Michelle M.

POSEIDON RESOURCES

December 9, 2008

SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD

2008 DEC -9 P 4:34

Mr. John Robertus
Executive Officer
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Subject: Adopted Resolution No. R9-2008-0039 conditionally approving *Revised Flow, Entrainment, and Impingement Minimization Plan*, Poseidon Resources Corporation, Carlsbad Desalination Project (CRU: 02-1429.02 bkelley).

Dear Mr. Robertus:

We are in receipt of your December 2, 2008 letter regarding Poseidon's November 14, 2008 submittal of an amendment to the Marine Life Mitigation Plan ("MLMP") pursuant to Resolution No. R9-2008-0039. The Regional Board's final approval of the MLMP is the last step in a months-long, interagency collaborative process to develop a feasible plan that protects coastal resources while allowing Poseidon to proceed with the development of a desalination plant desperately needed to address Southern California's significant water needs. This interagency process was specifically directed by paragraph 3(c) of the Board's April 9, 2008 Resolution.

The December 2 letter appears primarily concerned that the MLMP is a performance-based, site-specific plan with 11 candidate mitigation sites, rather than a "single-site" plan. The "single-site" mitigation plan approach was not employed during the interagency development of the plan; instead, the interagency process resulted in the evolution of performance-based requirements that will apply to the mitigation site or sites that may be chosen from among 11 candidate sites or identified by the Department of Fish & Game as priority sites. We submit this letter to address that concern and the other issues raised in the letter, and respectfully ask that you reconsider this matter. As explained below, the attached MLMP is fully responsive to the agency's directives, and issues raised previously by the Board have been addressed (Attachment 1).

1. **The Site-Specific MLMP Is the Result of the Interagency Process Ordered by the Regional Board and Consistent with the Regional Board's April 9, 2008 Resolution.**

While Poseidon has emphasized that the Regional Board has primary jurisdiction over the MLMP, the Regional Board directed that the actual development of the plan be accomplished in coordination with several other agencies, primarily the Coastal Commission. In the Executive Officer's remarks at the April 9, 2008 meeting to discuss the plan, he emphasized that the Regional Board intended to be a participant in an interagency process, which was largely guided by the Coastal Commission. The Regional Board's Resolution provides for "[c]oordination among participating agencies for the amendment of the Plan as required by Section 13225 of the

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California Water Code[.]"[1] Accordingly, the MLMP was developed collaboratively with and finally approved by the Coastal Commission, with the input of several other resource agencies, including the Regional Board. As a result of this interagency collaboration, the MLMP as amended is consistent with the resource protection objections of the Water Code and Resolution No. R9-2008-0039, as well as the strong protections of the Coastal Act.

During the process, Poseidon provided its entrainment study to the Regional Board and Coastal Commission for their review in March 2008. The Coastal Commission retained an independent scientist, Dr. Pete Raimondi, who issued a report that informed an interagency meeting held in May 2008 to discuss available and feasible mitigation options for the MLMP. Representatives from eight state agencies participated at the May 2008 interagency meeting, including the Executive Officer of the Regional Board. The MLMP was also vetted by the Coastal Commission's Scientific Advisory Panel (who concurred with Raimondi's recommendations) and finally approved in substance by the Coastal Commission at its August 6, 2008 meeting. The August 6, 2008 Coastal Commission meeting was monitored by a Regional Board representative, who did not offer an objection to the plan. The interagency process resulted in the development the plan as a site-specific, performance-criteria based plan focused on 11 candidate sites. This type of plan emerged as the consensus, rather than a "single-site" plan as indicated in your December 2, 2008 letter. On November 7, 2008, the Coastal Commission finally approved the plan.

Thus, in its present form before the Regional Board, the amended MLMP represents the product of months of coordination and consensus toward the common goal of coastal resource protection, providing for the creation of up to 55.4 acres of highly productive estuarine habitat in two phases, more than sufficient to meet coastal resource protection objectives. A requirement that Poseidon's plan be limited to a single site would run counter to the Regional Board's requirements that Poseidon coordinate with other agencies as directed by the Board.

Further, a "single-site" plan, as referenced in your December 2, 2008 letter, would have been infeasible in the six-month time frame allotted by the Resolution. In order to generate a "single-site" plan, Poseidon would have needed to identify and acquire a site, conduct the necessary engineering, environmental review and permitting (CEQA, RWQCB 401 Water Quality Certification, Dewatering Permit, Army Corps Section 10 and 404 permits, Coastal Development Permit, State Lands Commission Encroachment Permit, Department of Fish & Game Streambed Alteration Agreement, etc.), and negotiate contractual issues associated with a selected site. Consistent with the general understanding of these logistical limitations, Resolution No. R9-2008-0039 does not require the MLMP to be "single-site" but rather requires that it include, as it does, a "specific proposal for mitigation of impacts."

2. **<u>Poseidon Previously Has Addressed the Other Issues Raised in the Resolution and the February 19, 2008 Letter</u>**

The MLMP addresses the Regional Board's resource protection concerns, as articulated in its February 19, 2008 letter (Attachment 2) and in paragraph 3(a)-(e) of the Resolution.

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[1] Order No. R9-2008-0039, ¶ 3(c).

Poseidon provided responses to the Board's February 19, 2008 letter when it submitted an updated version of the plan to the Regional Board on March 7, 2008, along with a written summary of the additional information that had been incorporated into the revised plan in response to the staff's February comment letter. Poseidon also presented additional information in the form of expert testimony by Dr. Scott Jenkins, who elaborated at the April 9, 2008 meeting on the points raised in the staff's comments (Partial Transcript of Proceedings, Attachment 3).

The Board's April 9, 2008 Resolution identified five concerns, all of which have been addressed: (a) Identification of impacts from impingement and entrainment; (b) Adequate monitoring data to determine the impacts from impingement and entrainment; (c) Coordination among participating agencies for the amendment of the Plan as required by Section 13225 of the California Water Code; (d) Adequacy of mitigation; and (e) Commitment to fully implement the amendment to the Plan.[2]

The interagency coordination accomplished to date satisfies concern (c). Concern (e), Poseidon's commitment to fully implement the amendment to the Plan, is enforced via Poseidon's obligation to submit a Coastal Development Permit application for Phase I mitigation to the Coastal Commission within two years of the issuance of the Coastal Development Permit for the Carlsbad Desalination Project, and a Coastal Development Permit application for Phase II mitigation within five years of the issuance of the Coastal Development Permit for Phase I.

Concerns (a), (b), and (d) were addressed during the development of the MLMP through the interagency process. Poseidon provided the Regional Board and Coastal Commission staff its entrainment study for review. The Coastal Commission's independent expert, Dr. Pete Raimondi, was able to determine that that study's sampling and data collection methods were consistent with those used in other studies conducted in California pursuant to agency guidelines. Dr. Raimondi also found that the study provided adequate data to determine the types and numbers of organisms that would be subject to entrainment and to determine the area of the source water bodies – that is, the area of Agua Hedionda and nearshore ocean waters where entrainable organisms would be subject to entrainment. Poseidon's calculations were found to be generally consistent with those used in other recent studies, although the calculations Poseidon used to determine its source water areas differed from those used in other recent studies to reflect the tidal exchange between Agua Hedionda Lagoon and the nearshore ocean environment. Coastal Commission staff provided the results of Dr. Raimondi's review and recommendations to the Regional Board and other interested state agencies in May 2008, which are documented on pages 11 and 12 of the Commission's Recommended Revised Condition Compliance Findings (Attachment 4 - Item W16a: regarding Poseidon Resources Submittal of a Marine Life Mitigation Plan).

Further, in accordance with the requirements of Resolution No. R9-2008-0039, Condition A of the MLMP attached hereto (Attachment 1) addresses:

- Required acreages of estuarine wetlands mitigation (Section 1);

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[2] Resolution No. R9-2008-0039, ¶ 3(a)-(e).

- Mitigation site selection procedures (Section 2);
- Minimum standards, objectives, and restrictions (Section 3);
- Wetlands construction, permitting, and implementation schedules (Section 4); and
- Pre-restoration monitoring, construction monitoring, post-restoration monitoring, management, and remediation (Section 5).

As shown within Condition A of the attached MLMP (Attachment 1), a two-phase wetlands restoration program is contemplated. Phase I provides for 37 acres of estuarine wetlands mitigation. Phase II provides for up to an additional 18.4 acres of estuarine wetlands mitigation, unless Poseidon proposes and the Commission approves alternatives to reduce or eliminate the 18.4 acres of mitigation, including implementing new entrainment reduction technology or mitigation credits for conducting dredging.

In addition, the Coastal Commission addressed the adequacy of the mitigation set forth in the MLMP when it made a finding requiring up to 55.4 acres of estuarine wetland restoration in the Southern California Bight, subject to the conditions shown in the MLMP. The Coastal Commission determined that this acreage provides a sufficient degree of certainty that the facility's entrainment impacts will be fully mitigated and brings the MLMP into conformity with the Coastal Act's marine life protection policies (See Attachment 4 at 16). Further, the Coastal Commission found that "implementation of the MLMP will ensure that the project's entrainment-related impacts will be fully mitigated and will enhance and restore the marine resources and biological productivity of coastal waters in conformity to coastal Acts Section 30230 and 30231" (Attachment 4 at 19).

In sum, the Regional Board's substantive concerns have been comprehensively addressed during the plan development, as indicated in the plan itself, Poseidon's March 7, 2008 submittal to the Regional Board, expert testimony at the April 9, 2008 Regional Board meeting, as well as in the findings made by the Coastal Commission when it finally adopted the plan on November 7, 2008. The staff's December 2, 2008 letter does not appear to raise any additional or specific concerns not already addressed.

3. <u>The MLMP Was Submitted Pursuant to Timing that Facilitated Agency Processing, After Notice Was Provided to the Regional Board</u>

The MLMP was timely submitted in light of the flexibility required to accomplish the important objective of interagency coordination. Peter MacLaggan of Poseidon met with the Executive Officer on September 17, 2008 at the Regional Water Quality Control Board office, weeks in advance of the October 8, 2008 submittal deadline. Mr. MacLaggan informed the Executive Officer that the Coastal Commission would not be in a position to sign off on the final MLMP language by October 8, 2008 and asked whether Poseidon should submit the current draft of the MLMP to the Regional Board or wait for the final approved language from the Coastal Commission. The Executive Officer indicated that he would prefer to receive the final language and subsequently advised the Regional Board at its November 12, 2008 that flexibility in the October 8, 2008 deadline was being allowed to accommodate the involvement of the other agencies. The Regional Board attorney also noted that the timeliness of the other agencies'

approval may have been impacted by litigation initiated by groups opposing the project. The MLMP was submitted November 14, 2008, exactly one week after the Coastal Commission issued its final approval on November 7, 2008. Only slightly delayed past the original October 8, 2008, Poseidon submitted a final MLMP at its first opportunity.

In order to facilitate the Regional Board's final review of the MLMP, we would appreciate an opportunity to meet with you to learn the details of any specific questions or concerns that staff feel have not have been addressed by our submittals. I will be calling you soon to set up a meeting. Thank you for your assistance.

Sincerely,

Peter M. MacLaggan
Senior Vice President

Enclosures

cc: Mike Porter
Chiara Clemente
Richard Wright - Chair
David King – Vice-Chair
Eric Anderson
Wayne Rayfield
Kris Weber
Grant Destache
George Loveland
Gary Thompson

Attachment 1

Marine Life Mitigation Plan

November 14, 2008

P O S E I D O N R E S O U R C E S

November 14, 2008

Mr. John Robertus
Executive Officer
California Regional Water Quality Control Board, San Diego Region
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Dear Mr. Robertus:

Subject: Adopted Order No. R9-2008-0039 conditionally approving *Revised Flow, Entrainment, and Impingement Minimization* Plan, Poseidon Resources Corporation, Carlsbad Desalination Project (CRU: 02-1429.02 bkelley).

Attached is the *Marine Life Mitigation Plan* (MLMP) for Poseidon's proposed Carlsbad Desalination Project. The MLMP represents a proposed amendment to the Carlsbad Desalination Project *Flow, Entrainment and Impingement Minimization Plan* (Minimization Plan), which was conditionally approved by Regional Board Resolution No. R9-2008-0039.

This MLMP was developed in consultation with several participating agencies, and through proceedings before the California Coastal Commission. The Coastal Commission approved the substance of the MLMP at its August 6, 2008 meeting, and directed Poseidon and Coastal Commission staff to reach agreement on minor administrative issues such as budget and reimbursements that would not require further Commission approval. Poseidon and Coastal Commission staff have now reached agreement on those issues, and will report the final MLMP to the Commission at the Commission's December 2008 meeting. Accordingly, the MLMP attached hereto is addressed to the Coastal Commission and its Executive Director. Once approved by the Regional Board, we understand the MLMP would be equally enforceable by the Regional Board and its Executive Officer.

As approved by the Coastal Commission, the requirements of the MLMP are consistent with, and in many respects more stringent than, the requirements under California Water Code section 13142.5, pursuant to which authority the Regional Board directed the preparation of the Minimization Plan.

Background. Regional Board Order No. R9-2006-0065 (NPDES CA0109223) regulates the proposed discharge of saline wastewater from the Carlsbad Desalination Project. Cooling water from the Encina Power Station (EPS) will provide the main source of desalination intake water. During times when EPS power generation is temporarily shut down, EPS will operate its intake structure to provide Poseidon with sufficient intake water to operate.

Minimization Plan Submittal and Conditional Approval. Order No. R9-2006-0065 required Poseidon to submit a Minimization Plan to address implementation or mitigation measures for minimizing impacts to marine organisms during periods when EPS power generation is shut down. An initial version of the Minimization Plan was submitted to the Regional Board in 2007, and an updated version was submitted to the Regional Board on February 13, 2008. Regional

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Board staff commented on the updated version in a February 19, 2008 letter. In response, Poseidon submitted an updated version of the Minimization Plan to the Regional Board on March 7, 2008, along with correspondence that addressed how the Minimization Plan had been revised to incorporate Regional Board staff comments.

After reviewing Poseidon's extensive submittal, the Regional Board adopted Resolution No. R9-2008-0039 on April 9, 2008, which conditionally approved the Minimization Plan. The Resolution required Poseidon to submit an amendment to the Minimization Plan addressing the Regional Board's February 19 letter, as well as the following items:

- Identification of impacts from impingement and entrainment;
- Adequate monitoring data to determine the impacts from impingement and entrainment;
- Coordination among participating agencies for the amendment of the Plan as required by Section 13225 of the California Water Code;
- Adequacy of mitigation; and
- Commitment to fully implement the amendment of the Plan.

