10.9302**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8100e-003	0.0236	0.0349	6.0000e-005	1.7600e-003	3.4000e-004	2.0900e-003	5.0000e-004	3.1000e-004	8.1000e-004	0.0000	5.7267	5.7267	4.0000e-005	0.0000	5.7276
Worker	2.1000e-003	2.7800e-003	0.0263	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4800e-003	0.0000	4.8494	4.8494	2.5000e-004	0.0000	4.8546
Total	**4.9100e-003**	**0.0264**	**0.0612**	**1.3000e-004**	**7.1700e-003**	**3.8000e-004**	**7.5400e-003**	**1.9400e-003**	**3.5000e-004**	**2.2900e-003**	**0.0000**	**10.5761**	**10.5761**	**2.9000e-004**	**0.0000**	**10.5822**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0176	0.1000	0.0542	1.5000e-004		5.1400e-003	5.1400e-003		5.1400e-003	5.1400e-003	0.0000	10.9004	10.9004	1.4200e-003	0.0000	10.9302
Total	**0.0176**	**0.1000**	**0.0542**	**1.5000e-004**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**10.9004**	**10.9004**	**1.4200e-003**	**0.0000**	**10.9302**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8100e-003	0.0236	0.0349	6.0000e-005	1.7600e-003	3.4000e-004	2.0900e-003	5.0000e-004	3.1000e-004	8.1000e-004	0.0000	5.7267	5.7267	4.0000e-005	0.0000	5.7276
Worker	2.1000e-003	2.7800e-003	0.0263	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4800e-003	0.0000	4.8494	4.8494	2.5000e-004	0.0000	4.8546
Total	**4.9100e-003**	**0.0264**	**0.0612**	**1.3000e-004**	**7.1700e-003**	**3.8000e-004**	**7.5400e-003**	**1.9400e-003**	**3.5000e-004**	**2.2900e-003**	**0.0000**	**10.5761**	**10.5761**	**2.9000e-004**	**0.0000**	**10.5822**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2936	0.0000	1.2936	0.6987	0.0000	0.6987	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4872	5.5534	3.8885	4.6800e-003		0.2692	0.2692		0.2477	0.2477	0.0000	434.4535	434.4535	0.1331	0.0000	437.2490
Total	**0.4872**	**5.5534**	**3.8885**	**4.6800e-003**	**1.2936**	**0.2692**	**1.5627**	**0.6987**	**0.2477**	**0.9464**	**0.0000**	**434.4535**	**434.4535**	**0.1331**	**0.0000**	**437.2490**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.1371	0.7871	2.2087	1.8300e-003	0.0471	7.8300e-003	0.0550	0.0127	7.2000e-003	0.0199	0.0000	162.4106	162.4106	1.5300e-003	0.0000	162.4427
Vendor	0.0195	0.1635	0.2421	4.4000e-004	0.0122	2.3400e-003	0.0145	3.4800e-003	2.1500e-003	5.6400e-003	0.0000	39.7051	39.7051	3.0000e-004	0.0000	39.7114
Worker	6.0600e-003	8.0300e-003	0.0759	1.9000e-004	0.0156	1.2000e-004	0.0158	4.1600e-003	1.1000e-004	4.2600e-003	0.0000	14.0095	14.0095	7.1000e-004	0.0000	14.0245
Total	**0.1627**	**0.9586**	**2.5267**	**2.4600e-003**	**0.0750**	**0.0103**	**0.0852**	**0.0203**	**9.4600e-003**	**0.0298**	**0.0000**	**216.1252**	**216.1252**	**2.5400e-003**	**0.0000**	**216.1786**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5045	0.0000	0.5045	0.2725	0.0000	0.2725	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1146	2.2983	2.7000	4.6800e-003		0.1046	0.1046		0.1046	0.1046	0.0000	434.4530	434.4530	0.1331	0.0000	437.2485
Total	**0.1146**	**2.2983**	**2.7000**	**4.6800e-003**	**0.5045**	**0.1046**	**0.6091**	**0.2725**	**0.1046**	**0.3771**	**0.0000**	**434.4530**	**434.4530**	**0.1331**	**0.0000**	**437.2485**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.1371	0.7871	2.2087	1.8300e-003	0.0471	7.8300e-003	0.0550	0.0127	7.2000e-003	0.0199	0.0000	162.4106	162.4106	1.5300e-003	0.0000	162.4427
Vendor	0.0195	0.1635	0.2421	4.4000e-004	0.0122	2.3400e-003	0.0145	3.4800e-003	2.1500e-003	5.6400e-003	0.0000	39.7051	39.7051	3.0000e-004	0.0000	39.7114
Worker	6.0600e-003	8.0300e-003	0.0759	1.9000e-004	0.0156	1.2000e-004	0.0158	4.1600e-003	1.1000e-004	4.2600e-003	0.0000	14.0095	14.0095	7.1000e-004	0.0000	14.0245
Total	**0.1627**	**0.9586**	**2.5267**	**2.4600e-003**	**0.0750**	**0.0103**	**0.0852**	**0.0203**	**9.4600e-003**	**0.0298**	**0.0000**	**216.1252**	**216.1252**	**2.5400e-003**	**0.0000**	**216.1786**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2936	0.0000	1.2936	0.6987	0.0000	0.6987	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1478	1.6694	1.2031	1.6200e-003		0.0790	0.0790		0.0727	0.0727	0.0000	148.0243	148.0243	0.0461	0.0000	148.9920
Total	**0.1478**	**1.6694**	**1.2031**	**1.6200e-003**	**1.2936**	**0.0790**	**1.3726**	**0.6987**	**0.0727**	**0.7714**	**0.0000**	**148.0243**	**148.0243**	**0.0461**	**0.0000**	**148.9920**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0450	0.2499	0.7406	6.3000e-004	0.0410	2.6700e-003	0.0437	0.0104	2.4600e-003	0.0129	0.0000	55.2534	55.2534	5.4000e-004	0.0000	55.2646
Vendor	6.3400e-003	0.0511	0.0801	1.5000e-004	4.2200e-003	7.5000e-004	4.9700e-003	1.2100e-003	6.9000e-004	1.9000e-003	0.0000	13.5080	13.5080	1.0000e-004	0.0000	13.5101
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**0.0532**	**0.3036**	**0.8445**	**8.5000e-004**	**0.0506**	**3.4600e-003**	**0.0541**	**0.0131**	**3.1900e-003**	**0.0163**	**0.0000**	**73.4287**	**73.4287**	**8.7000e-004**	**0.0000**	**73.4469**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5045	0.0000	0.5045	0.2725	0.0000	0.2725	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Off-Road	0.0397	0.7956	0.9346	1.6200e-003		0.0362	0.0362		0.0362	0.0362	0.0000	148.0241	148.0241	0.0461	0.0000	148.9918
Total	**0.0397**	**0.7956**	**0.9346**	**1.6200e-003**	**0.5045**	**0.0362**	**0.5407**	**0.2725**	**0.0362**	**0.3087**	**0.0000**	**148.0241**	**148.0241**	**0.0461**	**0.0000**	**148.9918**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0450	0.2499	0.7406	6.3000e-004	0.0410	2.6700e-003	0.0437	0.0104	2.4600e-003	0.0129	0.0000	55.2534	55.2534	5.4000e-004	0.0000	55.2646
Vendor	6.3400e-003	0.0511	0.0801	1.5000e-004	4.2200e-003	7.5000e-004	4.9700e-003	1.2100e-003	6.9000e-004	1.9000e-003	0.0000	13.5080	13.5080	1.0000e-004	0.0000	13.5101
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**0.0532**	**0.3036**	**0.8445**	**8.5000e-004**	**0.0506**	**3.4600e-003**	**0.0541**	**0.0131**	**3.1900e-003**	**0.0163**	**0.0000**	**73.4287**	**73.4287**	**8.7000e-004**	**0.0000**	**73.4469**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3500e-003	0.0189	0.0297	6.0000e-005	1.5600e-003	2.8000e-004	1.8400e-003	4.5000e-004	2.6000e-004	7.0000e-004	0.0000	5.0030	5.0030	4.0000e-005	0.0000	5.0037
Worker	1.6900e-003	2.2500e-003	0.0211	6.0000e-005	4.8100e-003	4.0000e-005	4.8500e-003	1.2800e-003	3.0000e-005	1.3100e-003	0.0000	4.1488	4.1488	2.0000e-004	0.0000	4.1530
Total	**4.0400e-003**	**0.0212**	**0.0508**	**1.2000e-004**	**6.3700e-003**	**3.2000e-004**	**6.6900e-003**	**1.7300e-003**	**2.9000e-004**	**2.0100e-003**	**0.0000**	**9.1517**	**9.1517**	**2.4000e-004**	**0.0000**	**9.1568**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3500e-003	0.0189	0.0297	6.0000e-005	1.5600e-003	2.8000e-004	1.8400e-003	4.5000e-004	2.6000e-004	7.0000e-004	0.0000	5.0030	5.0030	4.0000e-005	0.0000	5.0037
Worker	1.6900e-003	2.2500e-003	0.0211	6.0000e-005	4.8100e-003	4.0000e-005	4.8500e-003	1.2800e-003	3.0000e-005	1.3100e-003	0.0000	4.1488	4.1488	2.0000e-004	0.0000	4.1530
Total	**4.0400e-003**	**0.0212**	**0.0508**	**1.2000e-004**	**6.3700e-003**	**3.2000e-004**	**6.6900e-003**	**1.7300e-003**	**2.9000e-004**	**2.0100e-003**	**0.0000**	**9.1517**	**9.1517**	**2.4000e-004**	**0.0000**	**9.1568**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0116					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0116**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0116					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0116**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6400e-003	0.0213	0.0334	6.0000e-005	1.7600e-003	3.1000e-004	2.0700e-003	5.0000e-004	2.9000e-004	7.9000e-004	0.0000	5.6283	5.6283	4.0000e-005	0.0000	5.6292
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**4.5500e-003**	**0.0238**	**0.0572**	**1.3000e-004**	**7.1700e-003**	**3.5000e-004**	**7.5200e-003**	**1.9400e-003**	**3.3000e-004**	**2.2600e-003**	**0.0000**	**10.2957**	**10.2957**	**2.7000e-004**	**0.0000**	**10.3014**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6400e-003	0.0213	0.0334	6.0000e-005	1.7600e-003	3.1000e-004	2.0700e-003	5.0000e-004	2.9000e-004	7.9000e-004	0.0000	5.6283	5.6283	4.0000e-005	0.0000	5.6292
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**4.5500e-003**	**0.0238**	**0.0572**	**1.3000e-004**	**7.1700e-003**	**3.5000e-004**	**7.5200e-003**	**1.9400e-003**	**3.3000e-004**	**2.2600e-003**	**0.0000**	**10.2957**	**10.2957**	**2.7000e-004**	**0.0000**	**10.3014**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2815	0.0000	1.2815	0.6921	0.0000	0.6921	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.5692	6.4305	4.6341	6.2400e-003		0.3043	0.3043		0.2799	0.2799	0.0000	570.1676	570.1676	0.1775	0.0000	573.8951
Total	**0.5692**	**6.4305**	**4.6341**	**6.2400e-003**	**1.2815**	**0.3043**	**1.5858**	**0.6921**	**0.2799**	**0.9720**	**0.0000**	**570.1676**	**570.1676**	**0.1775**	**0.0000**	**573.8951**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.1750	0.9720	2.8801	2.4600e-003	0.0504	0.0104	0.0608	0.0139	9.5500e-003	0.0234	0.0000	214.8743	214.8743	2.0900e-003	0.0000	214.9180
Vendor	0.0244	0.1968	0.3086	5.9000e-004	0.0162	2.9000e-003	0.0191	4.6400e-003	2.6600e-003	7.3100e-003	0.0000	52.0307	52.0307	3.9000e-004	0.0000	52.0389
Worker	7.3400e-003	9.7700e-003	0.0916	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.9779	17.9779	8.8000e-004	0.0000	17.9965
Total	**0.2067**	**1.1786**	**3.2802**	**3.3100e-003**	**0.0875**	**0.0134**	**0.1009**	**0.0240**	**0.0124**	**0.0364**	**0.0000**	**284.8828**	**284.8828**	**3.3600e-003**	**0.0000**	**284.9534**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4998	0.0000	0.4998	0.2699	0.0000	0.2699	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1528	3.0644	3.5999	6.2400e-003		0.1394	0.1394		0.1394	0.1394	0.0000	570.1669	570.1669	0.1775	0.0000	573.8945
Total	**0.1528**	**3.0644**	**3.5999**	**6.2400e-003**	**0.4998**	**0.1394**	**0.6392**	**0.2699**	**0.1394**	**0.4094**	**0.0000**	**570.1669**	**570.1669**	**0.1775**	**0.0000**	**573.8945**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.1750	0.9720	2.8801	2.4600e-003	0.0504	0.0104	0.0608	0.0139	9.5500e-003	0.0234	0.0000	214.8743	214.8743	2.0900e-003	0.0000	214.9180
Vendor	0.0244	0.1968	0.3086	5.9000e-004	0.0162	2.9000e-003	0.0191	4.6400e-003	2.6600e-003	7.3100e-003	0.0000	52.0307	52.0307	3.9000e-004	0.0000	52.0389
Worker	7.3400e-003	9.7700e-003	0.0916	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.9779	17.9779	8.8000e-004	0.0000	17.9965
Total	**0.2067**	**1.1786**	**3.2802**	**3.3100e-003**	**0.0875**	**0.0134**	**0.1009**	**0.0240**	**0.0124**	**0.0364**	**0.0000**	**284.8828**	**284.8828**	**3.3600e-003**	**0.0000**	**284.9534**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.6600e-003	0.0366	0.0602	1.2000e-004	3.3200e-003	5.5000e-004	3.8700e-003	9.5000e-004	5.1000e-004	1.4500e-003	0.0000	10.4481	10.4481	8.0000e-005	0.0000	10.4497
Worker	3.3400e-003	4.4300e-003	0.0413	1.3000e-004	0.0102	7.0000e-005	0.0103	2.7200e-003	7.0000e-005	2.7900e-003	0.0000	8.4972	8.4972	4.1000e-004	0.0000	8.5057
Total	**8.0000e-003**	**0.0410**	**0.1015**	**2.5000e-004**	**0.0135**	**6.2000e-004**	**0.0142**	**3.6700e-003**	**5.8000e-004**	**4.2400e-003**	**0.0000**	**18.9452**	**18.9452**	**4.9000e-004**	**0.0000**	**18.9554**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.6600e-003	0.0366	0.0602	1.2000e-004	3.3200e-003	5.5000e-004	3.8700e-003	9.5000e-004	5.1000e-004	1.4500e-003	0.0000	10.4481	10.4481	8.0000e-005	0.0000	10.4497
Worker	3.3400e-003	4.4300e-003	0.0413	1.3000e-004	0.0102	7.0000e-005	0.0103	2.7200e-003	7.0000e-005	2.7900e-003	0.0000	8.4972	8.4972	4.1000e-004	0.0000	8.5057
Total	**8.0000e-003**	**0.0410**	**0.1015**	**2.5000e-004**	**0.0135**	**6.2000e-004**	**0.0142**	**3.6700e-003**	**5.8000e-004**	**4.2400e-003**	**0.0000**	**18.9452**	**18.9452**	**4.9000e-004**	**0.0000**	**18.9554**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4700e-003	0.0194	0.0319	6.0000e-005	1.7600e-003	2.9000e-004	2.0500e-003	5.0000e-004	2.7000e-004	7.7000e-004	0.0000	5.5313	5.5313	4.0000e-005	0.0000	5.5322
Worker	1.7700e-003	2.3400e-003	0.0219	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.4985	4.4985	2.2000e-004	0.0000	4.5030
Total	**4.2400e-003**	**0.0217**	**0.0537**	**1.3000e-004**	**7.1700e-003**	**3.3000e-004**	**7.5000e-003**	**1.9400e-003**	**3.1000e-004**	**2.2400e-003**	**0.0000**	**10.0298**	**10.0298**	**2.6000e-004**	**0.0000**	**10.0352**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4700e-003	0.0194	0.0319	6.0000e-005	1.7600e-003	2.9000e-004	2.0500e-003	5.0000e-004	2.7000e-004	7.7000e-004	0.0000	5.5313	5.5313	4.0000e-005	0.0000	5.5322
Worker	1.7700e-003	2.3400e-003	0.0219	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.4985	4.4985	2.2000e-004	0.0000	4.5030
Total	**4.2400e-003**	**0.0217**	**0.0537**	**1.3000e-004**	**7.1700e-003**	**3.3000e-004**	**7.5000e-003**	**1.9400e-003**	**3.1000e-004**	**2.2400e-003**	**0.0000**	**10.0298**	**10.0298**	**2.6000e-004**	**0.0000**	**10.0352**

3.12 Pond 15 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.3009	0.0000	1.3009	0.6937	0.0000	0.6937	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.5289	5.9133	4.3821	6.2400e-003		0.2743	0.2743		0.2523	0.2523	0.0000	560.9061	560.9061	0.1775	0.0000	564.6329
Total	**0.5289**	**5.9133**	**4.3821**	**6.2400e-003**	**1.3009**	**0.2743**	**1.5751**	**0.6937**	**0.2523**	**0.9461**	**0.0000**	**560.9061**	**560.9061**	**0.1775**	**0.0000**	**564.6329**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.5000e-003	0.0746	0.1227	2.5000e-004	6.7600e-003	1.1200e-003	7.8900e-003	1.9400e-003	1.0300e-003	2.9700e-003	0.0000	21.3059	21.3059	1.6000e-004	0.0000	21.3092
Worker	6.8100e-003	9.0300e-003	0.0842	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.3275	17.3275	8.3000e-004	0.0000	17.3450
Total	**0.0163**	**0.0837**	**0.2069**	**5.1000e-004**	**0.0276**	**1.2700e-003**	**0.0289**	**7.4800e-003**	**1.1700e-003**	**8.6500e-003**	**0.0000**	**38.6334**	**38.6334**	**9.9000e-004**	**0.0000**	**38.6542**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5073	0.0000	0.5073	0.2706	0.0000	0.2706	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1528	3.0644	3.5999	6.2400e-003		0.1394	0.1394		0.1394	0.1394	0.0000	560.9055	560.9055	0.1775	0.0000	564.6322
Total	**0.1528**	**3.0644**	**3.5999**	**6.2400e-003**	**0.5073**	**0.1394**	**0.6468**	**0.2706**	**0.1394**	**0.4100**	**0.0000**	**560.9055**	**560.9055**	**0.1775**	**0.0000**	**564.6322**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.5000e-003	0.0746	0.1227	2.5000e-004	6.7600e-003	1.1200e-003	7.8900e-003	1.9400e-003	1.0300e-003	2.9700e-003	0.0000	21.3059	21.3059	1.6000e-004	0.0000	21.3092
Worker	6.8100e-003	9.0300e-003	0.0842	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.3275	17.3275	8.3000e-004	0.0000	17.3450
Total	**0.0163**	**0.0837**	**0.2069**	**5.1000e-004**	**0.0276**	**1.2700e-003**	**0.0289**	**7.4800e-003**	**1.1700e-003**	**8.6500e-003**	**0.0000**	**38.6334**	**38.6334**	**9.9000e-004**	**0.0000**	**38.6542**

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt C - Subtidal Conveyor Option

San Diego Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	110.00	53.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	110.00	51.00
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	60.00	27.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00
tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00

tblGrading	MaterialExported	0.00	155,000.00
tblGrading	MaterialExported	0.00	155,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Dewatering Pond 15
tblOffRoadEquipment	PhaseName		Earthwork 1
tblOffRoadEquipment	PhaseName		Earthwork 2
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30

tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00

tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	14.8775	156.1189	117.2760	0.1568	25.9120	7.3741	33.2861	13.6561	6.8146	20.4707	0.0000	15,536.4892	15,536.4892	3.9308	0.0000	15,619.0353
2018	11.5939	127.6131	97.3993	0.1363	25.3738	5.9102	31.2840	13.5099	5.4374	18.9473	0.0000	13,561.9426	13,561.9426	3.7899	0.0000	13,641.5300
2019	10.5050	115.3185	88.4897	0.1296	25.5597	5.2989	30.8586	13.4879	4.8750	18.3629	0.0000	12,703.5655	12,703.5655	3.7830	0.0000	12,783.0084
Total	**36.9764**	**399.0505**	**303.1650**	**0.4227**	**76.8456**	**18.5832**	**95.4287**	**40.6539**	**17.1270**	**57.7808**	**0.0000**	**41,801.9974**	**41,801.9974**	**11.5036**	**0.0000**	**42,043.5736**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Year	lb/day										lb/day					
2017	5.3236	72.6548	86.7995	0.1568	10.8821	3.1533	14.0354	5.5373	3.1460	8.6833	0.0000	15,536.4892	15,536.4892	3.9308	0.0000	15,619.0353
2018	3.5869	62.8812	77.5126	0.1363	10.3407	2.7402	13.0809	5.3908	2.7355	8.1263	0.0000	13,561.9426	13,561.9426	3.7899	0.0000	13,641.5299
2019	3.2725	60.5324	73.4487	0.1296	10.2998	2.7059	13.0057	5.3498	2.7039	8.0538	0.0000	12,703.5655	12,703.5655	3.7830	0.0000	12,783.0084
Total	**12.1830**	**196.0684**	**237.7608**	**0.4227**	**31.5226**	**8.5994**	**40.1219**	**16.2779**	**8.5854**	**24.8633**	**0.0000**	**41,801.9973**	**41,801.9973**	**11.5036**	**0.0000**	**42,043.5736**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**67.05**	**50.87**	**21.57**	**0.00**	**58.98**	**53.73**	**57.96**	**59.96**	**49.87**	**56.97**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	
9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2019	12/31/2019	6	104	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36
Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48
Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42
Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38

Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40
Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Earthwork 1	Pumps	1	8.00	1000	0.74
Earthwork 2	Pumps	1	8.00	1000	0.74

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806		890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**		**890.0494**	**890.0494**	**0.1159**		**892.4832**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806	0.0000	890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**890.0494**	**890.0494**	**0.1159**		**892.4832**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	12.4921	142.3947	99.7062	0.1200		6.9021	6.9021		6.3499	6.3499		12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**12.4921**	**142.3947**	**99.7062**	**0.1200**	**24.6392**	**6.9021**	**31.5413**	**13.3094**	**6.3499**	**19.6593**		**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day											lb/day				
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5293	4.1644	6.8064	0.0113	0.3186	0.0603	0.3789	0.0909	0.0555	0.1464		1,117.2186	1,117.2186	8.5900e-003		1,117.3990
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.6972**	**4.3735**	**8.7623**	**0.0162**	**0.7294**	**0.0633**	**0.7927**	**0.1999**	**0.0582**	**0.2581**		**1,509.2926**	**1,509.2926**	**0.0287**		**1,509.8958**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5293	4.1644	6.8064	0.0113	0.3186	0.0603	0.3789	0.0909	0.0555	0.1464		1,117.2186	1,117.2186	8.5900e-003		1,117.3990
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968

Total	**0.6972**	**4.3735**	**8.7623**	**0.0162**	**0.7294**	**0.0633**	**0.7927**	**0.1999**	**0.0582**	**0.2581**		**1,509.2926**	**1,509.2926**	**0.0287**		**1,509.8958**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6392**	**5.8513**	**30.4904**	**13.3094**	**5.3832**	**18.6926**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Fugitive Dust					24.6445	0.0000	24.6445	13.3101	0.0000	13.3101			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6445**	**5.8513**	**30.4957**	**13.3101**	**5.3832**	**18.6932**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6114	0.0000	9.6114	5.1909	0.0000	5.1909			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6114**	**2.6813**	**12.2926**	**5.1909**	**2.6813**	**7.8722**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day											lb/day				
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639

Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

3.12 Pond 15 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					25.0163	0.0000	25.0163	13.3411	0.0000	13.3411			0.0000			0.0000
Off-Road	10.1706	113.7167	84.2707	0.1200		5.2743	5.2743		4.8523	4.8523		11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**10.1706**	**113.7167**	**84.2707**	**0.1200**	**25.0163**	**5.2743**	**30.2906**	**13.3411**	**4.8523**	**18.1935**		**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.7564	0.0000	9.7564	5.2030	0.0000	5.2030			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.7564**	**2.6813**	**12.4376**	**5.2030**	**2.6813**	**7.8843**	**0.0000**	**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639

Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt C - Subtidal Conveyor Option

San Diego Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	110.00	53.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	110.00	51.00
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	60.00	27.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00
tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00

tblGrading	MaterialExported	0.00	155,000.00
tblGrading	MaterialExported	0.00	155,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Dewatering Pond 15
tblOffRoadEquipment	PhaseName		Earthwork 1
tblOffRoadEquipment	PhaseName		Earthwork 2
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30

tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00

tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	14.7599	155.9369	114.8683	0.1575	25.9120	7.3732	33.2852	13.6561	6.8138	20.4699	0.0000	15,599.6259	15,599.6259	3.9304	0.0000	15,682.1652
2018	11.5220	127.5071	95.7287	0.1366	25.3738	5.9096	31.2834	13.5099	5.4369	18.9468	0.0000	13,594.9739	13,594.9739	3.7896	0.0000	13,674.5563
2019	10.4738	115.2677	87.8552	0.1300	25.5597	5.2987	30.8584	13.4879	4.8748	18.3627	0.0000	12,730.6987	12,730.6987	3.7829	0.0000	12,810.1394
Total	**36.7557**	**398.7117**	**298.4522**	**0.4241**	**76.8456**	**18.5815**	**95.4271**	**40.6539**	**17.1255**	**57.7793**	**0.0000**	**41,925.2984**	**41,925.2984**	**11.5030**	**0.0000**	**42,166.8610**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Year	lb/day										lb/day					
2017	5.2060	72.4728	84.3918	0.1575	10.8821	3.1524	14.0345	5.5373	3.1452	8.6825	0.0000	15,599.6259	15,599.6259	3.9304	0.0000	15,682.1652
2018	3.5150	62.7752	75.8420	0.1366	10.3407	2.7397	13.0803	5.3908	2.7350	8.1257	0.0000	13,594.9739	13,594.9739	3.7896	0.0000	13,674.5563
2019	3.2413	60.4816	72.8142	0.1300	10.2998	2.7057	13.0055	5.3498	2.7037	8.0536	0.0000	12,730.6987	12,730.6987	3.7829	0.0000	12,810.1394
Total	**11.9622**	**195.7296**	**233.0481**	**0.4241**	**31.5226**	**8.5977**	**40.1203**	**16.2779**	**8.5839**	**24.8618**	**0.0000**	**41,925.2984**	**41,925.2984**	**11.5030**	**0.0000**	**42,166.8610**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**67.45**	**50.91**	**21.91**	**0.00**	**58.98**	**53.73**	**57.96**	**59.96**	**49.88**	**56.97**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	
9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2019	12/31/2019	6	104	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36
Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48
Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42

Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40
Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Earthwork 1	Pumps	1	8.00	1000	0.74
Earthwork 2	Pumps	1	8.00	1000	0.74

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806		890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**		**890.0494**	**890.0494**	**0.1159**		**892.4832**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806	0.0000	890.0494	890.0494	0.1159		892.4832

Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**890.0494**	**890.0494**	**0.1159**		**892.4832**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	12.4921	142.3947	99.7062	0.1200		6.9021	6.9021		6.3499	6.3499		12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**12.4921**	**142.3947**	**99.7062**	**0.1200**	**24.6392**	**6.9021**	**31.5413**	**13.3094**	**6.3499**	**19.6593**		**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4590	4.0680	5.0119	0.0114	0.3186	0.0597	0.3783	0.0909	0.0549	0.1458		1,125.8779	1,125.8779	8.3600e-003		1,126.0535
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.6178**	**4.2544**	**7.0351**	**0.0166**	**0.7294**	**0.0627**	**0.7921**	**0.1999**	**0.0577**	**0.2575**		**1,543.3866**	**1,543.3866**	**0.0285**		**1,543.9850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4590	4.0680	5.0119	0.0114	0.3186	0.0597	0.3783	0.0909	0.0549	0.1458		1,125.8779	1,125.8779	8.3600e-003		1,126.0535
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.6178**	**4.2544**	**7.0351**	**0.0166**	**0.7294**	**0.0627**	**0.7921**	**0.1999**	**0.0577**	**0.2575**		**1,543.3866**	**1,543.3866**	**0.0285**		**1,543.9850**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6392**	**5.8513**	**30.4904**	**13.3094**	**5.3832**	**18.6926**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6445	0.0000	24.6445	13.3101	0.0000	13.3101			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6445**	**5.8513**	**30.4957**	**13.3101**	**5.3832**	**18.6932**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6114	0.0000	9.6114	5.1909	0.0000	5.1909			0.0000			0.0000

Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6114**	**2.6813**	**12.2926**	**5.1909**	**2.6813**	**7.8722**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

3.12 Pond 15 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					25.0163	0.0000	25.0163	13.3411	0.0000	13.3411			0.0000			0.0000
Off-Road	10.1706	113.7167	84.2707	0.1200		5.2743	5.2743		4.8523	4.8523		11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**10.1706**	**113.7167**	**84.2707**	**0.1200**	**25.0163**	**5.2743**	**30.2906**	**13.3411**	**4.8523**	**18.1935**		**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.7564	0.0000	9.7564	5.2030	0.0000	5.2030			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	11,890.2535	11,890.2535	3.7620		11,969.2545
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.7564**	**2.6813**	**12.4376**	**5.2030**	**2.6813**	**7.8843**	**0.0000**	**11,890.2535**	**11,890.2535**	**3.7620**		**11,969.2545**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt C - Subtidal Conveyor Option - Annaul Equipment

San Diego Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	110.00	53.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	110.00	51.00
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	60.00	27.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00
tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00

tblGrading	MaterialExported	0.00	155,000.00
tblGrading	MaterialExported	0.00	155,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Dewatering Pond 15
tblOffRoadEquipment	PhaseName		Earthwork 1
tblOffRoadEquipment	PhaseName		Earthwork 2
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30

tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00

tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.5448	5.9030	4.4421	5.8500e-003	1.3426	0.2779	1.6205	0.7121	0.2561	0.9682	0.0000	530.4053	530.4053	0.1364	0.0000	533.2698
2018	0.7771	8.4051	6.4491	9.1800e-003	2.6353	0.3878	3.0231	1.4074	0.3567	1.7641	0.0000	825.8232	825.8232	0.2257	0.0000	830.5629
2019	0.5574	6.0597	4.7442	7.1200e-003	1.3492	0.2765	1.6257	0.7068	0.2544	0.9612	0.0000	628.5146	628.5146	0.1792	0.0000	632.2778
Total	**1.8793**	**20.3678**	**15.6353**	**0.0222**	**5.3271**	**0.9421**	**6.2693**	**2.8263**	**0.8672**	**3.6935**	**0.0000**	**1,984.7431**	**1,984.7431**	**0.5413**	**0.0000**	**1,996.1105**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Year	tons/yr										MT/yr					
2017	0.1722	2.6479	3.2535	5.8500e-003	0.5536	0.1133	0.6668	0.2859	0.1130	0.3989	0.0000	530.4048	530.4048	0.1364	0.0000	533.2693
2018	0.2526	4.1652	5.1465	9.1800e-003	1.0645	0.1801	1.2447	0.5589	0.1798	0.7387	0.0000	825.8223	825.8223	0.2257	0.0000	830.5620
2019	0.1813	3.2108	3.9621	7.1200e-003	0.5557	0.1417	0.6973	0.2836	0.1415	0.4251	0.0000	628.5140	628.5140	0.1792	0.0000	632.2771
Total	**0.6062**	**10.0239**	**12.3620**	**0.0222**	**2.1737**	**0.4351**	**2.6088**	**1.1285**	**0.4343**	**1.5627**	**0.0000**	**1,984.7411**	**1,984.7411**	**0.5413**	**0.0000**	**1,996.1084**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**67.75**	**50.79**	**20.94**	**0.00**	**59.20**	**53.82**	**58.39**	**60.07**	**49.92**	**57.69**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	
9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2019	12/31/2019	6	104	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36
Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48
Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42
Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38

Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40
Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Earthwork 1	Pumps	1	8.00	1000	0.74
Earthwork 2	Pumps	1	8.00	1000	0.74

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5200e-003	0.0463	0.0685	1.3000e-004	3.4500e-003	6.6000e-004	4.1100e-003	9.9000e-004	6.1000e-004	1.6000e-003	0.0000	11.2413	11.2413	8.0000e-005	0.0000	11.2431
Worker	4.1200e-003	5.4600e-003	0.0516	1.3000e-004	0.0106	8.0000e-005	0.0107	2.8200e-003	7.0000e-005	2.9000e-003	0.0000	9.5193	9.5193	4.8000e-004	0.0000	9.5294
Total	**9.6400e-003**	**0.0518**	**0.1201**	**2.6000e-004**	**0.0141**	**7.4000e-004**	**0.0148**	**3.8100e-003**	**6.8000e-004**	**4.5000e-003**	**0.0000**	**20.7606**	**20.7606**	**5.6000e-004**	**0.0000**	**20.7725**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5200e-003	0.0463	0.0685	1.3000e-004	3.4500e-003	6.6000e-004	4.1100e-003	9.9000e-004	6.1000e-004	1.6000e-003	0.0000	11.2413	11.2413	8.0000e-005	0.0000	11.2431
Worker	4.1200e-003	5.4600e-003	0.0516	1.3000e-004	0.0106	8.0000e-005	0.0107	2.8200e-003	7.0000e-005	2.9000e-003	0.0000	9.5193	9.5193	4.8000e-004	0.0000	9.5294
Total	**9.6400e-003**	**0.0518**	**0.1201**	**2.6000e-004**	**0.0141**	**7.4000e-004**	**0.0148**	**3.8100e-003**	**6.8000e-004**	**4.5000e-003**	**0.0000**	**20.7606**	**20.7606**	**5.6000e-004**	**0.0000**	**20.7725**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0176	0.1000	0.0542	1.5000e-004		5.1400e-003	5.1400e-003		5.1400e-003	5.1400e-003	0.0000	10.9004	10.9004	1.4200e-003	0.0000	10.9302
Total	**0.0176**	**0.1000**	**0.0542**	**1.5000e-004**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**10.9004**	**10.9004**	**1.4200e-003**	**0.0000**	**10.9302**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8100e-003	0.0236	0.0349	6.0000e-005	1.7600e-003	3.4000e-004	2.0900e-003	5.0000e-004	3.1000e-004	8.1000e-004	0.0000	5.7267	5.7267	4.0000e-005	0.0000	5.7276
Worker	2.1000e-003	2.7800e-003	0.0263	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4800e-003	0.0000	4.8494	4.8494	2.5000e-004	0.0000	4.8546
Total	**4.9100e-003**	**0.0264**	**0.0612**	**1.3000e-004**	**7.1700e-003**	**3.8000e-004**	**7.5400e-003**	**1.9400e-003**	**3.5000e-004**	**2.2900e-003**	**0.0000**	**10.5761**	**10.5761**	**2.9000e-004**	**0.0000**	**10.5822**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0176	0.1000	0.0542	1.5000e-004		5.1400e-003	5.1400e-003		5.1400e-003	5.1400e-003	0.0000	10.9004	10.9004	1.4200e-003	0.0000	10.9302
Total	**0.0176**	**0.1000**	**0.0542**	**1.5000e-004**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**10.9004**	**10.9004**	**1.4200e-003**	**0.0000**	**10.9302**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8100e-003	0.0236	0.0349	6.0000e-005	1.7600e-003	3.4000e-004	2.0900e-003	5.0000e-004	3.1000e-004	8.1000e-004	0.0000	5.7267	5.7267	4.0000e-005	0.0000	5.7276
Worker	2.1000e-003	2.7800e-003	0.0263	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4800e-003	0.0000	4.8494	4.8494	2.5000e-004	0.0000	4.8546
Total	**4.9100e-003**	**0.0264**	**0.0612**	**1.3000e-004**	**7.1700e-003**	**3.8000e-004**	**7.5400e-003**	**1.9400e-003**	**3.5000e-004**	**2.2900e-003**	**0.0000**	**10.5761**	**10.5761**	**2.9000e-004**	**0.0000**	**10.5822**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2936	0.0000	1.2936	0.6987	0.0000	0.6987	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4872	5.5534	3.8885	4.6800e-003		0.2692	0.2692		0.2477	0.2477	0.0000	434.4535	434.4535	0.1331	0.0000	437.2490
Total	**0.4872**	**5.5534**	**3.8885**	**4.6800e-003**	**1.2936**	**0.2692**	**1.5627**	**0.6987**	**0.2477**	**0.9464**	**0.0000**	**434.4535**	**434.4535**	**0.1331**	**0.0000**	**437.2490**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0195	0.1635	0.2421	4.4000e-004	0.0122	2.3400e-003	0.0145	3.4800e-003	2.1500e-003	5.6400e-003	0.0000	39.7051	39.7051	3.0000e-004	0.0000	39.7114
Worker	6.0600e-003	8.0300e-003	0.0759	1.9000e-004	0.0156	1.2000e-004	0.0158	4.1600e-003	1.1000e-004	4.2600e-003	0.0000	14.0095	14.0095	7.1000e-004	0.0000	14.0245
Total	**0.0256**	**0.1715**	**0.3180**	**6.3000e-004**	**0.0278**	**2.4600e-003**	**0.0303**	**7.6400e-003**	**2.2600e-003**	**9.9000e-003**	**0.0000**	**53.7146**	**53.7146**	**1.0100e-003**	**0.0000**	**53.7359**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5045	0.0000	0.5045	0.2725	0.0000	0.2725	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1146	2.2983	2.7000	4.6800e-003		0.1046	0.1046		0.1046	0.1046	0.0000	434.4530	434.4530	0.1331	0.0000	437.2485
Total	**0.1146**	**2.2983**	**2.7000**	**4.6800e-003**	**0.5045**	**0.1046**	**0.6091**	**0.2725**	**0.1046**	**0.3771**	**0.0000**	**434.4530**	**434.4530**	**0.1331**	**0.0000**	**437.2485**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0195	0.1635	0.2421	4.4000e-004	0.0122	2.3400e-003	0.0145	3.4800e-003	2.1500e-003	5.6400e-003	0.0000	39.7051	39.7051	3.0000e-004	0.0000	39.7114
Worker	6.0600e-003	8.0300e-003	0.0759	1.9000e-004	0.0156	1.2000e-004	0.0158	4.1600e-003	1.1000e-004	4.2600e-003	0.0000	14.0095	14.0095	7.1000e-004	0.0000	14.0245

