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Santa Ana Regional Water Quality Control Board

February 4, 2018

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Transmitted via electronic mail

WATER BOARDS STAFF'S COMMENTS AND REQUESTS FOR INFORMATION CONCERNING THE MODIFICATIONS TO THE REVISED DIFFUSER DESIGN, ENVIRONMENTAL ANALYSIS OF THE REVISED DIFFUSER DESIGN, MITIGATION, SLANT WELLS, AND FEASIBILITY ANALYSIS FOR THE PROPOSED HUNTINGTON BEACH DESALINATION PROJECT

Dear Mr. Maloni:

As you are aware, the Santa Ana Regional Water Quality Control Board (Regional Board) deemed Poseidon Water's (Poseidon) application for a California Water Code section 13142.5, subdivision (b) (Water Code section 13142.5(b)) determination for the proposed Huntington Beach Desalination Project (Project) complete on October 1, 2018. Since that time, staff from the Santa Ana Regional Water Quality Control Board (Regional Water Board) and State Water Resources Control Board (collectively, Water Boards staff) has worked with Poseidon to continue to review Poseidon's application materials.

This letter identifies additional information gaps in the application documents submitted for the proposed Project. Water Boards staff needs this information to complete its review of the application and move forward with a recommendation to the Regional Water Board for the proposed Project.

Diffuser

The Regional Board received Poseidon's *Response to Request for Information Regarding Environmental Analysis of the 2018 Diffuser Modifications* dated November 27, 2018, which includes a revised environmental analysis (Appendix BBBBB2). The response and revisions address comments raised by the State Lands Commission regarding Poseidon's August 3, 2018 submittals: *Linear Diffuser Optimization and Design for Poseidon's Huntington Beach Desalination Plant* and *Huntington Beach Desalination Plant 2018 Diffuser Modification Environmental Analysis* (included as part of Appendix BBBBB). Water Boards staff has reviewed the response and the revised environmental analysis and has consulted staff from the State Lands Commission and Coastal Commission on the matter. Based on our review and

consultation, Water Boards staff believes additional information is needed to assess the environmental impact of the revised diffuser design.

Additional analysis is needed for marine sediments that will need to be moved in advance of the linear cradle placement for the diffuser. The analysis in Appendix BBBBB states that "[a]fter the riprap is removed, the top several feet of the seabed will be dredged and levelled. Excess material will be side-cast. As stated in the 2017 Supplemental Environmental Impact Report (EIR), any excavated suspended sediments would *likely* be redistributed by ocean currents *and if excess material cannot be re-used or relocated on the ocean floor, it will be loaded on support barges and taken to the Port of Long Beach for disposal in an appropriate land-based facility. The potential land disposal of ocean floor sediment that might not redistribute by the natural ocean currents was previously evaluated in the 2017 Supplemental EIR and would not substantially change with the new linear diffuser modifications.*" (Appendix BBBBB, p. 2, italics added.) This is revised in Appendix BBBBB2 to read, "[a]fter the riprap is removed, approximately 200 to 300 cubic yards of the seabed will be levelled. Excess material will be side-cast. As stated in the 2017 Supplemental EIR, any excavated suspended sediments would be redistributed by ocean currents." (Appendix BBBBB2, pp. 16–17.) Similar revisions were made to the discussion of air impacts related to construction. (Appendix BBBBB2, p. 21.)

The analysis in Appendix BBBBB identified the possibility that excess sediment would not be redistributed and followed the worst-case scenario approach used in the 2017 Supplemental EIR.[1] In contrast, Appendix BBBBB2 eliminates the possibility that excess sediment would not be redistributed and deviated from the worst-case scenario approach with no evidence or explanation to justify the change. The worst-case scenario (i.e., the possibility that all excess sediment will not be side-cast) must be analyzed to address the incremental increase in air emission impacts that may result if excess sediment needs to be transported offsite for disposal.

Water Boards staff requests that Poseidon include the worst-case scenario approach and provide additional analysis to address the potential impacts associated with the towing and onshore disposal of the 200-300 cubic yards of sediment from "leveling" activities. The analysis should include a discussion of air quality impacts from increased emissions, anchoring impacts for additional vessels in the diffuser sediment-leveling area, and greenhouse gas impacts for additional onshore and offshore vehicle movement. Additionally, Appendix BBBBB2 analyzes only one additional day of air emissions, which does not address the possibility of onshore sediment disposal occurring at a different time from riprap transport in the air emissions analysis. This possibility should be included in the air emissions analysis. Water Boards staff also requests clarification as to whether the disposal of sediments could occur simultaneously with the last day of dredging and wedgewire screen construction (the scenario for maximum daily construction emission) and provide any associated data analysis.

