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# Th9a & Th10a

## Addendum

May 10, 2022

**TO:** Coastal Commissioners and Interested Parties

**FROM:** Dr. Kate Huckelbridge, Senior Deputy Director  
Tom Luster, Senior Environmental Scientist

**SUBJECT:** Addendum to Staff Report for CDP Application 9-21-0488 and Appeal A-5-HNB-10-225 (Poseidon Water)

This addendum provides several comments received after the April 25, 2022 publication of the recommended Commission findings, staff's response to those comments, and modifications to those recommended findings (shown below in ~~striketrough~~ and **bold underline** text). These modifications, including the responses to comments, are hereby incorporated into the recommended findings. These proposed revisions do not change staff's recommendation that the Commission **deny** the original jurisdiction and de novo CDPs.

### MODIFICATIONS

**Recommended Findings, Cover Page:** Change dates as shown:

"Staff Report: ~~2/23/22~~ **4/25/22**  
Hearing Date: ~~3/17/22~~ **5/12/22**"

### Section II.A – Project Description and Background

Page 26, last paragraph, third sentence:

"Phase II involved a more detailed review of the intake options identified as technically feasible during Phase I and included economic evaluations of the expected costs of different intakes **at several different scales**, "constructability" issues that would likely arise along the stretch of the shoreline closest to Poseidon's proposed facility site, and others."

Page 27, bulleted paragraph on Poseidon/Orange County Water District Term Sheet – add footnote (“FN”) after the following:

“These include Poseidon applying for, and receiving approval from, the Metropolitan Water District (“MWD”) for an annual operating subsidy<sup>FN</sup>...”

“<sup>FN</sup>MWD offers a Local Resources Program (“LRP”) incentive for certain projects proposed by local water districts that add to the supply or reliability within the MWD service area. Poseidon has stated it intends to apply for the current maximum LRP subsidy of \$475 per acre-foot of water produced for up to 15 years. At Poseidon’s proposed 56,000 acre-feet of annual production, this subsidy would total about \$26 million per year, which would represent more than half of the \$52.5 million MWD has currently designated for its LRP and other related programs. Over 15 years, this subsidy would total about \$400 million.”

## Section II.G – Geologic Hazards – Tsunami

Pages 76-77, On-site Effects, modify as shown below:

**“On-Site Effects:** At the project site, Poseidon’s model results show very little inundation of the project site from an extreme tsunami under current sea level rise conditions. For both the existing topography and proposed grading, most of the project site appears to be on high enough ground to remain out of the path of the tsunami, even when the water overtops PCH. The intake pump stations, particularly the southern intake pump, could experience shallow inundation (of less than a foot) that could persist for hours after the initial tsunami runup. This intake pump inundation is likely to be accompanied by tsunami-related debris, which could damage or block the pumps and could compromise functionality of the pumps beyond the immediate time of inundation.

With +1.6 feet of SLR, and a 2,475-year ARP tsunami, relatively shallow inundation (0-2 feet) is expected in the project area, largely on the western portion of the project area surrounding the proposed water storage tank. Poseidon recently proposed elevating some of the buildings proposed on this western part of the site, though that April 14, 2022 proposal was not accompanied by updated modeling. No inundation is shown on the proposed **main** building pad (with elevations of 14-16 feet, NAVD88) as floodwaters around the pad appear to reach maximums of 11-12 feet, NAVD88. Poseidon’s tsunami modeling for 1.6 feet of sea level rise show that the water levels will be below the elevation of any sensitive equipment but could cause inundation at the pump stations. Inundation of the western site could cause the product water pumps to be rapidly covered with 1-1.25 feet of water; the pump stations close to the seaward property boundary could experience inundation of 2 to 2.4 feet and floodwaters could take about an hour to recede. This, too, is likely to be accompanied by tsunami-associated debris that could damage or block the pumps for longer periods. **As noted, Poseidon has now proposed to elevate some project components in the western portion of its site to elevations of 13-14 feet NAVD88, which would reduce risk of damage.**