Total	**0.0256**	**0.1715**	**0.3180**	**6.3000e-004**	**0.0278**	**2.4600e-003**	**0.0303**	**7.6400e-003**	**2.2600e-003**	**9.9000e-003**	**0.0000**	**53.7146**	**53.7146**	**1.0100e-003**	**0.0000**	**53.7359**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2936	0.0000	1.2936	0.6987	0.0000	0.6987	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1478	1.6694	1.2031	1.6200e-003		0.0790	0.0790		0.0727	0.0727	0.0000	148.0243	148.0243	0.0461	0.0000	148.9920
Total	**0.1478**	**1.6694**	**1.2031**	**1.6200e-003**	**1.2936**	**0.0790**	**1.3726**	**0.6987**	**0.0727**	**0.7714**	**0.0000**	**148.0243**	**148.0243**	**0.0461**	**0.0000**	**148.9920**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.3400e-003	0.0511	0.0801	1.5000e-004	4.2200e-003	7.5000e-004	4.9700e-003	1.2100e-003	6.9000e-004	1.9000e-003	0.0000	13.5080	13.5080	1.0000e-004	0.0000	13.5101
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**8.2500e-003**	**0.0536**	**0.1039**	**2.2000e-004**	**9.6300e-003**	**7.9000e-004**	**0.0104**	**2.6500e-003**	**7.3000e-004**	**3.3700e-003**	**0.0000**	**18.1753**	**18.1753**	**3.3000e-004**	**0.0000**	**18.1823**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5045	0.0000	0.5045	0.2725	0.0000	0.2725	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0397	0.7956	0.9346	1.6200e-003		0.0362	0.0362		0.0362	0.0362	0.0000	148.0241	148.0241	0.0461	0.0000	148.9918
Total	**0.0397**	**0.7956**	**0.9346**	**1.6200e-003**	**0.5045**	**0.0362**	**0.5407**	**0.2725**	**0.0362**	**0.3087**	**0.0000**	**148.0241**	**148.0241**	**0.0461**	**0.0000**	**148.9918**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.3400e-003	0.0511	0.0801	1.5000e-004	4.2200e-003	7.5000e-004	4.9700e-003	1.2100e-003	6.9000e-004	1.9000e-003	0.0000	13.5080	13.5080	1.0000e-004	0.0000	13.5101
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**8.2500e-003**	**0.0536**	**0.1039**	**2.2000e-004**	**9.6300e-003**	**7.9000e-004**	**0.0104**	**2.6500e-003**	**7.3000e-004**	**3.3700e-003**	**0.0000**	**18.1753**	**18.1753**	**3.3000e-004**	**0.0000**	**18.1823**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3500e-003	0.0189	0.0297	6.0000e-005	1.5600e-003	2.8000e-004	1.8400e-003	4.5000e-004	2.6000e-004	7.0000e-004	0.0000	5.0030	5.0030	4.0000e-005	0.0000	5.0037
Worker	1.6900e-003	2.2500e-003	0.0211	6.0000e-005	4.8100e-003	4.0000e-005	4.8500e-003	1.2800e-003	3.0000e-005	1.3100e-003	0.0000	4.1488	4.1488	2.0000e-004	0.0000	4.1530
Total	**4.0400e-003**	**0.0212**	**0.0508**	**1.2000e-004**	**6.3700e-003**	**3.2000e-004**	**6.6900e-003**	**1.7300e-003**	**2.9000e-004**	**2.0100e-003**	**0.0000**	**9.1517**	**9.1517**	**2.4000e-004**	**0.0000**	**9.1568**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3500e-003	0.0189	0.0297	6.0000e-005	1.5600e-003	2.8000e-004	1.8400e-003	4.5000e-004	2.6000e-004	7.0000e-004	0.0000	5.0030	5.0030	4.0000e-005	0.0000	5.0037
Worker	1.6900e-003	2.2500e-003	0.0211	6.0000e-005	4.8100e-003	4.0000e-005	4.8500e-003	1.2800e-003	3.0000e-005	1.3100e-003	0.0000	4.1488	4.1488	2.0000e-004	0.0000	4.1530
Total	**4.0400e-003**	**0.0212**	**0.0508**	**1.2000e-004**	**6.3700e-003**	**3.2000e-004**	**6.6900e-003**	**1.7300e-003**	**2.9000e-004**	**2.0100e-003**	**0.0000**	**9.1517**	**9.1517**	**2.4000e-004**	**0.0000**	**9.1568**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0116					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0116**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0116					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0116**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6400e-003	0.0213	0.0334	6.0000e-005	1.7600e-003	3.1000e-004	2.0700e-003	5.0000e-004	2.9000e-004	7.9000e-004	0.0000	5.6283	5.6283	4.0000e-005	0.0000	5.6292
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**4.5500e-003**	**0.0238**	**0.0572**	**1.3000e-004**	**7.1700e-003**	**3.5000e-004**	**7.5200e-003**	**1.9400e-003**	**3.3000e-004**	**2.2600e-003**	**0.0000**	**10.2957**	**10.2957**	**2.7000e-004**	**0.0000**	**10.3014**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6400e-003	0.0213	0.0334	6.0000e-005	1.7600e-003	3.1000e-004	2.0700e-003	5.0000e-004	2.9000e-004	7.9000e-004	0.0000	5.6283	5.6283	4.0000e-005	0.0000	5.6292
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**4.5500e-003**	**0.0238**	**0.0572**	**1.3000e-004**	**7.1700e-003**	**3.5000e-004**	**7.5200e-003**	**1.9400e-003**	**3.3000e-004**	**2.2600e-003**	**0.0000**	**10.2957**	**10.2957**	**2.7000e-004**	**0.0000**	**10.3014**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Fugitive Dust					1.2815	0.0000	1.2815	0.6921	0.0000	0.6921	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.5692	6.4305	4.6341	6.2400e-003		0.3043	0.3043		0.2799	0.2799	0.0000	570.1676	570.1676	0.1775	0.0000	573.8951
Total	**0.5692**	**6.4305**	**4.6341**	**6.2400e-003**	**1.2815**	**0.3043**	**1.5858**	**0.6921**	**0.2799**	**0.9720**	**0.0000**	**570.1676**	**570.1676**	**0.1775**	**0.0000**	**573.8951**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0244	0.1968	0.3086	5.9000e-004	0.0162	2.9000e-003	0.0191	4.6400e-003	2.6600e-003	7.3100e-003	0.0000	52.0307	52.0307	3.9000e-004	0.0000	52.0389
Worker	7.3400e-003	9.7700e-003	0.0916	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.9779	17.9779	8.8000e-004	0.0000	17.9965
Total	**0.0317**	**0.2066**	**0.4001**	**8.5000e-004**	**0.0371**	**3.0500e-003**	**0.0401**	**0.0102**	**2.8000e-003**	**0.0130**	**0.0000**	**70.0086**	**70.0086**	**1.2700e-003**	**0.0000**	**70.0354**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4998	0.0000	0.4998	0.2699	0.0000	0.2699	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1528	3.0644	3.5999	6.2400e-003		0.1394	0.1394		0.1394	0.1394	0.0000	570.1669	570.1669	0.1775	0.0000	573.8945
Total	**0.1528**	**3.0644**	**3.5999**	**6.2400e-003**	**0.4998**	**0.1394**	**0.6392**	**0.2699**	**0.1394**	**0.4094**	**0.0000**	**570.1669**	**570.1669**	**0.1775**	**0.0000**	**573.8945**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0244	0.1968	0.3086	5.9000e-004	0.0162	2.9000e-003	0.0191	4.6400e-003	2.6600e-003	7.3100e-003	0.0000	52.0307	52.0307	3.9000e-004	0.0000	52.0389
Worker	7.3400e-003	9.7700e-003	0.0916	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.9779	17.9779	8.8000e-004	0.0000	17.9965
Total	**0.0317**	**0.2066**	**0.4001**	**8.5000e-004**	**0.0371**	**3.0500e-003**	**0.0401**	**0.0102**	**2.8000e-003**	**0.0130**	**0.0000**	**70.0086**	**70.0086**	**1.2700e-003**	**0.0000**	**70.0354**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.6600e-003	0.0366	0.0602	1.2000e-004	3.3200e-003	5.5000e-004	3.8700e-003	9.5000e-004	5.1000e-004	1.4500e-003	0.0000	10.4481	10.4481	8.0000e-005	0.0000	10.4497
Worker	3.3400e-003	4.4300e-003	0.0413	1.3000e-004	0.0102	7.0000e-005	0.0103	2.7200e-003	7.0000e-005	2.7900e-003	0.0000	8.4972	8.4972	4.1000e-004	0.0000	8.5057
Total	**8.0000e-003**	**0.0410**	**0.1015**	**2.5000e-004**	**0.0135**	**6.2000e-004**	**0.0142**	**3.6700e-003**	**5.8000e-004**	**4.2400e-003**	**0.0000**	**18.9452**	**18.9452**	**4.9000e-004**	**0.0000**	**18.9554**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.6600e-003	0.0366	0.0602	1.2000e-004	3.3200e-003	5.5000e-004	3.8700e-003	9.5000e-004	5.1000e-004	1.4500e-003	0.0000	10.4481	10.4481	8.0000e-005	0.0000	10.4497
Worker	3.3400e-003	4.4300e-003	0.0413	1.3000e-004	0.0102	7.0000e-005	0.0103	2.7200e-003	7.0000e-005	2.7900e-003	0.0000	8.4972	8.4972	4.1000e-004	0.0000	8.5057

Total	**8.0000e-003**	**0.0410**	**0.1015**	**2.5000e-004**	**0.0135**	**6.2000e-004**	**0.0142**	**3.6700e-003**	**5.8000e-004**	**4.2400e-003**	**0.0000**	**18.9452**	**18.9452**	**4.9000e-004**	**0.0000**	**18.9554**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4700e-003	0.0194	0.0319	6.0000e-005	1.7600e-003	2.9000e-004	2.0500e-003	5.0000e-004	2.7000e-004	7.7000e-004	0.0000	5.5313	5.5313	4.0000e-005	0.0000	5.5322
Worker	1.7700e-003	2.3400e-003	0.0219	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.4985	4.4985	2.2000e-004	0.0000	4.5030
Total	**4.2400e-003**	**0.0217**	**0.0537**	**1.3000e-004**	**7.1700e-003**	**3.3000e-004**	**7.5000e-003**	**1.9400e-003**	**3.1000e-004**	**2.2400e-003**	**0.0000**	**10.0298**	**10.0298**	**2.6000e-004**	**0.0000**	**10.0352**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4700e-003	0.0194	0.0319	6.0000e-005	1.7600e-003	2.9000e-004	2.0500e-003	5.0000e-004	2.7000e-004	7.7000e-004	0.0000	5.5313	5.5313	4.0000e-005	0.0000	5.5322
Worker	1.7700e-003	2.3400e-003	0.0219	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.4985	4.4985	2.2000e-004	0.0000	4.5030
Total	**4.2400e-003**	**0.0217**	**0.0537**	**1.3000e-004**	**7.1700e-003**	**3.3000e-004**	**7.5000e-003**	**1.9400e-003**	**3.1000e-004**	**2.2400e-003**	**0.0000**	**10.0298**	**10.0298**	**2.6000e-004**	**0.0000**	**10.0352**

3.12 Pond 15 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.3009	0.0000	1.3009	0.6937	0.0000	0.6937	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.5289	5.9133	4.3821	6.2400e-003		0.2743	0.2743		0.2523	0.2523	0.0000	560.9061	560.9061	0.1775	0.0000	564.6329
Total	**0.5289**	**5.9133**	**4.3821**	**6.2400e-003**	**1.3009**	**0.2743**	**1.5751**	**0.6937**	**0.2523**	**0.9461**	**0.0000**	**560.9061**	**560.9061**	**0.1775**	**0.0000**	**564.6329**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.5000e-003	0.0746	0.1227	2.5000e-004	6.7600e-003	1.1200e-003	7.8900e-003	1.9400e-003	1.0300e-003	2.9700e-003	0.0000	21.3059	21.3059	1.6000e-004	0.0000	21.3092
Worker	6.8100e-003	9.0300e-003	0.0842	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.3275	17.3275	8.3000e-004	0.0000	17.3450
Total	**0.0163**	**0.0837**	**0.2069**	**5.1000e-004**	**0.0276**	**1.2700e-003**	**0.0289**	**7.4800e-003**	**1.1700e-003**	**8.6500e-003**	**0.0000**	**38.6334**	**38.6334**	**9.9000e-004**	**0.0000**	**38.6542**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5073	0.0000	0.5073	0.2706	0.0000	0.2706	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1528	3.0644	3.5999	6.2400e-003		0.1394	0.1394		0.1394	0.1394	0.0000	560.9055	560.9055	0.1775	0.0000	564.6322
Total	**0.1528**	**3.0644**	**3.5999**	**6.2400e-003**	**0.5073**	**0.1394**	**0.6468**	**0.2706**	**0.1394**	**0.4100**	**0.0000**	**560.9055**	**560.9055**	**0.1775**	**0.0000**	**564.6322**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.5000e-003	0.0746	0.1227	2.5000e-004	6.7600e-003	1.1200e-003	7.8900e-003	1.9400e-003	1.0300e-003	2.9700e-003	0.0000	21.3059	21.3059	1.6000e-004	0.0000	21.3092
Worker	6.8100e-003	9.0300e-003	0.0842	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.3275	17.3275	8.3000e-004	0.0000	17.3450

Total	0.0163	0.0837	0.2069	5.1000e-004	0.0276	1.2700e-003	0.0289	7.4800e-003	1.1700e-003	8.6500e-003	0.0000	38.6334	38.6334	9.9000e-004	0.0000	38.6542

ORERP - Alt C - Subtidal Pipeline Option - Generator Only

San Diego Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	542.77	**CH4 Intensity (lb/MWhr)**	0.022	**N2O Intensity (lb/MWhr)**	0.005

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Intensity factor adjusted for 32.2% RPS for 2014 SDG&E

Table Name	Column Name	Default Value	New Value
tblEnergyUse	LightingElect	3.25	0.00
tblEnergyUse	NT24E	4.27	5,605.40
tblEnergyUse	NT24NG	7.25	0.00
tblEnergyUse	T24E	1.48	0.00
tblEnergyUse	T24NG	4.54	0.00
tblLandUse	LotAcreage	0.02	91.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.022
tblProjectCharacteristics	CO2IntensityFactor	720.49	542.77

tblProjectCharacteristics	N2OIntensityFactor	0.006	0.005
tblProjectCharacteristics	OperationalYear	2014	2020

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	5.6054e+006	1,380.0289	0.0559	0.0127	1,385.1446
Total		**1,380.0289**	**0.0559**	**0.0127**	**1,385.1446**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	5.6054e+006	1,380.0289	0.0559	0.0127	1,385.1446
Total		**1,380.0289**	**0.0559**	**0.0127**	**1,385.1446**

ORERP - Alt C - Subtidal Pipeline Option

San Diego Air Basin, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	110.00	53.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	110.00	51.00
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	60.00	27.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	1/1/2020	12/31/2020
tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	9/1/2019	9/1/2020
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00

tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00
tblGrading	MaterialExported	0.00	155,000.00
tblGrading	MaterialExported	0.00	155,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Dewatering Pond 15
tblOffRoadEquipment	PhaseName		Earthwork 1
tblOffRoadEquipment	PhaseName		Earthwork 2
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30

tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00

tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	14.8775	156.1189	117.2760	0.1568	25.9120	7.3741	33.2861	13.6561	6.8146	20.4707	0.0000	15,536.4892	15,536.4892	3.9308	0.0000	15,619.0353
2018	11.5939	127.6131	97.3993	0.1363	25.3738	5.9102	31.2840	13.5099	5.4374	18.9473	0.0000	13,561.9426	13,561.9426	3.7899	0.0000	13,641.5300
2019	0.3344	1.6018	4.2190	9.5900e-003	0.5435	0.0246	0.5681	0.1468	0.0227	0.1695	0.0000	813.3120	813.3120	0.0210	0.0000	813.7539
2020	9.7480	105.0507	83.3542	0.1296	25.3215	4.7553	30.0768	13.3609	4.3749	17.7358	0.0000	12,418.9157	12,418.9157	3.7816	0.0000	12,498.3299
Total	**36.5538**	**390.3845**	**302.2484**	**0.4323**	**77.1508**	**18.0642**	**95.2149**	**40.6736**	**16.6495**	**57.3231**	**0.0000**	**42,330.6595**	**42,330.6595**	**11.5233**	**0.0000**	**42,572.6490**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	5.3236	72.6548	86.7995	0.1568	10.8821	3.1533	14.0354	5.5373	3.1460	8.6833	0.0000	15,536.4892	15,536.4892	3.9308	0.0000	15,619.0353
2018	3.5869	62.8812	77.5126	0.1363	10.3407	2.7402	13.0809	5.3908	2.7355	8.1263	0.0000	13,561.9426	13,561.9426	3.7899	0.0000	13,641.5299
2019	0.3344	1.6018	4.2190	9.5900e-003	0.5435	0.0246	0.5681	0.1468	0.0227	0.1695	0.0000	813.3120	813.3120	0.0210	0.0000	813.7539
2020	3.2541	60.3091	73.2561	0.1296	10.2069	2.7036	12.9105	5.3003	2.7019	8.0021	0.0000	12,418.9157	12,418.9157	3.7816	0.0000	12,498.3299
Total	**12.4989**	**197.4469**	**241.7872**	**0.4323**	**31.9731**	**8.6217**	**40.5948**	**16.3752**	**8.6059**	**24.9811**	**0.0000**	**42,330.6595**	**42,330.6595**	**11.5233**	**0.0000**	**42,572.6490**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**65.81**	**49.42**	**20.00**	**0.00**	**58.56**	**52.27**	**57.37**	**59.74**	**48.31**	**56.42**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	

9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2020	12/31/2020	6	105	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36
Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48

Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42
Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40
Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Earthwork 1	Pumps	1	8.00	1000	0.74
Earthwork 2	Pumps	1	8.00	1000	0.74

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT

Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806		890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**		**890.0494**	**890.0494**	**0.1159**		**892.4832**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806	0.0000	890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**890.0494**	**890.0494**	**0.1159**		**892.4832**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2205	1.7351	2.8360	4.7300e-003	0.1328	0.0251	0.1579	0.0379	0.0231	0.0610		465.5077	465.5077	3.5800e-003		465.5829
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.3884**	**1.9443**	**4.7919**	**9.6100e-003**	**0.5435**	**0.0281**	**0.5716**	**0.1468**	**0.0259**	**0.1727**		**857.5818**	**857.5818**	**0.0237**		**858.0797**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	12.4921	142.3947	99.7062	0.1200		6.9021	6.9021		6.3499	6.3499		12,279.5654	12,279.5654	3.7624		12,358.5766

Total	**12.4921**	**142.3947**	**99.7062**	**0.1200**	**24.6392**	**6.9021**	**31.5413**	**13.3094**	**6.3499**	**19.6593**		**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5293	4.1644	6.8064	0.0113	0.3186	0.0603	0.3789	0.0909	0.0555	0.1464		1,117.2186	1,117.2186	8.5900e-003		1,117.3990
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.6972**	**4.3735**	**8.7623**	**0.0162**	**0.7294**	**0.0633**	**0.7927**	**0.1999**	**0.0582**	**0.2581**		**1,509.2926**	**1,509.2926**	**0.0287**		**1,509.8958**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5293	4.1644	6.8064	0.0113	0.3186	0.0603	0.3789	0.0909	0.0555	0.1464		1,117.2186	1,117.2186	8.5900e-003		1,117.3990
Worker	0.1679	0.2092	1.9559	4.8800e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		392.0741	392.0741	0.0201		392.4968
Total	**0.6972**	**4.3735**	**8.7623**	**0.0162**	**0.7294**	**0.0633**	**0.7927**	**0.1999**	**0.0582**	**0.2581**		**1,509.2926**	**1,509.2926**	**0.0287**		**1,509.8958**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6392**	**5.8513**	**30.4904**	**13.3094**	**5.3832**	**18.6926**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000

Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2068	1.5666	2.7153	4.7200e-003	0.1327	0.0233	0.1561	0.0379	0.0215	0.0593		457.5056	457.5056	3.5100e-003		457.5794
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.3593**	**1.7574**	**4.4816**	**9.6000e-003**	**0.5435**	**0.0263**	**0.5697**	**0.1468**	**0.0242**	**0.1710**		**834.8536**	**834.8536**	**0.0222**		**835.3206**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6445	0.0000	24.6445	13.3101	0.0000	13.3101			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6445**	**5.8513**	**30.4957**	**13.3101**	**5.3832**	**18.6932**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6114	0.0000	9.6114	5.1909	0.0000	5.1909			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6114**	**2.6813**	**12.2926**	**5.1909**	**2.6813**	**7.8722**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4962	3.7598	6.5166	0.0113	0.3186	0.0560	0.3746	0.0909	0.0515	0.1424		1,098.0135	1,098.0135	8.4300e-003		1,098.1906
Worker	0.1525	0.1909	1.7664	4.8800e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		377.3479	377.3479	0.0187		377.7412
Total	**0.6488**	**3.9506**	**8.2830**	**0.0162**	**0.7293**	**0.0589**	**0.7883**	**0.1998**	**0.0542**	**0.2541**		**1,475.3615**	**1,475.3615**	**0.0272**		**1,475.9318**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1928	1.4255	2.5961	4.7100e-003	0.1327	0.0217	0.1544	0.0379	0.0200	0.0578		449.6180	449.6180	3.4300e-003		449.6900
Worker	0.1416	0.1764	1.6229	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		363.6940	363.6940	0.0176		364.0639
Total	**0.3344**	**1.6018**	**4.2190**	**9.5900e-003**	**0.5435**	**0.0246**	**0.5681**	**0.1468**	**0.0227**	**0.1695**		**813.3120**	**813.3120**	**0.0210**		**813.7539**

3.12 Pond 15 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.7780	0.0000	24.7780	13.2141	0.0000	13.2141			0.0000			0.0000

Off-Road	9.4321	103.6722	79.3277	0.1201		4.7330	4.7330		4.3543	4.3543		11,630.5497	11,630.5497	3.7616		11,709.5424
Total	**9.4321**	**103.6722**	**79.3277**	**0.1201**	**24.7780**	**4.7330**	**29.5110**	**13.2141**	**4.3543**	**17.5684**		**11,630.5497**	**11,630.5497**	**3.7616**		**11,709.5424**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1821	1.2138	2.5106	4.7000e-003	0.1327	0.0194	0.1522	0.0379	0.0179	0.0557		439.3301	439.3301	3.3200e-003		439.3999
Worker	0.1339	0.1648	1.5159	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1117		349.0359	349.0359	0.0168		349.3876
Total	**0.3159**	**1.3785**	**4.0264**	**9.5800e-003**	**0.5435**	**0.0223**	**0.5658**	**0.1468**	**0.0206**	**0.1674**		**788.3660**	**788.3660**	**0.0201**		**788.7875**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6634	0.0000	9.6634	5.1535	0.0000	5.1535			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	11,630.5497	11,630.5497	3.7616		11,709.5424
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6634**	**2.6813**	**12.3447**	**5.1535**	**2.6813**	**7.8348**	**0.0000**	**11,630.5497**	**11,630.5497**	**3.7616**		**11,709.5424**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1821	1.2138	2.5106	4.7000e-003	0.1327	0.0194	0.1522	0.0379	0.0179	0.0557		439.3301	439.3301	3.3200e-003		439.3999
Worker	0.1339	0.1648	1.5159	4.8800e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1117		349.0359	349.0359	0.0168		349.3876
Total	**0.3159**	**1.3785**	**4.0264**	**9.5800e-003**	**0.5435**	**0.0223**	**0.5658**	**0.1468**	**0.0206**	**0.1674**		**788.3660**	**788.3660**	**0.0201**		**788.7875**