As discussed below, the above requirements of Resolution No. R9-2008-0039 have been addressed by Poseidon, the Regional Board, the California Coastal Commission, and participating agencies through an independent review of Poseidon's entrainment study and related monitoring data, interagency coordination, and development of the final MLMP.

MLMP Development and Approval. In March 2008, Poseidon provided a copy of its entrainment study for Regional Board and Coastal Commission staff for their review. The Coastal Commission staff retained Dr. Pete Raimondi, an independent scientist with expertise in evaluating entrainment studies, to review Poseidon's study and provide recommendations regarding the adequacy of the information contained therein.

In May 2008, the Coastal Commission staff convened an interagency meeting, which included Regional Board staff, to determine what mitigation options might be available and feasible for Poseidon to include as part of its MLMP.

Attendees included representatives from:

- California Department of Fish and Game
- California Department of Transportation
- California State Lands Commission
- San Diego Regional Water Quality Control Board
- City of Carlsbad
- City of Vista
- U.S. Fish and Wildlife Service
- California Coastal Commission

In June 2008, the Coastal Commission staff asked the Commission's Marine Review Committee (MRC) to review Dr. Raimondi's conclusions and make further recommendations for Poseidon to include in its proposed MLMP.

Also in June 2008, Coastal Commission staff provided Poseidon a copy of the conditions the Commission had required of Southern California Edison for its wetland restoration project at San Dieguito Lagoon (Edison Conditions). Based on input received from the MRC, Coastal Commission staff recommended to Poseidon that it incorporate modified versions of the Edison Conditions into its proposed MLMP to ensure that the mitigation site ultimately selected would be subject to compatible and consistent mitigation requirements.

On July 7, 2008, Poseidon submitted to Coastal Commission staff a revised MLMP, which incorporated the results of the reviews by Coastal Commission staff, Dr. Raimondi, MRC and the several state and local agencies listed above. The Coastal Commission reviewed and approved the substance of that Plan, subject to certain modifications, at its August 6, 2008 hearing.

Highlights of MLMP. The MLMP approved by the Coastal Commission consists of two parts: Conditions A and B. In accordance with the requirements of Resolution No. R9-2008-0039, Condition A of the MLMP attached hereto addresses:

- Required acreages of estuarine wetlands mitigation (Section 1);
- Mitigation site selection procedures (Section 2);
- Minimum standards, objectives, and restrictions (Section 3);
- Wetlands construction, permitting, and implementation schedules (Section 4); and
- Pre-restoration monitoring, construction monitoring, post-restoration monitoring, management, and remediation (Section 5).

As shown within Condition A of the attached MLMP, a two-phase wetlands restoration program is proposed. Phase I provides 37 acres of estuarine wetlands mitigation. Phase II provides for up to an additional 18.4 acres of estuarine wetlands mitigation unless Poseidon proposes and the Commission approves alternatives to reduce or eliminate the 18.4 acres of mitigation, including implementing new entrainment reduction technology or mitigation credits for conducting dredging. Under the MLMP, Poseidon is obligated to submit a CDP application for Phase I mitigation to the Coastal Commission within two years of the issuance of the CDP for the Carlsbad Desalination Project, and for Phase II mitigation, Poseidon is obligated to submit a CDP application within five years of the issuance of the CDP for Phase I mitigation.

Condition A (Section 2) of the MLMP also:

- Establishes standards for final mitigation site selection;
- Sets forth a "short list" of potential sites to be considered; and

- Provides that any additional future priority sites that may be recommended by the California Department of Fish and Game also may be considered.

Per the requirements of Resolution No. R9-2008-0039, Condition B of the MLMP sets forth the MLMP's administrative structure and budget, and the work plan for implementing the mitigation. As part of this administrative structure, Condition B also establishes means to remediate any deficiencies and resolve disputes associated with MLMP implementation. Poseidon's commitment to implement the MLMP as an amendment to the Mitigation Plan will be enforced by the Regional Board through the requirements of Order R9-2006-0065 and by the Coastal Commission through Condition 8 of Poseidon's CDP.

In order to facilitate the Regional Board's review of the MLMP, we would appreciate an opportunity to meet with you in the near future to discuss how the proposed MLMP accomplishes the Regional Board's resource protection objectives and Poseidon's duties under the Water Code. I look forward to speaking with you soon, and will be calling you to set up a meeting. Thank you for your assistance.

Sincerely,

Peter M. MacLaggan
Senior Vice President

Enclosure

Cc: Mike Porter
Chiara Clemente

POSEIDON RESOURCES MARINE LIFE MITIGATION PLAN

INTRODUCTION

Poseidon's Carlsbad desalination facility will be co-located with the Encina Power Station and will use the power plant's once-through cooling intake and outfall structures. The desalination facility is expected to use about 304 million gallons per day (mgd) of estuarine water drawn through the structure. The facility will operate both when the power plant is using its once-through cooling system and when it is not.

This Marine Life Mitigation Plan (the Plan) will result in mitigation necessary to address the entrainment impacts caused by the facility's use of estuarine water. The Plan includes two phases of mitigation – Poseidon is required during Phase I to provide at least 37 acres of estuarine wetland restoration, as described below. In Phase II, Poseidon is required to provide an additional 18.4 acres of estuarine wetland restoration. However, as described below, Poseidon may choose to provide all 55.4 acres of restoration during Phase I. Poseidon may also choose during Phase II to apply for a CDP to reduce or eliminate the required 18.4 acres of mitigation and instead conduct alternative mitigation by implementing new entrainment reduction technology or obtaining mitigation credit for conducting dredging.

CONDITION A: WETLAND RESTORATION MITIGATION

The permittee shall develop, implement and fund a wetland restoration project that compensates for marine life impacts from Poseidon's Carlsbad desalination facility.

1.0 PHASED IMPLEMENTATION

Phase I: Poseidon is to provide at least 37 acres of estuarine wetland restoration. Within two years of issuance of the desalination facility's coastal development permit (CDP), Poseidon is to submit a complete CDP application for a proposed restoration project, as described below.

Phase II: Poseidon is to provide an additional 18.4 acres of estuarine wetland restoration. Within five years of issuance of the Phase I CDP, Poseidon is to submit a complete CDP application proposing up to 18.4 acres of additional restoration, subject to reduction as described below.

2.0 SITE SELECTION

In consultation with Commission staff, the permittee shall select a wetland restoration site or sites for mitigation in accordance with the following process and terms.

Within 9 months of the effective date of this permit, the permittee shall submit the proposed site(s) and preliminary wetland restoration plan to the Commission for its review and approval or disapproval.

The location of the wetland restoration project(s) shall be within the Southern California Bight. The permittee shall select from sites including, but not limited to, the following eleven sites: Tijuana Estuary in San Diego County; San Dieguito River Valley in San Diego County; Agua Hedionda Lagoon in San Diego County; San Elijo Lagoon in San Diego County; Buena Vista Lagoon in San Diego County; Huntington Beach Wetland in Orange County, Anaheim Bay in

Orange County, Santa Ana River in Orange County, Los Cerritos Wetland in Los Angeles County, Ballona Wetland in Los Angeles County, and Ormond Beach in Ventura County. The permittee may also consider any sites that may be recommended by the California Department of Fish & Game as high priority wetlands restoration projects. Other sites proposed by the permittee may be added to this list with the Executive Director's approval.

The basis for the selection shall be an evaluation of the site(s) against the minimum standards and objectives set forth in subsections 3.1 and 3.2 below. The permittee shall take into account and give serious consideration to the advice and recommendations of the Scientific Advisory Panel (SAP) established and convened by the Executive Director pursuant to Condition B.1.0. The permittee shall select the site(s) that meets the minimum standards and best meets the objectives.

3.0 PLAN REQUIREMENTS

In consultation with Commission staff, the permittee shall develop a wetland restoration plan for the wetland site(s) identified through the site selection process. The wetland restoration plan shall meet the minimum standards and incorporate as many as feasible of the objectives in subsections 3.1 and 3.2, respectively.

3.1 Minimum Standards

The wetland restoration project site(s) and preliminary plan(s) must meet the following minimum standards:

a. Location within Southern California Bight;

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

c. Creates or substantially restores a minimum of 37 acres and up to at least 55.4 acres of habitat similar to the affected habitats in Agua Hedionda Lagoon, excluding buffer zone and upland transition area;

d. Provides a buffer zone of a size adequate to ensure protection of wetland values, and at least 100 feet wide, as measured from the upland edge of the transition area.

e. Any existing site contamination problems would be controlled or remediated and would not hinder restoration;

f. Site preservation is guaranteed in perpetuity (through appropriate public agency or nonprofit ownership, or other means approved by the Executive Director), to protect against future degradation or incompatible land use;

g. Feasible methods are available to protect the long-term wetland values on the site(s), in perpetuity;

h. Does not result in a net loss of existing wetlands; and

i. Does not result in an adverse impact on endangered animal species or an adverse unmitigated impact on endangered plant species.

3.2 Objectives

The following objectives represent the factors that will contribute to the overall value of the wetland. The selected site(s) shall be determined to achieve these objectives. These objectives shall also guide preparation of the restoration plan.

a. Provides maximum overall ecosystem benefits, e.g. maximum upland buffer, enhancement of downstream fish values, provides regionally scarce habitat, potential for local ecosystem diversity;

b. Provides substantial fish habitat compatible with other wetland values at the site(s);

c. Provides a buffer zone of an average of at least 300 feet wide, and not less than 100 feet wide, as measured from the upland edge of the transition area.

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

e. Restoration involves minimum adverse impacts on existing functioning wetlands and other sensitive habitats;

f. Site selection and restoration plan reflect a consideration of site specific and regional wetland restoration goals;

g. Restoration design is that most likely to produce and support wetland-dependent resources;

h. Provides rare or endangered species habitat;

i. Provides for restoration of reproductively isolated populations of native California species;

j. Results in an increase in the aggregate acreage of wetland in the Southern California Bight;

k. Requires minimum maintenance;

l. Restoration project can be accomplished in a reasonably timely fashion; and,

m. Site(s) in proximity to the Carlsbad desalination facility.

3.3 Restrictions

a. The permittee may propose a wetland restoration project larger than the minimum necessary size specified in subsection 3.1(c) above, if biologically appropriate for the site(s), but the additional acreage must (1) be clearly identified, and (2) must not be the portion of the project best satisfying the standards and objectives listed above.

b. If the permittee jointly enters into a restoration project with another party: (1) the permittee's portion of the project must be clearly specified, (2) any other party involved cannot gain mitigation credit for the permittee's portion of the project, and (3) the permittee may not receive mitigation credit for the other party's portion of the project.

c. The permittee may propose to divide the mitigation requirement between a maximum of two wetland restoration sites, unless there is a compelling argument, approved by the Executive Director, that the standards and objectives of subsections 3.1 and 3.2 will be better met at more than two sites.

4.0 PLAN IMPLEMENTATION

4.1 Coastal Development Permit Applications

The permittee shall submit complete Coastal Development Permit applications for the Phase I and Phase II restoration plan(s) that shall include CEQA documentation and local or other state agency approvals. The CDP application for Phase I shall be submitted within 24 months following the issuance of the Coastal Development Permit for the Carlsbad desalination facility. The CDP application for Phase II shall be submitted within 5 years of issuance of the CDP for Phase I. The Executive Director may grant an extension to these time periods at the request of and upon a demonstration of good cause by the permittee. The restoration plans shall substantially conform to Section 3.0 above and shall include, but not be limited to the following elements:

a. Detailed review of existing physical, biological, and hydrological conditions; ownership, land use and regulation;

b. Evaluation of site-specific and regional restoration goals and compatibility with the goal of mitigating for Poseidon's marine life impacts;

c. Identification of site opportunities and constraints;

d. Schematic restoration design, including:

1. Proposed cut and fill, water control structures, control measures for stormwater, buffers and transition areas, management and maintenance requirements;
2. Planting program, including removal of exotic species, sources of plants and or seeds (local, if possible), protection of existing salt marsh plants, methods for preserving top soil and augmenting soils with nitrogen and other necessary soil amendments before planting, timing of planting, plans for irrigation until established, and location of planting and elevations on the topographic drawings;
3. Proposed habitat types (including approximate size and location);
4. Assessment of significant impacts of design (especially on existing habitat values) and net habitat benefits;
5. Location, alignment and specifications for public access facilities, if feasible;
6. Evaluation of steps for implementation e.g. permits and approvals, development agreements, acquisition of property rights;
7. Cost estimates;

8. Topographic drawings for final restoration plan at 1" = 100 foot scale, one foot contour interval; and
9. Drawings shall be directly translatable into final working drawings.

g. Detailed information about how monitoring and maintenance will be implemented;

h. Detailed information about construction methods to be used;

i. Defined final success criteria for each habitat type and methods to be used to determine success;

j. Detailed information about how Poseidon will coordinate with the Scientific Advisory Panel including its role in independent monitoring, contingency planning review, cost recovery, etc.;

k. Detailed information about contingency measures that will be implemented if mitigation does not meet the approved goals, objectives, performance standards, or other criteria; and,

l. Submittal of "as-built" plans showing final grading, planting, hydrological features, etc. within 60 days of completing initial mitigation site construction.

4.2 Wetland Construction Phase

Within 6 months of approval of the Phase I restoration plan, subject to the permittee's obtaining the necessary permits, the permittee shall commence the construction phase of the wetland restoration project. The permittee shall be responsible for ensuring that construction is carried out in accordance with the specifications and within the timeframes specified in the approved final restoration plan and shall be responsible for any remedial work or other intervention necessary to comply with final plan requirements.

4.3 Timeframe for Resubmittal of Project Elements

If the Commission does not approve any element of the project (i.e. site selection, restoration plan), the Commission will specify the time limits for compliance relative to selection of another site or revisions to the restoration plan.

5.0 WETLAND MONITORING, MANAGEMENT AND REMEDIATION

Monitoring, management (including maintenance), and remediation shall be conducted over the "full operating life" of Poseidon's desalination facility, which shall be 30 years from the date "as-built" plans are submitted pursuant to subsection 4.1(1).

The following section describes the basic tasks required for monitoring, management and remediation. Condition B specifies the administrative structure for carrying out these tasks, including the roles of the permittee and Commission staff.

5.1 Monitoring and Management Plan

A monitoring and management plan will be developed in consultation with the permittee and appropriate wildlife agencies, concurrently with the preparation of the restoration plan to provide an overall framework to guide the monitoring work. It will include an overall description of the studies to be conducted over the course of the monitoring program and a description of management tasks that are anticipated, such as trash removal. Details of the monitoring studies and management tasks will be set forth in a work program (see Condition B).

