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San Diego Chapter
Serving the Environment in San Diego and Imperial Counties
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April 1, 2009

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

Subject: Approval of Flow, Entrainment and Impingement Minimization Plan for Tentative Order R9-2009-0038 amending Order R9-2006-0065 WDR for the Poseidon Resources Seawater Desalination Plant Discharge to the Pacific Ocean via the Encina Power Station

Dear Chairman Wright and Members of the Board:

First, we wish to thank staff for preparing the extensive list of documents pertaining to the Poseidon Resources seawater desalination project[1]. We found it very useful in reviewing the project and preparing this comment letter. We also have found the March 27, 2009 staff report useful as it raises a number of open issues. After reviewing the many reports and analyzing the impingement data and the mitigation plan, we find that we still cannot support the project because it does not adequately estimate the expected impingement losses and relies on a yet to be defined mitigation plan. These factors, in our view, cause an unacceptable risk to the health and safety of our already stressed coastal marine ecosystem. We urge you to reject this minimization and mitigation plan.

The following comments are primarily on the March 9, 2009 Flow, Entrainment and Impingement Minimization Plan Submitted by Poseidon Resources Corporation and additional information not previously submitted by us.

Impingement Impacts. The impingement impacts in the past and latest March 9 report focuses on minimizing the approach velocity at the travelling fine screens. These reports fail to address that there is no escape path for the larger marine life that can swim away from the screen except to swim back up the intake tunnel. We are not aware of any reports that monitor the number of mobile marine life that have escaped in this manner. Cooling water is drawn into the power plants via two identical (each 12 feet wide by 8 feet high) intake tunnels located after the bar rack at the intake infrastructure. The left channel (facing the intake) provides the cooling water for generators Units 4 and 5 and the left channel provides the water to Units 1, 2 and 3. With the Encina Power Station

[1] Index of Electronically Available Supporting Documents for the March 9, 2009 Flow, Entrainment and Impingement Minimization Plan Submitted by Poseidon Resources Corporation
http://www.waterboards.ca.gov/sandiego/press_room/announcements/carlsbad_desalination/updates_3_13_09/index_table_poseidon.shtml

operating with all intake pumps operating the average velocities[2] at left and right tunnels are 10.2 and 2.3 feet/second, respectively. The Poseidon reports cite the average velocities but neglects the fact that the actual velocity profile across the tunnel varies, increasing from the sides to the center[3]. This fact is important as the maximum velocity will be higher than the average dependent several factors such as the configuration and roughness of the channel. Actual flow velocity profiles should be measured.

The approximate distances of the cooling water tunnels from the intake structure to the traveling screens are 360 feet for Units 1, 2, and 3 and 960 feet for Units 4 and 5. Given these long distances and ability for the unharmed fishes to swim back up a lightless tunnel against the currents, makes the chances for escape from none for the weakest and to very slim for the strongest swimmers. The wall roughness also presents a hazard to aquatic life as are very likely to contact the walls. These conditions are the de facto parameters not the water velocity at the fine screen that define the potential for impingement.

The Poseidon conducted an impingement survey consisting of weekly samples for 52 weeks from June 24-25, 2004 to June 8-9, 2005. [4] It is unfortunate, that the survey did not provide separate impingement results for the two channels. One would expect that the left channel would produce a higher impact numbers of the marine life entrained.

It is our understanding that to meet the 304 MGD intake flow when the Encina Power Station is temporarily shut down or for the "stand alone" case, one pump each from Units 4 and 5 will be used to provide 316 MGD. We expect that this option would have a higher impingement impact compared to other options that use a combination of pumps from Units 1, 2, and 3 plus either one pump for Unit 4 or 5. Using pumps for Units 1, 2, and 3 reduce the travel distances, overall in tunnel velocities and the aquatic losses due to contact with the tunnel walls as compared to the option using only the Unit 4 and 5 pumps that has the highest tunnel velocity and travel distance.

Refer to the further discussion of the impingement impacts in the section next section.

Estimating Flow Proportioned Impingement In order to determine the impingement impacts when the Encina Power Plant is not operating, the desalination plant requires 304 MGD to maintain full production. The estimated the entrainment and impingement impacts is necessary to develop the Marine Life Mitigation Plan (MLMP) at these reduced intake flows compared to the typical cooling water flows for the power plant. Poseidon prepared this estimate.[5]

A concern that has received a good deal of attention is to explain why there was an exceptional increase in impingement data for two sample weeks; the 30th week, January 12-13, 2005 and February 23-24. Reference 5 treats these at "outliers" and does not provide a plausible reason. There is no discussion if the number of fishes in the source water beyond the small number of freshwater fish that were impinged due to immigration. An examination of the species that were impinged shows high number of the topsmelt impingement count, 2551, compared to prior values and compared to the shiner surfperch. This is illustrated by computing the cumulative counts of these two species over the 52 week period and comparing the results. This integration procedure