CalEEMod Version: CalEEMod.2013.2.2

ORERP - Alt C - Subtidal Pipeline Option

San Diego Air Basin, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	110.00	53.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	110.00	51.00
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	60.00	27.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	1/1/2020	12/31/2020
tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	9/1/2019	9/1/2020
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00

tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00
tblGrading	MaterialExported	0.00	155,000.00
tblGrading	MaterialExported	0.00	155,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Dewatering Pond 15
tblOffRoadEquipment	PhaseName		Earthwork 1
tblOffRoadEquipment	PhaseName		Earthwork 2
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30

tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00

tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	14.7599	155.9369	114.8683	0.1575	25.9120	7.3732	33.2852	13.6561	6.8138	20.4699	0.0000	15,599.6259	15,599.6259	3.9304	0.0000	15,682.1652
2018	11.5220	127.5071	95.7287	0.1366	25.3738	5.9096	31.2834	13.5099	5.4369	18.9468	0.0000	13,594.9739	13,594.9739	3.7896	0.0000	13,674.5563
2019	0.3032	1.5510	3.5846	9.9400e-003	0.5435	0.0244	0.5679	0.1468	0.0225	0.1693	0.0000	840.4452	840.4452	0.0209	0.0000	840.8850
2020	9.7190	105.0066	82.7358	0.1300	25.3215	4.7551	30.0766	13.3609	4.3747	17.7356	0.0000	12,445.0445	12,445.0445	3.7815	0.0000	12,524.4565
Total	**36.3040**	**390.0017**	**296.9173**	**0.4341**	**77.1508**	**18.0624**	**95.2131**	**40.6736**	**16.6479**	**57.3215**	**0.0000**	**42,480.0894**	**42,480.0894**	**11.5226**	**0.0000**	**42,722.0630**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2017	5.2060	72.4728	84.3918	0.1575	10.8821	3.1524	14.0345	5.5373	3.1452	8.6825	0.0000	15,599.6259	15,599.6259	3.9304	0.0000	15,682.1652
2018	3.5150	62.7752	75.8420	0.1366	10.3407	2.7397	13.0803	5.3908	2.7350	8.1257	0.0000	13,594.9739	13,594.9739	3.7896	0.0000	13,674.5563
2019	0.3032	1.5510	3.5846	9.9400e-003	0.5435	0.0244	0.5679	0.1468	0.0225	0.1693	0.0000	840.4452	840.4452	0.0209	0.0000	840.8850
2020	3.2250	60.2650	72.6377	0.1300	10.2069	2.7034	12.9103	5.3003	2.7017	8.0020	0.0000	12,445.0445	12,445.0445	3.7815	0.0000	12,524.4565
Total	**12.2491**	**197.0641**	**236.4561**	**0.4341**	**31.9731**	**8.6199**	**40.5930**	**16.3752**	**8.6043**	**24.9795**	**0.0000**	**42,480.0893**	**42,480.0893**	**11.5226**	**0.0000**	**42,722.0630**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**66.26**	**49.47**	**20.36**	**0.00**	**58.56**	**52.28**	**57.37**	**59.74**	**48.32**	**56.42**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	

9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2020	12/31/2020	6	105	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36
Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48

Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42
Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40
Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Earthwork 1	Pumps	1	8.00	1000	0.74
Earthwork 2	Pumps	1	8.00	1000	0.74

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT

Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806		890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**		**890.0494**	**890.0494**	**0.1159**		**892.4832**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	1.2999	7.4064	4.0156	0.0110		0.3806	0.3806		0.3806	0.3806	0.0000	890.0494	890.0494	0.1159		892.4832
Total	**1.2999**	**7.4064**	**4.0156**	**0.0110**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**0.3806**	**0.3806**	**0.0000**	**890.0494**	**890.0494**	**0.1159**		**892.4832**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1912	1.6950	2.0883	4.7500e-003	0.1328	0.0249	0.1576	0.0379	0.0229	0.0608		469.1158	469.1158	3.4900e-003		469.1890
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.3501**	**1.8814**	**4.1115**	**9.9500e-003**	**0.5435**	**0.0279**	**0.5714**	**0.1468**	**0.0256**	**0.1725**		**886.6245**	**886.6245**	**0.0236**		**887.1204**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	12.4921	142.3947	99.7062	0.1200		6.9021	6.9021		6.3499	6.3499		12,279.5654	12,279.5654	3.7624		12,358.5766

Total	**12.4921**	**142.3947**	**99.7062**	**0.1200**	**24.6392**	**6.9021**	**31.5413**	**13.3094**	**6.3499**	**19.6593**		**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4590	4.0680	5.0119	0.0114	0.3186	0.0597	0.3783	0.0909	0.0549	0.1458		1,125.8779	1,125.8779	8.3600e-003		1,126.0535
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.6178**	**4.2544**	**7.0351**	**0.0166**	**0.7294**	**0.0627**	**0.7921**	**0.1999**	**0.0577**	**0.2575**		**1,543.3866**	**1,543.3866**	**0.0285**		**1,543.9850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1200		2.6813	2.6813		2.6813	2.6813	0.0000	12,279.5654	12,279.5654	3.7624		12,358.5766
Total	**2.9381**	**58.9306**	**69.2297**	**0.1200**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,279.5654**	**12,279.5654**	**3.7624**		**12,358.5766**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4590	4.0680	5.0119	0.0114	0.3186	0.0597	0.3783	0.0909	0.0549	0.1458		1,125.8779	1,125.8779	8.3600e-003		1,126.0535
Worker	0.1589	0.1864	2.0232	5.2000e-003	0.4107	2.9900e-003	0.4137	0.1090	2.7600e-003	0.1117		417.5087	417.5087	0.0201		417.9315
Total	**0.6178**	**4.2544**	**7.0351**	**0.0166**	**0.7294**	**0.0627**	**0.7921**	**0.1999**	**0.0577**	**0.2575**		**1,543.3866**	**1,543.3866**	**0.0285**		**1,543.9850**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6392	0.0000	24.6392	13.3094	0.0000	13.3094			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6392**	**5.8513**	**30.4904**	**13.3094**	**5.3832**	**18.6926**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6093	0.0000	9.6093	5.1907	0.0000	5.1907			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6093**	**2.6813**	**12.2906**	**5.1907**	**2.6813**	**7.8719**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000

Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.1769					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Total	**0.1769**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1800	1.5311	1.9899	4.7400e-003	0.1327	0.0231	0.1558	0.0379	0.0213	0.0591		461.0603	461.0603	3.4200e-003		461.1320
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.3248**	**1.7012**	**3.8264**	**9.9400e-003**	**0.5435**	**0.0260**	**0.5695**	**0.1468**	**0.0240**	**0.1708**		**862.9084**	**862.9084**	**0.0222**		**863.3734**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.6445	0.0000	24.6445	13.3101	0.0000	13.3101			0.0000			0.0000
Off-Road	10.9451	123.6625	89.1163	0.1201		5.8513	5.8513		5.3832	5.3832		12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**10.9451**	**123.6625**	**89.1163**	**0.1201**	**24.6445**	**5.8513**	**30.4957**	**13.3101**	**5.3832**	**18.6932**		**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6114	0.0000	9.6114	5.1909	0.0000	5.1909			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	12,086.5811	12,086.5811	3.7627		12,165.5982
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6114**	**2.6813**	**12.2926**	**5.1909**	**2.6813**	**7.8722**	**0.0000**	**12,086.5811**	**12,086.5811**	**3.7627**		**12,165.5982**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4320	3.6745	4.7758	0.0114	0.3186	0.0555	0.3740	0.0909	0.0510	0.1419		1,106.5446	1,106.5446	8.2000e-003		1,106.7168
Worker	0.1448	0.1701	1.8365	5.2000e-003	0.4107	2.9300e-003	0.4137	0.1090	2.7100e-003	0.1117		401.8481	401.8481	0.0187		402.2414
Total	**0.5769**	**3.8446**	**6.6123**	**0.0166**	**0.7293**	**0.0584**	**0.7877**	**0.1998**	**0.0537**	**0.2536**		**1,508.3927**	**1,508.3927**	**0.0269**		**1,508.9581**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1686	1.3939	1.8908	4.7400e-003	0.1327	0.0215	0.1542	0.0379	0.0198	0.0576		453.1189	453.1189	3.3300e-003		453.1889
Worker	0.1346	0.1572	1.6937	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1116		387.3262	387.3262	0.0176		387.6961
Total	**0.3032**	**1.5511**	**3.5846**	**9.9400e-003**	**0.5435**	**0.0244**	**0.5679**	**0.1468**	**0.0225**	**0.1693**		**840.4451**	**840.4451**	**0.0209**		**840.8850**

3.12 Pond 15 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.7780	0.0000	24.7780	13.2141	0.0000	13.2141			0.0000			0.0000

Off-Road	9.4321	103.6722	79.3277	0.1201		4.7330	4.7330		4.3543	4.3543		11,630.5497	11,630.5497	3.7616		11,709.5424
Total	**9.4321**	**103.6722**	**79.3277**	**0.1201**	**24.7780**	**4.7330**	**29.5110**	**13.2141**	**4.3543**	**17.5684**		**11,630.5497**	**11,630.5497**	**3.7616**		**11,709.5424**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1595	1.1875	1.8225	4.7300e-003	0.1327	0.0193	0.1520	0.0379	0.0177	0.0556		442.7617	442.7617	3.2200e-003		442.8294
Worker	0.1274	0.1469	1.5856	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1117		371.7330	371.7330	0.0168		372.0848
Total	**0.2869**	**1.3345**	**3.4081**	**9.9300e-003**	**0.5435**	**0.0222**	**0.5656**	**0.1468**	**0.0204**	**0.1672**		**814.4948**	**814.4948**	**0.0200**		**814.9141**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.6634	0.0000	9.6634	5.1535	0.0000	5.1535			0.0000			0.0000
Off-Road	2.9381	58.9306	69.2297	0.1201		2.6813	2.6813		2.6813	2.6813	0.0000	11,630.5497	11,630.5497	3.7616		11,709.5424
Total	**2.9381**	**58.9306**	**69.2297**	**0.1201**	**9.6634**	**2.6813**	**12.3447**	**5.1535**	**2.6813**	**7.8348**	**0.0000**	**11,630.5497**	**11,630.5497**	**3.7616**		**11,709.5424**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1595	1.1875	1.8225	4.7300e-003	0.1327	0.0193	0.1520	0.0379	0.0177	0.0556		442.7617	442.7617	3.2200e-003		442.8294
Worker	0.1274	0.1469	1.5856	5.2000e-003	0.4107	2.9100e-003	0.4137	0.1090	2.7000e-003	0.1117		371.7330	371.7330	0.0168		372.0848
Total	**0.2869**	**1.3345**	**3.4081**	**9.9300e-003**	**0.5435**	**0.0222**	**0.5656**	**0.1468**	**0.0204**	**0.1672**		**814.4948**	**814.4948**	**0.0200**		**814.9141**

ORERP - Alt C - Subtidal Pipeline Option - Annual Equipment

San Diego Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	720.49	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - per EIS

Land Use - per EIS

Construction Phase - provided by Everest 2016

Off-road Equipment - provided by Everest 2016

Trips and VMT - provided by Everest 2016

Grading Quantities - provided by Everest 2016

Construction Off-road Equipment Mitigation - water 3x per day

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	12.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	24.00

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	105.00
tblConstructionPhase	NumDays	155.00	104.00
tblConstructionPhase	NumDays	110.00	53.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	110.00	51.00
tblConstructionPhase	NumDays	110.00	131.00
tblConstructionPhase	NumDays	110.00	27.00
tblConstructionPhase	NumDays	60.00	27.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	1/1/2020	12/31/2020
tblConstructionPhase	PhaseEndDate	3/3/2018	1/31/2018
tblConstructionPhase	PhaseStartDate	9/1/2019	9/1/2020
tblConstructionPhase	PhaseStartDate	11/2/2017	10/1/2017
tblGrading	AcresOfGrading	416.00	91.00

tblGrading	AcresOfGrading	420.00	34.00
tblGrading	AcresOfGrading	416.00	34.00
tblGrading	MaterialExported	0.00	155,000.00
tblGrading	MaterialExported	0.00	155,000.00
tblLandUse	LotAcreage	0.02	91.00
tblOffRoadEquipment	HorsePower	84.00	20.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	HorsePower	84.00	1,000.00
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentType		Pumps
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	8.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	0.00	1.00
tblOffRoadEquipment	PhaseName		Dewatering Pond 15
tblOffRoadEquipment	PhaseName		Earthwork 1
tblOffRoadEquipment	PhaseName		Earthwork 2
tblProjectCharacteristics	OperationalYear	2014	2020
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripLength	20.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	HaulingTripNumber	16,250.00	0.00
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30

tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripLength	6.60	7.30
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	48.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	VendorTripNumber	0.00	20.00
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripLength	16.80	10.80
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00

tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	40.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	0.00	50.00
tblTripsAndVMT	WorkerTripNumber	15.00	50.00
tblVehicleTrips	CC_TL	6.60	7.30
tblVehicleTrips	CNW_TL	6.60	7.30
tblVehicleTrips	CW_TL	14.70	9.50

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.5448	5.9030	4.4421	5.8500e-003	1.3426	0.2779	1.6205	0.7121	0.2561	0.9682	0.0000	530.4053	530.4053	0.1364	0.0000	533.2698
2018	0.7771	8.4051	6.4491	9.1800e-003	2.6353	0.3878	3.0231	1.4074	0.3567	1.7641	0.0000	825.8232	825.8232	0.2257	0.0000	830.5629
2019	0.0122	0.0628	0.1552	3.8000e-004	0.0207	9.5000e-004	0.0217	5.6100e-003	8.8000e-004	6.4900e-003	0.0000	28.9751	28.9751	7.4000e-004	0.0000	28.9907
2020	0.5108	5.5155	4.3638	6.8100e-003	1.3287	0.2497	1.5784	0.7013	0.2297	0.9310	0.0000	591.7386	591.7386	0.1801	0.0000	595.5208
Total	**1.8449**	**19.8864**	**15.4102**	**0.0222**	**5.3274**	**0.9163**	**6.2436**	**2.8264**	**0.8434**	**3.6698**	**0.0000**	**1,976.9421**	**1,976.9421**	**0.5430**	**0.0000**	**1,988.3441**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2017	0.1722	2.6479	3.2535	5.8500e-003	0.5536	0.1133	0.6668	0.2859	0.1130	0.3989	0.0000	530.4048	530.4048	0.1364	0.0000	533.2693
2018	0.2526	4.1652	5.1465	9.1800e-003	1.0645	0.1801	1.2447	0.5589	0.1798	0.7387	0.0000	825.8223	825.8223	0.2257	0.0000	830.5620
2019	0.0122	0.0628	0.1552	3.8000e-004	0.0207	9.5000e-004	0.0217	5.6100e-003	8.8000e-004	6.4900e-003	0.0000	28.9751	28.9751	7.4000e-004	0.0000	28.9907
2020	0.1698	3.1665	3.8337	6.8100e-003	0.5352	0.1419	0.6771	0.2781	0.1418	0.4200	0.0000	591.7379	591.7379	0.1801	0.0000	595.5201
Total	**0.6069**	**10.0424**	**12.3888**	**0.0222**	**2.1740**	**0.4363**	**2.6103**	**1.1285**	**0.4355**	**1.5640**	**0.0000**	**1,976.9400**	**1,976.9400**	**0.5430**	**0.0000**	**1,988.3421**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**67.10**	**49.50**	**19.61**	**0.00**	**59.19**	**52.38**	**58.19**	**60.07**	**48.36**	**57.38**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Paving	8/1/2017	9/30/2017	6	53	
2	Dewatering Pond 15	Site Preparation	10/1/2017	11/1/2017	6	27	
3	Earthwork 1	Grading	10/1/2017	1/31/2018	6	105	
4	Demobilization 1	Paving	2/1/2018	2/28/2018	6	24	
5	Core Nesting Season 1	Architectural Coating	3/1/2018	7/31/2018	6	131	
6	Remobilization 1	Paving	8/1/2018	8/31/2018	6	27	
7	Earthwork 2	Grading	9/1/2018	12/31/2018	6	104	
8	Demobilization 2	Paving	1/1/2019	2/28/2019	6	51	

9	Core Nesting Season 2	Paving	3/1/2019	7/31/2019	6	131	
10	Remobilization 2	Paving	8/1/2019	8/31/2019	6	27	
11	Pond 15 Grading	Grading	9/1/2020	12/31/2020	6	105	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,500; Non-Residential Outdoor: 500 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Mobilization	Pavers	0	8.00	125	0.42
Mobilization	Paving Equipment	0	8.00	130	0.36
Mobilization	Rollers	0	8.00	80	0.38
Earthwork 1	Excavators	0	8.00	162	0.38
Earthwork 1	Graders	0	8.00	174	0.41
Earthwork 1	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 1	Scrapers	4	8.00	361	0.48
Earthwork 1	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 1	Pavers	0	8.00	125	0.42
Demobilization 1	Paving Equipment	0	8.00	130	0.36
Demobilization 1	Rollers	0	8.00	80	0.38
Core Nesting Season 1	Air Compressors	0	6.00	78	0.48
Remobilization 1	Pavers	0	8.00	125	0.42
Remobilization 1	Paving Equipment	0	8.00	130	0.36
Remobilization 1	Rollers	0	8.00	80	0.38
Earthwork 2	Excavators	0	8.00	162	0.38
Earthwork 2	Graders	0	8.00	174	0.41
Earthwork 2	Rubber Tired Dozers	4	8.00	255	0.40
Earthwork 2	Scrapers	4	8.00	361	0.48

Earthwork 2	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Demobilization 2	Pavers	0	8.00	125	0.42
Demobilization 2	Paving Equipment	0	8.00	130	0.36
Demobilization 2	Rollers	0	8.00	80	0.38
Core Nesting Season 2	Pavers	0	8.00	125	0.42
Core Nesting Season 2	Paving Equipment	0	8.00	130	0.36
Core Nesting Season 2	Rollers	0	8.00	80	0.38
Remobilization 2	Pavers	0	8.00	125	0.42
Remobilization 2	Paving Equipment	0	8.00	130	0.36
Remobilization 2	Rollers	0	8.00	80	0.38
Pond 15 Grading	Excavators	0	8.00	162	0.38
Pond 15 Grading	Graders	0	8.00	174	0.41
Pond 15 Grading	Rubber Tired Dozers	4	8.00	255	0.40
Pond 15 Grading	Scrapers	4	8.00	361	0.48
Pond 15 Grading	Tractors/Loaders/Backhoes	8	8.00	97	0.37
Dewatering Pond 15	Pumps	6	8.00	20	0.74
Dewatering Pond 15	Rubber Tired Dozers	0	8.00	255	0.40
Dewatering Pond 15	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Earthwork 1	Pumps	1	8.00	1000	0.74
Earthwork 2	Pumps	1	8.00	1000	0.74

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 1	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT
Demobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 1	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 1	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Earthwork 2	16	50.00	48.00	0.00	10.80	7.30	0.00	LD_Mix	HDT_Mix	HHDT

Demobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Core Nesting Season 2	0	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Remobilization 2	0	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pond 15 Grading	16	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Dewatering Pond 15	6	50.00	20.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