5.2 Pre-restoration site monitoring

Pre-restoration site monitoring shall be conducted to collect baseline data on the wetland attributes to be monitored. This information will be incorporated into and may result in modification to the overall monitoring plan.

5.3 Construction Monitoring

Monitoring shall be conducted during and immediately after each stage of construction of the wetland restoration project to ensure that the work is conducted according to plans.

5.4 Post-Restoration Monitoring and Remediation

Upon completion of construction of the wetland(s), monitoring shall be conducted to measure the success of the wetland(s) in achieving stated restoration goals (as specified in the restoration plan(s)) and in achieving performance standards, specified below. The permittee shall be fully responsible for any failure to meet these goals and standards during the facility's full operational years. Upon determining that the goals or standards are not achieved, the Executive Director shall prescribe remedial measures, after consultation with the permittee, which shall be immediately implemented by the permittee with Commission staff direction. If the permittee does not agree that remediation is necessary, the matter may be set for hearing and disposition by the Commission.

Successful achievement of the performance standards shall (in some cases) be measured relative to approximately four reference sites, which shall be relatively undisturbed, natural tidal wetlands within the Southern California Bight. The Executive Director shall select the reference sites. The standard of comparison, i.e., the measure of similarity to be used (e.g., within the range, or within the 95% confidence interval) shall be specified in the work program.

In measuring the performance of the wetland project, the following physical and biological performance standards will be used:

a. **Longterm Physical Standards.** The following long-term standards shall be maintained over the full operative life of the desalination facility:

    1. ***Topography.*** The wetland(s) shall not undergo major topographic degradation (such as excessive erosion or sedimentation);
    2. ***Water Quality.*** Water quality variables to be specified shall be similar to reference wetlands;
    3. ***Tidal prism.*** If the mitigation site(s) require dredging, the tidal prism shall be maintained and tidal flushing shall not be interrupted; and,

4. ***Habitat Areas.*** The area of different habitats shall not vary by more than 10% from the areas indicated in the restoration plan(s).

b. **Biological Performance Standards.** The following biological performance standards shall be used to determine whether the restoration project is successful. Table 1, below, indicates suggested sampling locations for each of the following biological attributes; actual locations will be specified in the work program:

1. ***Biological Communities.*** Within 4 years of construction, the total densities and number of species of fish, macroinvertebrates and birds (see Table 1) shall be similar to the densities and number of species in similar habitats in the reference wetlands;
2. ***Vegetation.*** The proportion of total vegetation cover and open space in the marsh shall be similar to those proportions found in the reference sites. The percent cover of algae shall be similar to the percent cover found in the reference sites;
3. ***Spartina Canopy Architecture.*** The restored wetland shall have a canopy architecture that is similar in distribution to the reference sites, with an equivalent proportion of stems over 3 feet tall;
4. ***Reproductive Success.*** Certain plant species, as specified by in the work program, shall have demonstrated reproduction (i.e. seed set) at least once in three years;
5. ***Food Chain Support.*** The food chain support provided to birds shall be similar to that provided by the reference sites, as determined by feeding activity of the birds; and
6. ***Exotics.*** The important functions of the wetland shall not be impaired by exotic species.

Table 1: Suggested Sampling Locations

	Salt Marsh			Open Water			Tidal
	Spartina	Salicornia	Upper	Lagoon	Eelgrass	Mudflat	Creeks
1) Density/spp:							
– Fish				X	X	X	X
– Macroinvert-ebrates				X	X	X	X
– Birds	X	X	X	X		X	X
2) % Cover							
Vegetation	X	X	X		X		
algae	X	X				X	
3) Spartina architecture	X						
4) Reproductive success	X	X	X				
5) Bird feeding				X		X	X

6) Exotics	X	X	X	X	X	X	X

6.0 ALTERNATIVE MITIGATION

As part of Phase II, Poseidon may propose in its CDP application alternatives to reduce or eliminate the required 18.4 acres of mitigation. The alternative mitigation proposed may be in the form of implementing new entrainment reduction technology or may be mitigation credits for conducting dredging, either of which could reduce or eliminate the 18.4 acres of mitigation.

CONDITION B: ADMINISTRATIVE STRUCTURE

1.0 ADMINISTRATION

Personnel with appropriate scientific or technical training and skills will, under the direction of the Executive Director, oversee the mitigation and monitoring functions identified and required by Condition A. The Executive Director will retain scientific and administrative support staff needed to perform this function, as specified in the work program.

This technical staff will oversee the preconstruction and post-construction site assessments, mitigation project design and implementation (conducted by permittee), and monitoring activities (including plan preparation); the field work will be done by contractors under the Executive Director's direction. The contractors will be responsible for collecting the data, analyzing and interpreting it, and reporting to the Executive Director.

The Executive Director shall convene a Scientific Advisory Panel to provide the Executive Director with scientific advice on the design, implementation and monitoring of the wetland restoration. The panel shall consist of recognized scientists, including a marine biologist, an ecologist, a statistician and a physical scientist.

2.0 BUDGET AND WORK PROGRAM

The funding necessary for the Commission and the Executive Director to perform their responsibilities pursuant to these conditions will be provided by the permittee in a form and manner reasonably determined by the Executive Director to be consistent with requirements of State law, and which will ensure efficiency and minimize total costs to the permittee. The amount of funding will be determined by the Commission on a biennial basis and will be based on a proposed budget and work program, which will be prepared by the Executive Director in consultation with the permittee, and reviewed and approved by the Commission in conjunction with its review of the restoration plan. If the permittee and the Executive Director cannot agree on the budget or work program, the disagreement will be submitted to the Commission for resolution.

The budget to be funded by the permittee will be for the purpose of reasonable and necessary costs to retain personnel with appropriate scientific or technical training and skills needed to assist the Commission and the Executive Director in carrying out the mitigation and lost resource compensation conditions. In addition, reasonable funding will be included in this budget for necessary support personnel, equipment, overhead, consultants, the retention of contractors

needed to conduct identified studies, and to defray the costs of members of any scientific advisory panel(s) convened by the Executive Director for the purpose of implementing these conditions.

Costs for participation on any advisory panel shall be limited to travel, per diem, meeting time and reasonable preparation time and shall only be paid to the extent the participant is not otherwise entitled to reimbursement for such participation and preparation. The amount of funding will be determined by the Commission on a biennial basis and will be based on a proposed budget and work program, which will be prepared by the Executive Director in consultation with the permittee, and reviewed and approved by the Commission in conjunction with its review of the restoration plan. If the permittee and the Executive Director cannot agree on the budget or work program, the disagreement will be submitted to the Commission for resolution. Total costs for such advisory panel shall not exceed $100,000 per year adjusted annually by any increase in the consumer price index applicable to California.

The work program will include:

a. A description of the studies to be conducted over the subsequent two year period, including the number and distribution of sampling stations and samples per station, methodology and statistical analysis (including the standard of comparison to be used in comparing the mitigation project to the reference sites);

b. A description of the status of the mitigation projects, and a summary of the results of the monitoring studies to that point;

c. A description of four reference sites;

d. A description of the performance standards that have been met, and those that have yet to be achieved;

e. A description of remedial measures or other necessary site interventions;

f. A description of staffing and contracting requirements; and,

g. A description of the Scientific Advisory Panel's role and time requirements in the two year period.

The Executive Director may amend the work program at any time, subject to appeal to the Commission.

3.0 ANNUAL REVIEW AND PUBLIC WORKSHOP REVIEW

The permittee shall submit a written review of the status of the mitigation project to the Executive Director no later than April 30 each year for the prior calendar year. The written review will discuss the previous year's activities and overall status of the mitigation project, identify problems and make recommendations for solving them, and review the next year's program.

To review the status of the mitigation project, the Executive Director will convene and conduct a duly noticed public workshop during the first year of the project and every other year thereafter unless the Executive Director deems it unnecessary. The meeting will be attended by the contractors who are conducting the monitoring, appropriate members of the Scientific Advisory Panel, the permittee, Commission staff, representatives of the resource agencies (CDFG, NMFS, USFWS), and the public. Commission staff and the contractors will give presentations on the previous biennial work program's activities, overall status of the mitigation project, identify problems and make recommendations for solving them, and review the next upcoming period's biennial work program.

The public review will include discussions on whether the wetland mitigation project has met the performance standards, identified problems, and recommendations relative to corrective measures necessary to meet the performance standards. The Executive Director will use information presented at the public review, as well as any other relevant information, to determine whether any or all of the performance standards have been met, whether revisions to the standards are necessary, and whether remediation is required. Major revisions shall be subject to the Commission's review and approval.

The mitigation project will be successful when all performance standards have been met each year for a three-year period. The Executive Director shall report to the Commission upon determining that all of the performance standards have been met for three years and that the project is deemed successful. If the Commission determines that the performance standards have been met and the project is successful, the monitoring program will be scaled down, as recommended by the Executive Director and approved by the Commission. A public review shall thereafter occur every five years, or sooner if called for by the Executive Director. The work program shall reflect the lower level of monitoring required. If subsequent monitoring shows that a standard is no longer being met, monitoring may be increased to previous levels, as determined necessary by the Executive Director.

The Executive Director may make a determination on the success or failure to meet the performance standards or necessary remediation and related monitoring at any time, not just at the time of the workshop review.

4.0 ADDITIONAL PROCEDURES

4.1 Dispute Resolution

In the event that the permittee and the Executive Director cannot reach agreement regarding the terms contained in or the implementation of any part of this Plan, the matter may be set for hearing and disposition by the Commission.

4.2 Extensions

Any of the time limits established under this Plan may be extended by the Executive Director at the request of the permittee and upon a showing of good cause.

CONDITION C: SAP DATA MAINTENANCE

The permittee shall make available on a publicly-accessible website all scientific data collected as part of the project. The website and the presentation of data shall be subject to Executive Director review and approval.

Attachment 2

March 7, 2008 response to RWQCB staff

February 19, 2008 comments

P O S E I D O N R E S O U R C E S

Item 7, Supporting Document 5
April 9, 2008

REGIONAL
QUALITY
BOARD

2008 -7 A 11:45

March 7, 2008

Mr. Eric Becker
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4353

RE: NCR: 02-1429.02:cbecker

Dear Mr. Becker:

Enclosed are the Carlsbad Desalination Project revised Flow, Entrainment and Impingement Minimization Plan (Plan) dated March 6, 2008, as well as Poseidon's detailed responses to your comment letter dated February 19, 2008. Poseidon respectfully requests that the Regional Board review and approve the revised Plan pursuant to Order R9-2006-0065.

If you have any questions please feel free to contact me at (619) 595-7802.

Sincerely,

Peter M. MacLaggan
Senior Vice President

Poseidon Resources Corporation
501 West Broadway, Suite 840, San Diego, CA 92101 USA
619-595-7802 Fax 619-595-7892

Project Office 4600 Carlsbad Boulevard, Carlsbad, CA 92008

Poseidon Resources March 7, 2008 Response
San Diego Regional Water Quality Control Board Letter dated February 19, 2008
(NCR: 02-1429.02ebecker

1. The Plan does not yet integrate all the elements of the statutory requirements of California Water Code (CWC) Section 13142. The proposed project only includes "mitigation", while the statute CWC Section 13142.5(b) also requires that dischargers implement best available technology and mitigation measures. The Plan does not appear to include technology measures for the intake structure to reduce impingement and entrainment (I&E).

Response: Water Code Section 13142.5(b) requires industrial facilities using seawater for processing to use the best available site, design, technology, *and* mitigation feasible to minimize impacts to marine life. The Plan has been reorganized so to sequentially analyze the steps that have been take by Poseidon to address each of these provisions:

- Chapter 2 identifies best available site feasible to minimize Project related impacts to marine life;
- Chapter 3 identifies best available design feasible to minimize Project related impacts to marine life;
- Chapter 4 evaluates identifies best available technology feasible to minimize Project related impacts to marine life;
- Chapter 5 quantifies the unavoidable impacts to marine life; and
- Chapter 6 identifies best available mitigation feasible to minimize Project related impacts to marine life

2. The Plan provides an evaluation of impacts based upon one year of data, 2004-05 with record rainfall, but does not explicitly evaluate the on-going impacts from Poseidon's operations.

Response: As described in Chapter 5 of the Plan, the potential entrainment impacts from Poseidon's seawater intake were explicitly assessed using the facility's permitted intake flows of 304 MGD and the potential impingement impacts were assessed assuming these reduced flows and discontinued power plant heat treatment effects.

3. The Carlsbad desalination project's (CDP) listing of impacts appears to omit specific impacts to target invertebrates.

Response: The requested information has been included in Chapter 5 and Attachments 2 and 5 of the revised Plan.

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SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD

4. The proposed mitigation project does not appear to account for all pertinent impacts resulting from impingement of invertebrates, entrainment of invertebrates, discharges of brine, etc.

Response: Poseidon is using all feasible methods to minimize or reduce its entrainment and impingement impacts. These methods are likely to reduce the Project related impacts to marine life well below the levels identified in Chapter 5 of the Plan. To minimize unavoidable Project related impacts to marine life, Poseidon has voluntarily committed to a state-agency coordinated process to identify the best available mitigation feasible. The objective of the mitigation portion of this plan is to identify mitigation needs, set forth mitigation goals, and present a plan and approach for achieving the goals.

As shown in Chapter 6, the proposed mitigation strategy includes the implementation of project a coastal wetlands restoration plan that will be developed pursuant to the state-agency coordinated process; long-term preservation of Agua Hedionda Lagoon; and/or other activities which will benefit the coastal environment in San Diego County. The proposed restoration plan will be enforceable through conditions of approval of the project and the program's success will be monitored through performance standards, monitoring and reporting.

5. The CHREP did not identify and evaluate the possible mitigation projects located within the same watershed, prior to proposing the out of watershed mitigation in San Dieguito Lagoon. The best mitigation for impacting the lagoon would be to replace lost functions by restoring current upland acreage to the historic wetland condition, or by creating new wetlands where there were none historically.

Response: Investigations to date have not identified any mitigation opportunities within Agua Hedionda Lagoon (see Section 6.5) that meet the goals of the program. As a result, the proposed mitigation plan includes a core offsite mitigation program that meets the plan goals and objectives that is being developed in parallel with Poseidon's continued effort to identify feasible mitigation opportunities in Agua Hedionda Lagoon.

Poseidon recognizes the Regional Board would prefer to see mitigation in Agua Hedionda Lagoon if feasible. Accordingly, while Section 6.6 of this plan identifies a core offsite mitigation project, the mitigation plan also presents an implementation action schedule that includes additional coordination activities to either (1) confirm the lack of opportunities, or (2) identify if new mitigation options exist within Agua Hedionda Lagoon.

