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

SAN DIEGO REGIONAL
WATER QUALITY
CONTROL BOARD

2008 MAR -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:ebecker

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

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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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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 1bs, 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 1bs, 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

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[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.