3.2 Mobilization - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Vendor	5.5200e-003	0.0463	0.0685	1.3000e-004	3.4500e-003	6.6000e-004	4.1100e-003	9.9000e-004	6.1000e-004	1.6000e-003	0.0000	11.2413	11.2413	8.0000e-005	0.0000	11.2431
Worker	4.1200e-003	5.4600e-003	0.0516	1.3000e-004	0.0106	8.0000e-005	0.0107	2.8200e-003	7.0000e-005	2.9000e-003	0.0000	9.5193	9.5193	4.8000e-004	0.0000	9.5294
Total	**9.6400e-003**	**0.0518**	**0.1201**	**2.6000e-004**	**0.0141**	**7.4000e-004**	**0.0148**	**3.8100e-003**	**6.8000e-004**	**4.5000e-003**	**0.0000**	**20.7606**	**20.7606**	**5.6000e-004**	**0.0000**	**20.7725**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.5200e-003	0.0463	0.0685	1.3000e-004	3.4500e-003	6.6000e-004	4.1100e-003	9.9000e-004	6.1000e-004	1.6000e-003	0.0000	11.2413	11.2413	8.0000e-005	0.0000	11.2431
Worker	4.1200e-003	5.4600e-003	0.0516	1.3000e-004	0.0106	8.0000e-005	0.0107	2.8200e-003	7.0000e-005	2.9000e-003	0.0000	9.5193	9.5193	4.8000e-004	0.0000	9.5294
Total	**9.6400e-003**	**0.0518**	**0.1201**	**2.6000e-004**	**0.0141**	**7.4000e-004**	**0.0148**	**3.8100e-003**	**6.8000e-004**	**4.5000e-003**	**0.0000**	**20.7606**	**20.7606**	**5.6000e-004**	**0.0000**	**20.7725**

3.3 Dewatering Pond 15 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0176	0.1000	0.0542	1.5000e-004		5.1400e-003	5.1400e-003		5.1400e-003	5.1400e-003	0.0000	10.9004	10.9004	1.4200e-003	0.0000	10.9302
Total	**0.0176**	**0.1000**	**0.0542**	**1.5000e-004**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**10.9004**	**10.9004**	**1.4200e-003**	**0.0000**	**10.9302**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8100e-003	0.0236	0.0349	6.0000e-005	1.7600e-003	3.4000e-004	2.0900e-003	5.0000e-004	3.1000e-004	8.1000e-004	0.0000	5.7267	5.7267	4.0000e-005	0.0000	5.7276
Worker	2.1000e-003	2.7800e-003	0.0263	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4800e-003	0.0000	4.8494	4.8494	2.5000e-004	0.0000	4.8546
Total	**4.9100e-003**	**0.0264**	**0.0612**	**1.3000e-004**	**7.1700e-003**	**3.8000e-004**	**7.5400e-003**	**1.9400e-003**	**3.5000e-004**	**2.2900e-003**	**0.0000**	**10.5761**	**10.5761**	**2.9000e-004**	**0.0000**	**10.5822**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e

Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0176	0.1000	0.0542	1.5000e-004		5.1400e-003	5.1400e-003		5.1400e-003	5.1400e-003	0.0000	10.9004	10.9004	1.4200e-003	0.0000	10.9302
Total	**0.0176**	**0.1000**	**0.0542**	**1.5000e-004**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**5.1400e-003**	**5.1400e-003**	**0.0000**	**10.9004**	**10.9004**	**1.4200e-003**	**0.0000**	**10.9302**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.8100e-003	0.0236	0.0349	6.0000e-005	1.7600e-003	3.4000e-004	2.0900e-003	5.0000e-004	3.1000e-004	8.1000e-004	0.0000	5.7267	5.7267	4.0000e-005	0.0000	5.7276
Worker	2.1000e-003	2.7800e-003	0.0263	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4800e-003	0.0000	4.8494	4.8494	2.5000e-004	0.0000	4.8546
Total	**4.9100e-003**	**0.0264**	**0.0612**	**1.3000e-004**	**7.1700e-003**	**3.8000e-004**	**7.5400e-003**	**1.9400e-003**	**3.5000e-004**	**2.2900e-003**	**0.0000**	**10.5761**	**10.5761**	**2.9000e-004**	**0.0000**	**10.5822**

3.4 Earthwork 1 - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2936	0.0000	1.2936	0.6987	0.0000	0.6987	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.4872	5.5534	3.8885	4.6800e-003		0.2692	0.2692		0.2477	0.2477	0.0000	434.4535	434.4535	0.1331	0.0000	437.2490

Total	**0.4872**	**5.5534**	**3.8885**	**4.6800e-003**	**1.2936**	**0.2692**	**1.5627**	**0.6987**	**0.2477**	**0.9464**	**0.0000**	**434.4535**	**434.4535**	**0.1331**	**0.0000**	**437.2490**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0195	0.1635	0.2421	4.4000e-004	0.0122	2.3400e-003	0.0145	3.4800e-003	2.1500e-003	5.6400e-003	0.0000	39.7051	39.7051	3.0000e-004	0.0000	39.7114
Worker	6.0600e-003	8.0300e-003	0.0759	1.9000e-004	0.0156	1.2000e-004	0.0158	4.1600e-003	1.1000e-004	4.2600e-003	0.0000	14.0095	14.0095	7.1000e-004	0.0000	14.0245
Total	**0.0256**	**0.1715**	**0.3180**	**6.3000e-004**	**0.0278**	**2.4600e-003**	**0.0303**	**7.6400e-003**	**2.2600e-003**	**9.9000e-003**	**0.0000**	**53.7146**	**53.7146**	**1.0100e-003**	**0.0000**	**53.7359**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5045	0.0000	0.5045	0.2725	0.0000	0.2725	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1146	2.2983	2.7000	4.6800e-003		0.1046	0.1046		0.1046	0.1046	0.0000	434.4530	434.4530	0.1331	0.0000	437.2485
Total	**0.1146**	**2.2983**	**2.7000**	**4.6800e-003**	**0.5045**	**0.1046**	**0.6091**	**0.2725**	**0.1046**	**0.3771**	**0.0000**	**434.4530**	**434.4530**	**0.1331**	**0.0000**	**437.2485**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0195	0.1635	0.2421	4.4000e-004	0.0122	2.3400e-003	0.0145	3.4800e-003	2.1500e-003	5.6400e-003	0.0000	39.7051	39.7051	3.0000e-004	0.0000	39.7114
Worker	6.0600e-003	8.0300e-003	0.0759	1.9000e-004	0.0156	1.2000e-004	0.0158	4.1600e-003	1.1000e-004	4.2600e-003	0.0000	14.0095	14.0095	7.1000e-004	0.0000	14.0245
Total	**0.0256**	**0.1715**	**0.3180**	**6.3000e-004**	**0.0278**	**2.4600e-003**	**0.0303**	**7.6400e-003**	**2.2600e-003**	**9.9000e-003**	**0.0000**	**53.7146**	**53.7146**	**1.0100e-003**	**0.0000**	**53.7359**

3.4 Earthwork 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2936	0.0000	1.2936	0.6987	0.0000	0.6987	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1478	1.6694	1.2031	1.6200e-003		0.0790	0.0790		0.0727	0.0727	0.0000	148.0243	148.0243	0.0461	0.0000	148.9920
Total	**0.1478**	**1.6694**	**1.2031**	**1.6200e-003**	**1.2936**	**0.0790**	**1.3726**	**0.6987**	**0.0727**	**0.7714**	**0.0000**	**148.0243**	**148.0243**	**0.0461**	**0.0000**	**148.9920**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.3400e-003	0.0511	0.0801	1.5000e-004	4.2200e-003	7.5000e-004	4.9700e-003	1.2100e-003	6.9000e-004	1.9000e-003	0.0000	13.5080	13.5080	1.0000e-004	0.0000	13.5101
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**8.2500e-003**	**0.0536**	**0.1039**	**2.2000e-004**	**9.6300e-003**	**7.9000e-004**	**0.0104**	**2.6500e-003**	**7.3000e-004**	**3.3700e-003**	**0.0000**	**18.1753**	**18.1753**	**3.3000e-004**	**0.0000**	**18.1823**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5045	0.0000	0.5045	0.2725	0.0000	0.2725	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0397	0.7956	0.9346	1.6200e-003		0.0362	0.0362		0.0362	0.0362	0.0000	148.0241	148.0241	0.0461	0.0000	148.9918
Total	**0.0397**	**0.7956**	**0.9346**	**1.6200e-003**	**0.5045**	**0.0362**	**0.5407**	**0.2725**	**0.0362**	**0.3087**	**0.0000**	**148.0241**	**148.0241**	**0.0461**	**0.0000**	**148.9918**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	6.3400e-003	0.0511	0.0801	1.5000e-004	4.2200e-003	7.5000e-004	4.9700e-003	1.2100e-003	6.9000e-004	1.9000e-003	0.0000	13.5080	13.5080	1.0000e-004	0.0000	13.5101
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**8.2500e-003**	**0.0536**	**0.1039**	**2.2000e-004**	**9.6300e-003**	**7.9000e-004**	**0.0104**	**2.6500e-003**	**7.3000e-004**	**3.3700e-003**	**0.0000**	**18.1753**	**18.1753**	**3.3000e-004**	**0.0000**	**18.1823**

3.5 Demobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3500e-003	0.0189	0.0297	6.0000e-005	1.5600e-003	2.8000e-004	1.8400e-003	4.5000e-004	2.6000e-004	7.0000e-004	0.0000	5.0030	5.0030	4.0000e-005	0.0000	5.0037
Worker	1.6900e-003	2.2500e-003	0.0211	6.0000e-005	4.8100e-003	4.0000e-005	4.8500e-003	1.2800e-003	3.0000e-005	1.3100e-003	0.0000	4.1488	4.1488	2.0000e-004	0.0000	4.1530
Total	**4.0400e-003**	**0.0212**	**0.0508**	**1.2000e-004**	**6.3700e-003**	**3.2000e-004**	**6.6900e-003**	**1.7300e-003**	**2.9000e-004**	**2.0100e-003**	**0.0000**	**9.1517**	**9.1517**	**2.4000e-004**	**0.0000**	**9.1568**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.3500e-003	0.0189	0.0297	6.0000e-005	1.5600e-003	2.8000e-004	1.8400e-003	4.5000e-004	2.6000e-004	7.0000e-004	0.0000	5.0030	5.0030	4.0000e-005	0.0000	5.0037
Worker	1.6900e-003	2.2500e-003	0.0211	6.0000e-005	4.8100e-003	4.0000e-005	4.8500e-003	1.2800e-003	3.0000e-005	1.3100e-003	0.0000	4.1488	4.1488	2.0000e-004	0.0000	4.1530
Total	**4.0400e-003**	**0.0212**	**0.0508**	**1.2000e-004**	**6.3700e-003**	**3.2000e-004**	**6.6900e-003**	**1.7300e-003**	**2.9000e-004**	**2.0100e-003**	**0.0000**	**9.1517**	**9.1517**	**2.4000e-004**	**0.0000**	**9.1568**

3.6 Core Nesting Season 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0116					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0116**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0116					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0116**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.7 Remobilization 1 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6400e-003	0.0213	0.0334	6.0000e-005	1.7600e-003	3.1000e-004	2.0700e-003	5.0000e-004	2.9000e-004	7.9000e-004	0.0000	5.6283	5.6283	4.0000e-005	0.0000	5.6292
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**4.5500e-003**	**0.0238**	**0.0572**	**1.3000e-004**	**7.1700e-003**	**3.5000e-004**	**7.5200e-003**	**1.9400e-003**	**3.3000e-004**	**2.2600e-003**	**0.0000**	**10.2957**	**10.2957**	**2.7000e-004**	**0.0000**	**10.3014**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.6400e-003	0.0213	0.0334	6.0000e-005	1.7600e-003	3.1000e-004	2.0700e-003	5.0000e-004	2.9000e-004	7.9000e-004	0.0000	5.6283	5.6283	4.0000e-005	0.0000	5.6292
Worker	1.9100e-003	2.5400e-003	0.0238	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.6673	4.6673	2.3000e-004	0.0000	4.6722
Total	**4.5500e-003**	**0.0238**	**0.0572**	**1.3000e-004**	**7.1700e-003**	**3.5000e-004**	**7.5200e-003**	**1.9400e-003**	**3.3000e-004**	**2.2600e-003**	**0.0000**	**10.2957**	**10.2957**	**2.7000e-004**	**0.0000**	**10.3014**

3.8 Earthwork 2 - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2815	0.0000	1.2815	0.6921	0.0000	0.6921	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.5692	6.4305	4.6341	6.2400e-003		0.3043	0.3043		0.2799	0.2799	0.0000	570.1676	570.1676	0.1775	0.0000	573.8951
Total	**0.5692**	**6.4305**	**4.6341**	**6.2400e-003**	**1.2815**	**0.3043**	**1.5858**	**0.6921**	**0.2799**	**0.9720**	**0.0000**	**570.1676**	**570.1676**	**0.1775**	**0.0000**	**573.8951**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0244	0.1968	0.3086	5.9000e-004	0.0162	2.9000e-003	0.0191	4.6400e-003	2.6600e-003	7.3100e-003	0.0000	52.0307	52.0307	3.9000e-004	0.0000	52.0389
Worker	7.3400e-003	9.7700e-003	0.0916	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.9779	17.9779	8.8000e-004	0.0000	17.9965
Total	**0.0317**	**0.2066**	**0.4001**	**8.5000e-004**	**0.0371**	**3.0500e-003**	**0.0401**	**0.0102**	**2.8000e-003**	**0.0130**	**0.0000**	**70.0086**	**70.0086**	**1.2700e-003**	**0.0000**	**70.0354**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4998	0.0000	0.4998	0.2699	0.0000	0.2699	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1528	3.0644	3.5999	6.2400e-003		0.1394	0.1394		0.1394	0.1394	0.0000	570.1669	570.1669	0.1775	0.0000	573.8945
Total	**0.1528**	**3.0644**	**3.5999**	**6.2400e-003**	**0.4998**	**0.1394**	**0.6392**	**0.2699**	**0.1394**	**0.4094**	**0.0000**	**570.1669**	**570.1669**	**0.1775**	**0.0000**	**573.8945**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0244	0.1968	0.3086	5.9000e-004	0.0162	2.9000e-003	0.0191	4.6400e-003	2.6600e-003	7.3100e-003	0.0000	52.0307	52.0307	3.9000e-004	0.0000	52.0389
Worker	7.3400e-003	9.7700e-003	0.0916	2.6000e-004	0.0209	1.5000e-004	0.0210	5.5400e-003	1.4000e-004	5.6800e-003	0.0000	17.9779	17.9779	8.8000e-004	0.0000	17.9965
Total	**0.0317**	**0.2066**	**0.4001**	**8.5000e-004**	**0.0371**	**3.0500e-003**	**0.0401**	**0.0102**	**2.8000e-003**	**0.0130**	**0.0000**	**70.0086**	**70.0086**	**1.2700e-003**	**0.0000**	**70.0354**

3.9 Demobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.6600e-003	0.0366	0.0602	1.2000e-004	3.3200e-003	5.5000e-004	3.8700e-003	9.5000e-004	5.1000e-004	1.4500e-003	0.0000	10.4481	10.4481	8.0000e-005	0.0000	10.4497
Worker	3.3400e-003	4.4300e-003	0.0413	1.3000e-004	0.0102	7.0000e-005	0.0103	2.7200e-003	7.0000e-005	2.7900e-003	0.0000	8.4972	8.4972	4.1000e-004	0.0000	8.5057
Total	**8.0000e-003**	**0.0410**	**0.1015**	**2.5000e-004**	**0.0135**	**6.2000e-004**	**0.0142**	**3.6700e-003**	**5.8000e-004**	**4.2400e-003**	**0.0000**	**18.9452**	**18.9452**	**4.9000e-004**	**0.0000**	**18.9554**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.6600e-003	0.0366	0.0602	1.2000e-004	3.3200e-003	5.5000e-004	3.8700e-003	9.5000e-004	5.1000e-004	1.4500e-003	0.0000	10.4481	10.4481	8.0000e-005	0.0000	10.4497
Worker	3.3400e-003	4.4300e-003	0.0413	1.3000e-004	0.0102	7.0000e-005	0.0103	2.7200e-003	7.0000e-005	2.7900e-003	0.0000	8.4972	8.4972	4.1000e-004	0.0000	8.5057
Total	**8.0000e-003**	**0.0410**	**0.1015**	**2.5000e-004**	**0.0135**	**6.2000e-004**	**0.0142**	**3.6700e-003**	**5.8000e-004**	**4.2400e-003**	**0.0000**	**18.9452**	**18.9452**	**4.9000e-004**	**0.0000**	**18.9554**

3.10 Core Nesting Season 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					

Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.11 Remobilization 2 - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4700e-003	0.0194	0.0319	6.0000e-005	1.7600e-003	2.9000e-004	2.0500e-003	5.0000e-004	2.7000e-004	7.7000e-004	0.0000	5.5313	5.5313	4.0000e-005	0.0000	5.5322
Worker	1.7700e-003	2.3400e-003	0.0219	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.4985	4.4985	2.2000e-004	0.0000	4.5030
Total	**4.2400e-003**	**0.0217**	**0.0537**	**1.3000e-004**	**7.1700e-003**	**3.3000e-004**	**7.5000e-003**	**1.9400e-003**	**3.1000e-004**	**2.2400e-003**	**0.0000**	**10.0298**	**10.0298**	**2.6000e-004**	**0.0000**	**10.0352**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	2.4700e-003	0.0194	0.0319	6.0000e-005	1.7600e-003	2.9000e-004	2.0500e-003	5.0000e-004	2.7000e-004	7.7000e-004	0.0000	5.5313	5.5313	4.0000e-005	0.0000	5.5322
Worker	1.7700e-003	2.3400e-003	0.0219	7.0000e-005	5.4100e-003	4.0000e-005	5.4500e-003	1.4400e-003	4.0000e-005	1.4700e-003	0.0000	4.4985	4.4985	2.2000e-004	0.0000	4.5030
Total	**4.2400e-003**	**0.0217**	**0.0537**	**1.3000e-004**	**7.1700e-003**	**3.3000e-004**	**7.5000e-003**	**1.9400e-003**	**3.1000e-004**	**2.2400e-003**	**0.0000**	**10.0298**	**10.0298**	**2.6000e-004**	**0.0000**	**10.0352**

3.12 Pond 15 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.3009	0.0000	1.3009	0.6937	0.0000	0.6937	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Off-Road	0.4952	5.4428	4.1647	6.3000e-003		0.2485	0.2485		0.2286	0.2286	0.0000	553.9305	553.9305	0.1792	0.0000	557.6927
Total	**0.4952**	**5.4428**	**4.1647**	**6.3000e-003**	**1.3009**	**0.2485**	**1.5493**	**0.6937**	**0.2286**	**0.9223**	**0.0000**	**553.9305**	**553.9305**	**0.1792**	**0.0000**	**557.6927**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.0600e-003	0.0642	0.1197	2.5000e-004	6.8300e-003	1.0100e-003	7.8400e-003	1.9500e-003	9.3000e-004	2.8900e-003	0.0000	21.0189	21.0189	1.6000e-004	0.0000	21.0221
Worker	6.5100e-003	8.5200e-003	0.0795	2.6000e-004	0.0211	1.5000e-004	0.0212	5.5900e-003	1.4000e-004	5.7400e-003	0.0000	16.7892	16.7892	8.0000e-004	0.0000	16.8059
Total	**0.0156**	**0.0727**	**0.1991**	**5.1000e-004**	**0.0279**	**1.1600e-003**	**0.0290**	**7.5400e-003**	**1.0700e-003**	**8.6300e-003**	**0.0000**	**37.8081**	**37.8081**	**9.6000e-004**	**0.0000**	**37.8281**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5073	0.0000	0.5073	0.2706	0.0000	0.2706	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1543	3.0939	3.6346	6.3000e-003		0.1408	0.1408		0.1408	0.1408	0.0000	553.9298	553.9298	0.1792	0.0000	557.6920
Total	**0.1543**	**3.0939**	**3.6346**	**6.3000e-003**	**0.5073**	**0.1408**	**0.6481**	**0.2706**	**0.1408**	**0.4113**	**0.0000**	**553.9298**	**553.9298**	**0.1792**	**0.0000**	**557.6920**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.0600e-003	0.0642	0.1197	2.5000e-004	6.8300e-003	1.0100e-003	7.8400e-003	1.9500e-003	9.3000e-004	2.8900e-003	0.0000	21.0189	21.0189	1.6000e-004	0.0000	21.0221
Worker	6.5100e-003	8.5200e-003	0.0795	2.6000e-004	0.0211	1.5000e-004	0.0212	5.5900e-003	1.4000e-004	5.7400e-003	0.0000	16.7892	16.7892	8.0000e-004	0.0000	16.8059
Total	**0.0156**	**0.0727**	**0.1991**	**5.1000e-004**	**0.0279**	**1.1600e-003**	**0.0290**	**7.5400e-003**	**1.0700e-003**	**8.6300e-003**	**0.0000**	**37.8081**	**37.8081**	**9.6000e-004**	**0.0000**	**37.8281**

ORERP - Alt C - Subtidal Pipeline Option - Generator Only

San Diego Air Basin, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	1.00	1000sqft	91.00	1,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2020
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	542.77	**CH4 Intensity (lb/MWhr)**	0.022	**N2O Intensity (lb/MWhr)**	0.005

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Intensity factor adjusted for 32.2% RPS for 2014 SDG&E

Table Name	Column Name	Default Value	New Value
tblEnergyUse	LightingElect	3.25	0.00
tblEnergyUse	NT24E	4.27	5,605.40
tblEnergyUse	NT24NG	7.25	0.00
tblEnergyUse	T24E	1.48	0.00
tblEnergyUse	T24NG	4.54	0.00
tblLandUse	LotAcreage	0.02	91.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.022
tblProjectCharacteristics	CO2IntensityFactor	720.49	542.77

tblProjectCharacteristics	N2OIntensityFactor	0.006	0.005
tblProjectCharacteristics	OperationalYear	2014	2020

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	5.6054e+006	1,380.0289	0.0559	0.0127	1,385.1446
Total		**1,380.0289**	**0.0559**	**0.0127**	**1,385.1446**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	5.6054e+006	1,380.0289	0.0559	0.0127	1,385.1446
Total		**1,380.0289**	**0.0559**	**0.0127**	**1,385.1446**

APPENDIX N

Coastal Commission Consistency

APPENDIX N
Coastal Commission Consistency

Otay River Estuary Restoration Project Consistency with the Coastal Resources Planning and Management Policies of the California Coastal Act

Provision	Alternative B-Intertidal Alternative	Alternative C-Subtidal Alternative
Article 2 Section 30210.In carrying out the requirement of Section 4 of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.	This alternative would not result in any permanent changes to the current public access routes along the south end of San Diego Bay. The Bayshore Bikeway, which accommodates bicycle and pedestrian access, extends around the south end of the Bay to the west of the Otay River Floodplain Site and south and east of the Pond 15 Site providing coastal access for the public. No public access onto the project site is currently available and no public access would be provided into this area following restoration due to the sensitivity of the resources that would be supported. However, ample visual access into the site would continue to be provided from the Bayshore Bikeway. During the mobilization, demobilization, site grading, and soil transport phases of the project, there would be disruption in travel along the Bayshore Bikeway and Saturn Boulevard bike path. To minimize any conflicts between construction vehicles and the public, the contractor would be required to have a flagger present at the Main Street and Bay Boulevard construction access and egress points to ensure safe crossing onto the Bayshore Bikeway. In addition, the bike path on Saturn Boulevard would temporarily be rerouted along the eastern perimeter of the Otay River Floodplain, as shown in Figure 2-2, Project Features. This alternative would be consistent with this provision of the CCA.	Consistent with the discussion for Alternative B, Alternative C would not result in any permanent changes to the current public access routes along the south end of San Diego Bay. In addition, the measures described for Alternative B to minimize any conflicts between construction vehicles and the public would also be implemented under Alternative C. This alternative would be consistent with this provision of the CCA.
Article 2 Section 30211.Development not to interfere with access. Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.	The proposed project sites are not located adjacent or in proximity to the beach, therefore, the implementation of Alternative B would not interfere with the public's right to access the sea.	Same as Alternative B.