Poseidon and will be contacting the Department of Fish & Game to more fully assess the potential for restoration opportunities in Agua Hedionda Lagoon. If subsequent Agua Hedionda Lagoon mitigation is determined to be feasible, Poseidon will coordinate with

regulatory agencies to implement such mitigation. If Agua Hedionda Lagoon mitigation is confirmed as infeasible, Poseidon will implement the proposed offsite mitigation project.

6. The proposed mitigation ratio of 1:1 isn't fully supported. The Plan should be revised to include an evaluation of other mitigation options that may be available within the watershed. The proposed mitigation ratio appears inadequate in light of several factors generally considered by the Regional Board:

Response: See the response to the previous comment regarding Poseidon's plans to further investigation restoration opportunities in the Agua Hedionda Lagoon watershed. *Poseidon recognizes that the degree of mitigation required will be dependent on* mitigation ratio requirements of the various regulatory agencies. As a result the proposed Plan (Chapter 6) provides for additional coordination with the regulatory agencies to finalize agency-mandated acreage requirements. Poseidon intends to prepare and submit a restoration project implementation plan to the Executive Director of the Regional Board: for review and approval which will contain the following:

- Goals, objectives, performance criteria and maintenance and monitoring to ensure the success of the proposed Restoration Plan.
- Identification of specific creation, restoration, or enhancement measures that will be used at each site, including grading and planting plans, the timing of the mitigation measures, monitoring that will be implemented to establish baseline conditions and to determine whether the sites are meeting performance criteria.
- Identification of contingency measures that will be implemented should any of the mitigation sites not meet performance criteria.
- As-built plans for each site included in the Restoration Project.
- Annual monitoring reports for no less than five years or until the sites meet performance criteria.
- Legal mechanism(s) proposed to ensure permanent protection of each site – e.g., conservation easements, deed restriction, or other methods.

6. a - The proposed mitigation project is located within a different watershed (the San Dieguito Lagoon) instead of the Agua Hedionda Lagoon. A higher ratio may be appropriate for this project because the referenced mitigation project is out-of-kind (i.e., discharger is not actually replacing the lost resources and functions).

Response: *See responses 5 and 6 above.*

6.b It is not clear that the proposed one-time mitigation is adequate to compensate for the long-term ongoing impacts to beneficial uses, resources, and functions present in Agua Hedionda Lagoon.

Response: As described in Chapter 6, the primary objective of the restoration plan is to create or restore coastal habitat similar to that of Agua Hedionda Lagoon, which will provide measurable long term environmental benefits adequate to fully mitigate unavoidable impingement and entrainment impacts associated with CDP operations. The restoration plan will rely on well-established methods, techniques and technologies for development and nurturing of coastal habitat of high productivity and long-term sustainability. The restoration plan will target coastal restoration and enhancement activities with clearly defined methodology to measure performance and success.

6.c The mitigation project is for restoration of coastal wetland habitat, rather than the lagoon habitat impacted by the operation of the CDP.

Response: As indicated previously, the intent of the restoration plan is to create habitat comparable to that in Agua Hedionda Lagoon.

7. Poseidon might benefit from convening a joint meeting with the resources agencies (including California Dept Fish and Game, US Fish and Wildlife Service, Army Corps of Engineers, National Marine Fisheries) to discuss the impacts to beneficial uses, resources, and functions by the proposed project, and on the preferred mitigation project so they can discuss agency concerns/comments.

Response: Chapter 6 of the revised Plan includes an action plan and schedule for coordinating with regulatory and resource agencies to finalize locations and acreages selected for the proposed mitigation. Additionally, Poseidon intends to prepare and submit a restoration project implementation plan to the Executive Director of the Regional Board and the Coastal Commission for review and approval which will contain the following:

- Goals, objectives, performance criteria and maintenance and monitoring to ensure the success of the proposed Restoration Plan.
- Identification of specific creation, restoration, or enhancement measures that will be used at each site, including grading and planting plans, the timing of the mitigation measures, monitoring that will be implemented to establish baseline conditions and to determine whether the sites are meeting performance criteria.
- Identification of contingency measures that will be implemented should any of the mitigation sites not meet performance criteria.

- As-built plans for each site included in the Restoration Project.
- Annual monitoring reports for no less than five years or until the sites meet performance criteria.
- Legal mechanism(s) proposed to ensure permanent protection of each site – e.g., conservation easements, deed restriction, or other methods.

Specific Comments on the Plan

8. The assessment should address the seasonal and/or daily variations in impingement impacts.

Response: The results of impingement surveys are summarized in Table 5-1 and the weekly sampling data has been included in Attachment 2 of the revised Plan. These survey data are used in conjunction with intake flows coincident with each that is recorded by the power plant in order to interpolate impingement effects between each of the weekly surveys. These weekly totals are summarized for the annual totals by species including impinged invertebrate species of a size that could be identified in the field. Samples of unknown or unrecognizable impinged species were collected for laboratory verification.

Impingement survey results not only reflect the presence of impingeable fish and invertebrates in the area of the intake screens, but also reflect the variability in their susceptibility to impingement. Many factors, such as debris on the intake screens, turbidity and local currents influence the potential impingement of each species. The majority of these factors have little or no weekly periodicity only a mild seasonality.

9. The assessment needs to include results of an impingement study for target invertebrates. Table 3.2 includes only results for fish during 2004-05.

Response: Attachment 2 contains all impingement data for invertebrates collected during the 2004/2005 impingement study. Review of the this data indicates that bothe the number and the total weight of impinged invertebrates was less than 0.1 kgs/day.

10. The assessment states that: "The total amount of impinged organisms for the individual sampling events is presented in Table 3-2" (p.19). The Plan, however, does not clearly identify individual sampling events. The interpretation of the results is hampered by the absence of a presentation of results for impinged organisms (including invertebrates) with dates, times, and flow rates of sampling events.

Response: Attachment 2 of the Plan includes the requested information.

11. The assessment states that, "The daily biomass of impinged fish during normal operations is 0.96 kgs/day (1.92 lbs/day) for an intake flow of 304 MGD" (p.19). The text discussion should clarify how this figure is determined and how the total conversion discrepancy since 0.96 kgs converts to 2.12 lbs, not 1.92 lbs as indicated in the Plan.

Response: The Plan has been revised to reflect that 0.96 kgs converts to 2.12 lbs, not 1.92 lbs as previously indicated.

The daily biomass of impinged fish, sharks and rays during normal operations of 0.96 kgs/day was calculated by dividing the total annual sample weight of 351,672 grams (see last row of the second column of the Table 5-1 summarizing all impingement data) by the total number of days per year (i.e., 351,672 grams/365 days = 963.48 grams/day = 0.96 kgs/day.

The total annual sample weight of 351,672 grams of all fish was determined based on 24-hr composite samples collected each week during the sampling period of June 2004 of June 2005. The sample accounted for all fish captured at the intake screens over 24-hr period of plant operations during the day of sampling. During each sampling event, the actual amount of the impinged fish contained in the daily sample was counted and weighted as reported in Attachment 2. In addition, the actual power plant flow during the 24-hr sampling period was noted. Than the total sample count and weight for fish of given taxon was calculated as a sum of the individual sample counts of this taxon for all sampling events. Similarly, the total flow for the sampling period was calculated as the sum of the power plant intake flows of each of the sampling events. The unit number and weight of each taxon was calculated by dividing the total number and weight of fish of a given taxon by the power plant intake flow on the day of the sample was collected. Than the unit number and weight for a given taxon was multiplied by the desalination plant intake flow of 304 MGD to calculate the projected number and weight of impinged marine organisms under the stand-alone desalination facility operation. These values are presented in Table 5-1 by taxon.

12. The assessment of impacts from entrainment assessment appears to include larval fish but does not clearly include impacts to fish eggs and invertebrates. It is the understanding of the Regional Board that the 2004-05 study was to include monitoring of (at least) entrained Cancer crab megalops and lobster larvae, but the assessment does not appear to include these data. Also, it is unclear that sampling followed a protocol approved by the Regional Board as stated (p.22).

Response: *The study was conducted according to sampling a protocol reviewed and* approved by the Regional Board. Prior to approving the study plan, the Board engaged an outside, independent consultant under contract and funded by the EPA, to review and

comment on the plan. The Board's consultant suggested a number of changes that were accepted and incorporated in the final Board approved study plan and protocol. The approved protocol, including sampling and sample processing methods and techniques of data analysis and modeling to assess intake effects were followed as described in the final protocol. A copy of the final protocol has been included as Attachment 3 of the Plan. Attachment 5 provides the monthly entrainment survey results of fish and target invertebrate larvae.

13. The Plan does not clearly identify the supporting data or an explanation of underlying assumptions and calculations that were used to estimate proportional mortality values for larval fish as presented (p.23) in the Plan. Therefore, the Regional Board could not objectively evaluate the validity of the estimated proportional entrainment mortality (12.2%) presented in the Plan.

Response: Section 5.3 of the revised Plan provides a detailed explanation of the underlying assumptions, methodology and supporting data used to estimate the entrainment impact of this study.

14. Impacts are based upon the few most commonly entrained (most abundant) species. It is unclear how much more severe impacts may be when populations are small.

Response: In most cases, the more abundant a species of larvae is in an entrainment sample, the closer the intake is to the species' habitat or a center of its spawning population(s). Many of the larval fish species occurring in low numbers in the Poseidon study entrainment samples are ocean species, and conversely larval fish entrained in the highest number were lagoon species.

15. The Regional Board has the following comments regarding the estimated number of lagoon acres impacted, as presented in the plan since:

a. The estimate of the number of lagoon acres used by the three most commonly entrained species is based on a 2000 Coastal Conservancy Inventory (Table 4-2, p.23). It is unclear if this document is accurate or appropriate for the purpose of determining such an important component of the area of habitat production forgone (APF). The reference document (Attachment 4, Table 2), includes the footnote caveat "...This information is not suitable for any regulatory purpose and should not be the basis for any determination relating to impact assessment or mitigation." An accurate delineation of lagoon habitats should be used for this critical component of the APF.

Response: In order to calculate the APF, the number of lagoon habitat acreage occupied by the three most commonly entrained lagoon fish larvae[1] was multiplied by the average Proportional Entrainment Mortality (PM) for the three lagoon species. The estimated acres of lagoon habitat for these species are based on a 2000 Coastal Conservancy Inventory of Agua Hedionda Lagoon habitat shown in Table 5-5. The actual acreage will be confirmed through a survey of the lagoon habitats that will be conducted during the final design of Poseidon's restoration plan. To the extent that the lagoon habitat acreage established in the survey is higher or lower than that included in the 2000 Inventory, Poseidon's wetlands restoration plan will be proportional adjusted to account for the actual acreage identified in the survey.

b. The estimate of the number of lagoon acres used by the three most commonly entrained species appears to exclude salt marsh and brackish freshwater acreage (p.23). Excluding these intertidal habitats may result in the analysis underestimating this component of the APF.

Response: The areas of Agua Hedionda Lagoon that have potential to be impacted by the CDP operations are those habitats occupied by the three most commonly entrained lagoon fish larvae.[2] These habitats include 49 acres of mudflat/tidal channel and 253 acres of open water. It is not appropriate to include the other lagoon habitats in the APF calculation, such as brackish/freshwater, riparian, salt marsh or upland habitats, that are not occupied by the impacted species.

c. The calculation of the APF (p.23) appears to use values for mortality and lagoon acreage that are not fully supported.

Response: Section 5.3 of the revised Plan includes the calculations in support of the estimate of APF.

d. The text should be revised to include a clear explanation of how the estimated lagoon acreage for commonly entrained species was adjusted to include only impacts associated with operations of CDP, rather than impacts from operation of the Encina Power Station.

Response: Section 5.3 of the revised Plan includes an explanation of how the estimated lagoon acreage for commonly entrained species was adjusted to reflect stand-alone operations of CDP

[1] Ninety-eight percent of the fish larvae that would be entrained by the CDP stand-alone operations are gobies, blennies and hypsopops.
[2] Ninety-eight percent of the fish larvae that would be entrained by the CDP stand-alone operations are gobies, blennies and hypsopops.

16. The evaluation concludes that the small fraction of marine organisms lost to entrainment would have "no effect on the species' ability to sustain their population" and goes on to describe the natural rates of high mortality (p. 24). But the argument that that there are "excess" larvae appears to omit an important consideration. Besides contributing to marine food webs, the naturally high production of larvae serves as a buffer against catastrophic and cumulative impacts to populations. These are important 'ecological services' that must not be taken lightly or given away without adequate mitigation.

Response: Comment noted.

17. The Regional Board prefers that the evaluation of the impact be presented as a rate (loss of x-amount of organisms per year, or impact/year). The proposed mitigation is a fixed amount ($3 to $4 million). It seems unlikely that a fixed amount would adequately compensate for a loss that is a rate over multiple, future years. It appears more likely that a proposed fixed amount really only accounts for mitigation for just one year of operation. The Regional Board may find a fixed amount to be acceptable, provided that:

a. The average annual impact could be reasonably determined and reasonably translated into a dollar amount, and that amount (or correct share) is paid every year of operation - but that is not what is proposed in the Plan or the CHREP.

Response: Attachments 2 and 5 of the revised Plan includes the requested presentation of the impingement and entrainment data, respectively.

To minimize the unavoidable Project related impacts to marine life, Poseidon has voluntarily committed to a state-agency coordinated process to identify the best available mitigation feasible. The objective of the mitigation portion of the Plan is to identify mitigation needs, set forth mitigation goals, and present a plan and approach for achieving these goals.

As described in Chapter 6 of the revised Plan, the proposed mitigation strategy includes the implementation of project a coastal wetlands restoration plan that will be developed pursuant to a state-agency coordinated process; long-term preservation of Agua Hedionda Lagoon; and/or other activities which will benefit the coastal environment in San Diego County. The proposed restoration plan will be enforceable through conditions of approval of the project and the program's success will be monitored through performance standards, monitoring and reporting. The Regional Board, Coastal Commission and State Lands Commission have ongoing jurisdiction over the proposed Project to insure the adequacy of the proposed restoration plan.

Additionally, ten years after the lease is issued, that the CDP will be subject to further environmental review by the State Lands Commission (SLC) to analyze all environmental effects of facility operations and alternative technologies that may reduce any impacts found. SLC may require additional requirements as are reasonable and as are consistent with applicable state and federal laws and regulations.

This approach will insure that the stand-alone CDP operations continue to use the best available site, design, technology and mitigation feasible to minimize Project related impacts to marine life.

b. A fixed amount might also be reasonable if the CDP mitigates its share by increasing lagoon acreage via restoration or creation. Such in-kind mitigation would (if functional) replace the productivity lost to the operation of the CDP, and the impact would be fully mitigated.

