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SIERRA CLUB
FOUNDED 1892

Main Office: (619) 299 1743
Chapter Coordinator: (619) 299 1741
Fax: (619) 299 1742
Email: creiff@sierraclubsandiego.org
www.sierraclubsandiego.org

San Diego Chapter
Serving the Environment in San Diego and Imperial Counties
3820 Ray Street

SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD

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March 31, 2008

State of California
Regional Water Quality Control Board
San Diego Region
9174 Sky Park Court
San Diego, California
Attn: Brian Kelly

Subject: Comments on Poseidon Resources Corp. Proposed Carlsbad Desalination Project Technical Report for Revised Flow, Entrainment, and Impingement Plan (a special study) dated March 6, 2008

Dear Chair Dr. Wright and members of the Board:

Summary: We believe that it is essential to assess the subject report (Report) from a marine ecosystems viewpoint. Both the Pew Oceans Commission Report and the U.S. Commission on Ocean Policy have found that the coastal and marine resources of the United States are under stress from a multitude of human impacts. Their action plans include ecosystems based management of these valuable resources. The ecosystems management requires a holistic approach and is a departure from prior practices that directed attention to individual species. Both the National Oceanic and Atmospheric Administration[1] and the State of California are now pursuing this new approach. The State of California in 1999 enacted the Marine Life Management Act[2] (MLMA). The MLMA has two general policies. The first applies to all marine life management by the state and the second focuses more narrowly on fisheries management policies. The overriding goal of this Act is to ensure the conservation, sustainable use, and restoration of California's living marine resources. It recognizes the value of maintaining the health of the marine ecosystems, which is essential to productive fisheries and non-consumptive uses of marine living resources.

Our review of the Report indicates that it is seriously flawed and not acceptable because it fails to apply the ecosystems management approach required by the MLMA policy.

- The quantification of unavoidable impacts to marine life not acceptable because the methodology for entrainment impacts is inadequate as it evaluates primarily fish larvae and a few number of invertebrates species. It fails to quantify the loss of entrained marine organisms including phytoplankton and zooplankton and their impact on the health and biodiversity of the marine ecosystems.

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[1] Burgess, James, et al, NOAA's Ecosystems Approach to Management, NOAA Ecosystem Goal Team, NOAA Headquarters Silver Spring, MD http://ecosystems.noaa.gov/docs/EGT_Oceans_2005_Paper_070105.doc

[2] Weber, Michael L and Burr Heneman, Guide to California's Marine Life Management Act http://www.fgc.ca.gov/mlma/index.html

- The Report concludes that the impingement impacts of the stand alone facility are "*de minimis* and insignificant" without providing scientific studies that assess the loss of 19,408 fishes and 96 individual species during the period from June 2004 to June 2005 to the health and biodiversity of the marine ecosystems.
- An ecosystem based management plan that is coordinated statewide that brings together the CDP and other activities and facilities that use the coastal resources should be required.
- Comprehensive receiving waters monitoring program should be required.
- The proposed mitigation plan is severely flawed.

Detailed comments:

First and foremost, the Report fails to provide a site specific conceptual food web model. This model serves to show the relationship among the various species and their interactions in response to the impingement and entrainment impacts. It is an essential tool for the ecosystems based management of the CDP project. It also serves as a communication tool for the various stakeholders. An informative example of a generalized aquatic food web model is shown in the 2007 NOAA power point presentation[3] to the Department of Toxic Substances Control. This model can serve as the basis for developing the site specific model.

Mortality and injury to marine life caused during transport through intake and discharge tunnels not addressed. The Report does not but should provide information on the number of fish, larvae and all other marine life that are killed, injured or dazed in the intake and discharge channels the CDP by abrasion, hard contact with the tunnel, disoriented by turbulent flow, and other mechanical means. The NRG sketch depicts the circulating water intake and discharge. The intake tunnel length is approximately 1050 feet. The discharge channel is much longer as the sketch shows only a portion of it.

Elimination of Heat Treatment Related Mortality. The Report (Chapter 3.7) proposes to clean the intake and discharge system by periodically circulating plastic scrubbing balls. The Report does not indicate where the debris from the cleaning will be disposed. The Encina Power Station disposed the heat treatment debris into the receiving waters via the discharge tunnel. We objected to this practice as it is in violation of the NPDES CA 0001350, No. R9- 2006-043, Paragraph III, Discharge Prohibitions. Furthermore, it is highly likely that plastic, an ocean pollutant, will be worn off from the plastic scrubbing balls and be included in the debris. We continue to object to the practice of disposing the clean-up debris into the receiving waters.

Micro-screens effectiveness to minimize impingement and entrainment losses is problematical. The Report on page 4-27 cites the Big Bend Power Plant experience with fine mesh screens. The referenced EPA 821-R-02003 states that these are traveling mesh screens were found to have operational problems. The Report does not provide operational information such as pilot plant tests to verify that this technology is proven and reliable. The Report makes no mention that biofouling and biofilm buildup will occur in the micro-screens to require periodic chemical (biocides) treatment. Furthermore, as questioned previously, the Report does not address the expected survivability of the entrained marine organisms after being flushed out from the micro-screen filter and transported out the lengthy (approx 1500 ft) discharge tunnel. The Report does not but should

[3] Klimas, Denise, M and Donald A. MacDonald, Components of Estuarine and Marine Ecological Risk Assessment, NOAA Office of Response and Restoration, presentation to California Department of Toxic Substances Control Ecological Risk Assessment Workshops July-August 2007 http://www.dtsc.ca.gov/AssessingRisk/upload/07_klimas.pdf

provide a monitoring plan to quantify taxa, their abundance, and the survivability of the marine organisms at the ocean outfall.