Otay River Estuary Restoration Project Consistency with the Coastal Resources Planning and Management Policies of the California Coastal Act

Provision	Alternative B-Intertidal Alternative	Alternative C-Subtidal Alternative
Article 2 Section 30212. New development projects. Public access from the nearest public roadway to the shoreline and along the coast shall be provided in new development projects except where: (1) it is inconsistent with public safety, military security needs, or the protection of fragile coastal resources, (2) adequate access exists nearby, or, (3) agriculture would be adversely affected. Dedicated accessway shall not be required to be opened to public use until a public agency or private association agrees to accept responsibility for maintenance and liability of the accessway.	Alternative B involves the restoration of coastal wetlands, and does not propose development. This section of the CCA is not applicable to the project.	Same as Alternative B.
Article 2 Section 30212.5 Public facilities; distribution. Wherever appropriate and feasible, public facilities, including parking areas or facilities, shall be distributed throughout an area so as to mitigate against the impacts, social and otherwise, of overcrowding or overuse by the public of any single area.	Alternative B does not include any public facilities, this section of the CCA is not applicable to the project.	Same as Alternative B.
Article 2 Section 303213. Lower cost visitor and recreational facilities; encouragement and provision; overnight room rentals. Lower cost visitor and recreational facilities shall be protected, encouraged, and, where feasible, provided. Developments providing public recreational opportunities are preferred. The Commission shall not: (1) require that overnight room rentals be fixed at an amount certain for any privately owned and operated hotel, motel, or other similar visitor-serving facility located on either public or private lands; or (2) establish or approve any method for the identification of low or moderate income persons for the purpose of determining eligibility for overnight room rentals in any such facilities.	Alternative B does not propose any recreational facilities. In addition, the site does not include any areas that could support development of these facilities. This section is not applicable to the project.	Same as Alternative B.

Otay River Estuary Restoration Project Consistency with the Coastal Resources Planning and Management Policies of the California Coastal Act

Provision	Alternative B-Intertidal Alternative	Alternative C-Subtidal Alternative
Article 2 Section 30214(a)Implementation of public access policies; legislative intent. The public access policies of this article shall be implemented in a manner that takes into account the need to regulate the time, place, and manner of public access depending on the facts and circumstances in each case.	Although public access within the restored project site is not proposed, Alternative B is consistent to the maximum extent practicable with this section of the CCA. The anticipated presence of federally and state listed endangered and threatened species within the restored sites, as well as the sensitive coastal wetland habitat that supports them necessitates the need to regulate public access within this site.	Same as Alternative B~~/~~.
Article 3 Section 30220. Protection of certain water-oriented activities: Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.	Alternative B would not impact the limited existing water-oriented recreational activities that surround the project site in south San Diego Bay. However, to protect sensitive resources, no new public access would be granted to the project site following restoration.	Same as Alternative B.
Article 3 Section 30221. Oceanfront land; protection for recreational use and development: Oceanfront land suitable for recreational use shall be protected for recreational use and development unless present and forseeable future demand for public or commercial recreational activities that could be accommodated on the property is already adequately provided for in the area.	Alternative B would not be implemented on oceanfront land, therefore, this section is not applicable.	Same as Alternative B.
Article 3 Section 30222 Private lands; priority of development purposes: The use of private lands suitable for visitor-serving commercial recreational facilities designed to enhance public opportunities for coastal recreation shall have priority over private residential, general industrial, or general commercial development, but not over agriculture or coastal dependent industry.	Alternative B would implement restoration on the San Diego Bay National Wildlife Refuge (NWR); these public lands were acquired to conserve listed species, migratory birds, and coastal wetlands. This section of the CCA is not applicable to this action.	Same as Alternative B.
Article 3 Section 30222.5. Oceanfront lands; aquaculture; priority: Oceanfront land that is suitable for costal dependent aquaculture shall be protected for that use, and proposals for aquaculture facilities located on those sites shall be given priority, except over other coastal dependent developments or uses.	Alternative B would implement restoration on the San Diego Bay NWR, which was established to conserve listed species, migratory birds, and coastal wetlands. Aquaculture is not considered a compatible use on this NWR.	Same as Alternative B.

Otay River Estuary Restoration Project Consistency with the Coastal Resources Planning and Management Policies of the California Coastal Act

Provision	Alternative B-Intertidal Alternative	Alternative C-Subtidal Alternative
Article 3 Section 30223. Upland Areas: Upland areas necessary to support coastal recreational uses shall be reserved for such uses, where feasible.	The uplands within the Otay River Floodplain Site are not currently open to public access, although opportunities for public access are and will continue to be provided further to the east on the Refuge. The implementation of Alternative B would restore existing uplands to coastal wetland habitat, consistent with the recommendation of the San Diego Bay NWR Comprehensive Conservation Plan (USFWS 2006). It is not feasible to reserve this area for coastal recreational uses.	Same as Alternative B.
Article 3 Section 30224. Recreational boating use; encouragement; facilities. Increased recreational boating use of coastal waters shall be encouraged, in accordance with this division, by developing dry storage areas, increasing public launching facilities, providing additional berthing space in existing harbors, limiting non-water-dependent land uses that congest access corridors and preclude boating support facilities, providing harbors of refuge, and by providing for new boating facilities in natural harbors, new protected water areas, and in areas dredged from dry land.	The Otay River Floodplain Site is upland area not suitable for boating, and the Pond 15 Site is not appropriate for recreational boating due to the shallow water habitat, need to protect sensitive species and habitat, and the public access restriction in this area.	Same as Alternative B.
Article 4 Section 30230. Marine resources; maintenance: Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that would sustain the biological productivity of coastal waters and that would maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.	The implementation of Alternative B involves the restoration of coastal wetlands, including shallow, subtidal marine habitat. The restored habitat, which would be managed to sustain the biological productivity of the habitat, is intended to support a range of organisms from plants and benthic invertebrates to fish and a variety of avian species. This alternative is consistent with this section of the CCA.	The implementation of Alternative C would be similar to Alternative B, but additional subtidal habitat would be provided under this alternative. This alternative is consistent with this section of the CCA.

Otay River Estuary Restoration Project Consistency with the Coastal Resources Planning and Management Policies of the California Coastal Act

Provision	Alternative B-Intertidal Alternative	Alternative C-Subtidal Alternative
Article4 Section 30231.Biological productivity; water quality: The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface waterflow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.	The implementation of Alternative B would restore tidal influence to the Otay River Floodplain and Pond 15 sites; sites that historically supported intertidal habitat. The restored wetlands in these areas would provide benefits to water quality within south San Diego Bay. This alternative is consistent with this section of the CCA.	Same as Alternative B.
Article 4 Section 30232 Oil and hazardous substance spills. Protection against the spillage of crude oil, gas, petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur.	Under Alternative B, best management practices would be implemented during project construction to avoid or minimize the potential for impacts to water quality related to spills. In addition, these best management practices include measures to ensure that effective containment and cleanup procedures are in place and can be rapidly executed to fully address any accidental spills that might occur. This alternative is consistent to the maximum extent practicable with this section of the CCA.	Same as Alternative B.
Article 4 Section 30233 Diking, filling, or dredging; continued movement of sediment and nutrients (a)The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited. (b) Dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and	Under Alternative B, excavation of the Otay River Floodplain is proposed to restore coastal wetlands to an area filled in the early 1900s. The excavated material would be used to fill Pond 15 to achieve elevations suitable for supporting subtidal and intertidal wetlands including shallow subtidal, intertidal mudflat, and salt marsh habitat. Mitigation measures, including monitoring of turbidity levels during levee breaching and the use of a silt curtain during excavation to the north of Pond 15, have been incorporated into the scope of the project ~~Best management practices would be implemented during construction~~ to avoid or minimize siltation within San	Same as Alternative B.

Otay River Estuary Restoration Project Consistency with the Coastal Resources Planning and Management Policies of the California Coastal Act

Provision	Alternative B-Intertidal Alternative	Alternative C-Subtidal Alternative
wildlife habitats and water circulation. Dredge points suitable for beach replenishment should be transported for these purposes to the appropriate beaches or into suitable longshore current systems. (c) In addition to the other provisions of this section, diking, filling, or dredging in existing estuaries and wetlands shall maintain or enhance the functional capacity of the wetland or estuary. (d) Erosion control and flood control facilities construction on watercourses can impede the movement of sediment and nutrients that would otherwise be carried by storm runoff into coastal waters. To facilitate the continued delivery of these sediments to the littoral zone, the material removed from these facilities may be placed at appropriate points on the shoreline in accordance with other applicable provisions of this division, where feasible mitigation measures have been provided to minimize adverse environmental effects.	Diego Bay that could lead to increased turbidity levels in the south end of the Bay. In addition, the plans to restore the two project sites under Alternative B have been designed to ensure that tidal velocities moving in and out of the site would not result in erosion within or downstream of the project site, nor would it impact marine or wildlife habitat. Post-construction monitoring would be conducted to ensure that the restored systems are functioning as planned. This alternative is consistent with this section of the CCA.	
Article 4 Section 30234 Commercial fishing and recreational boating facilities. Facilities serving the commercial fishing and recreational boating industries shall be protected and, where feasible, upgraded. Existing commercial fishing and recreational boating harbor space shall not be reduced unless the demand for those facilities no longer exists or adequate substitute space has been provided. Proposed recreational boating facilities shall, where feasible, be designed and located in such a fashion as not to interfere with the needs of the commercial fishing industry.	The project site does not currently support commercial fishing or recreational boating activity. Following restoration, the restored wetlands would support resources that are highly susceptible to disturbance, therefore, fishing and boating within the restored project site is not considered compatible with the purposes for which the San Diego Bay NWR was established. This section of the CCA is not applicable to this alternative.	Same as Alternative B.

Otay River Estuary Restoration Project Consistency with the Coastal Resources Planning and Management Policies of the California Coastal Act

Provision	Alternative B-Intertidal Alternative	Alternative C-Subtidal Alternative
Article 4 Section 30234.5 Economic, commercial, and recreational importance of fishing. The economic, commercial, and recreational importance of fishing activities shall be recognized and protected.	Refer to the response for Article 4 Section 30234. Note that under Alternative B, restoration of wetland habitat would expand the acreage of habitat available to support fish in San Diego Bay, including nursery areas for commercial and recreational fish species.	Same as Alternative B.
Article 4 Section 30235 Construction altering natural shoreline Revetments, breakwaters, groins, harbor channels, seawalls, cliff retaining walls, and other such construction that alters natural shorelines processes shall be permitted when required to serve coastal dependent uses or to protect existing structures or public beaches in danger from erosion, and when designed to eliminate or mitigate adverse impacts on local shoreline can supply. Existing marine structures causing water stagnation contributing to pollution problems and fish kills should be phased out or upgraded where feasible.	No natural shoreline is present within the project boundary; all of the area to be restored has been disturbed in the past by development of the salt ponds, the salt pond levees, and/or adjacent transportation routes including, a railroad and the Bayshore Bikeway. This section of the CCA is not applicable to this alternative.	Same as Alternative B.
Article 4 Section 30236 Water Supply and Flood Control. Channelization, dams, or other substantial alterations of rivers and streams shall incorporate the best mitigation measures feasible, and be limited to (1) necessary water supply projects, (2) flood control projects where no other method for protecting existing structures in the floodplain is feasible and where such protection is necessary for public safety or to protect existing development, or (3) developments where the primary function is the improvement of fish and wildlife habitat.	The project proposes to move an existing berm from the north side of the Otay River Floodplain Site to the southern boundary of the restoration site ~~an additional berm in the southern portion of the Otay River Floodplain Site~~ to protect the adjacent Port land from tidal inundation and flooding~~ensure flood control in this area~~. If the Port restores its property to wetland habitat, the berm could be removed at a future date. ~~However,~~ Because the ~~main~~ purpose of this project is the improvement of wildlife habitat, Alternative B is consistent with this section of the CCA.	Same as Alternative B.
Article 5 Section 30240 Environmentally Sensitive Habitat Areas (a)Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent of those resources shall be allowed within those areas.	Management of lands included within the National Wildlife Refuge System is consistent with this section of the CCA to the maximum extent possible under existing laws, policies, and guidelines. Adequate measures have been incorporated into the scope of the project under Alternative B to reduce the potential for impacts to environmentally sensitive	Same as Alternative B.

Otay River Estuary Restoration Project Consistency with the Coastal Resources Planning and Management Policies of the California Coastal Act

Provision	Alternative B-Intertidal Alternative	Alternative C-Subtidal Alternative
(b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.	lands on-site and adjacent to the restoration site to below a level of significance. These measures include avoiding construction during the nesting season, restricting construction activity to the project footprint, and implementing pre- and post-construction monitoring of biological resources. In addition, this alternative would restore additional acreage of environmentally sensitive lands within San Diego Bay.	
Article 5 Section 30241 Prime Agricultural Land; Maintenance in Agricultural Production The maximum amount of prime agricultural land shall be maintained in agricultural production to assure the protection of the areas' agricultural economy, and conflicts shall be minimized between agricultural and urban land uses through all of the following.	The project would not adversely impact ~~site does not include~~ any areas identified as prime agricultural land. This section of the CCA is therefore not applicable to Alternative B.	Same as Alternative B.
Article 5 Section 30241.5 Agricultural land; determination of viability of uses; economic feasibility evaluation If the viability of existing agricultural uses is an issue pursuant to subdivision (b) of Section 30241 as to any local coastal program or amendment to any certified local coastal program submitted for review and approval under this division, the determination of viability shall include, but not be limited to, consideration of an economic feasibility evaluation containing at least both of the following elements.	There are no existing agricultural uses on the proposed project site; therefore this section of the CCA is not applicable to Alternative B.	Same as Alternative B.
Article 5 Section 30242 Lands suitable for agricultural use; conversion All other lands suitable for agricultural use shall not be converted to non-agricultural uses unless (1) continued or renewed agricultural use is not feasible, or (2) such conversion	Neither the Otay River Floodplain Site (a former salt pond), nor the Pond 15 Site (an active salt pond) are suitable for agriculture uses. This section of the CCA is therefore not applicable to Alternative B.	Same as Alternative B.

Otay River Estuary Restoration Project Consistency with the Coastal Resources Planning and Management Policies of the California Coastal Act

Provision	Alternative B-Intertidal Alternative	Alternative C-Subtidal Alternative
Article 5 Section 30243 Productivity of soils and timberlands; conversion The long-term productivity of soils and timberlands shall be protected, and conversions of coastal commercial timberlands in units of commercial size to other uses or their division into units of noncommercial size shall be limited to providing for necessary timber processing and related facilities.	This section of the CCA is not applicable to Alternative B.	This section of the CCA is not applicable to Alternative C.
Article 5 Section 30244 Archeological or Paleontological Resources Where development would adversely impact archeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.	Based on the formations underlying the project site, there is low potential for paleontological resources. Based on the results of a cultural resources investigation, the construction design proposed under Alternative B has been modified to avoid known archaeological resources in the vicinity of the project. In addition, cultural resource monitors would be present during all excavation. If resources are encountered, excavation would be stopped and the appropriate entities, including the SHPO would be consulted. The project also includes mitigation measures to ensure the protection of paleontological resources. This alternative is consistent with this section of the CCA.	Same as Alternative B.
Article 6 Section 30250: Location; existing developed area (a) New residential, commercial, or industrial development, except as otherwise provided in this division, shall be located within, contiguous with, or in close proximity to, existing developed areas able to accommodate it or, where such areas are not able to accommodate it, in other areas with adequate public services and where it would not have significant adverse effects, either individually or cumulatively, on coastal resources. In addition, land divisions, other than leases for agricultural uses, outside existing developed areas shall be permitted only where 50 percent of the usable parcels in the area have been developed and the created parcels	The project does not involve the development of residential, commercial, or industrial uses. Therefore this section of the CCA is not applicable to Alternative B.	The project does not involve the development of residential, commercial, or industrial uses. Therefore this section of the CCA is not applicable to Alternative C.

Otay River Estuary Restoration Project Consistency with the Coastal Resources Planning and Management Policies of the California Coastal Act

Provision	Alternative B-Intertidal Alternative	Alternative C-Subtidal Alternative
would be no smaller than the average size of surrounding parcels. (b) Where feasible, new hazardous industrial development shall be located away from existing developed areas. (c) Visitor-serving facilities that cannot feasibly be located in existing developed areas shall be located in existing isolated developments or at selected points of attraction for visitors.		
Article 6 Section 30251 Scenic and Visual Qualities The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas. New development in highly scenic areas such as those designated in the California Coastline Preservation and Recreation Plan prepared by the Department of Parks and Recreation and by local government shall be subordinate to the character of its setting.	Alternative B proposes the restoration of native coastal wetland habitat. No obstruction of views from surrounding public or private properties would occur and the existing scenic quality of the area would not be degraded. This alternative is therefore consistent with this section of the CCA.	Same as Alternative B.
Article 6 Section 30252 Maintenance and enhancement of public access The location and amount of new development should maintain and enhance public access to the coast by (1) facilitating the provision or extension of transit service, (2) providing commercial facilities within or adjoining residential development or in other areas that would minimize the use of coastal access roads, (3) providing nonautomobile circulation within the development, (4) providing adequate parking facilities or providing substitute means of serving the development with public transportation, (5) assuring the potential for public transit for high intensity uses such as	This section only addresses access issues related to the development of residential, commercial, or industrial uses and no such uses are proposed. This section of the CCA is therefore not applicable to Alternative B.	Same as Alternative B.