Response: See previous response.

Attachment 3

Partial Transcript of Proceedings from the April 9, 2008 RWQCB Meeting

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

SAN DIEGO REGION

In the Matter of the Public Hearing RE: All items on the agenda, including, but not limited to, Poseidon Resources Corporation, Proposed Desalination Project.	)

PARTIAL TRANSCRIPT OF PROCEEDINGS, taken at 9174 Sky Park Court, San Diego, California, commencing on Wednesday, April 9, 2008, heard before THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, reported by GIDGETTE NIEVES, CSR No. 10142, a Certified Shorthand Reporter in and for the State of California.

1 MR. WRIGHT: He already used up 15 minutes, so
2 next speakers please keep your comments brief.
3 MR. JENKINS: I'm going to address a concern in
4 the staff report regarding the entrainment study, which
5 started in '04 and went to '05. And a large portion of
6 that study was conducted in water year 2005. And the
7 staff report expressly concerns that 2005 was a year of
8 abnormally high rainfall. And the implied worry in that
9 comment was that the high rainfall produced in at a normal
10 lagoon environment that was unsuitable to sustain the salt
11 water organisms the entrainment study was targeting. I
12 want to explain why that's not the case in this particular
13 lagoon. There's two fundamental reasons for it. Number
14 one it's a very small water shed. Number two, the Agua
15 Hedionda Lagoon holds a very large volume of seawater.
16 Now, in the upper portion of this figure, this table three
17 of Page nine of the Tetra (sic) Tech study recently
18 completed on the Agua Hedionda water shed. And the
19 numbers for 2005 appear across the top. I'm going to take
20 the maximum daily discharge measured in 2005 from the Agua
21 Hedionda creek, and I'm going to apply that maximum daily
22 discharge against the delusion capacity of this lagoon and
23 show you that the resulting change of the salinity of the
24 lagoon is very small. So then taking the 144 cubic feet
25 per seconds maximum flow rate of the creek and applying it

1 over a day that would be an influx of 285 acre feet of
2 storm water into the lagoon. Now, it's a very deep
3 lagoon. There's over 1700 acre feet below tide of
4 seawater in this lagoon. In addition, there's an
5 additional 1750 feet of high (inaudibly) exchange. That
6 would be additional water between low tide and high tide.
7 So the total salt water volume of the lagoon is over 3,450
8 acre feet. So even the worse case scenario in 2005 the
9 maximum daily discharge will only result in eight percent
10 of lagoon water being comprised of storm water. That
11 would depress the salinity only down to about 30.75 parts
12 per thousand. That's about a 2.7 part per thousand
13 depression in salinity. Now, the fluctuation of salinity
14 in the ocean reaches those levels many times as well in
15 the coastal ocean around the lagoon.
16 So in conclusion, the lagoon was not transformed
17 into a fresh water lagoon during the 2005 rainy period.
18 It still remained a predominantly seawater body.
19 I'm now going to pass the presentation off to
20 Dr. David Mayer, who's going to explain whether these
21 kinds of salinity depressions during the 2005 peek runoff
22 were significant, and he will also show you how his
23 analysis method of the entrainment losses is independent
24 of the fluctuations of the population of these seawater
25 organisms.

1 MR. MAYER: Thank you, Dr. Jenkins.

2 David Mayer. And board members and Chairman

3 Wright. My background is marine biology and fishery

4 science trained at the University of Washington.

5 Some decade ago I was doing work at the Yellow

6 River and where I was using a model there to help assess

7 entrainment affects of a powerplant that were being

8 proposed. And the model was called Empirical Transport

9 Model. It occurred to me at that time that it might be

10 useful on the Pacific Coast we're looking at entrainment

11 affects from our coastal powerplants, which are ongoing

12 rivers, but the Pacific Ocean being regarded in some

13 places as river flowing past these large intakes. So I

14 imported this model into the Regional Water Quality

15 Control Board and later the CC comprehension mission

16 process of looking at assessing entrainment affects. And

17 that model over these past ten years has been developed by

18 a number of renowned university professors in mathematics

19 and statistics at University of Washington and Santa

20 Barbara. Most currently Dr. Amundi (sic), that I've

21 worked with over there a long period of time at U.C. Santa

22 Cruz, continues to work on this model. There's just some

23 background to the kind of work that ended up to generate a

24 number that will later be discussed by Mr. Nordby on how

25 this mitigation fits together with offsetting the

1 entrainment losses.

2 Scott Jenkins told you our study again in 2004,

3 and continued for a year on a monthly basis. We collected

4 samples that are wide number of locations in both the

5 upper and middle and lower lagoons and the open ocean.

6 When we sample, we sample over 24 hour basis so we're able

7 to capture the kinds of larval fish that we're focusing on

8 a very long-term and very intensive basis.

9 Our findings basically lead us--and you probably

10 heard this before. The nine percent of all the larval

11 fish that are entrained at the existing seawater intake

12 for the powerplant are made up by three species. And the

13 most of one is a very small species of fish called a gobie

14 that lives in various tiny mud burrows. The adult gobie

15 never gets any bigger than about an inch long. It's not

16 surprising to think that the enormous number of mud flats

17 in the upper lagoon that those products of their

18 reproduction are carried down into the lower lagoon where

19 the intakes located. None of the entrained species are a

20 major threatened that we found in none of them. Less than

21 one percent catalase are supported commercial interest

22 from importance. And the project has no impact on the

23 species' ability to maintain populations but the loss of

24 these larvaes going through the powerplant we recognize as

25 something that could be mitigated, and that's what's being

1 proposed, is to create a body or an acreage of wetlands or
2 habitat that the fish in those areas of new production
3 will create larvaes to offset the losses through the
4 project and partly. Question.
5 MR. ANDERSON: What were the other two species?
6 MR. MAYER: A blenie, which is again a very
7 small fish. Probably get's no bigger than about two
8 inches long. We believe that 90 percent of its population
9 is found in the aquaculture pet set up in front of the
10 intake where they're growing muscles and oysters. And
11 these are fish that live in those little crevices.
12 And the third one is the garaboley (sic), which
13 is the large fish you see bright yellow on reefs. They
14 apparently have learned to live in large numbers on the
15 rocky reef of the breakwater right in front of the intake.
16 There's a very, very large population there. So those two
17 species are actually there sort of an artificial habitat
18 setting.
19 So we look at the entrainment side what's going
20 through a very small to the powerplant and the proposed
21 desal project. We use the result of those to scale up to
22 the proposed volume of the desal project. We use that in
23 a modeling to come to our conclusions. We also looked at
24 fish and other ordinances that are actually screened out
25 by these existing screens and the screens that we use

1 during the Poseidon operation, and that's known as
2 impingement. We came to very similar conclusions at the
3 Coastal Commission. We are finding that the losses due to
4 this are diminimus and insignificant.
5 In general, we believe our results from this
6 model I described to you, the ETM, its result is used as a
7 portion to find an estimate of how many acres of habitat
8 need to be replaced in order to offset the entrainment
9 losses.
10 As I mentioned earlier, Dr. Amundi, who has
11 worked with us throughout this decade in Santa Cruz
12 continues to do so. He conceived of an idea of taking our
13 result from this model and using the estimated acreages of
14 habitat--and I'll be heading on as an example where we did
15 this. And we've done this in many other places along the
16 coast now--to come up with a number of acres. And this is
17 referred to a perry (phonetic) production foregone. It's
18 not that habitat is being destroyed out there. Is that if
19 we were to try to create habitat to create enough larval
20 fish that are being entrained that we're assuming 100
21 percent of them are lost. They're not all lost, but we
22 assume that for conservatism. How many acres would we do?
23 So we came up with a result of using this method of 37
24 acres. This would completely offset 100 percent of all
25 the entrained larval fish.

What I want to leave this spot with you before I turn it over to Mr. Nordby is that we are focused on larval fish. We assume 100 percent of those are lost going through the intake. Along with every 100 gallons of water going in there's one larval fish for every 100 gallons of water. But along with those larval fish there are thousand -- tenths of thousand frankly of zoea planktons, which are crustaceans. And there's nearly millions of phytoplankton that go through essentially untouched because they are a hard body, have very hard shells. Unlike larval fish, they are kind of naked going through. So in that sense all of that goes through unharming yet this new marsh or restoration acres will produce more zoea plankton and phytoplankton. And I'm not sure what amounts but in very large quantities, so you have kind of a doubling of that affect. We're offsetting something that isn't really being affected. As well as many other animals that will be described that utilize these weapons that aren't even affected by any of the project intakes, seawater intake.

Any questions?

MR. WRIGHT: I appreciate all the expertise that's coming before us. But I just want to remind all the speakers that a mitigation plan is not before us. That's something that is supposed to be produced at a

Attachment 4

California Coastal Commission Item W16a:
regarding Poseidon Resources Submittal of a Marine
Life Mitigation Plan

STATE OF CALIFORNIA—THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER, *GOVERNOR*

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W16a

RECOMMENDED REVISED CONDITION COMPLIANCE FINDINGS

November 21, 2008

To:	To Commissioners and Interested Parties
From:	Peter Douglas, Executive Director Alison Dettmer, Deputy Director Tom Luster, Staff Environmental Scientist
Regarding:	**Condition Compliance for CDP No. E-06-013** – Poseidon Resources (Channelside), LLC; **Special Condition 8**: Submittal of a Marine Life Mitigation Plan
Commissioners on Prevailing Side:	Commissioners Achadjian, Blank, Burke, Hueso, Kram, Lowenthal, Neely, Potter, Reilly, Shallenberger, and Chair Kruer
Exhibit 1:	Approved Marine Life Mitigation Plan (MLMP)
Exhibit 2:	Staff's Proposed Draft MLMP Conditions (June 2008)
Exhibit 3:	Poseidon's August 2, 2008 Proposed MLMP and attachments
Exhibit 4:	Transcript of August 6, 2008 hearing (Commission deliberations only)

STAFF NOTE

Staff prepared these recommended Revised Findings to reflect the Commission's August 6, 2008 decision approving a Marine Life Mitigation Plan for the Poseidon desalination facility in Carlsbad, San Diego County. The Plan is required pursuant to ***Special Condition 8*** of Coastal Development Permit #E-06-013. The Commission's approval at the August hearing included modifications to the Plan proposed by both staff and Poseidon. Because the Commission's action differed from staff's recommendation, revised findings are necessary. The recommended Revised Findings herein support the Plan as approved by the Commission and are based on staff's review of the August 6, 2008 hearing transcript and the record before the Commission. Recommended changes from the August 6th document are shown in ~~strikethrough~~ and **bold underline** text.

Please note that the Commission required Poseidon to submit within 60 days of Commission approval a revised Plan for Executive Director review and approval that incorporates the Commission's approved modifications. Poseidon submitted a plan in early October 2008, which has been reviewed and approved by the Executive Director, and is attached as Exhibit 1.

SUMMARY

On November 15, 2007, the Commission conditionally approved CDP E-06-013 for Poseidon Resources (Channelside), LLC (Poseidon) for construction and operation of a desalination facility to be located adjacent to the Encina Power Plant in Carlsbad, San Diego County. As part of the Adopted Findings for its approval, the Commission imposed **Special Condition 8**, which required Poseidon to submit for further Commission review and approval, a Marine Life Mitigation Plan **(MLMP, or the Plan)**.[1]

In June 2008, Commission staff provided to Poseidon recommended conditions to include in its Plan (see Exhibit 2). On July 7, 2008, Poseidon submitted to Commission staff ~~its~~ **a** proposed Marine Life Mitigation Plan (the Plan). **On August 2, Poseidon submitted a revised version of that Plan (see Exhibit 3).** ~~This report provides staff's analysis of the Plan, staff's evaluation of whether the Plan conforms to the Adopted Findings and **Special Condition 8**, and staff's recommendation as to whether the Commission should approve the Plan.~~

~~In brief, staff's analysis shows that the Plan as submitted does not conform to the Adopted Findings and ***Special Condition 8***. However, if modified as described herein, staff believes the modified Plan would conform to the applicable Findings and ***Special Condition 8***. Staff therefore recommends the Commission **approve** the Plan, as modified herein. The modifications staff has identified as being necessary for Plan approval are summarized below and are further detailed in Sections 1.1 and 4.0 of this memorandum.~~ **At its August 6, 2008 hearing, the Commission approved a modified Plan. Because the Commission's action differed from staff's recommendation, revised findings are necessary.**

~~Staff recommends the Plan be modified to include the following~~**The Commission modified the Plan as follows**:

1) Poseidon ~~shall~~ **is to** create or restore ~~between~~ **up to** 55.4 ~~and 68~~ acres of coastal estuarine wetland habitat within the Southern California Bight. **For Phase I, within 10 months of issuance of the desalination facility's coastal development permit (CDP), Poseidon must submit proposed site(s) and a Preliminary Restoration Plan for Commission review and approval. Within two years of issuance of the CDP for the desalination facility, Poseidon must submit a complete CDP application to restore at least 37**

---

[1] The Commission's approval of this CDP also included **Special Condition 10**, which required Poseidon to submit for Commission review and approval an Energy Minimization and Greenhouse Gas Reduction Plan. ~~That Special Condition and Poseidon's submitted plan are evaluated in a separate staff report under Item W5a of the August 6, 2008 Commission hearing.~~ **The Commission approved the Energy Minimization and Greenhouse Gas Emission Reduction Plan at its August 6, 2008 hearing. The recommended Revised Findings for that Plan are on the Commission's December 2008 hearing agenda as Item W16b.**

acres of estuarine wetlands. For Phase II, Poseidon must within five years of issuance of the Phase I CDP submit a complete CDP application either to restore an additional 18.4 acres of estuarine wetlands or to propose reducing or eliminating this Phase II restoration requirement by instead implementing technologies not currently available or feasible that would reduce entrainment levels below currently anticipated levels or by undertaking dredging in Agua Hedionda Lagoon in a manner that warrants mitigation credit. Poseidon may apply to do all 55.4 acres of restoration during Phase I.

2) Poseidon shall implement its Marine Life Mitigation Plan in conformity to the conditions provided in Exhibit 2 of ~~this memorandum~~ **these Findings**.

3) Within 60 days of the Commission's approval of ~~this modified~~ **the** Plan **(i.e., as approved at the August 6, 2008 hearing)**, Poseidon shall submit for the Executive Director's review and approval a revised Plan that includes these modifications.

