
Poseidon Huntington Beach Desalination Facility

Marine Life Mitigation Plan at Newland Marsh: Fee-Based Mitigation

Huntington Beach, Orange County, California

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LIST OF ACRONYMS AND ABBREVIATIONS

APF	Area of Production Foregone
CCC	California Coastal Commission
Caltrans	California Department of Transportation
ETM	Empirical Transport Model
HBWC	Huntington Beach Wetlands Conservancy
mgd	Million Gallons per Day
MLMP	Marine Life Mitigation Plan
MLMR	Marine Life Mortality Report
SCC	State Coastal Conservancy
SRT	Self-Regulating Tide
SWRCB	State Water Resources Control Board

1.0 INTRODUCTION

Poseidon Water (Poseidon) is proposing the development of a desalination facility (Project) in Huntington Beach, Orange County, California. As part of the Project's permitting process, Poseidon is required to offset the Project's impacts to marine life. The amount of off-set due to the intake and discharge of seawater is determined through the calculation of the Area of Production Foregone (APF) to determine the number of replacement habitat credits needed in terms of wetland or estuarine habitat restoration (Desalination Amendment, State Water Resources Control Board 2015).

This Marine Life Mitigation Plan (MLMP) details the proposed mitigation program that Poseidon will undertake and demonstrates compliance with the Desal Amendment to the State Water Resources Control Board's (SWRCB) Water Quality Control Plan for the Ocean Waters of California (Desalination Amendment) and the California Coastal Commission (CCC) past precedents related to the preparation of a MLMP. Specifically, this MLMP is designed to demonstrate compliance with the provisions found in Section III.M2.e. of the SWRCB's Desalination Amendment, which requires the use the best available mitigation measures feasible to minimize the intake and mortality of all forms of marine life.

Poseidon proposes to mitigate for Project-related impacts through the completion of a restoration program at the Newland Marsh in Huntington Beach in cooperation with the Huntington Beach Wetlands Conservancy (HBWC). The restoration will build on the successful record that the HBWC has had at the Huntington Wetlands over the past 20 years. The proposed restoration of Newland Marsh will also assure high productivity for estuarine and coastal organisms in the vicinity of the area of the proposed Project. The expected benefits are described in this MLMP. Consistent with Sections III.M2.e.(3) and (4) of the Desalination Amendment, Poseidon proposes to undertake the restoration through a fee-based agreement.

This MLMP provides the basis for the proposed restoration program, the benefits that will be achieved, and details regarding the proposed financial commitment.

2.0 MARINE LIFE MORTALITY REPORT SUMMARY

The Desalination Amendment requires the development of a Marine Life Mortality Report (MLMR) estimating the marine life mortality resulting from construction and operation of a desalination facility. The amount of habitat credits required to offset the impacts associated with the operation of the Huntington Beach Desalination Facility is based upon the guidance for calculating the APF found in the Desalination Amendment. An Expert Review Panel undertaken for the SWRCB provided recommendations on mitigation for residual impingement and entrainment caused by intakes that withdraw water directly from the ocean without any filtration (surface intakes) (Foster et al. 2012). The approach recommended uses an Empirical Transport Model (ETM) to estimate the APF. Mitigation is then based on the cost of replacing the production lost ('foregone') to entrainment by restoration that replaces the lost production or other projects deemed equivalent. The APF approach has been adopted by California regulatory agencies to determine mitigation for entrainment by desalination plants. Estimates of APF are based on both intake of surface water as well as discharge of brines.

For the intake at the proposed Huntington Beach Desalination Facility, Tenera Environmental prepared a July 1, 2015 technical memorandum entitled "Memorandum on Approach for APF Calculations at Huntington Beach," which analyzes the potential entrainment of planktonic

organisms from the long-term, stand-alone operation of the desalination project. The Desalination Amendment allows for a one percent reduction in the final estimate of APF for projects that incorporate a 1 mm screen into the intake design. As the final intake design for the desalination plant will include a screen with 1 mm mesh, the final APF estimate was reduced one percent. The Tenera memorandum estimates the Project's entrainment-related mitigation requirement to be 16.9 acres.

For the discharger impacts, the proposed Project could require an additional 23.43 acres of mitigation pursuant to the requirements of the Desalination Amendment that address salinity levels in the Project's discharge and the effects of the proposed brine diffuser. Mitigation for the long-term, stand-alone operation would encompass mitigation for impacts from comingled discharge from the Huntington Beach Generating Station. The comingled discharge would result in larval mortality based on a 115 million gallons per day (mgd) turbulent shearing water volume. Modeling results indicate an APF of 8.13 acres. When the desalination plant becomes a stand-alone facility after the Huntington Beach Generating Station transitions away from once-through-cooling, the turbulent portion of the 781 mgd of the source water entrained will be approximately 180 mgd, or 23 percent of the total 781 mgd. The final APF for the stand-alone diffuser operation totals 23.43 acres, or 9.12 acres contributed by estuarine taxa and 14.31 acres contributed by coastal taxa.