Otay River Estuary Restoration Project Consistency with the Coastal Resources Planning and Management Policies of the California Coastal Act

Provision	Alternative B-Intertidal Alternative	Alternative C-Subtidal Alternative
high-rise office buildings, and by (6) assuring that the recreational needs of new residents would not overload nearby coastal recreation areas by correlating the amount of development with local park acquisition and development plans with the provision of onsite recreational facilities to serve the new development.		
Article 6 Section 30253 (1) New development shall: Minimize risks to life and property in areas of high geologic, flood, and fire hazard.	Fluvial and tidal hydraulics modeling was conducted for the restoration design that would be implemented under Alternative B. Fluvial modeling identified the potential for ~~projected increase over existing conditions of~~ increased flooding levels downstream of the Otay River Floodplain Site during the 100-year flood as a result of lowering the site elevations to accommodate restoration. To address this effect, the following measure has been incorporated into the scope of the project to avoid exacerbating current predicted flood levels downstream of the project: the height of the existing levee between Ponds 22 and 23 would be raised by 2 to 3 feet to direct floodwaters through the salt works to the east of the Otay River rather than allowing the water to overtop the levee and flow down the river toward the residential development of the southwest. In addition, to restrict tidal flows to the project site and avoid introducing tidal action to the Port property located immediately to the south of the Otay River Floodplain Site, a berm would be constructed between the restored wetland habitat and the adjacent Port property. As a result, no changes to the existing tidal or flood regime within the Port property would occur. Implementing these measures would avoid significant adverse effects related to flooding. This alternative is consistent to the maximum extent practicable with this section of the CCA.	Same as Alternative B.

Otay River Estuary Restoration Project Consistency with the Coastal Resources Planning and Management Policies of the California Coastal Act

Provision	Alternative B-Intertidal Alternative	Alternative C-Subtidal Alternative
Article 6 Section 30253 (2) New development shall: Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.	Implementing Alternative B would not create or contribute significantly to erosion within San Diego Bay or the outer levees of the existing salt ponds. The proposal to increase the elevation of the levee between Ponds 22 and 23 and to construct a berm between the Port property and the restoration site within the Otay River Floodplain would not occur in proximity to any existing coastal bluffs or cliffs and these activities ~~. This~~ would not substantially alter the natural landform in the area. This alternative is consistent with this section of the CCA.	Same as Alternative B.
Article 6 Section 30253(3) New development shall: Be consistent with requirements imposed by an air pollution control district or the State Air Resources Control Board as to each particular development.	Impacts related to air quality and greenhouse gas emissions were analyzed as part of the environmental impact analysis for this project. As a result, measures were incorporated into the scope of the project to ensure that PM_{10} emissions and fugitive dust generated during project construction would not exceed acceptable levels and would be consistent with the requirements imposed by the San Diego Air Pollution Control District (SDAPCD) and the State Air Resources Control Board. Following construction, the only air emission that would be associated with this project would involve occasional vehicle trips associated with habitat management, maintenance, and monitoring. The emissions generated from post-construction activities would not exceed established thresholds. This alternative would be consistent with this section of the CCA.	Same as Alternative B.
Article 6 Section 30253 (4) New development shall: Minimize energy consumption and vehicle miles traveled.	Although the final construction method has not yet been finalized, two ~~of the~~ potential options for moving the excavated material from the Otay River Floodplain Site to the Pond 15 are proposed: use of a conveyor belt and truck transport. Use of the conveyor belt would reduce the amount of fuel consumed and vehicle miles traveled during transport of material from the	The implementation of t~~T~~his alternative would require more ~~increased~~ truck trips than would be generated under ~~from the~~ Alternative B. However, once construction is complete, only minimal increases in vehicle miles traveled would be required to ensure proper monitoring and maintenance. Therefore, t~~T~~his alternative would be consistent with this policy.

Otay River Estuary Restoration Project Consistency with the Coastal Resources Planning and Management Policies of the California Coastal Act

Provision	Alternative B-Intertidal Alternative	Alternative C-Subtidal Alternative
	excavation site to Pond 15. ~~Method would eliminate the need to truck the material around the south end of San Diego Bay, resulting in significant reductions in fuel consumption and vehicle miles traveled. The third option would involve haul truck trips between the two project sites.~~ However, the majority of fuel consumption occurring as a result of this project ~~these~~ would ~~only~~ generally only occur ~~be~~ during construction activity. During operations, truck trips would minimally increase over the existing condition for maintenance and monitoring. This alternative would not reduce vehicle miles traveled, but would minimize vehicle miles traveled. This alternative would be consistent with this policy.	
Article 6 Section 30253(5) New development shall: Where appropriate, protect special communities and neighborhoods which, because of their unique characteristics, are popular visitor destination points for recreational uses.	No significant adverse impacts to the communities or neighborhoods surrounding the project site are anticipated as a result of implementing Alternative B. This alternative would be consistent with this section of the CCA.	Same as Alternative B.
Article 6 Section 30254 Public Works Facilities New or expanded public works facilities shall be designed and limited to accommodate needs generated by development or uses permitted consistent with the provisions of this division; provided, however, that it is the intent of the Legislature that State Highway Route 1 in rural areas of the coastal zone remain a scenic two-lane road. Special districts shall not be formed or expanded except where assessment for, and provision of, the service would not induce new development inconsistent with this division. Where existing or planned public works facilities can accommodate only a limited amount of new development, services to coastal dependent land use, essential public	The project does not involve the development of public works facilities. This section is not applicable to Alternative B.	Same as Alternative B.

Otay River Estuary Restoration Project Consistency with the Coastal Resources Planning and Management Policies of the California Coastal Act

Provision	Alternative B-Intertidal Alternative	Alternative C-Subtidal Alternative
services and basic industries vital to the economic health of the region, state, or nation, public recreation, commercial recreation, and visitor-serving land uses shall not be precluded by other development.		
Article 6 Section 30254.5 Terms or conditions on sewage treatment plant development; prohibition Notwithstanding any other provision of law, the Commission may not impose any term or condition on the development of any sewage treatment plant which is applicable to any future development that the Commission finds can be accommodated by that plant consistent with this division. Nothing in this section modifies the provisions and requirements of Sections 30254 and 30412.	The project does not propose a sewage treatment plant. This section is not applicable to Alternative B.	Same as Alternative B.
Article 6 Section 30255 Priority of Coastal Dependent Developments Coastal-dependent developments shall have priority over other developments on or near the shoreline. Except as provided elsewhere in this division, coastal-dependent developments shall not be sited in a wetland. When appropriate, coastal-related developments should be accommodated within reasonable proximity to the coastal-dependent uses they support.	The implementation of Alternative B would result in coastal wetland restoration, which is a coastal dependent project. However, this project does not involve development; therefore, this section of the CCA is not applicable to this alternative.	Same as Alternative B.
Article 7 Industrial Development	The project does not propose new or expanded industrial development. This Article is not applicable to Alternative B.	Same as Alternative B.

Mitigation Monitoring and Reporting Program
Otay River Estuary Restoration Project

Federal Lead Agency:

U.S. Fish and Wildlife Service
San Diego National Wildlife Refuge Complex
P.O. Box 2358
Chula Vista, California 91912

Cooperating Agency:

U.S. Army Corps of Engineers

FEBRUARY 2018

Measure Number	Timing	Measure	Responsible for Monitoring	Completion
		Topography / Visual Quality		
MM-VIS-1	During the establishment of the vegetation to control weeds	**MM-VIS-1**: Should slope armoring along the Otay River channel be deemed necessary, a revegetation plan and accompanying monitoring plan to address the establishment of vegetative screening for the affected area shall be approved by the U.S. Fish and Wildlife Service (Service) and the Executive Director of the California Coastal Commission (Commission) prior to the initiation of any grading at the project. The revegetation plan shall be prepared by a qualified restoration specialist and shall identify the proposed plantings, hydroseed mix, and applicable treatment, monitoring, and success criteria. The revegetation plan shall include the following requirements: Following installation of the Otay Channel Protection (if required) as proposed adjacent to the Bayshore Bikeway and Pond 48 (Project Feature 2, as shown on Figure 2-1a of the EIS), low shrub vegetation shall be installed to enhance existing visual screening of the Otay channel. Vegetative screening shall be implemented on the south side of the fence line along the Bayshore Bikeway where channel armoring is visible to cyclists utilizing the Bikeway. Planting of low shrub vegetation shall only be required where existing vegetation does not adequately screen views of the proposed armoring for Otay channel protection project feature. Plant material to be installed and planting density/spacing shall be consistent with existing vegetation located on the south side of Bikeway-adjacent fencing, or as adequate to screen views of the project feature. The Otay Channel Protection area shall be monitored and maintained during the establishment of the vegetation to control weeds and ensure that the site is meeting applicable success criteria. If necessary to meet these success criteria, additional hydroseeding and/or plantings shall be conducted and/or adaptive management measures shall be implemented as needed until the Otay Channel Protection area vegetative screening area is adequately vegetated (see Appendix D). The revegetated area shall continue to be monitored and maintained for a period of 5 years after the success criteria has been met to ensure that no significant weed infestations or vegetation losses are occurring. Monitoring reports shall be submitted to the Service annually to detail the progress towards achieving the required species and vegetation coverage. Once the approved success criteria have been met, a final report shall be submitted to the Service and the Commission to document completion	U.S. Fish and Wildlife Service	Once the approved success criteria have been met.

		in accordance with the approved revegetation plan.		
Geology, Soils, and Agricultural Resources				
MM-GEO-1	Throughout the duration of construction, including while construction activities are temporarily halted during the core nesting season	MM-GEO-1: A project-specific stormwater pollution prevention plan (SWPPP) shall be prepared and approved by the U.S. Fish and Wildlife Service (Service) and the Regional Water Quality Control Board before the start of construction. The SWPPP shall be implemented by the contractor throughout the duration of construction, including while construction activities are temporarily halted during the core nesting season. The best management practices (BMPs) contained in the SWPPP shall include, but are not limited to, silt fences, fiber rolls, gravel bags, and soil stabilization measures such as erosion control mats and hydroseeding to prevent soil erosion and sedimentation during wind and rain events. Implementation of these BMPs as delineated in the SWPPP shall apply to all areas proposed for excavation. Structural BMPs (or suites of BMPs) shall be designed to treat, infiltrate or filter the amount of stormwater runoff produced by all storms up to and including the 85th percentile, 24-hour storm event for volume-based BMPs, and/or the 85th percentile, 1-hour storm event, with an appropriate safety factor (i.e., 2 or greater), for flow-based BMPs. The SWPPP shall also include a schedule and protocols for inspection, cleaning and repairing of BMPs. The Service is responsible for ensuring that the contractor implements and maintains the BMPs identified in the SWPPP.	U.S. Fish and Wildlife Service and Regional Water Control Board	Completion of all construction and initial restoration activities.
MM-GEO-2	Until all required runoff control measures are operating effectively to the satisfaction of the registered professional engineer or certified hydrogeologist.	MM-GEO-2: To ensure the long-term stability of all slopes created within the project site, a post-construction erosion control plan shall be prepared by a registered professional engineer or certified hydrogeologist and approved by the Service prior to the commencement of grading. A map or graphic shall be included in the erosion control plan identifying the locations and specific erosion and sedimentation control measures to be implemented. As part of the erosion control plan, the contractor shall be required to confirm that slope gradients are constructed as designed, all post-construction erosion control measures are in place, and the slopes are planted or seeded immediately upon completion of construction activities consistent with the revegetation plan as identified in MM-VIS-1. Planting and/or seeding of slopes material shall be monitored and maintained during establishment of the vegetation to ensure that vegetative cover, as determined by a qualified restoration specialist, is achieved as specified in the revegetation plan identified in MM-VIS-1.	U.S. Fish and Wildlife Service and Regional Water Quality Control Board in consultation with a registered professional engineer or certified hydrogeologist	Until all required runoff control measures are operating effectively to the satisfaction of the registered professional engineer or certified hydrogeologist.
Paleontological Resources				

MM-PALEO-1	During all grading and other significant ground-disturbing activities.	MM-PALEO-1: Prior to commencement of any grading activity on site, Poseidon shall retain a qualified paleontologist, subject to the review and approval of the Service. The qualified paleontologist shall be on site during all rough grading and other significant ground-disturbing activities in depths greater than 10 feet below ground surface. The paleontologist shall prepare a paleontological resources impact mitigation program for the proposed action. The program shall be consistent with the guidelines of the Society of Vertebrate Paleontologists (2010) and shall include the following: • Attendance at the pre-construction conference by a qualified paleontologist or his/her representative. • Development and implementation of a training program for project personnel. • Monitoring of excavation activities by a qualified paleontological monitor in areas identified as likely to contain paleontological resources. The monitor shall be equipped to salvage fossils and/or matrix samples as they are unearthed in order to avoid construction delays. The monitor shall be empowered to temporarily halt or divert equipment in the area of the find in in the event paleontological resources are discovered. • Because the underlying sediments may contain abundant fossil remains that can only be recovered by a screening and picking matrix, these sediments shall occasionally be spot-screened through 1/8- to 1/20-inch mesh screens to determine whether microfossils exist. If microfossils are encountered, additional sediment samples (up to 6,000 pounds) shall be collected and processed. • Preparation of recovered specimens to a point of identification and permanent preservation. This includes the washing and picking of mass samples to recover small invertebrate and vertebrate fossils and the removal of surplus sediment from around larger specimens to reduce the volume of storage for the repository and the storage cost for the developer. • Identification and curation of specimens into a museum repository with permanent retrievable storage. • Preparation of a report of findings with an appended itemized inventory of specimens.When submitted to the Service, the report	U.S. Fish and Wildlife Service in consultation with a qualified paleontologist.	Until all grading and other significant ground-disturbing activities have been completed.

		and inventory would signify completion of the program to mitigate impacts to paleontological resources.		
		Hydrology and Water Quality		
MM-HYD-1 and MM-HYD-2	During construction of the levee breach and final construction of the inlet/outlet at Pond 15	MM-HYD-1: Just prior to breaching Pond 15, the U.S. Fish and Wildlife Service (Service) shall ensure that the turbidity level measured in Pond 15 does not exceed 20 percent of the turbidity level measured in the area of the Bay located adjacent to Pond 15. If the turbidity level in Pond 15 is found to exceed the 20 percent threshold, breaching shall be delayed until the turbidity level in Pond 15 is consistent with the 20 percent threshold. In addition, the breaching of Pond 15 shall be scheduled to start during an incoming neap tide to minimize water velocities, thereby minimizing resuspension of sediment within Pond 15. During breaching, it is possible that some scour and associated resuspension could occur within the two channels located within Pond 15; therefore, monitoring of turbidity levels in Pond 15 shall be conducted during the breaching process. If evidence of scour or resuspension of sediment is observed, then work shall be suspended until silt curtains are installed across the interior channels of Pond 15 to minimize turbidity and reduce the amount of resuspended sediment that could exit Pond 15 and enter San Diego Bay. **MM-HYD-2** The Service shall ensure that prior to initiating the excavation of the inlet/outlet channel in the area immediately to the north of Pond 15 in San Diego Bay (as well as within Pond 15 should the levee be breached before the portion of the channel to be located within the boundaries of Pond 15 has been excavated) that a silt curtain has been deployed around the entire inlet/outlet channel work area to minimize turbidity impacts to Bay waters as result of excavation activities. In addition, the Service shall ensure that monitoring is conducted during the excavation process to verify that turbidity levels outside of the area enclosed by the silt curtain are within acceptable levels (i.e., within 20 percent of the turbidity level measured in adjacent areas of the bay undisturbed by project activity). If acceptable levels are exceeded, excavation operations shall be stopped until the Service is assured that corrective measures are in place to reduce turbidity levels outside of the silt curtain to acceptable levels. Following completion of the levee breach and excavation of the inlet/outlet at Pond 15, a qualified engineer shall inspect the site for erosion or sedimentation impacts and the structural integrity of the levee. A report outlining the findings of the inspection, along with the identification of any concerns and recommendations for appropriate actions to address any identified concerns, shall be provided to the Service within 30 days of the inspection. Similarly, silt curtains shall be installed and turbidity levels monitored around construction	U.S. Fish and Wildlife Service in consultation with a qualified engineer.	Following completion of the levee breach and final construction of the inlet/outlet at Pond 15.

		activities associated with reinforcing bridge piers and when installing rock for bank protection.		
MM-HYD-3	Prior to commencement of construction activities.	MM-HYD-3: Prior to commencement of construction activities, the contractor shall prepare to the satisfaction of the Service a hazardous substance management, handling, storage, disposal, and emergency response plan for all phases of construction. The plan shall address where and how construction vehicles will be parked, fueled, and serviced and what actions will be taken to avoid and reduce the risk of accidental release of hazardous materials (e.g., diesel fuel, gasoline, lubricants, coolant, oil solvents, cleaners) during construction activities at the site. The plan shall also identify the worst case spill scenario and list the protocols for spill prevention and response actions that would be taken in the event of unintended spillage of hazardous materials or unintended release of hazardous substances during construction activities. As part of plan implementation, a hazardous materials spill kit shall be maintained on site and a construction monitor shall be designated to ensure that all contractors are in compliance with applicable regulations, including regulations regarding hazardous materials and hazardous wastes, including disposal. Hazardous materials shall not be disposed of or released on the ground, in the underlying groundwater, or in any surface water. Totally enclosed containment shall be provided for all trash. All construction waste, including litter, garbage, and other solid waste, shall be diverted, recycled, or properly disposed of. Petroleum products and other potentially hazardous materials shall be removed to a waste facility permitted to treat, store, or dispose of such materials.	U.S. Fish and Wildlife Service	When all construction and restoration activities are completed.
MM-HYD-4	During the transport of excavated material from the Otay River Floodplain Site to the Pond 15 Site.	MM-HYD-4**:** The Service shall ensure that appropriate measures are implemented by the contractor during the transport of excavated material from the Otay River Floodplain Site to the Pond 15 Site to prevent the release of excavated material and dust into adjacent upland and wetland habitats and open water areas, as well as to minimize the potential for tracking dirt onto surface streets. Such measures shall include always covering the loads of trucks hauling excavated or other loose materials on public streets and requiring trucks hauling materials within the project site to maintain at least 2 feet of freeboard (i.e., vertical space between the top of the load and top of the trailer); watering active haul roads and staging areas as needed to minimize the generation of dust from construction activity; installing wheel washers where vehicles enter and exit unpaved roads; conducting daily street sweeping if visible soil materials are carried to adjacent streets; and establishing construction traffic speeds of 15 miles per hour or less on all unpaved roads. All construction workers shall be educated on proper protocols for loading, transport, and unloading of trucks prior to commencement of soil-hauling activities.	U.S. Fish and Wildlife Service	When all transportation of excavated material from the Otay River Floodplain Site to the Pond 15 Site has been completed.