The first ~~recommendation~~ **modification** is based on a review of Poseidon's proposed Plan by staff and the Commission's independent scientific experts.[2] Poseidon's entrainment study identified impacts that these reviewers believe require more mitigation than Poseidon ~~has~~ **had** proposed. ~~Staff further believes that t~~**T**his amount of mitigation is necessary to ensure the project conforms to **Special Condition 8** and Sections 30230, 30231, and 30260 of the Coastal Act. Based on results from Poseidon's entrainment study, ~~this range in acreage – from 55 to 68 acres – represents the range in statistical confidence that would~~ **55.4 acres of wetland restoration will** provide the Commission with 80% ~~(i.e., 55 acres) to 95%~~ confidence ~~(i.e., 68 acres)~~ that the mitigation ~~would~~ **will** fully mitigate the impacts identified in the study. Section 4.2 of ~~this memorandum~~ **these Findings** provides a more detailed discussion.[3]

The second ~~recommendation is meant to~~ **modification** ensure**s** that mitigation is timely and successful. It ~~would~~ require**s** Poseidon to implement its mitigation subject to the conditions similar to those the Commission required of Southern California Edison at its San Dieguito Restoration Project (see, for example CDPs #183-73 and #6-04-88). Although Poseidon's current Plan does not commit to provide mitigation at a particular site, Poseidon had previously identified a mitigation site in San Dieguito Lagoon adjacent to Edison's as ~~the best~~ **its preferred** location to mitigate for its entrainment impacts. ~~Staff recommends the two projects be held to similar standards.~~ The Commission's scientific experts ~~concur with this recommendation~~ **recommend that the two restoration projects be subject to similar standards (see Exhibit 1 – Approved Conditions for Marine Life Mitigation Plan)**. Section 4.2 provides a more detailed discussion of this ~~recommendation~~ **modification**.

---

[2] Staff consulted with members of the Commission's ~~Marine Review Committee~~ **Scientific Advisory Panel (SAP)**. Committee members are identified in Section 3.0 of this memorandum.

~~[3] As an alternative to staff's recommendation, the Commission may wish to require mitigation in a manner similar to past decisions in which it applied a mitigation ratio to the identified level of impact. If the Commission selects this alternative approach, staff recommend mitigation be provided at between a 2:1 to 3:1 ratio, which would result in from 85 to 127.5 acres of coastal estuarine wetland habitat as mitigation.~~

The third ~~recommendation~~ **modification** is ~~meant~~ to help **ensure** Poseidon ~~and the Commission~~ implements the ~~approved~~ mitigation plan **as approved**. Additionally, the 60-day deadline in the recommendation ~~would be~~ **is** consistent with the requirement imposed by the San Diego Regional Water Quality Control Board that Poseidon provide a mitigation plan for Board approval by October 9, 2008.[4]

~~With these recommended modifications, staff believes Poseidon's Plan would conform to applicable provisions of *Special Condition 8.*~~

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1.0 MOTION & RESOLUTION

Motion:

*"~~I move that the Commission approve the Marine Life Mitigation Plan attached to the staff recommendation as Exhibit 1 if modified as shown in Section 1.1 below and Exhibit 2 of this memorandum, as compliant with **Special Condition 8** of CDP E-06-013.~~ **I move that the Commission adopt the revised findings in support of the Commission's action on August 6, 2008 to approve the Marine Life Mitigation Plan as compliant with Special Condition 8 of CDP E-06-013.**"*

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[4] The Regional Board's Order, adopted on April 9, 2008 requires, in part: "*Within six months of adoption of this resolution, Poseidon shall submit to the Regional Board Executive Officer, for approval by the Regional Board an amendment to the Plan that includes a specific proposal for mitigation of the impacts, by impingement and entrainment upon marine organisms resulting from the intake of seawater from Agua Hedionda Lagoon, as required by Section VI.C.2(e) of Order No. R9-2006-0065; and shall resolve the concerns identified in the Regional Board's February 19, 2008 letter to Poseidon Resources, and the following additional concerns:*

a) Identification of impacts from impingement and entrainment;
b) Adequate monitoring data to determine the impacts from impingement and entrainment;
c) Coordination among participating agencies for the amendment of the Plan as required by Section 13225 of the California Water Code;
d) Adequacy of mitigation; and
e) Commitment to fully implement the amendment to the Plan.

Resolution to Approve:

~~*The Commission hereby finds that the compliance plan titled "Marine Life Mitigation Plan" prepared and submitted by the permittee, Poseidon Resources (Channelside) LLC, dated July 3, 2008, if modified as shown in Section 1.1 and Exhibit 2 of the July 24, 2008 Commission staff report, is adequate, if fully implemented to comply with* **Special Condition 8** *of CDP E-06-013.*~~ ***The Commission hereby adopts the findings set forth below for the Commission's approval of the Marine Life Mitigation Plan as compliant with Special Condition 8 of CDP E-06-013 on the ground that the findings support the Commission's decision made on August 6, 2008 and accurately reflect the reasons for it.***

Staff Recommendation:

~~Staff recommends a "YES" vote, which will result in the **approval** of the modified plan as compliant with the Adopted Findings and **Special Condition 8** and adoption of the motion, resolution, and findings herein. The motion passes only by an affirmative vote of a majority of the Commissioners present. Staff's recommended modifications are provided in Section 1.1 below, and further detailed in Section 4.0 of this memorandum. If these recommended modifications are not incorporated into the Plan, staff recommends the Commission find the Plan, as submitted, does not conform to **Special Condition 8** and staff would therefore recommend the Plan be denied.~~ **Staff recommends a "YES" vote on the motion. Passage of the motion will result in the adoption of revised findings as set forth in this staff report. The motion requires a majority vote of the members from the prevailing side present at the revised findings hearing, with at least three of the prevailing members voting. Only those Commissioners on the prevailing side of the Commission's action are eligible to vote on the revised findings.**

1.1 ~~RECOMMENDED~~ MODIFICATIONS

1) Poseidon shall create or restore ~~between~~ **up to** 55.**4** ~~and 68~~ acres of coastal estuarine wetland habitat within the Southern California Bight. **For Phase I, within 10 months of issuance of the desalination facility's coastal development permit (CDP), Poseidon must submit proposed site(s) and a Preliminary Restoration Plan for Commission review and approval. Within two years of issuance of the CDP for the desalination facility, Poseidon must submit a complete CDP application to restore at least 37 acres of estuarine wetlands. For Phase II, Poseidon must within five years of issuance of the Phase I CDP submit a complete CDP application either to restore an additional 18.4 acres of estuarine wetlands or to propose reducing or eliminating this Phase II restoration requirement by instead implementing technologies not currently available or feasible that would reduce entrainment levels below currently anticipated levels or by undertaking dredging in Agua Hedionda Lagoon in a manner that warrants mitigation credit. Poseidon may apply to do all 55.4 acres of restoration during Phase I.**

2) Poseidon shall implement its Marine Life Mitigation Plan in conformity to the conditions provided in Exhibit 2 of ~~this memorandum~~ **these Findings**.

3) Within 60 days of the Commission's approval of ~~this modified~~ the Plan **(i.e., as approved at the August 6, 2008 hearing)**, Poseidon shall submit for the Executive Director's review and approval a revised Plan that includes these modifications.

2.0 STANDARD OF REVIEW

The ~~Commission must determine whether the~~ subject plan **must** conforms to **Special Condition 8 of CDP E-06-013**, which states:

*"**Marine Life Mitigation Plan:** PRIOR TO ISSUANCE OF THE PERMIT, the Permittee shall submit to and obtain from the Commission approval of a Marine Life Mitigation Plan (the Plan) that complies with the following:*

a) Documentation of the project's expected impacts to marine life due to entrainment and impingement caused by the facility's intake of water from Agua Hedionda Lagoon. This requirement can be satisfied by submitting a full copy of the Permittee's Entrainment Study conducted in 2004-2005 for this project.
b) To the maximum extent feasible, the mitigation shall take the form of creation, enhancement, or restoration of aquatic and wetland habitat.
c) Goals, objectives and performance criteria for each of the proposed mitigation sites. It shall identify specific creation, restoration, or enhancement measures that will be used at each site, including grading and planting plans, the timing of the mitigation measures, monitoring that will be implemented to establish baseline conditions and to determine whether the sites are meeting performance criteria. The Plan shall also identify contingency measures that will be implemented should any of the mitigation sites not meet performance criteria.
d) Requires submittals of "as-built" plans for each site and annual monitoring reports for no less than five years or until the sites meet performance criteria.
e) Defines legal mechanism(s) proposed to ensure permanent protection of each site – e.g., conservation easements, deed restriction, or other methods.

The Permittee shall comply with the approved Plan. Prior to implementing the Plan, the Permittee shall submit a proposed wetlands restoration project that complies with the Plan in the form of a separate coastal development permit application for the planned wetlands restoration project."

The Commission's **Permit** Findings supporting **Special Condition 8** state that the Plan is **to** ensure that all project-related entrainment impacts will be fully mitigated and that marine resources and the biological productivity of coastal waters, wetlands, and estuaries, will be enhanced and restored in compliance with Coastal Act Sections 30230 and 30231. The **Permit** Findings further state that the Plan must provide mitigation to the maximum extent feasible through creating, enhancing, or restoring aquatic and wetland habitat and must include acceptable performance standards, monitoring, contingency measures, and legal mechanisms to ensure permanent protection of the proposed mitigation sites.

3.0 PLAN DEVELOPMENT AND REVIEW

On November 15, 2007, the Commission approved CDP No. E-06-013 for Poseidon's proposal to construct and operate a desalination facility in Carlsbad, San Diego County. As part of that approval, the Commission required Poseidon, through **Special Condition 8**, to submit for additional Commission review and approval a Marine Life Mitigation Plan addressing the impacts that will be caused by the facility's use of estuarine water and entrainment of marine organisms.

~~Since~~ **After** the Commission's project approval in November 2007, staff and Poseidon ~~have~~ worked to develop a Plan that would meet the requirements of ***Special Condition 8*** and would be consistent with the Commission's **Permit** Findings. In March 2008, and as required by ***Special Condition 8***, Poseidon provided a copy of its entrainment study for Commission staff review. Staff provided the study to Dr. Pete Raimondi, an independent scientist with expertise in evaluating entrainment studies, for his review and recommendations (described in more detail in Section 4.0 below).[5] Dr. Raimondi provided the initial results of his review and recommendations to Poseidon in April 2008. In May 2008, staff conducted with Poseidon an interagency meeting with representatives from state and local agencies to determine what mitigation options might be available and feasible for Poseidon to include as part of its Plan.

Attendees included representatives from:

California Department of Fish and Game	City of Carlsbad
California Department of Transportation	City of Vista
California State Lands Commission	U.S. Fish and Wildlife Service
San Diego Regional Water Quality Control Board	

In June 2008, based in part on concerns Poseidon expressed about Dr. Raimondi's review and recommendations, staff asked the Commission's ~~Marine Review Committee (MRC)~~ **Scientific Advisory Panel (SAP)**[6] to review Dr. Raimondi's conclusions and make further

---

[5] Dr. Raimondi is Professor and Chair of Ecology and Evolutionary Biology at the University of California, Santa Cruz Center for Ocean Health, Long Marine Lab. Dr. Raimondi is considered by many to be California's leading expert on entrainment analysis. He has been a key participant and reviewer of most of the entrainment studies done along the California coast during the past decade, including those done for the Diablo Canyon Nuclear Power Plant, the Huntington Beach Generating Station, Morro Bay Power Plant, and Moss Landing Power Plant. He is also a member of the Coastal Commission's ~~Marine Review Committee~~ **Scientific Advisory Panel (SAP)** responsible for determining mitigation needed for the San Onofre Nuclear Generating Station (SONGS) and providing review and oversight for the SONGS mitigation work at San Dieguito Lagoon.

[6] The ~~Marine Review Committee~~ **SAP** is a team of independent scientists that provides guidance and oversight to the Commission on ecological issues associated with the San Dieguito Restoration Project. That Project is being implemented by Southern California Edison pursuant to requirements of coastal development permits issued by the Commission and is meant to mitigate for marine resources losses caused by the San Onofre Nuclear Generating Station (SONGS). The ~~Marine Review Committee~~ **SAP currently** consists of ***Dr. Richard Ambrose***, Professor and Director of Environmental Science & Engineering Program, Department of Environmental Health Sciences, University of California Los Angeles; ***Dr. John Dixon***, Senior Ecologist, California Coastal Commission; ***Dr. Mark Page***, Marine Science Institute, University of California at Santa Barbara; ***Dr. Pete Raimondi***, Professor and Chair of Ecology and Evolutionary Biology, University of California at Santa Cruz; ***Dr. Dan Reed***, Marine Science Institute, University of California at Santa Barbara; ***Dr. Steve Schroeter***, Marine Science Institute, University of

recommendations for Poseidon to include in its proposed Plan. The ~~MRC~~ **SAP** review is described in more detail in Section 4.0.

Also in June 2008, staff provided Poseidon a copy of the conditions the Commission had required of Southern California Edison (Edison) for its wetland restoration project at San Dieguito Lagoon **(see Exhibit 2)**. Until June, Poseidon had been proposing a site adjacent to Edison's as ~~the best~~ **its preferred** site for ~~its~~ mitigation. Based on the Commission's **Permit** Findings and discussion at the November 2007 hearing, staff recommended to Poseidon that it *incorporate modified versions of the Edison conditions into its proposed Plan to ensure the two* adjacent mitigation sites would be subject to compatible and consistent mitigation requirements. These conditions are in Exhibit 2**1**.

On July 7, 2008, staff received Poseidon's ~~currently~~ proposed Plan for review by the Commission ~~(see Exhibit 1)~~. On July 14, 2008, staff again consulted with the ~~MRC~~ **SAP** to evaluate changes Poseidon had proposed in this most recent submittal. **On August 2, 2008, Poseidon submitted a revised** ~~Poseidon's current~~ proposed Plan~~,~~ **(see Exhibit 3).** ~~and t~~**T**he results of reviews by staff, Dr. Raimondi, and the ~~MRC~~ **SAP** are described in Section 4.0 below.

4.0 ANALYSIS FOR CONFORMITY TO SPECIAL CONDITION 8

~~Staff's evaluation of the proposed Plan shows that the~~**Poseidon's proposed** Plan, as submitted, ~~does~~ **did** not ensure conformity to ***Special Condition 8***. ~~Staff recommends the Plan be modified~~ **The Commission therefore required modifications to the Plan** to address two main areas in which the Plan ~~does not yet~~ **did not** conform to the condition: 1) the adequacy of mitigation proposed in the Plan; and, 2) assurances that the Plan will result in successful mitigation being implemented in a timely manner.