To mitigate for an estimated APF of 40.3 acres, Poseidon proposes to undertake the restoration of the 44 acre Newland Marsh in cooperation with the Huntington Beach Conservancy under a fee-based agreement, including costs related to planning, permitting, implementation, and long-term monitoring.

3.0 NEWLAND MARSH RESTORATION PROJECT

3.1 Background and Existing Conditions

Newland Marsh is part of the Huntington Beach Wetland complex, located in Huntington Beach, Orange County, California. The wetland complex is an approximately 200-acre remnant of an approximately 2,900-acre former wetland complex which once existed at the mouth of the Santa Ana River. The wetlands have suffered substantial degradation over time due to isolation from tidal influence, neglect, encroachment, unauthorized access, and historic diking, filling, and oil exploration. Diking and filling of natural creeks for the purpose of oil and gas exploration isolated the area from surface tidal exchange for over 70 years (Dage and Reardon 2004).

The wetland complex has undergone substantial restoration over the past 20 years. Because of the presence of extensive historic marsh plains at or near desired elevations, the area was well suited for restoration without significant alteration. The area consists of restored salt marsh and coastal dune habitat and is comprised of four distinct areas separated by roads: Talbert Marsh, Brookhurst Marsh, Magnolia Marsh (including Upper Marsh), and Newland Marsh (Figure 1). The marshes are connected to the Pacific Ocean by a Huntington Beach flood control channel (HB Channel). The dike separating Talbert Marsh from the flood control channel was breached in 1989, restoring full tidal influence to this section.

Newland Marsh is the only component of the Huntington Beach Wetland complex that is not presently restored to tidal action (restoration of Talbert Marsh, Brookhurst Marsh, and Magnolia Marsh is described in Section 4.2). The 44-acre Newland Marsh is comprised of three areas: Newland West Marsh, Newland East Marsh, and Newland North Marsh. Newland East and North Marshes possess mainly uplands, salt panne and degraded pickleweed. Existing surface conditions in the Newland West Marsh is mainly non-tidal coastal marsh with uplands along the

south perimeter. Over time, significant portions of the West Marsh unit have become more brackish to freshwater marsh.

The property is currently owned by the California Department of Transportation (Caltrans). The HBWC has recently prioritized the acquisition of the Newland Marsh property in its Southern California Wetland Work Plan. Caltrans is currently going through the administrative process of declaring property surplus and determining its valuation for sale to another state agency, such as the State Coastal Conservancy (SCC). Once this transfer takes place, the state agency will