5.2.1 Methodology for Impingement Assessment, intake flow velocity. The statement that if intake through-screen velocity is below or equal to 0.5 fps, the impingement mortality of the intake screens is considered to be negligible has been disputed by the Henderson and Seaby[4]. Their report lists nine problems that question this assertion of which six are applicable for the CDP. Two that not relevant here are high and low water temperatures and the third problem of flow direction with respect to gravity is not present because it is horizontal in this case. These six problems are listed below:

1. *Fish often do not know in which way to swim and so may become entrained or impinged even if they have they have the speed to escape.*
3. *There is no consideration of the effects of tide, currents etc. on flow rates through the screens.*
4. *There can be problems because fish orientate at 90 degrees to the screen and not the flow.*
5. *The velocity is determined at the screens - at this point the fish may already be trapped.*
8. *Fish eggs are often free floating and are therefore vulnerable to entrainment irrespective of the intake velocity*
9. *Larval fish, post-larval fish and very young fish are poor swimmers and cannot achieve 0.5 ft/sec. They also do not all react to a flow by moving away from it.*

The quantification of unavoidable impacts to marine life is not acceptable. The Marine Life Protection Act requires an ecosystem based approach. This requires that the impingement and entrainment impacts be assessed for all the marine organisms from the benthos, up the food web, and to the top consumers as shown in the Generalized Aquatic Food Web shown in the NOAA power point presentation cited above. Table 5-1 tabulates the impingement of fishes, sharks and rays during June 2004 to June 2005 prorated for 304 MGD. Note that under normal operations 19,408 individuals were impinged and 97 separate species. No ecological assessment has been provided to indicate whether these losses are sustainable and can maintain a healthy biologically diverse ecosystem. Instead the Report dismisses the impingement loss by citing that it amounts to 2.11 lbs/day. Likewise, the entrainment effects methodology is flawed because it addresses only the fish larvae entrainment.

Need for an ecosystem based management plan. These local impingement and entrainment impacts must be evaluated to assess the connectivity with the coastal marine ecosystems to the north and south. This means that an ecosystem based management plan that is coordinated state-wide is needed.

Reference site data needed to prevent shifting baselines. The Report should obtain ecological health data for reference marine sites that have not been used for once-through-cooling source water and the source water marine for the CDP for comparison benchmarking. Ecological health date for the CDP marine source waters as a reference basis is not acceptable. The ecosystems management must avoid the practice of shifting or sliding baselines.[5] See also.[6]

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[4] Henderson, P.A and R.M.H. Seaby, Technical Evaluation of USEPA Proposed Cooling Water Intake Regulations for New Facilities Pisces Conservation Ltd, November 2000 http://www.powerstationeffects.co.uk/reports/final316b.pdf

[5] University of California Natural Reserve System *Transect* Autumn 2003, Vol. 21, No. 2 http://nrs.ucop.edu/Transect/TR21.2-F03.pdf

[6] Saenz-Arroyo, Andrea, et al Rapidly shifting environmental baselines among fishers of the Gulf of California, *Proceedings Biological Sciences* v. 272(1575); Sep 22, 2005 http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1559885

Comprehensive receiving waters monitoring program is required. The Report lacks a comprehensive receiving waters monitoring program to evaluate the ecological health the marine ecosystems. The program should include sampling of benthic infauna, phytoplankton, zooplankton, benthic and piscivorous fish. We also recommend that the monitoring program be included in the region wide southern California Bight monitoring program.

The proposed mitigation plan is severely flawed. Chapter 6.2 states the conservative assumption that CDP will cause 100 percent mortality of the marine organisms that are diverted from the Agua Hedionda Lagoon to the CDP. However, the Report does not provide data on the taxa and abundance of these organisms in the seawater that reside in the Lagoon but also in the coastal waters. Without this information, it is very questionable that a mitigation plan could be devised that would provide the necessary habitat and recruitment conditions for both the Lagoon and coastal marine organisms.

California actions to implement the MLMA The above comments represent a significant departure from the approach presented in the Flow, Entrainment and Minimization Plan. These comments are based on the MLMA that was enacted in 1999. The implementation of the Plan is still underway. The Ocean Protective Council Five Year Strategic Plan Action Status February 2008[7] has two relevant objectives. The first is listed under Section C. Ocean and Coastal Water Quality, Objective 3, Once-through-cooling; Work to eliminate the harmful impacts of once-through-cooling coastal power plants. Status: In progress. The second objective is listed in Section E. Coastal and Ocean Ecosystems, Objective 2: Marine Life Management Act; Help establish ecologically and economically sustainable fisheries. The action is to make resources available to support Dept Fish and Game's work on the MLMA. Status: In Progress.

Conclusion: Despite the fact that there has been slow progress to implement the MLMA, we believe that is in still in the best interests to protect the marine ecosystems to begin now to apply the principles of MLMA as described in the comments above.

Sincerely,

Ed Kimura

Edward Kimura
Sierra Club
San Diego Chapter

[7] California Ocean Protection Council – Five Year Strategic Plan, Action Status February 2008
http://www.resources.ca.gov/copc/docs/Strategic_Plan_Update_208.pdf