Section 4.1 below describes the submitted Plan's key elements **and the Commission's adopted modifications (shown in Exhibit 1)**. Sections 4.2 and 4.3 evaluate elements of the Plan that ~~staff believes~~ require modification. ~~Staff's recommendations~~ **The modifications** are based on review by staff and by members of the Commission's ~~Marine Review Committee (MRC)~~ **Scientific Advisory Panel (SAP)**, as described in Section 3.0. They also reflect comments received from other agencies, including the U.S. Fish and Wildlife Service and the California State Lands Commission. ~~The discussions below also identify concerns Poseidon expressed about staff's recommendations and staff's response to those concerns. Staff believes its third recommendation~~ **The third modification**, which ~~would~~ requires Poseidon to submit a revised Plan that incorporates these modifications, ~~would~~ helps **ensure** ~~the Commission and~~ Poseidon ~~in implementing~~ **implements** the modified Plan.

California at Santa Barbara; and, ***Dr. Russ Schmitt***, Director of Coastal Research Center, University of California at Santa Barbara.

4.1 PLAN DESCRIPTION

Poseidon's proposed Plan includes**d** the following main elements:

- **Phased Mitigation Approach:** Poseidon proposes**d** that it implement necessary mitigation in two phases. Phase I would result in 37 acres of wetland restoration or creation within the Southern California Bight. During this phase, Poseidon would also conduct technology review to determine whether new or developing technologies would be reasonably feasible to reduce entrainment. It would also conduct a new entrainment study ten years after beginning operations to determine whether additional mitigation is needed for the facility's entrainment impacts. Phase I would apply during the time Poseidon's desalination facility operations are concurrent with operations of the power plant's cooling water system.

  Phase II would occur if the power plant stops operating or, for three consecutive years, operates at a level that provides less than 15% of the water Poseidon needs to operate the desalination facility (i.e., about 16.6 billion gallons per year)[7]. This amount would be based on the power plant's average water use over any three-year period. Under Phase II, Poseidon would conduct a new entrainment analysis and evaluate potential new technologies, similar to the review described in Phase I. Poseidon would then provide the results of those analyses to the Commission for review. If the Commission determines the analyses show a need for additional mitigation or the evaluations show certain technologies might reduce entrainment impacts, Poseidon would request its Plan be amended to require those changes. If additional mitigation is needed, Poseidon would propose one of the following:
  - Assume dredging obligations for Agua Hedionda Lagoon from the power plant and obtain mitigation credit of up to 81 acres of restoration credit for conducting dredging; or,
  - Provide additional wetland mitigation of up to 5.5 acres.

- **Suggested Conditions:** ~~The~~ **Poseidon's proposed** Plan includes**d** suggested conditions that Poseidon would use to implement further studies, evaluate new technologies, select its mitigation site(s), and implement mitigation options. Many of these are modified versions of conditions the Commission required Edison use to implement its mitigation measures for the impacts to marine life from the San Onofre Nuclear Generating Station. These are discussed in Section 4.3 below.

In adopting the final MLMP, the Commission incorporated several concepts from Poseidon's proposed Plan with a number of modifications, including:

- **Entrainment impacts: The Commission determined that Poseidon's entrainment impacts resulted in a loss of marine organisms equivalent to that produced in a 55.4-acre area of estuarine and nearshore habitat (see Sections 4.2.1 & 4.2.2 below for details).**

[7] Poseidon's average withdrawal of 304 million gallons per day would equal almost 111 billion gallons per year. 15% of that amount is about 16.6 billion gallons, or about 45 million gallons per day.

- **Phased mitigation: The Commission required mitigation in up to two phases:**
  - **During Phase I, Poseidon is to create or restore at least 37 acres of coastal estuarine wetland habitat in one or two sites within the Southern California Bight. Within 10 months of issuance of the CDP for the desalination facility, Poseidon is to submit a preliminary site selection and restoration plan for Commission approval, and with 24 months of issuance of that CDP, Poseidon is to submit a complete CDP application for restoration of at least 37 acres of estuarine wetlands. Poseidon may choose to restore the full 55.4 acres of wetlands during Phase I.**

  - **For Phase II, Poseidon must within five years of issuance of the Phase I CDP submit a complete CDP application to restore an additional 18.4 acres of estuarine wetlands, or as part of that application may request to reduce or eliminate this Phase II restoration requirement by instead implementing technologies that are not currently available or feasible to reduce entrainment impacts below currently anticipated levels or undertaking dredging in Agua Hedionda lagoon in a manner that warrants mitigation credit.**

- **Required conditions: Poseidon is to implement its Marine Life Mitigation Plan as modified by the Commission and in conformity to the conditions provided in Exhibit 1 of these Findings. Those modifications require Poseidon to submit within sixty days of the Commission's August 6, 2008 approval a revised Plan that includes all required conditions and modifications for the Executive Director's review and approval.**

4.2 ANALYSIS – ADEQUACY OF MITIGATION

This section evaluates the following elements of Poseidon's proposed Plan:

Section 4.2.1: Analysis of Poseidon's entrainment study
Section 4.2.2: Determining the mitigation needed to address identified impacts
Section 4.2.3: Analysis of Poseidon's phased approach
Section 4.2.4: Analysis of dredging as proposed mitigation

4.2.1 Analysis of Poseidon's Entrainment Study

Special Condition 8 required Poseidon to submit its entrainment study for Commission staff review. In March 2008, Poseidon submitted data and modeling results from its study. The study was conducted using the Empirical Transport Model (ETM), which is used to identify the level of adverse effect caused by entrainment. The model compares the portion of a population at risk of entrainment to the portion of that population actually entrained. It calculates this proportional mortality for each of the main species subject to entrainment, and uses the source water area of each species – that is, the total volume or area of water in which species are at risk of being entrained – to calculate the Area of Production Foregone (APF), which provides an estimate of the average area of habitat that would be needed to produce the organisms lost to entrainment. As shown below, this APF provides the basis for determining the amount of mitigation needed to address entrainment impacts.

As described in Section 3 above, staff provided Poseidon's data and study results to Dr. Raimondi for review. In reviewing the study, Dr. Raimondi concluded the following:

- **Adequacy of Study:** Dr. Raimondi found that, as submitted, Poseidon's study could not be evaluated for its technical merits or its estimates of impacts. However, by reviewing additional relevant Poseidon documents and documents from the associated power plant's entrainment study, and by working with the consultants that had conducted Poseidon's study (Tenera Consultants), Dr. Raimondi was able to determine that the study's sampling and data collection methods were consistent with those used in other recent studies conducted in California pursuant to the protocols and guidelines used by the U.S. EPA, Regional Water Quality Control Boards, California Energy Commission, and Coastal Commission.

  Dr. Raimondi also found that the study provided adequate data to determine the types and numbers of organisms that would be subject to entrainment and to determine the area of the source water bodies – that is, the area of Agua Hedionda and nearshore ocean waters where entrainable organisms would be subject to entrainment. The study identified a source water area within Agua Hedionda of 302 acres and a nearshore source water area of about 22,000 acres. Poseidon's calculations were generally consistent with those used in other recent studies, although the calculations Poseidon used to determine its source water areas differed from those used in other recent studies to reflect the tidal exchange between Agua Hedionda Lagoon and the nearshore ocean environment.

- ***Determining the Effects of Poseidon's Entrainment:*** Poseidon concluded that the entrainment caused by 302 MGD of water withdrawal by the desalination facility would result in an APF of 37 acres in Agua Hedionda Lagoon. Dr. Raimondi's review revealed that Poseidon's APF calculation was accurate, albeit at the 50% confidence level – that is, the 37-acre APF represented the area for which the study could assure **with** at least 50% confidence that the area reflected the full extent of Poseidon's entrainment impacts in the Lagoon. This calculation is based on applying standard statistical techniques to the error rates Poseidon generated in its study. Dr. Raimondi also used those error rates to calculate APFs at the 80% and 95% confidence levels – that is, the number of acres for which the area of full entrainment impacts could be described with at least 80% or 95% confidence. This resulted in APFs of 49 and 61 acres, respectively.

  Poseidon's study did not include an APF for the area of nearshore ocean waters that would be affected by entrainment; therefore, using Poseidon's data, Dr. Raimondi calculated an APF for the entrainment effects Poseidon would cause in these nearshore waters. At the same 50%, 80%, and 95% confidence levels, the APFs would be 55, 64, and 72 acres, respectively. The APFs for both source water areas and each confidence level are shown in Table 1 below.

Table 1: APF Totals

Source water areas:	**APF (in acres) at three levels of confidence:**		
	50%	***80%***	***95%***
Estuarine: 302 acres of source water	37	49	61
Nearshore: 22,000 acres of source water	55	64	72
Total APF	**92 acres**	**113 acres**	**133 acres**

In its July 3, 2008 proposed MLMP submittal, Poseidon raised a number of concerns with staff's and Dr. Raimondi's review (see **also** Exhibit B of **Poseidon's August 2, 2008 submittal in Exhibit 3** ~~of the MLMP~~). In response, and to supplement Dr. Raimondi's review, Commission staff requested that the ~~MRC~~ **SAP** assess the review and respond to Poseidon's concerns.

Poseidon stated its study made a number of conservative assumptions that result in an overestimate of the mitigation needed**.** ~~and that t~~Those ~~conservative~~ assumptions**, and the SAP's response,** include:

- *The study overestimated the number of larvae in the lagoon and assumed a greater amount of entrainable larvae than are actually present.* In response, Dr. Raimondi and the ~~MRC~~ **SAP** noted that this type of study is based on actual sampling data, not estimates. The data reviewed were those Poseidon provided from its sampling efforts, so there should be no overestimate or assumption of a greater number of larvae than were actually sampled. If Poseidon believes the data are incorrect, that would suggest either that the raw data should be re-evaluated or the study should be run again. Further, if Poseidon's contention were true – that is, if the study overstated the number of larvae in the Lagoon – this would result in a higher APF and would therefore result in a need for *more* mitigation.[8]

- *The study assumes the project will render all affected acreage (i.e., the APF) non-functional, even though that acreage would only be partially affected and would continue to allow numerous other species to function.* In response, the ~~MRC~~ **SAP** reiterated that these entrainment studies do not assume the complete loss of ecosystem function within an area of APF; instead, they identify only the area that would be needed to replace the numbers and types of species identified in the study as subject to entrainment. The APF is used to determine impacts to only those species most affected by entrainment, and the mitigation resulting from the APF is meant to account only for those effects.

[8] To provide a simple example, the APF is based in part on proportional mortality, which is the ratio of the number of organisms entrained compared to those at risk of being entrained. Assuming the number of entrained organisms remains the same, the fewer organisms in the Lagoon, the higher the proportion of those organisms entrained – therefore, Poseidon's contention results in a higher proportional impact area.

- *The study protocols assume 100% mortality for entrained organisms; however, Poseidon believes actual mortality will be significantly lower. Poseidon also contends that it should be required to provide less mitigation based on its contention of a lower mortality rate.* In response, the ~~MRC~~ **SAP** noted that the protocols used in these entrainment studies include an assumption of 100% mortality based on guidance from the U.S. EPA and reflecting the practice of California's State and Regional Water Boards, the California Energy Commission, and the Coastal Commission in conducting and evaluating these studies. This assumption applies to these studies regardless of the type of intake and discharge system being evaluated. For example, although each power plant or desalination facility may use different water volumes, have different and variable water velocities and levels of turbulence, use different types of screens, pumps, and other equipment, and draw in a different mix of organisms, all entrainment studies similar to Poseidon's have used this same 100% mortality rate. Further, there are no peer-reviewed scientific studies that support using a lower mortality rate for different types of power plant or desalination systems that cause entrainment. In the case of Poseidon's desalination facility, entrained organisms will be subject to a number of stressors – including high pressures, significant changes in salinity, possible high temperature differences if the power plant is operating, etc. – and they will then be discharged to a different environment than is found in Agua Hedionda. Any one or a combination of these stressors could result in mortality.

  Poseidon's proposed phased mitigation approach, which is based in part on its contention of lower mortality rates, is evaluated in more detail below. One element of this approach, however, is that Poseidon states it might use alternative screening systems to reduce entrainment or entrainment mortality. ~~However, staff considers this only speculative at this time, and notes that screening systems that have been tested for reducing entrainment have not been found effective in the marine environment. The current scientific understanding is that entrainment impacts are based on an assumption of 100% mortality of organisms present in the full volume of water drawn into an intake system, and that is the basis of the analysis herein.~~ **Pursuant to the Commission's action, if Poseidon proposes to adopt alternative technologies that are not currently available or feasible to reduce entrainment, it may apply for reduced mitigation requirements as part of its Phase II CDP application.**

Based on the above, and on the reviews conducted by Dr. Raimondi and the SAP, the Commission concurs with the conclusions of the scientific reviews showing that the facility's expected entrainment impacts result in the above-referenced APFs and incorporates those conclusions into its approval of the Plan.

4.2.2 Determining the mitigation needed to address identified impacts

The APFs generated from the study and shown in Table 1 identify the extent of expected entrainment impacts, and also serve as the basis for identifying the type and amount of mitigation needed to address those impacts. Past entrainment studies have generally used the 50% confidence level APF as the basis for mitigation and applied a mitigation ratio (e.g., 1:1, 2:1, 3:1, etc.) to compensate for mitigation occurring at a distance from the affected area, to reflect a temporal loss of habitat functions caused by the impact, to reflect mitigation that provides a different type of habitat than the affected area, or other concerns. This option is described briefly later in this Section.

For this review, however, Dr. Raimondi provided an alternative approach to determine the amount of mitigation needed, based on two main assumptions:

- First, that any mitigation provided would be in the form of restored habitat similar to the types of habitat that produced or supported the affected entrained organisms – that is, that mitigation would consist of tidally-influence salt marsh or shallow water areas similar to those found in Agua Hedionda Lagoon.

- Second, that the mitigation provided would be fully successful – that is, the mitigation site would provide fully functioning habitat that would meet required performance standards, contingency plans, etc., required for such projects to ensure success. This was based on an additional assumption – that Poseidon would be providing mitigation at a site in San Dieguito Lagoon adjacent to Edison's restoration site and would be subject to the same conditions the Commission required of Edison. Dr. Raimondi and the ~~MRC~~ **SAP** believe the conditions required of Edison provide a high level of certainty that Edison's restoration efforts will be successful and that they would provide a similar level of certainty for Poseidon's mitigation at this location.