Figure 1 – Huntington Beach Wetlands Complex

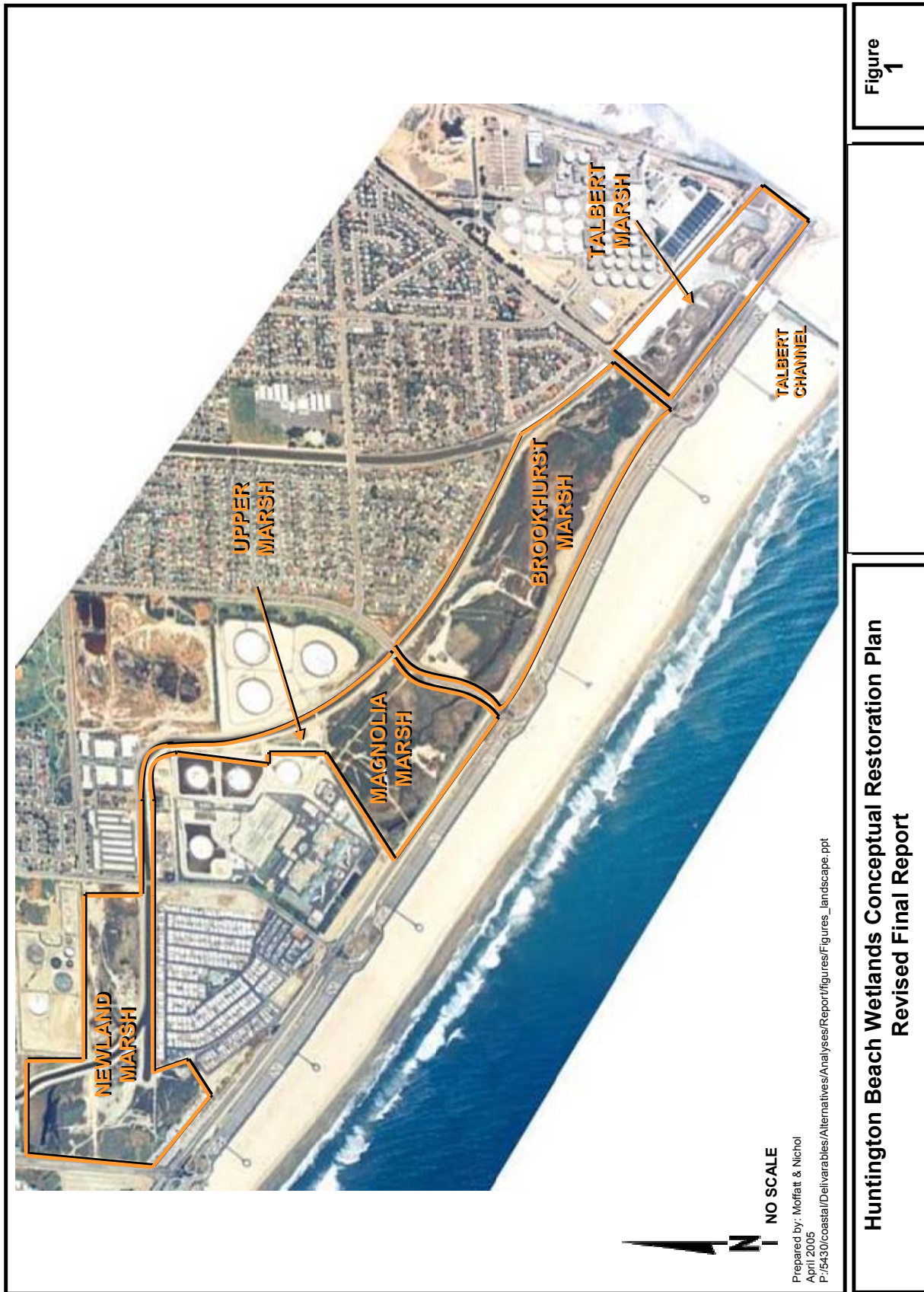


Figure 1

Huntington Beach Wetlands Conceptual Restoration Plan
Revised Final Report

FIGURE COURTESY OF:
HUNTINGTON BEACH WETLANDS CONCEPTUAL RESTORATION PLAN REVISED FINAL REPORT

transfer or lease the property to the HBWC. It is expected that any transfer to HBWC would also contain a restriction or easement restricting use to wetland restoration in perpetuity.

Newland Marsh, like other wetlands in the Huntington complex, has a number of constraints. Roads, flood control infrastructure, housing developments and a mobile home park lie immediately adjacent to the property and will need protection from inundation. The wetlands will in turn need protection, or “buffering,” from the residential developments. Electrical transmission lines, including a high voltage line, run across the middle of the property and maybe relocated or protected in place, and a long abandoned oil well on the site needs to be evaluated. Finally, the status of the small former boatyard parcel must be determined. If any development occurs on that parcel, it will need to be buffered from the wetlands.

3.2 Project Objectives

Newland Marsh has the potential to become a biologically productive coastal wetland on par with the other three marshes comprising the Huntington Beach Wetlands complex. Upon acquisition of the Newland Marsh property, HBWC plans to connect Newland Marsh to the tidal channel that currently serves Brookhurst Marsh and Talbert Marsh.

HBWC has identified the following objectives for Newland Marsh:

- Restore tidal influence throughout the site and improve tidal circulation;
- Maximize salt marsh / tidal habitats with no net harm to threatened and endangered species existing at the site, such as the Belding’s savannah sparrow;
- Increase saltwater-dependent ecosystem diversity and habitats for threatened and endangered species by increasing the area of cordgrass, reinvigorating existing areas of pickleweed, and increasing the area of mudflat;
- Rehabilitate the wetland/upland transition zone;
- Maintain the dune habitat adjacent to Pacific Coast Highway;
- Maintain, and to the extent feasible, improve water quality in the existing hydraulic system including capturing floating debris;
- Provide public access consistent with project wildlife goals including integrating the project with the Orange County River Park trail system and providing public educational and outreach opportunities;
- Minimize costs and efforts for long-term wetland operation and maintenance;
- Phase implementation to accommodate constraints of land ownership, funding, and environmental conditions;
- Remediate or isolate any oil-related contaminants that may have ecological effects; and
- Do not aggravate existing conditions related to vectors, ocean and channel water quality, site contamination, scour effects of bridges, and flooding on adjacent properties.