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[1] The 2017 Supplemental EIR provided information regarding sediment disposal for the wedgewire screen intake construction activities in Section 2.0 (Project Description) and throughout the document. The EIR noted that "if excess material cannot be re-used or relocated on the ocean floor, it will be loaded on support barges and taken to the [Port of Long Beach] for disposal in an appropriate land-based facility." (2017 Final Supp. EIR, p. 2-28.) In addition, in Section 4.3 (Air Quality), the analysis determined that "the peak days of onshore emissions would be during dredging when equipment would be needed for material transfer at [Port of Long Beach], and haul trucks would be used to dispose of dredged material off site." (2017 Final Supp. EIR, p.4-90.) The 2017 Supplemental EIR thus included the onshore disposal of the dredged material in its worst-case scenario evaluation.

Additional information is also needed for the statement that the 2017 Supplemental EIR "overestimated" the amount of side-casted materials. In response to State Lands Commission's comment regarding calculations for change in emissions, the response memo states that "the amount of excavated and side-casted materials [1,000 to 3,300 cubic yards] required for the installation of the wedgewire screen were overestimated in the 2017 Supplemental EIR," and thus the operation of the derrick barge crane for the placement of the revised diffuser design will not result in additional hours of operation of the crane or exceed the 2017 Supplemental EIR estimated emissions. (Appendix BBBBB2, p. 3 ¶ 9.) The response does not explain or provide support for the assertion that the amounts were overestimated. Water Boards staff requests that Poseidon provides the additional information that supports the statement that the amounts were overestimated in the 2017 Supplemental EIR or adjust the emission calculations to include the additional emissions for the derrick barge.

Additionally, in Appendix BBBBB2, Poseidon indicated that the revised diffuser design that was submitted to the Water Boards on August 3, 2018 was further modified and realigned to fit within the State Lands Commission lease footprint. Water Boards staff requests the following information regarding the modifications to the revised diffuser design:

- A supplement to Appendix BBBBB clearly explaining the modifications that were made to the diffuser design and the basis for those modifications, and depictions of the changes. (This information was previously mentioned during a phone call between Hope Smythe and Scott Maloni on January 23, 2019 and on a Poseidon, Coastal Commission staff, State Lands Commission staff, Water Boards staff conference call on January 31, 2019.)
- An updated shearing analysis, using the Roberts (2018) methodology, or an explanation of why the previous shearing analysis still applies
- An analysis of the new brine mixing zone

Mitigation

In the *Revised Poseidon Huntington Beach Desalination Facility Marine Life Mitigation Plan: Bolsa Chica* (Appendix TT2) dated February 2018, Poseidon proposes to dredge the inlet of Bolsa Chica wetlands as mitigation for the proposed Project. Appendix TT2 also identifies several upland restoration opportunities that Poseidon would consider if needed to fulfill the Regional Board's mitigation acreage requirement for the proposed Project. Based on Water Boards staff's current estimates, it appears that the dredging and restoration activities would be adequate to mitigate for the loss of marine life and habitat associated with the proposed Project. However, the Ocean Plan requires mitigation that includes expansion, restoration, or creation. To fulfill this requirement, the proposed mitigation must also include restoration components. During a January 31, 2019, conference call, Poseidon indicated that the restoration projects would be included as part of the updated marine life mitigation plan.

Slant Wells

Water Boards staff appreciates Poseidon's engagement regarding the feasibility of subsurface intakes. Water Boards staff looks forward to receiving the results of the revised slant well model by February 5, 2019.

Feasibility

On January 4, 2019, Poseidon submitted two new reports to the Regional Board. The appendices are titled *Huntington Beach Desalination Plant 1-mm Screened Seawater Intake Site Determination Summary Report* (Appendix JJJJJ-1) and *Huntington Beach Desalination Plant D2 and U2 – Alternative 1mm Screened Seawater Intake Feasibility Analysis According to*

the OPA and CEQA (Appendix JJJJJ-2). The appendices do not provide sufficient information to support the conclusion that site E (Poseidon's proposed location) is the best available site feasible. Water Boards staff has identified information gaps in the appendices that lack supporting justification or citations in the following areas:

Timing
Appendix JJJJJ-2 estimates that permitting for an intake at station U2 or D2 would take 5 years and that permitting for station E would take 15 months. Given that a Section 404 permit, Coastal Development Permit, SLC lease, and easement for state beach impacts need to be obtained for station E. Based on the estimate for the time needed for a Section 404 permit and under the assumption that the state permitting process would run concurrently, it is unclear why the estimate for station E is not also 5 years, and further, how the 15-month estimate for station E was reached. Water Boards staff requests that Poseidon clarify why a different estimate for permitting time was calculated for station E.