Using the above assumptions, and using the APF figures noted above, Dr. Raimondi concluded with at least 50% confidence that creating or restoring 37 acres of suitable and fully functioning estuarine habitat would fully replace the lost productivity of Agua Hedionda Lagoon, that 49 acres would be needed to provide an 80% level of certainty, and that 61 acres would be needed to reach a 95% level of certainty. By applying the same approach to the nearshore APFs, Dr. Raimondi concluded that creating or restoring 55 acres of open water habitat would be needed to provide at least 50% certainty that that entrainment effects in that source water area would be fully mitigated, that 64 acres were needed to provide 80% certainty, and 72 acres would provide 95% certainty. However, in recognition of the impracticality of creating 55 to 72 acres of offshore open water habitat and recognizing the relatively greater productivity rates per acre of estuarine wetland habitats, Dr. Raimondi suggested that these offshore impacts be "converted" to estuarine mitigation areas. That is, by assuming that successfully restored wetland habitat would be ten times more productive than a similar area of nearshore ocean waters, every ten acres of nearshore impacts could be mitigated by creating or restoring one acre of estuarine habitat.[9] Applying this 10:1 ratio to the nearshore APFs results in 5.5, 6.4, and 7.2 acres, respectively. Although this approach would result in "out of kind" mitigation, it is also expected to produce overall better mitigation – not only is it not practicable to create nearshore, open water habitat, that habitat type is already well-represented along the shoreline, whereas creating or restoring coastal estuarine habitat types would support a long-recognized need to increase the amount of those habitat types in Southern California.[10] These totals are shown Table 2 below.

[9] This approach – converting offshore entrainment impacts to areas of wetland mitigation – has been used to help determine mitigation in several recent California power plant siting cases, including Huntington Beach (00-AFC-13), Morro Bay (00-AFC-12), and others.

[10] See, for example, the Southern California Wetlands Recovery Project at http://www.scwrp.org/index.htm

Table 2: Adjusted APF Totals

Habitat Type	APF (in acres) at three levels of confidence			Conversion ratio	Resulting APF (in acres) at three levels of confidence		
	50%	*80%*	*95%*		*50%*	*80%*	*95%*
Estuarine	37	49	61	1:1	37	49	61
Nearshore	55	64	72	10:1	5.5	6.4	7.2
Total Mitigation					**42.5**	**55.4**	**68.2**

In sum, Dr. Raimondi concluded that creating 55.4 to 68.2 acres of fully functioning estuarine habitat similar to habitat in Agua Hedionda Lagoon would provide between 80 to 95% confidence that Poseidon's entrainment impacts would be fully mitigated. This conclusion is also based on Poseidon's mitigation being subject to conditions similar to Edison's, which is discussed in more detail in Section 4.2.3 below.

Poseidon contends that ~~Dr. Raimondi's~~ **staff's** recommendation to apply an 80-95% level of certainty for mitigation is "extraordinary and unprecedented" and would result in excess mitigation for the project's expected impacts. In response, Dr. Raimondi and the ~~MRC~~ **SAP** state that ~~the confidence levels used are based on the error rates Poseidon calculated as part of its study, and generating these calculations is a standard practice for this type of entrainment study~~ **considering uncertainty is a standard practice in data analysis and that such consideration provides a context for understanding the likelihood that a particular amount of mitigation will provide full compensation for identified impacts. Staff notes that Poseidon's entrainment study included error rates that Dr. Raimondi used initially to calculate a higher estuarine APF of 87 acres at the 80% confidence level. Dr. Raimondi then used a different error rate, which he considered more appropriate for this study, to calculate an APF of 49 acres at the 80% confidence level.**[11]

Dr. Raimondi's recommendation of using the 80-95% confidence level is "unprecedented" only in that past studies have used the 50% confidence level **to describe the expected impact** and then applied a mitigation ratio, such as 2:1 or 3:1, to reflect the lower confidence level**,** ~~and~~ to include consideration of mitigation that may be "out of kind"**,** ~~or~~ provided at some distance from the affected area**, or may not be fully successful**. Dr. Raimondi's proposal, as supported by the ~~MRC~~ **SAP** and Commission staff, would actually result in less mitigation acreage than that standard mitigation approach, but it would have higher certainty of success.

~~Staff recognizes that the Commission could apply a mitigation ratio to the identified level of impact, consistent with past mitigation determinations for wetland impacts. For example, applying a 2:1 ratio to the 50% 42.5 acre total APF would yield 85 acres of restored coastal wetland habitat, and applying a 3:1 ratio would yield 127.5 acres of habitat. If the Commission selects this approach, staff believes these ratios would be appropriate minimums to apply to reflect that the Plan does not identify specific mitigation sites and the site(s) selected could be more than a hundred miles from the impact site at and near Agua Hedionda.~~

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[11] Poseidon's study included error rates based on source water sampling, which Dr. Raimondi believed were unreasonably high. He instead calculated an error rate based on the proportional mortality of each species being an independent replicate, which he believes better meshes with the logic behind the use of the APF to determine impacts.

~~However, as described previously, Commission staff believes that Dr. Raimondi's proposed approach of creating 55.4 to 68.2 acres would be an adequate and preferable approach – if Poseidon's proposed Plan is also modified to include staff's other recommended modifications, including the one described in the next section of this memorandum.~~

Based on the discussion above and on the record, the Commission finds that requiring 55.4 acres of estuarine wetland restoration in the Southern California Bight subject to the conditions shown in Exhibit 1 provides a sufficient degree of certainty that the facility's entrainment impacts will be fully mitigated and brings the Plan into conformity to Special Condition 8 and the Coastal Act's marine life protection policies.

4.2.3 Analysis of Proposed Mitigation Phasing

As noted above, Poseidon's Plan includes a proposed phased approach to mitigation, which would be based on changes in power plant operations or possible changes in technology. **Because of the possibility that Poseidon might in the future adopt technologies that are not currently available or feasible to reduce entrainment and because of uncertainty regarding future power plant operations, the Commission finds that it is appropriate to allow phasing of the mitigation. For the first phase, Poseidon must submit within two years of the issuance of the CDP for the desalination facility a complete CDP application for wetland restoration of at least 37 acres. Poseidon may apply during Phase I to implement the entire 55.4 acres of wetland restoration. For the second phase, Poseidon must within five years of issuance of the Phase I CDP submit a complete CDP application to restore the additional 18.4 acres of restoration, or as part of that application request the Commission reduce or eliminate the amount of required restoration if Poseidon implements the above-referenced technologies that result in reduced entrainment or if, as explained below, Poseidon performs dredging in Agua Hedionda Lagoon in a manner that warrants mitigation credit.** ~~For several reasons, staff recommends the Commission not accept this aspect of the Plan and instead require a specific type and amount of mitigation as described above. The entrainment impacts described in the Commission's Findings were based on Poseidon application to withdraw 304 million gallons per day of estuarine water to operate its desalination facility, and staff recommends the Commission use this as the basis for its decision on the amount of mitigation needed to address this impact.~~

~~Staff believes this phasing approach is speculative in that it is tied to unknown future operations of the power plant. Additionally, information in the record shows that the power plant owner expects to replace the existing power plant within the next few years and to operate the existing plant only at very low levels or on a back-up basis until it is no longer needed to support the regional electrical power grid. More recently, the power plant owner announced that it would consider constructing its own desalination facility to provide water for its proposed new power plant. If built, this facility would use only about one percent of the water Poseidon proposes to use, and so would likely have a relatively minor affect on the overall mitigation needed to adequately address the impacts of both facilities.~~

~~Staff also believes that tying Poseidon's mitigation to power plant operations would be inappropriate for purposes of the coastal development permit and the Commission's Findings. Poseidon's coastal development permit application did not include the power plant owner as a co-applicant, and the Commission has made no determinations about how the power plant should or may operate.~~

4.2.4 Analysis of dredging as project mitigation

~~Similarly, staff recommends the Commission not approve Poseidon's proposal to allow it to use as mitigation during Phase II the dredging activities now being conducted by the power plant owner.~~ Poseidon proposes a formula by which it could obtain up to 81 acres of credit for conducting dredging in Agua Hedionda Lagoon. **The Commission does not accept this formula because it does not currently have sufficient information to evaluate the purpose, nature, or extent of potential dredging, or whether Poseidon would be able to conduct the proposed dredging. It is possible, however, that Poseidon might carry out future dredging in a manner that warrants mitigation credit. Poseidon may therefore apply as part of its Phase II mitigation CDP application for a reduction in restoration requirements in exchange for mitigation credits that the Commission may consider for Poseidon's dredging activities.** ~~However, the Commission has not considered dredging in and of itself to be mitigation. Dredging that the power plant has conducted in the past has been done to maintain its intake channel, and similarly, Poseidon's main purpose for dredging would be to maintain that channel. The Commission has considered habitat benefits resulting from dredging for that primary purpose as merely incidental to the primary purpose of the dredging activities rather than mitigation. Had those dredging activities instead been considered mitigation, the power plant owner may have been required to continue dredging to maintain the area of mitigation, regardless of the need for an intake structure.~~

~~Further, as noted in the Findings, the power plant owner also owns the Lagoon and has expressed its intentions to maintain the Lagoon for the foreseeable future. Additionally, the power plant owner is not a permit co-applicant with Poseidon, and the permit record includes no agreement between Poseidon and the owner regarding dredging, so staff believes it would not be appropriate for the Commission to approve a plan that may create an expectation that Poseidon would take on these activities on the owner's property without landowner approval.~~

~~As Poseidon notes in its Plan, the Commission accepted as part of Edison's San Dieguito restoration project a commitment by Edison to maintain the San Dieguito tidal inlet in an open condition in perpetuity. However, in that instance, dredging was necessary for that project to support the more than 100 acres of restored tidal wetlands Edison had created as a substantial portion of the mitigation required pursuant to its SONGS coastal development permit. The Commission's acceptance of that mitigation element was also based on multiple years of study by the MRC, whose recommendation the Commission used in its decision. The MRC has not made a similar recommendation for Poseidon's proposal. Further, Poseidon has not proposed mitigation within Agua Hedionda that would require dredging.~~

~~Finally, Poseidon's proposal would not meet the provision of **Special Condition 8** requiring mitigation to be in the form of creation, enhancement, or restoration of aquatic and wetland habitat, to the maximum extent feasible. As noted above, there are wetland mitigation opportunities within the Southern California Bight well in excess of the amount needed to mitigate for this project's impacts, and Poseidon has not shown that it would be infeasible to provide the required type of mitigation.~~

4.3 Analysis – Assurance that Mitigation will Succeed

Until recently, Poseidon had proposed that it provide wetland restoration at a site in San Dieguito Lagoon, adjacent to Edison's restoration project. Review by staff, Dr. Raimondi, and the ~~MRC~~ **SAP** had been based on determining whether that site would provide suitable mitigation. In April 2008, Dr. Raimondi concluded that Poseidon's proposed San Dieguito site would likely provide suitable habitat for the losses of estuarine larvae at Agua Hedionda if the restored habitat was similar to the habitat affected at Agua Hedionda. In June 2008, Dr. Raimondi and the ~~MRC~~ **SAP** also concluded that the San Dieguito site would also provide at least partial mitigation for some species affected in Poseidon's nearshore impact area. Also in June, staff provided Poseidon with a modified version of the conditions the Commission required Edison to meet for conducting its site selection, construction, monitoring, and other aspects of its restoration plan, and recommended that Poseidon include these conditions as part of its proposed Plan. These are provided in Exhibit 2.

~~Since then,~~ **Several weeks before the August 2008 hearing,** Poseidon altered its Plan so that San Dieguito ~~is~~ **was** no longer necessarily Poseidon's preferred site. The Plan instead proposes that Poseidon select a site or sites somewhere within the Southern California Bight that meet conditions shown in Sections 3.1 and 3.2 of the Plan. Those conditions include**d** further modifications to the conditions staff provided in June.

Staff asked the ~~MRC~~ **SAP** to review Poseidon's two proposed changes – that is, its proposal to consider sites other than San Dieguito and the modifications in its Plan to staff's previously recommended conditions. Regarding, staff's proposed conditions, the ~~MRC~~ **SAP** believes those conditions – i.e., Exhibit 2 – would generally provide adequate assurance of success for a restoration project to be implemented in most coastal estuarine areas of Southern California, although a higher degree of assurance would result if specific sites were identified. The ~~MRC~~ **SAP** also determined that the changes Poseidon proposed to staff's conditions and included in its Plan would result in lesser mitigation standards than those required of Edison and would not provide equal assurance of mitigation success. The changes Poseidon proposed include the following:[12]

- Staff recommended that Poseidon submit a complete coastal development permit application for its Final Restoration Plan within 24 months of Commission approval of its Preliminary Plan (i.e., the Plan being reviewed herein). Poseidon **proposed** modi~~fied~~**ying** that recommendation in Section 4 of its Plan to allow submittal of that application either 24 months after issuance of the project coastal development permit or commencement of

[12] For a full comparison, see **Exhibit 3,** ~~Section 3 of~~ Poseidon's **proposed** Plan, and Exhibit 2 showing staff's originally recommended conditions.

commercial operations of the desalination facility, whichever is later. This could substantially delay the implementation of mitigation and could result in several years of impacts occurring without mitigation.

- A proposed change to Poseidon's Plan at Section 3.1(d) and at Section 3.2(c) would **allow the Executive Director or Commission to** reduce the required buffer zone at its mitigation sites from ~~no less than~~ **at least** 100 feet wide to an average that could be ~~much~~ less than 100 feet **wide**.
- ~~A proposed change at Section 3.1(i) would allow the Plan to affect endangered species in a way not allowed under the Edison requirements.~~
- Poseidon proposes to change Section 3.3(c) to allow mitigation to occur in up to four sites, rather than up to two sites, as required of Edison, which could fragment the mitigation and reduce its overall value.
- ~~Poseidon also proposed deleting a requirement at Section 5.4 that would require a designed tidal prism be maintained to ensure the wetland mitigation site has adequate tidal action.~~
- ~~Poseidon proposes that any fees it pays for coastal development permits or amendments be credited against the budget needed to implement the mitigation plan.~~

Staff and the ~~MRC~~ **SAP** reviewed these proposed changes and believe they would result in inadequate assurance that successful mitigation would be conducted in a timely manner**, and the Commission did not include those proposed revisions in its Plan approval**. ~~Staff's recommendation, therefore, is~~ **The Commission finds** that the Plan be modified to include the conditions in Exhibit 2.

CONCLUSION

The Commission finds that, as modified as described above and with the conditions in Exhibit 1, the Marine Life Mitigation Plan complies with *Special Condition 8* and the marine life protection policies of the Coastal Act. The Commission further finds that implementation of the Plan will ensure the project's entrainment-related impacts will be fully mitigated and will enhance and restore the marine resources and biological productivity of coastal waters in conformity to Coastal Acts Sections 30230 and 30231.