3.3 Project Description

HBWC's conceptual restoration plan for Newland Marsh includes restoration activities over approximately 44 acres to expand subtidal habitat, mudflats, and tidal marsh (Figure 2). The proposed plan involves introducing muted tidal influence to the marsh by installing culverts in the existing flood control levees, enlarging existing channels, and creating new channels. The current plan contemplates only muted tidal action such that higher high tides would not be conveyed through the culverts. Levees around the marsh may need to be improved to protect existing development. Limiting the water levels would reduce the heights of perimeter levees that would be necessary, reduce potential flooding to adjacent property, reduce impacts to the wetland from levee footprints, and reduce aesthetic impacts. Lower areas that would be inundated more frequently would likely become mudflat. Higher areas would likely become colonized by pickleweed. A public access program is envisioned that includes a trail comprehensive trail network.

Newland West Marsh

Newland West Marsh would be restored to a muted tidal condition with a 2.5-foot tidal range from +2.2 to +4.7 feet NAVD. Connection with one 3-foot diameter culvert to the HB Channel would be installed where the former HB Flood Channel meets the existing Channel north of the mobile home park. The culvert's invert elevation would be +0.0 feet NAVD. This connection feeds into three tributary channels toward the north and south, respectively. Additional excavation would occur within and along the tributary channels and banks to lower the site further to create mudflat area.

New low perimeter levees would be required along Beach Boulevard at the northwest edge of the site, along the northern boundary, and along the south and east boundaries near the mobile home park to prevent overtopping at high water. The culvert would be outfitted with a Self-Regulating Tide (SRT) gate to control high water levels. The SRT gate works with ballast to close when water levels within the HB channel exceed a certain elevation, in this case approximately +5.1 feet NAVD. The concept SRT is similar to those installed at the Santa Ana River tidal marsh for the same purpose. As storm flows cause the water surface elevation to rise in HB Channel, the gate would automatically close when water levels reach +5.1 feet NAVD, and remain closed until water levels in the Channel drop to levels lower than +5.1 feet NAVD. The site would be prevented from receiving storm flows and flooding during storm events.

Elevation changes would include lowering internal channels from existing elevations of between +3.5 to +4.5 feet NAVD to +1.0 feet NAVD. A perimeter moat would be created along the north reach of Beach Boulevard by lowering the surface from +4 feet and +5 feet to -1.0 feet NAVD. A 3-foot-high earthen dike would be installed to an elevation of +8 along the north, west, south and east property lines. An elevated overlook would be created at the west end near the Pacific Coast Highway/Beach Boulevard intersection by filling the existing ground from +6 feet NAVD to +9 feet NAVD.

Newland West Marsh contains one remnant of former industry at the south-central portion of the marsh that is assumed to be left in place and sequestered. This would be an appropriate location for placement of fill for earth budgeting or creation of an overlook.

Figure 2 – Proposed Newland Marsh Conceptual Restoration



Figure 2

Huntington Beach Wetlands Conceptual Restoration Plan
Revised Final Report

FIGURE COURTESY OF:
HUNTINGTON BEACH WETLANDS CONCEPTUAL RESTORATION PLAN REVISED FINAL REPORT

In summary, the modifications proposed to Newland West Marsh include:

- Install one 3-foot diameter culvert through the HB Channel levee at an invert elevation of +0.0 feet NAVD for a tidal connection outfitted with an SRT gate for high water level management;
- Enlarge three to six tributary channels to +1.0 feet NAVD extending throughout the marsh;
- Install perimeter channels to +1.0 feet NAVD along Beach Boulevard and near PCH, respectively, to discourage access; and
- Install new perimeter levees to +8.0 feet NAVD along portions of the north, west, south, and east marsh perimeters.

Newland Marsh East

Newland Marsh East would be restored to a muted tidal marsh with a tide range of approximately 3.0 feet from +2.2 to +5.2 feet NAVD. One 3-foot diameter culvert would connect directly into two small tributary channels extending east toward Newland Street. The culvert's invert elevation would be +0.0 feet NAVD. It would be outfitted with a SRT gate to control high water levels. Additional excavation would occur around the tributaries to lower the site further to create mudflat area. Area A in figure 2 shows this portion of the marsh.

Elevation changes would include generally lowering internal channels from existing elevations of between +2.5 feet to +4.0 feet NAVD to +1.5 feet NAVD. The banks of tributaries would be lowered to between +3.8 feet to +2.2 feet NAVD to create mudflat. An isolated small full tidal wetland would be created in the southeast corner of this parcel by lowering the site from +5.5 feet NAVD to 0 feet NAVD, and surrounding it with a dike to +10 feet NAVD. A 4-foot-high earthen dike would be installed up to +8 feet NAVD along the north and east property lines. An elevated overlook would be created at the northeast end near the Hamilton Street/Newland Street intersection by filling the existing ground from +6 feet NAVD to +8 feet NAVD.