Economic
Appendix JJJJJ-2 estimates that construction costs for an intake at station U2 or D2 would be $510,000,000, adding approximately 50% to total project costs that are currently estimated at $1 billion. Water Boards staff requests clarity regarding the estimate for construction costs for station E, and if/how these costs were deducted from the $1 billion estimate for total project costs. Additionally, Water Board staff requests that a more detailed breakdown of cost estimates for stations E, U2, and D2 be provided. For stations D2, E, and U2 please provide the following:

a. Details of design and construction cost estimates, including but not limited to design/sizing calculations of the intake structure and pipeline, pump station, and pipeline connecting to the Project. Please include assumptions, hydraulic profile, and cite sources of information for the design and cost estimate calculations. Water Boards staff also requests the revised report include any and all equations and data used for the calculation details for the parameters mentioned above, as well as the discharge pipeline.
b. Calculations to demonstrate impact of additional cost for an intake at station D2 or U2 on the cost of water to Orange County Water District. The cost needs to be compared to the cost of water at the proposed intake.

Environmental
Given that the Project will have negative effects on air emissions, as identified in the 2017 Supplemental EIR, it is unclear how an intake at station U2 or D2 would have significantly different emissions than the proposed intake. Water Boards staff requests clarification on how, or if, an intake at station U2 or D2 would result in significantly higher air emissions.

Station E is the closest station to the currently operating ocean intake for the Huntington Beach Generating Station. Accordingly, station E likely has already been experiencing entrainment effects from the existing intake. Water Boards staff requests that Poseidon provide information on how the currently operating intake may have affected larval concentrations at station E, in comparison to stations U2 and D2.

It is unclear why the mouth of the Santa Ana River and the hard/rocky substrate associated with Huntington Beach Pier and Orange County Sanitation District's riprap armoring on the outfalls structures are designated as sensitive habitat in Appendix JJJJJ-1. Water Boards staff requests that Poseidon provide scientific analysis or information to support classifying these areas as sensitive habitat.

In Table 2 of Appendix JJJJJ-1, there are several species that are not listed in Table 1 (e.g., *Cancer oregonsis*). Water Boards staff requests that additional information be provided to clarify why certain species from Table 1 are not in Table 2.

Appendix JJJJJ-1 describes how nursery grounds for Giant Sea Bass (*Stereolepis gigas*) have been identified near the head of the submarine canyon off Newport Beach and how, out of the three intake locations, station D2 is in closest proximity to the nursery grounds. Young-of-the-Year (YOY) Giant Sea Bass have been found only on the sandy soft bottom areas located within 500 meters of the mouth of submarine canyons; station D2 is located approximately 4000 m NW of the mouth of the canyon (Benseman and Allen, 2018). Larval settlement (from planktonic phase) takes place when Giant Sea Bass YOY are 10-21 mm long in total length (Benseman and Allen, 2018). Individuals of this size would be large enough to avoid entrainment through a surface intake using 1.0 mm wedgewire screens and likely would not be subject to impingement if the intake velocity is 0.5 feet/second. In addition, the growth rate for YOY GSB is 1.23 mm/d (Benseman and Allen, 2018), further supporting the case that they are not likely to be vulnerable to entrainment. Based on the information above, and the analyses provided in Appendix JJJJJ-1, Water Boards staff does not agree that station D2 will have a negative effect on GSB. Water Boards staff requests clarification as to how an intake at station D2 would result in higher intake and mortality of GSB than intakes at stations U2 or E.

Appendix JJJJJ-1 notes that station D2 is closest to the mouth of the Huntington Beach wetlands. However, because of the Southern California countercurrent, it seems just as likely that larvae coming from those wetlands would end up at an intake at station E as D2, depending on tides, weather, and currents. In addition, Appendix JJJJJ-1 also states the station U2 is the closest of the three stations to a Marine Protected Area (MPA), the Bolsa Chica Ecological Reserve. While station U2 is located 3.1 miles from the Bolsa Chica MPA, it is located down-current from the MPA because of the Southern California countercurrent, which runs northwest along the shoreline of much of the Southern California Bight. Water Boards staff requests that Poseidon provide detailed information on how the Southern California countercurrent would affect entrainment of larvae from the Huntington Beach wetlands intakes at stations U2, E, and D2.