		If excavated material is to be transported between the Otay River Floodplain Site and the Pond 15 Site via conveyor belt, the following procedures shall be followed: a. While excavated material is being loaded onto the conveyor belt for transport to Pond 15, the Contractor shall ensure that dust suppression is performed in accordance with Rule 55 or per more detailed requirements outlined in the specifications, whichever is more restrictive. b. During or after the excavated material is loaded onto the conveyor belt, the excavated material shall be sprayed with water to prevent material from blowing off the conveyor belt and if necessary, the material will be tarped to prevent dust emission and/or the spilling of excavated material from belt. Tarps or catchment aprons shall be install on the underside of the conveyor belt where it crosses the Otay River or crosses or borders any salt ponds in areas where there would be the potential for the water and substrate within the ponds to be contaminated by spillage from the conveyor belts. c. The process shall be continually monitored to ensure that excavated material is not entering any water bodies, including the Otay River and nearby salt ponds. If necessary to protect water quality, additional measures will be implemented to minimize the loss of excavated material from the belt. Additionally, a soil transport monitoring plan shall be prepared by the construction contractor for review and approval by the Service prior to commencement of soil transport activities. The soil transport monitoring plan shall include operational protocols to ensure that unanticipated spills of transported soil material do not occur from conveyor belt or truck transport operations and monitoring protocols to detect any spills that do occur. The monitoring plan shall also include remediation actions that will be implemented in the event of unintended spill or leakage of excavated material into adjacent wetland areas and salt ponds during soil transport via conveyor belt or truck transport.		
Noise				
MM-NOI-1	During all construction activities.	MM-NOI-1: a. Construction plans shall indicate that the hauling of material from the Otay River Floodplain Site to the Pond 15 Site will only be conducted between the hours of 7 a.m. and 7 p.m. Monday through Saturday and	U.S. Fish and Wildlife Service in coordination with the construction contractor.	When all construction and restoration activities are completed.

		is not permitted on Sundays or between the hours of 7 p.m. and 7 a.m. on any day. b. All construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers. c. Construction noise reduction methods, such as shutting off idling equipment, maximizing the distance between construction equipment staging areas and occupied residential areas, and use of electric air compressors and similar power tools rather than diesel equipment, shall be used. d. During construction, stationary construction equipment shall be placed such that emitted noise is directed away from or shielded from sensitive noise receptors. e. During construction, construction and vehicle staging areas shall be located as far as practical from noise-sensitive land uses.		
Biological Resources				
MM-BIO-1	During pre-construction and construction of the Project.	MM-BIO-1: To avoid or minimize the permanent loss of native habitat or plant communities resulting from project features, any areas that are bridged, reinforced, or widened to accommodate construction equipment would be restored to pre-construction conditions and vegetated with appropriate native plant species once construction is complete per the Construction Methods as described in Section 2.3.2.4 of this environmental impact statement. This includes the 1.36 acres of jurisdictional impacts. To avoid or minimize any long-term impacts to habitat or vegetation, staging areas, access routes, and other disturbed areas shall be decompacted and recontoured to ensure proper site drainage, and revegetated with appropriate native species. Any temporary equipment, structures, or utilities (e.g., water, power) installed at the project site shall be removed at the completion of construction. Impacts from project features that cannot be restored to pre-construction conditions due to the requirements of the construction will be mitigated per the restoration outlined in the FRP. In addition, the temporary impacts (0.62 acre) to the California Coastal Commission-only wetlands (mule fat scrub and Otay River Floodplain Restoration Site) shall be replaced in kind immediately upon completion of construction.	U.S. Fish and Wildlife Service and California Coastal Commission	Until native habitat or plant communities are restored to pre-construction conditions and vegetated with appropriate native plant species.
MM-BIO-2	During construction of Alternative B.	Mitigation for conversion of wetlands from one type to another resulting from implementation of Alternative B (or Alternative C) shall be provided at a mitigation ratio of 1:1.	California Coastal Commission	When all construction and restoration activities are completed and restoration success criteria has been

				achieved.
MM-BIO-3	During construction of Alternative B.	MM-BIO-3: Mitigation for permanent impacts to wetlands resulting from implementation of Alternative B (or Alternative C) shall be provided at a mitigation ratio of 4:1. Mitigation for permanent impacts to wetlands for high tide refugia resulting from implementation of Alternative B shall be provided at a 2:1 ratio. Mitigation for the raising of the levee at Pond 22/23 shall be provided at a 4:1 ratio.	California Coastal Commission	When all construction and restoration activities are completed and restoration success criteria has been achieved.
MM-BIO-4	Prior to construction	MM-BIO-4: Prior to construction, the boundaries of the project site, including staging areas, and truck haul routes, shall be flagged and protective fencing/silt fencing shall be installed to the satisfaction of the San Diego Bay National Wildlife Refuge (NWR) Manager or designated project biologist as approved by the Service. Silt fencing shall also be installed around all existing cismontane alkali marsh to protect it from sedimentation, excessive runoff, and human intrusion. Construction plans shall include notes or mapping of the location of the protective fencing. In addition, a biological monitor shall be present during the pre-construction meeting and during initial grading of these areas to ensure that no construction activity occurs outside the designated construction boundaries. The biological monitor shall be on site during clearing, grubbing, and grading activities to ensure that the approved limits of disturbance are not exceeded. The biological monitor shall also conduct periodic monitoring of storage areas, and protective fencing. Before construction activities occur in areas containing sensitive biological resources, all workers shall be educated by an approved biologist to recognize and avoid those areas that have been marked as sensitive. In addition to the measures described under MM-HYD-3 and MM-HYD-4, the project biologist shall monitor conditions in sensitive habitat areas located adjacent to ongoing construction to ensure that no impacts related to sedimentation are occurring. If impacts are noted, additional measures shall be developed and implemented to minimize the effects of dust and sedimentation on sensitive resources.	U.S. Fish and Wildlife Service	When all construction and restoration activities are completed.
MM-BIO-5	N/A	See MM-BIO-2.	N/A	N/A
MM-BIO-6	N/A	See MM-BIO-3.	N/A	N/A
MM-BIO-7	During construction at the Otay River Floodplain Site and Pond 15 Site.	MM-BIO-7: Permanent impacts to wetlands resulting from implementation of Alternative C would not be entirely offset by the wetland acreage provided as part of the FRP. This deficit shall be mitigated through the purchase of wetland mitigation credits at an agency-approved mitigation bank.	California Coastal Commission	When adequate mitigation credits have been obtained.
MM-BIO-8	No earlier than 30	MM-BIO-8: To mitigate for the loss of estuary seablite (*Suaeda esteroa*), a	U.S. Fish and Wildlife	When all construction

	days prior to the commencement of clearing, grubbing, and earth movement on the project site.	sensitive plant species, from the Otay River Floodplain Site and Pond 15 Site, estuary seablite shall be included in the planting palette. Estuary seablite planting shall be included in the mid-high marsh habitat and shall be planted at a 2:1 mitigation ratio in newly created mid to high marsh areas, and *lyceum californicum* and *Suaeda taxifolia* shall be included in the planting palette for the new wetlands at a 1:1 ratio. A monitoring plan and success criteria for evaluating estuary seablite populations shall be included in the Revegetation Plan required by MM-VIS-1.	Service and California Coastal Commission	and restoration activities are completed and restoration success criteria has been achieved..
MM-BIO-9	During preparation for and implementation of the breaching of the Pond 15 levee	MM-BIO-9: Special-status birds. No earlier than 30 days prior to the commencement of clearing, grubbing, and earth movement on the project site, the NWR Manager and/or project biologist shall conduct focused pre-construction surveys for light-footed Ridgway's rail (*Rallus obsoletus levipes*) and other avian species (such as western snowy plover (*Charadrius alexandrines nivosus*), Belding's Savannah sparrow (*Passerculus sandwichensis beldingi*) and burrowing owl (*Athene cunicularia*)) in the vicinity of the project site. Daily surveys for the presence of rails (family Rallidae) and other sensitive bird species shall be conducted at the Otay River crossing, in the Palomar channel, and in other potential rail habitat areas in the vicinity of the project. If sensitive species are present, an air horn or cracker shells shall be deployed to move the birds off the site prior to commencement of construction activities. If noise proves ineffective, physical presence may be used to haze birds and move them to safer parts of the San Diego Bay NWR. Such monitoring shall continue throughout the day to discourage rails and other birds from moving back into the project site, particularly during periods when construction equipment is not operational, such as during breaks. A subsequent pre-construction survey shall be conducted prior to the commencement of construction activities in subsequent years and daily monitoring should be reinitiated until all construction activity ceases on the project site.	U.S. Fish and Wildlife Service	When all construction and restoration activity has been completed within the project sites.
MM-BIO-10	Adverse effects to nesting seabirds and shorebirds	MM-BIO-10**:** To avoid impacts to nesting birds, all construction activity in and surrounding the Otay River Floodplain Site and the Pond 15 Site shall be confined to the period between September 30 and February 15, unless work outside this period is authorized by the Refuge Manager.	U.S. Fish and Wildlife Service	Until all construction and restoration work related to the project is completed
MM-BIO-11	During breaching of Pond 15 and/or opening of the proposed restoration area on	MM-BIO-11: East Pacific green sea turtle**.** A qualified biologist shall be on site during preparation for and implementation of the breaching of the Pond 15 levee to visually monitor for the presence of East Pacific green sea turtle (*Chelonia mydas*) and other sensitive species. The biologist shall have the authority to halt construction when wildlife is observed within or near the project	U.S. Fish and Wildlife Service	When all construction within the Pond 15 Site, including breaching has completed.

	the Otay River floodplain to tidal action.	site. Should working vessels (e.g., dredge, barge) be used to breach the Pond 15 levee, travel in the area would adhere to a 5-mile-per-hour speed limit. Land and/or water work crews shall be briefed on how to identify sea turtles and marine mammals that could occur in vicinity of the area affected by the breaching process. The biological monitor shall prepare incident reports of any observed sea turtle activity, and shall provide such reports to the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (Fisheries) within 24 hours of an observation. In the event of an incident involving a marine mammal or sea turtle, the Service shall immediately contact the NOAA Fisheries Southwest Regional Office's Stranding Coordinator, and shall submit a report to NOAA Fisheries within 24 hours.		
MM-BIO-12	During breaching of Pond 15 and/or opening of the proposed restoration area on the Otay River floodplain to tidal action.	MM-BIO-11: Eelgrass**.** Eelgrass (*Zostera* spp.) surveys, consistent with the requirements outlined in the 2014 California Eelgrass Mitigation Policy (CEMP), shall be conducted to detect any impacts to eelgrass in the vicinity of the proposed action as a result of breaching Pond 15 and/or opening the proposed restoration area on the Otay River floodplain to tidal action. Pre-breaching surveys for Pond 15 shall be conducted in San Diego Bay from the proposed opening of Pond 15 to the southeast corner of the Chula Vista Wildlife Reserve and at an appropriate reference site. Pre-opening surveys for the proposed restoration area on the Otay River floodplain shall be conducted in the Otay River channel between the opening of Pond 10 and the outlet in Pond 11; in the tidal channels of Ponds 10 and 11; and at an appropriate reference site. The same surveys shall be conducted within 30 days of breaching Pond 15 and 30 days of opening the Otay River floodplain tidal basin to the Bay. If impacts to eelgrass from implementation of the proposed action are identified, mitigation shall be provided in compliance with the CEMP. The Service shall develop an Eelgrass Mitigation Plan that includes a description of the impact, identification of a mitigation site that provides mitigation at the appropriate ratio, identification of a suitable local reference site, success criteria for the mitigation site and a monitoring plan for the mitigation and reference sites. Monitoring reports shall be filed with the resource agencies and the Executive Director of the California Coastal Commission.	U.S. Fish and Wildlife Service and NOAA Fisheries	When the results of required eelgrass surveys indicate that no adverse effects to eelgrass have occurred; or if impacts are identified, affected eelgrass beds have been restored to the satisfaction of NOAA.
Cultural Resources				
MM-CUL-1	Prior to commencement of any project excavation.	MM-CUL-1: Prior to commencement of any project excavation, a Memorandum of Agreement between the Service and the State Historic Preservation Office (SHPO) shall be signed that requires the following stipulations to be completed within 1 year of the commencement of project excavation: (1) in addition to the existing Historic American Landscape Survey (HALS) documentation, entitled	U.S. Fish and Wildlife Service (Service) and the State Historic Preservation Office (SHPO)	When all required actions addressed in the MOA have been completed.

		Cultural Resources Evaluation for the U.S. Fish and Wildlife Service Otay River Estuary Restoration Project, Otay Mesa, San Diego County, California, supplemental photodocumentation will be conducted for Ponds 13, 14, and 15 and the northern portion of Pond 20A; (2) oral history research will be conducted to document the history of the salt works and its ultimate inclusion in the San Diego Bay National Wildlife Refuge (NWR), as well as the 100-year-plus salt-making process at this site; (3) an overview of the salt works history will be posted on the NWR website; (4) an interpretive panel that expands upon the interpretation already developed to inform visitors of the historic significance of the salt works and an interpretive panel developed in partnership with the Sycuan Band of the Kumeyaay Nation, which addresses traditional ecological knowledge and resource exploitation of San Diego Bay, will be designed, fabricated, and installed on the NWR; and (5) a link to an appropriate website addressing the history of the Kumeyaay Nation will be posted on the Refuge website.		
MM-CUL-2	Dring construction activities within the Pond 15 site.	MM-CUL-2: The Service shall ensure that prior to the commencement of construction activities at either the Otay River Floodplain Site or the Pond 15 Site, the construction contractor has implemented protective measures such as temporary ballasts, wood beams, or other protective crossing mechanisms to protect the historic rail tracks located along Bay Boulevard at the construction access point to the Pond 15 Site. These temporary protective measures shall be periodically inspected to ensure their integrity and shall remain in place until all construction activity has ceased within the Pond 15 Site.	U.S. Fish and Wildlife Service	When all construction and restoration activities have ceased within the Pond 15 Site.
MM-CUL-3	During grading and subsurface disturbance within the project's area of potential effect.	MM-CUL-3: A qualified archaeologist meeting the Secretary of the Interior's Standards and Guidelines: Professional Qualifications Standards and a qualified Kumeyaay cultural monitor shall monitor all grading and subsurface disturbance within the project's area of potential effect. If any cultural resources are discovered during excavation, all earthwork in the vicinity shall be halted and the Service's Regional Historic Preservation Officer shall be immediately contacted to review the materials and recommend a treatment that is consistent with applicable laws and policies. In addition to standard monitoring techniques, for monitoring in wet areas the archaeological and Kumeyaay cultural monitors will select 5-gallon samples of excavated sediment to be screened through 1/8 inch wire mesh screen. Wet sediments may be stockpiled and dried prior to sampling by the monitors, before sediments are re-compacted as fill on site or hauled off site.	U.S. Fish and Wildlife Service in consultation with a qualified archaeologist and Kumeyaay cultural monitor	Within 30 days of the completion of all monitoring activities.

		If artifacts or other resources are identified, then the Project archaeologist will determine, in consultation with the Service's Regional Historic Preservation Officer, if the discovery constitutes a potential intact resource. If potential intact resources are discovered, then the notification and treatment methods outlined in Mitigation Measure MM-CUL-4 would be implemented. The treatment plan would likely require the boundaries of the site to be defined before excavation can be reinitiated in the vicinity of the discovery. The site shall be recorded and evaluated for eligibility for listing in the National Register of Historic Places (NRHP). Once this work is completed, additional measures may be required, depending on the results of the eligibility determination. If any site is encountered that is determined to be eligible for listing in the NRHP, the Service shall consult with the SHPO, federally recognized tribes, and interested parties, and additional measures may be required. The archaeological and Kumeyaay cultural monitor shall provide a monitoring report to the Service's Regional Historic Preservation Officer and the San Diego Bay NWR Manager describing the activities and findings of the monitoring effort within 30 days of the completion of all monitoring activity. Summaries of all actions taken related to the discovery of cultural resources during site excavation shall be provided to the Service's Regional Historic Preservation Officer and the NWR Manager within 15 days of completion of the action.		
MM-CUL-4	When archaeological resources are encountered on the San Diego Bay NWR.	MM-CUL-4: All archaeological resources encountered on the San Diego Bay NWR shall be handled in accordance with federal regulations. With respect to artifacts collected on the San Diego Bay NWR, either as part of site investigations and recovery or inadvertent discovery during excavation, the Service will ensure proper care of Federally owned and administered archaeological collections, including ensuring that prehistoric and historic artifacts and associated records are deposited in an institution with adequate long-term curatorial capabilities that can provide professional, systematic, and accountable curatorial services on a long-term basis. The curation institution will meet the federal curation standards as required in 36 CFR 79.	U.S. Fish and Wildlife Service	When construction and restoration activities have been completed.
MM-CUL-5	In the event of the inadvertent discovery of human remains.	MM-CUL-5: In the event of the inadvertent discovery of human remains, the Service's Regional Historic Preservation Officer and the San Diego County Coroner shall be immediately contacted per the Native American Graves Protection and Repatriation Act (NAGPRA) Section (3)(d)(1). All earthwork in the vicinity of the discovery shall be halted and the discovery site shall be	U.S. Fish and Wildlife Service	When all earthwork is completed.

		secured from further disturbance. If the remains are determined to be Native American, all required NAGPRA inadvertent discovery procedures, including, but not limited to, initiating consultation with the Kumeyaay Cultural Repatriation Committee, developing a plan of action, and repatriating any NAGPRA cultural items (i.e., funerary objects, sacred objects, objects of cultural patrimony) and/or human remains, shall be followed.		
Traffic, Circulation, and Parking				
MM-TRA-1	Prior to the commencement of any sediment transport.	MM-TRA-1**:** Prior to the commencement of any sediment transport, a construction area traffic control plan or detour plan shall be prepared for each location where construction activities would encroach into the right-of-way of a public roadway. The plans would include, but not be limited to, such features as warning signs, lights, flashing arrow boards, barricades, cones, lane closures, flaggers, pedestrian detours, parking restrictions, and restricted hours during which lane closures would not be allowed (e.g., 7 to 9 a.m. and 4 to 6 p.m.) or as determined by the Service.	U.S. Fish and Wildlife Service	Until construction activity within the public right-of-way has been completed.
MM-TRA-2	During all deliveries of construction materials and equipment to the project site.	MM-TRA-2: The contractor shall schedule all deliveries of construction materials and equipment to the project site to avoid peak-hour traffic congestion (e.g., 7 to 9 a.m. and 4 to 6 p.m.) or as determined by the Service.	U.S. Fish and Wildlife Service	After all deliveries of construction materials and equipment to the project site have finished.
Public Utilities and Easements				
MM-UTIL-1	Prior to the completion of final project construction plans.	MM-UTL-1**:** Prior to the completion of final project construction plans, individual utility agencies with utilities located within or adjacent to areas of construction activity shall be contacted to determine the extent and type of temporary protective measures that must be implemented to prevent construction damage to surface and subsurface utilities.	U.S. Fish and Wildlife Service	Until all work that could affect existing utilities has been completed.
Public Access and Recreational Opportunities				
MM-REC-1	During construction activities along Bayshore Bikeway.	MM-REC-1: 30 days prior to the start of any clearing and grubbing or mobilization(s), whichever occurs first, the contractor shall install warning and notification signs at the following locations: 1) along the Bayshore Bikeway in both directions and 50-feet away in both directions from the construction access point to the Pond 15 Site where vehicles will be crossing the Bayshore Bikeway and 2) at the Main Street/Frontage Road entrance to the Bayshore Bikeway in both directions and 50-feet away in both directions, as well as at the 13th Street entrance onto the east bound segment of the Bayshore Bikeway. The initial signs, to be posted 30 days prior to the start of construction, will alert riders of upcoming construction activity and the potential for future delays due	U.S. Fish and Wildlife Service	Until affected bikeways are restored to pre-project conditions following the completion of all construction and restoration activities.

		to the presence of construction vehicles. Prior to initiating construction and installing protective materials on the bike path, the initial signs shall be replaced with warning signs informing riders to expect delays due to construction vehicles crossing the bikeway or entering Main Street from the project site, as applicable. Where protective materials will be installed on the bicycle path, the warning signs shall clearlying alert riders to slow down due to the uneven surfaces that the protective materials will create. The contractor shall maintain all signs in good order throughout each of two construction periods. At the end of each construction period, the Bayshore Bikeway shall be returned to documented pre-project conditions. Prior to commencement of the second year of construction, the same signage procedures shall be followed as described above. Similarly, at 50-feet away from the Main Street entrance (north end) and at and 50-feet away from the Saturn Boulevard entrance (south end) to the Saturn Boulevard bike path initial signs shall be installed 30 days prior to construction to alert riders about the upcoming construction and associated temporary reroute of the bike path, including a map indicating where the reroute will be located, and two weeks prior to construction, signs, with a map of the rerouted section, shall be installed to direct users onto and along the rerouted section of trail. In addition, warning signs shall be installed 50-feet away from Main Street along the reroute informing users of presence of construction vehicles entering and exiting Main Street and the potential for delays. The temporary reroute and all directional signs shall be maintained throughout the two-year construction period. Prior to commencement of the second year of construction, the same warning sign procedures shall be followed as described above. At the end of construction, the Saturn Boulevard bike path shall be returned to documented, pre-project conditions. During active construction, flaggers shall be present to control trucks and bicycle traffic on the Bayshore Bikeway, with flaggers present at the Main Street/Frontage Road entrance to the Bayshore Bikeway, at the construction access point to the Pond 15 Site, and at the northern extent of the rerouted Saturn Boulevard bike path. The contractor shall maintain the bikeway in good repair at all times, frequently remove any dirt or debris deposited on the bikeway or Main Street by trucks and construction equipment, and provide protective barriers as necessary.		
MM-REC-2	While the Saturn Boulevard bike	MM-REC-2**:** Prior to the commencement of project construction, a reroute of the Saturn Boulevard bike path shall be designed and required approvals obtained,	U.S. Fish and Wildlife Service	Until affected bikeways are restored to pre-

	path is temporarily rerouted.	and prior to any other construction associated with the project, the contractor shall complete the approved temporary reroute of the bike path. Design, permitting, and construction shall be conducted in coordination with the City of San Diego Park and Recreation Department and Streets Division, as well as, County of San Diego Park and Recreation Department. The project construction documents shall indicate that the contractor is responsible for restoring the existing bike path to document pre-construction conditions following completion of all construction activities.		project conditions following the completion of all construction and restoration activities..
Economics and Employment				
MM-ECO-1	Until completion of the construction.	MM-ECO-1: To avoid conflicts with ongoing salt works operations, prior to the start of construction, the contractor shall provide the salt works management with an up-to-date construction schedule and timeline of activities related to the restoration project. The salt works management shall also receive monthly updates of construction progress and shall be informed immediately of any changes in the proposed schedule or timeline.	U.S. Fish and Wildlife Service	When construction and restoration activities have been completed and the affected areas of the salt works outside of the restoration sites have been restored to pre-project conditions.