A small educational/interactive marsh could be created at the east end of Newland Marsh East at Area B (Figure 2). This site would be appropriate for a small full tidal marsh area separated from the remainder of Newland East Marsh with a low earthen levee. One 3-foot diameter culvert would connect directly into two small tributary channels extending east toward Newland Street. The culvert's invert elevation would be +0.0 feet NAVD. It would also be outfitted with a SRT gate to control high water levels. The interactive marsh would include the full range of salt marsh habitat and would serve as an example of a prototype ecosystem. It would be accessible to the general public and capable of being intruded upon without detrimental environmental effects. It is intended to provide an opportunity for local schools and educational programs.

In summary, the modifications proposed to Newland East Marsh include:

- Install one 3-foot diameter culvert through the east HB Channel levee at an invert elevation of +0.0 feet NAVD outfitted with an SRT gate for high water level management;
- Slightly enlarge two tributary channels to +1.0 feet NAVD extending east from the culverts;

- Install new perimeter levees around the east and north marsh perimeter to an elevation of +8.0 feet NAVD; and
- Lower the sides of the tributaries to elevations between +3.8 feet and +2.2 feet NAVD within the marsh to create mudflat area;

Newland North Marsh

Newland Marsh North would be restored to muted tidal action and connected to the HB Channel with a one 1-foot diameter culvert. The culvert would feed directly into a small tributary channel that would extend east toward the site boundary as shown in Figure 2. The culvert's invert elevation would be +0.0 feet NAVD. It would be outfitted with a SRT gate to control high water levels. The banks of tributaries would be lowered to between +3.8 feet to +2.2 feet NAVD to create mudflat. A new perimeter levee would be required along the entire east and northern boundaries of the site.

Elevation changes would include generally lowering channels from existing elevations of between +2.5 feet to 0 feet NAVD. A 4-foot-high earthen dike would be installed to an elevation of +8 feet NAVD along the north and east property lines.

In summary, the modifications proposed to Newland North Marsh include:

- Install one 1-foot diameter culvert to connect to HB Channel at an invert elevation of +0.0 feet NAVD outfitted with an SRT gate for high water level management;
- Create one tributary channel extending east to +1.0 foot NAVD;
- Lower the sides of the tributaries to elevations between +3.8 feet and +2.2 feet NAVD within the marsh to create mudflat area;
- Install new perimeter levees around the east and north marsh perimeter to an elevation of +8.0 feet NAVD; and
- Possibly install a pedestrian bridge over the HB Channel for public access.

3.4 Expected Habitats within the Project

Newland Marsh would be transformed into intertidal salt marsh habitat under muted-tidal influence. Newland West Marsh would possess subtidal areas surrounded by low and mid-marsh, with little or no mudflat. Pickleweed would be the predominant surface cover with patches of cordgrass. Newland East and North sites would possess mudflat in and near channels, and pickleweed at most all other surfaces with small patches of cordgrass. Newland East Marsh would also possess a small area of subtidal and low marsh habitat with mudflats being exposed at low water to serve as an educational/interactive area. These marshes would provide habitat for fish, invertebrates, and birds including the Belding's Savannah Sparrow.

The exact disposition of habitat types and any changes from one wetland type to another would be developed as part of the design and environmental review.

3.5 Expected Biological Productivity of Restored Site

Studies of biological productivity following the restoration of Brookhurst Marsh provide evidence of benefits to aquatic ecosystems that can be expected following the restoration of Newland Marsh.

The fish population of Brookhurst Marsh has been studied by Allen et al. (2012). Beach seines, beam trawls and hook and line fishing were employed in monthly surveys. They found that the fish very quickly colonized the marsh areas after tidal flows were restored. Fish abundance and species richness have increased in Brookhurst Marsh from pre-restoration (no water, no fish) conditions. In Spring 2011, Brookhurst Marsh had a total of 306 individual fish caught in a total of 6 seines (total 20 spp., average of 44 fish per seine) as compared to the reference site, Talbert Marsh (total of 275 individual fish, average of 46 fish per seine). However, there were some differences in fish species composition and were hypothesized to be due to slower colonization by benthic invertebrates which serve as food source for fish such as California killifish; whereas fish that feed in the water column such as topsmelt and jacksnelt) were very prevalent.