Social

Appendix JJJJJ-2 concludes that it is socially infeasible to construct an intake at stations U2 or D2 due to impacts on recreation and access. However, no information is provided on whether construction of an intake at station E would impact recreation and access. Water Boards staff requests that Poseidon provide information on what impacts to beach access, beach usage, and annual beach events would result from construction of an intake at station E.

Technological

Appendix JJJJJ-2 is inconsistent in a number of ways with the similar consideration of offshore construction issues raised and addressed during the Independent Science and Technical Advisory Panel (ISTAP) when it reviewed the feasibility of an offshore subsurface intake gallery (SIG). The ISTAP looked at two construction methods (i.e., trestle and float-in) to construct a much larger SIG just a little farther offshore than where Poseidon's proposed intake pipes would be located. The ISTAP found that it would be technically feasible to construct the SIG using either construction method. The SIG involved a slightly deeper site (i.e., 42 feet below the water surface versus 30 feet for the single intake pipe), though the SIG site was subject to similar continuous long-period ocean swells as Poseidon has described for the intake pipe locations. Water Boards staff requests that Poseidon address the feasibility of using a modified version of the ISTAP's float-in method to install the intake pipe, or perhaps a combined version of the float-

in and trestle methods, in which a trestle structure/construction platform could be built at the offshore end of the existing intake pipe to be used as a staging location for the offshore installation.

Appendix JJJJJ-2 evaluated installing a 14-foot (168-inch) diameter intake pipe. This appears to result in overstated construction impacts and constructability concerns, as it appears the pipe could be substantially smaller than described. Research by Water Boards staff indicates that 8-8.5 foot-diameter pipelines have been used elsewhere for intake structures at desalination facilities that require similar or greater volumes of seawater than the proposed Project. Additionally, Poseidon's proposed intake design for the Carlsbad Desalination Project includes intake screens that are sized and designed to meet the 0.5 feet/second through-screen velocity requirement, although the water velocities inside the pipes connecting those screens to the facility would be just over 7 feet/second. If the same sizing formula were applied to the Project, a pipe pulling 106 MGD at ~7 feet/second would be significantly smaller (i.e., about 64 inches in diameter instead of 168 inches). Referring again to the above-referenced ISTAP report, Water Boards staff notes that installing the SIG would have involved placing a series of 54-inch diameter pipes perpendicular to the primary wave direction, which would be similar to Poseidon's placement of a 64-inch intake pipe. Appendix JJJJJ-2 additionally states that its intake pipe would need to be 10-14 feet in diameter due to net positive suction head requirements and to take into account future marine growth. Water Boards staff proposes to work with Poseidon to add additional inches to the diameter, if needed, to account for reduction in the diameter due to biofouling within the pipe, using industry standards for this type of suction pipeline in a marine environment. None of these concerns appears to have prevented Poseidon from proposing the smaller intake pipes at the Carlsbad Desalination Project. In fact, the smaller diameter pipes at that facility (and presumably at Huntington Beach) could be cleaned through pigging, which is not a viable method for a 14-foot pipe.

Water Boards staff request that Poseidon provide the following with respect to the intake pipes:

- The minimum suction pipe diameter needed.
- Appendix JJJJJ-2 concludes that installing onshore air burst systems for intakes at stations U2 and D2 is technically infeasible. Water Boards staff requests additional information clarifying why onshore air burst systems would be required for intakes at stations U2 and D2 and why self-cleaning screens (as currently proposed at station E), manual cleaning by divers, use of a boat-based airburst system, or pigging could not be installed instead. Water Board staff note also that the 2017 Supplemental EIR only addresses manual cleaning by divers and boat-based airburst system cleaning and does not address the need for an onshore-based system. Use of an onshore-based airburst system would require additional CEQA analysis. Additionally, if air burst systems are required at those stations, it seems likely that an air burst system would be necessary for an intake at station E as well. Water Boards staff requests information on the technical feasibility of installation of an onshore air burst systems for station E.
- Address the feasibility of locating D2/U2 parallel pipelines further inland, instead of under the state beach to minimize beach impacts. Also, Water Boards staff requests information that includes the schedule and layout for facility construction for the proposed Project, including any distribution line construction farther inland that may run parallel to shore.

If you wish to discuss these matters further, please contact me at (951) 782-4493 or hope.smythe@waterboards.ca.gov. You may also contact Milasol Gaslan at (951) 782-4419 or milasol.gaslan@waterboards.ca.gov.

Sincerely,

Hope Smythe
Executive Officer

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