[2] The average velocity is computed by dividing the flow rate by the cross sectional area of the channel.
[3] Refer to a textbook on fluid mechanics on water flow in channels. I referred to my college fluid mechanics text book by R.C Binder
[4] Poseidon Resources Corp, Flow, Entrainment and Minimization Plan, March 2009, Attachment 3- Impingement Results-Traveling Screen and Bar Rack Weekly Surveys
[5] Ibid, Attachment 5, Estimation of the Potential for Impingement should the CDP stand alone.

provides a trend in the impingement over time. Refer to the Figure 1 attached at the end of this letter. Note that the topsmelt shows the discontinuity in the cumulative count at the January 12-13 sample, whereas, the shiner perch does not. The number of shark/rays also show a jump in numbers compared to the past trend. These are relatively large predators and one reason for their increase is that they were attracted to the high numbers of fish in the tunnels.

The migration and spawning characteristics of the aquatic life in the Lagoon should be evaluated to determine the source numbers aquatic life over a sufficient time. Estimating the impingement just on the 52 week sample is not sufficient. We do not believe that the analysis presented in the footnote 5 is adequate.

Heat treatment replacement. This item remains to be addressed in a new WDR for the "stand alone" seawater desalination plant, the use of ½ inch diameter plastic balls to scrub the intake and discharge tunnels, open channels and pumps. The proponents claim that this new treatment would eliminate the heat treatment kills not cause harm to the aquatic life. If the energy in the plastic balls is adequate to remove the bio-fouling in water passageways, it does not seem logical that they would not be fatal to aquatic life as well.

This concludes our comments.

Thank you,

Sincerely,

Edward Kimura
Sierra Club
San Diego Chapter

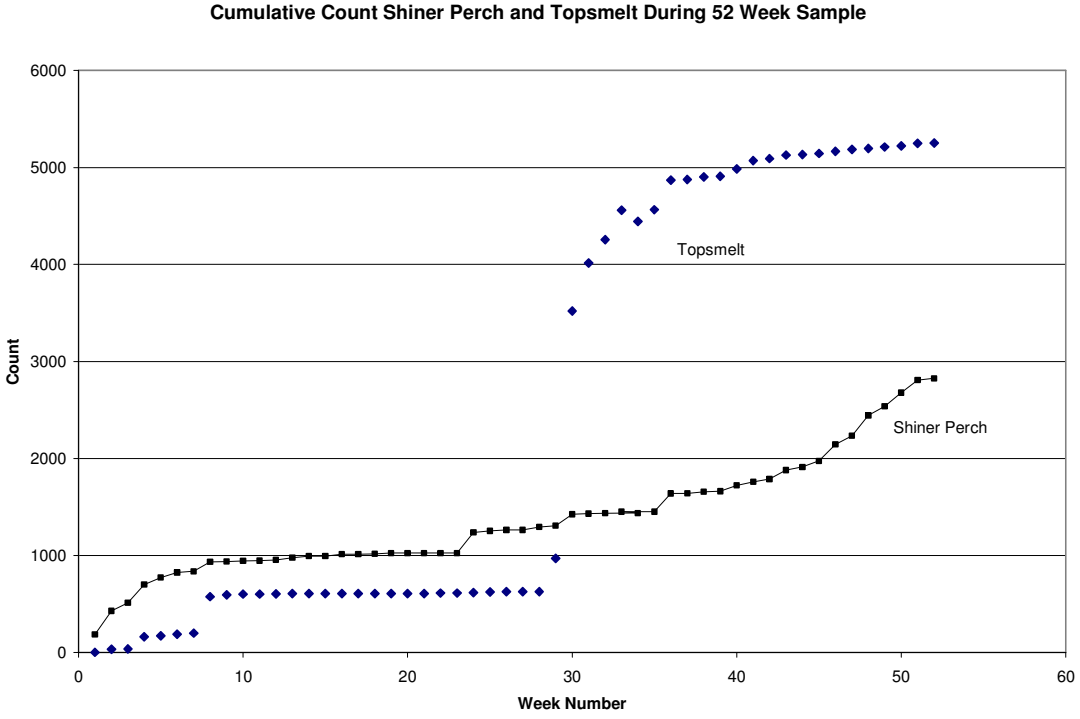
Cumulative Count Shiner Perch and Topsmelt During 52 Week Sample
6000
5000
4000
3000
2000
1000
0
Count
0
10
20
30
40
50
60
Week Number
Topsmelt
Shiner Perch

Figure 1