By the second year following restoration, there were little differences between Brookhurst and Talbert Marsh fish communities. Eelgrass also eventually colonized Brookhurst Marsh which also provided important habitat for fish, particularly juvenile halibut. Eelgrass in Brookhurst Marsh exhibited an increase in total area from 2010 to 2011 of approximately 44%. The presence of newly settled juveniles within the Huntington Beach Wetlands demonstrates the connectivity of this habitat with nearby coastal ocean areas, which is important not only for providing access to the newly restored Brookhurst Marsh as potential nursery habitat, but also allows primary production in marsh areas to contribute to the secondary production in deeper waters. Given the experience established at the Brookhurst marsh, it is expected that restoration of Newland Marsh, even in a muted tidal condition, would be beneficial to fish populations within the estuary and the nearby coastal zone.

3.6 Compliance with Desalination Amendment and CCC wetland mitigation conditions

The project must comply with conditions as set forth in the Desalination Amendment of the Ocean Plan (Table 1 and 2).

Table 1. Basis for meeting SWRCB Desal Amendment standards.

Desalination Amendment for Operator Mitigation	Basis for Compliance
Submit a Mitigation Plan, including project objectives, site selection, site protect instrument, baseline site conditions, a mitigation work plan, a maintenance plan, a long-term management plan, an adaptive management plan, performance standards, success criteria, monitoring requirements, and financial assurances.	This document is the MLMP and it contains the specific required elements.
Mitigation shall be accomplished through expansion, restoration or creation of one or more of the following: kelp beds, estuaries,	The proposed mitigation will restore tidal wetlands within an area that once contained extensive tidal marshes. The restoration will

Desalination Amendment for Operator Mitigation	Basis for Compliance
coastal wetlands, natural reefs, MPAs, or other projects approved by the regional water board.	remove barriers to tidal flow and provide access for estuarine and marine fish to this portion of the Huntington wetlands.
The owner/operator shall demonstrate that the project fully mitigates for intake-related marine life mortality by including expansion, restoration, or creation of habitat based on the APF acreage calculated.	Section 3.3-3.5 describes the proposed plan and the benefits to marine and estuarine fish. Substantial monitoring evidence has been collected for other portions of the Huntington wetlands that have been previously restored demonstrating the success of tidal restoration. The area of anticipated benefit at Newland Marsh is approximately equivalent to the estimated APF.
The mitigation project's production area shall overlap the facility's source water body. Impacts on the mitigation project due to entrainment by the facility must be offset by adding compensatory acreage to the mitigation project.	The Newland Marsh wetlands are within proximity to the proposed project; however, the fish within the wetlands are predominately estuarine species that may provide a forage base for marine species, but are not the same species as found in the vicinity of the intake/discharge of the project.
The owner/operator shall demonstrate that the project fully mitigates for discharge- and construction-related marine life mortality projected in the MLMR.	The anticipated acreage of restored tidal action at Newland Marsh is approximate to the APF estimated in the MLMR. Final credit acreage will be determined at the time of final plan preparation and approval.
The regional water board may permit out-of-kind mitigation for mitigation of open water or soft bottom species. In-kind mitigation shall be done for all other species whenever feasible.	This project is out-of-kind but provides substantial benefits to wetlands and coastal and estuarine fish.

Table 2. Basis for meeting standards under Fee-based Mitigation Program between Poseidon and the Huntington Beach Wetlands Conservancy.

Desalination Amendment Standards for Fee-based Mitigation Program	Basis for Compliance
The agency that manages the fee-based program must have legal and budgetary authority to accept and spend mitigation funds, a history of successful mitigation projects documented by having set and met performance standards for past projects, and stable financial backing in order to manage mitigation sites for the operational life of the facility.	Under a fee-based program, Huntington Beach Wetlands Conservancy would be the legal entity managing the mitigation funds and performing the mitigation construction and long term monitoring. Huntington Beach Wetlands Conservancy has the legal and budgetary authority to accept and spend mitigation funds, and has successfully implemented three previous projects in this area.
The amount of the fee shall be based on the	The amount of the fee would be based on the

Desalination Amendment Standards for Fee-based Mitigation Program	Basis for Compliance
cost of the mitigation project, or if the project is designed to mitigate cumulative impacts from multiple desalination facilities or other development projects, the amount of the fee shall be based on the desalination facility's fair share of the cost of the mitigation project.	estimated costs determined following the more detailed design and environmental review for the specific project to be undertaken by the Huntington Beach Wetlands Conservancy.
The manager of the fee-based mitigation program must consult CDFW, the Ocean Protection Council, the CCC, SLC, and state and regional water boards to develop mitigation projects that will best compensate for intake and mortality of all forms of marine life caused by the desalination facility.	These agencies would be consulted to develop the mitigation project.

In addition, this MLMP will also be reviewed by the California Coastal Commission and must meet the minimum standards for wetland mitigation in southern California as developed for other similar wetland mitigation projects such as the San Dieguito Wetland Restoration undertaken by Southern California Edison for the San Onofre Nuclear Power Plant intakes and the South San Diego Bay wetland mitigation project undertaken by Poseidon for its Carlsbad desalination facility. A description of this compliance is provided below:

3.6.1 Located within the southern California Bight

The restoration project is located within Huntington Beach, CA in Orange County and is proximal to the southern California Bight.

3.6.2. Potential for restoration as tidal wetland, with extensive intertidal and subtidal areas

The restoration project will be created through excavation, grading, and planting of an area that historically consisted of large areas of tidal wetland habitat that were transformed to non-tidal wetlands and upland habitat through development surrounding the area and the construction of a flood control channel through the middle of the area. The site does not receive regular tidal action but can be restored to muted tidal action through the placement of specially designed culverts. Based on the experience of other projects along the channel, the potential for success is high and will create extensive subtidal and intertidal habitats, and transitional wetland.

3.6.3. Creates or substantially restores a minimum of 40 acres of wetlands, excluding buffer zone and upland transition area.

The restoration of the Newland Marsh will substantially restore historic tidal wetlands and subtidal areas in this region. The acreage of the area is 44 acres and a final plan will take into account the buffers necessary to protect the restored wetland.

3.6.4. Provides a buffer zone not less than at least 100 feet wide.

Buffer zones will be incorporated into the final design. Buffers will not be included in the calculation of acreage that can be credited towards the APF required by the Huntington Beach desalination facility.

3.6.5. Any existing site contamination problems would not hinder restoration.

Site contamination issues would be evaluated and resolved prior to or concurrent with restoration. The Huntington Beach Conservancy has had experience in remediating former oil wells on other sites and the contamination was removed.

3.6.6. Site preservation is guaranteed in perpetuity.

As previously discussed, the Newland Marsh property is currently owned by Caltrans. Caltrans is actively pursuing divestment of the property and intends to sell the property to a state agency, such as the SCC. Once this transfer takes place, the state agency will transfer the property to the HBWC. HBWC will hold the property into perpetuity under a conservation easement for the long-term benefit of the public.

3.6.7. Feasible methods are available to protect the long-term wetland values on the site, in perpetuity.

Other wetlands managed by the HBWC have been successfully restored and managed to meet ecological objectives. Similar methods will be employed at the Newland Marsh unit.

3.6.8. The project does not result in a net loss of wetlands

The project design will involve some excavation. Some upland areas that include the former boat yard also may be excavated depending upon the final engineering design. Any wetlands that are converted to uplands will be mitigated at a 4:1 ratio such that there will be no net loss of wetlands.

3.6.9. Does not result in impact on endangered species.

Environmental review will be conducted as part of the project approval process and biological surveys will be undertaken. Avoidance measures will be enacted to avoid impacts to endangered species should they be present. Mitigation measures may be employed to off-site any habitat loss.

3.6.10. Provides maximum upland transition areas (in addition to buffer zones).

The project will be designed to meet requirements of projected sea level rise and provide transitional zones to accommodate sea level rise.

4.0 HUNTINGTON BEACH WETLANDS CONSERVANCY

4.1 Legal and Budgetary Authority

The HBWC is a non-profit, tax-exempt corporation that works with local, state, and federal agencies and property owners to acquire, restore, and manage coastal wetlands in the Orange County coastal zone. Funding for new projects and for restored wetlands maintenance comes from conservation bonds, state and federal grant funds, and private donations.

4.2 History of Successful Mitigation Projects

The HBWC owns and manages 118 acres of the Huntington Beach wetlands between the Santa Ana River and Newland Street, including Talbert Marsh, Brookhurst Marsh, and Magnolia Marsh. The HBWC and the SCC have worked together to plan and implement the restoration of these wetlands.

The Talbert Marsh offers the public a multipurpose trail on approximately 27 acres from Brookhurst Street to the Santa Ana River Trail and is owned in total by the HBWC. In 1989, a man-made dike separating the wetlands from the flood control channel was breached and tidal flushing action was restored. Throughout most of the year, the water in the marsh is seawater from the ocean inlet located at Talbert Marsh. Water flows in and out twice a day with the tide and can rise and fall as much as 8 feet. Fresh water also washes down storm water channels during winter rains. Restoration succeeded in improving tidal flushing and circulation to that marsh, establishment of sensitive salt marsh habitat, and improving flood control for the southern portion of Huntington Beach.

Brookhurst Marsh consists of approximately 67 acres between Brookhurst and Magnolia Streets. Restoration of this marsh began in September 2008 and was completed in March 2009. Restoration funding was provided in part by the Montrose Settlement Restoration Program. Future plans include a public access dune trail.

Magnolia Marsh is located between Magnolia Street and the AES power plant. Restoration of this approximately 43-acre marsh began in April 2009, and recreation of the historical marsh channels and restoration of full tidal influence were completed in March 2010. Public access features include an elevated observation deck over a tidal lagoon, a boat dock for on-the-water tours, and an interpretive trail system.

4.3 Stable Financial Backing to Manage Mitigation Sites

According to Guidestar, the HBWC is incorporated as a non-profit organization with the State of California. The HBWC has been in existence since 1986. As of 2014, the Conservancy had assets of \$6.9 million with an annual income of \$321,000 and expenses of \$251,000. No liabilities were reported. HBWC has successfully implemented several wetland restoration projects using funding from the State Coastal Conservancy and from the Montrose Coastal Restoration Fund.

5.0 MITIGATION FEE

5.1 Projected Costs

Wetland construction estimates were made by Moffatt and Nichol in 2006 at \$1,543,000. However, this was based on a preliminary conceptual design and did not include planning, design, and permitting. Construction costs have likely increased. Final costs would be determined after a restoration design is prepared and an environmental review is completed.

Poseidon would enter into an agreement with HBWC to fund the design and environmental review of the proposed Newland Marsh restoration. Once the project is approved under local authorizations and is accepted as meeting the mitigation requirements under the Desal Amendment and by the Coastal Commission, Poseidon would enter into a second agreement with the HBWC for the development of final construction plans, bid documents, and oversight of the construction activities. The agreement would also include mechanism for the payment of contractor fees, either through the HBWC or direct payments to the contractor.

Monitoring would be conducted by the HBWC as an independent monitor. HBWC would develop a monitoring plan to be approved by the agencies and to be in general consistency with other monitoring programs approved by the CCC. Costs for monitoring will be developed upon approval of the final monitoring plan. Poseidon would fund the monitoring program and, should remediation actions be necessary, will work with HBWC to assure that these actions are undertaken in order to meet the performance standards set for the wetland.

5.2 Agreement with HBWC for Cost Reimbursement

Poseidon would enter into an agreement with the HBWC for reimbursement of costs associated with implementation of the Newland Marsh restoration. Under the agreement, HBWC would be the responsible party for developing contracts, bid solicitation, contract implementation, and management. HBWC would also undertake monitoring and reporting on an annual basis. As necessary and in conjunction with the agencies and Poseidon, HBWC may alter the proposed restoration plan to achieve the performance and success criteria. Other than conducting the work as required and necessary, HBWC would not be responsible for any other permit requirements placed on Poseidon by the agencies.

Poseidon would be responsible for maintaining an escrow account where funds sufficient to cover expected restoration costs would be retained and upon which HBWC can withdraw to cover costs and management fees.

6.0 REPORTING

A long-term, post-construction monitoring and reporting program would be developed to quantify changes to the site over time. The HBWC conducted monitoring at the Brookhurst Marsh following construction. The monitoring plan would be developed in coordination the regulatory agencies and will focus on performance standards to be met in order for credits to be provided to Poseidon to meet its APF. The monitoring parameters for would include, at a minimum:

- Topographic monitoring and habitat distribution over time.
- Hydrologic monitoring to assure meeting certain tidal conditions

- Water quality monitoring to assure that dissolved oxygen levels do not decline below a level that fish populations would be affected.
- Monitoring of vegetation cover, invertebrates species and density, fish species and density, and bird species and density.
- Monitoring of nuisance algal cover and invasive species to assure that they do not affect the ecological functioning of the wetland system.

Monitoring would be conducted by the HBWC using qualified contractors to undertake a plan that is consistent with agency requirements. HBWC will report annually to the agencies on the progress in meeting the performance standards and any remedial actions that were undertaken. Full credit towards meeting the APF requirement will be provided once performance standards are met.

7.0 REFERENCES

- Allen, B.J., C.Whitcraft, C.G. Lowe. 2012. Huntington Beach Wetlands Restoration (CA). Final Report. NOAA Restoration Center Community-Based Restoration Program. 80pp.
- Dage L, Reardon M (2004) Phase I environmental site assessment: Huntington Beach Wetlands, Orange County, CA. GeoSyntec Consultants. 193 pp.
- Foster, M.S., Cailliet, G.M., Callaway, J., Raimondi, P. and Steinbeck, J. 2012. Mitigation and Fees for the Intake of Seawater by Desalination and Power Plants. Report to State Water Resources Control Board, Sacramento.
- Huntington Beach Wetlands Conservancy. Huntington Beach Wetlands Restoration Project Presentation by Gary Gorman.
- Moffat and Nichol, Engineers. 2006. Conceptual Plan for the Restoration of Newland Marsh. Prepared for the Huntington Beach Conservancy.
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