With +3.3 feet of SLR, the project site is expected to be inundated to just below the top of the proposed building pads where the key facilities will be constructed. Maximum inundation appears to reach between 13-14 feet NAVD88 around the building pad, within less than a foot of the proposed range of the finished floor elevations. Inundation at the pump station will worsen and as more of the surrounding areas are inundated, tsunami-associated debris could worsen damage and block the pumps for longer periods. Poseidon did not model tsunami-related inundation for sea level higher than 3.3 feet; however, the trends for increased flood levels, more debris, and longer times for the water to recede could be expected to continue. Inundation water levels are significant concerns for tsunamis, but much of the extensive damage associated with tsunamis is caused by fast-moving water and water-borne debris. There is little discussion in the model of projected velocities, though it indicates that velocities could be high enough to cause scour around equipment or damage from debris-laden flows, including impacts to the pump stations. With 3.3 feet of SLR, inundation impacts from the 2,475-year tsunami would be severely destructive to the larger area, with much of the Southeast Huntington Beach area projected to be inundated and damaged due to water velocities and tsunami-borne debris. Poseidon's model showed maximum current speeds at the adjacent mobile home park to be up to 10 feet per second, suggesting highly destructive conditions with the potential to convey large debris to parts of the project site, including where the product pumps and vehicle access would be located. The project's storage tanks for ammonia and chlorine are also proposed to be adjacent to the proposed product pumps at about the same elevation; however, there was no discussion of the potential for tsunami flows to damage the chemical storage tanks or cause a chemical spill. The potential for damage would increase with more sea level rise.

**As part of Poseidon's April 12th Category IV Improvements Summary Memo, Poseidon notes that a portion of the site is now proposed to have an increased grading elevation of approximately +13 to +14 feet, NAVD88 in order to elevate process equipment and electrical systems above the anticipated maximum considered tsunami (MCT). The area would include the product water pumpstation, product water electrical structure, and surge tank pads. In the updated site plan submitted as part of the April 12th Memo, the containment area where ammonia and fluoride tanks would be sited are also noted to be raised to the same elevations. While no additional tsunami modeling was conducted to confirm the newly proposed elevated building pad for these facilities would be safe, these changes to Poseidon's proposal will reduce the risk of damage to these process facilities (including contamination from damaged chemical storage) during an extreme tsunami over the proposed project life including the additional risk posed by sea level rise.**

## Section II.H Coastal Hazards – Flooding and Effects of Sea Level Rise

Page 87, add after first paragraph:

“On April 20, 2022, Poseidon submitted a letter concerning the applicability of a recent report and new sea level rise projections released by NOAA (Global and Regional Sea Level Rise Scenarios for the United States, Sweet et al., 2022) as it pertains to the proposed project. In summary, the letter contends that this updated NOAA report, which includes a narrower and slightly lower range of projections for 2050 and removal of the projection scenario based on rapid and extreme ice melt (commonly referred to as the H++ scenario), suggests that sea level rise and coastal hazards pose less of a risk than previously expected.

The Ocean Protection Council, in coordination with other stakeholders, is currently in the process of updating the 2018 State Sea-Level Rise Guidance to account for the new NOAA projections and other studies, and to reflect our continually evolving understanding of climate change and sea level rise. This kind of periodic update to best available science has become somewhat routine – for example, the 2018 State SLR Guidance was an update to previous SLR projections and statewide guidance from 2013. In the past, the Coastal Commission’s practice has been to continue relying on the current statewide guidance while taking newer relevant studies that are released in between update cycles under advisement in its decision-making. As such, the Commission has been using and will continue to use the projections and other sea level rise planning recommendations consistent with the 2018 OPC State SLR Guidance while the update is being completed. As discussed in greater detail in the staff report, this includes taking a precautionary approach by evaluating and understanding the impacts associated with higher sea level rise projections, including the H++ scenario for critical infrastructure projects like the proposed Poseidon project.

Commission staff have also completed an initial review of the new NOAA report and do not agree with the applicant’s contention that sea level rise and coastal hazards pose less of a risk to the project and project site than previously expected, and do not find that the new projections substantively change our understanding of the overall sea level rise risk in the area in a way that would justify a different recommendation. While these new NOAA projections include a narrower and slightly lower range of projections for 2050, the report notes that even this smaller amount of sea level rise will increase coastal flooding, with major and moderate high tide flood events occurring as frequently as moderate and minor high tide flood events occur today. Furthermore, (excepting the H++ scenario as discussed below) the higher end projections of approximately 2m (6.6ft) for 2100 (similar to the medium-high projection scenario in the 2018 OPC State SLR

Guidance) remain largely unchanged. As discussed in the NOAA report, this suggests that the rate of sea level rise will accelerate more than previously expected in latter half of the 21<sup>st</sup> century. Given the 50-60 year proposed operating life of the project, the Poseidon facility will be in operation through approximately 2070-2080, precisely the time horizon at which the rate of sea level rise is expected to be increasing more rapidly. This will necessitate implementing adaptation strategies to address higher amounts of sea level rise at a time when sea levels are rising faster than ever before, particularly if the proposed infrastructure is retained in place beyond its proposed lifetime.

Additionally, while the NOAA report suggests that the extreme sea level rise scenario based on rapid ice melt (the H++ scenario in the 2018 OPC State SLR Guidance) has been “removed”, as the quoted text in the applicant’s letter notes, the NOAA report still explains that such a scenario could potentially occur “toward the end of the 21<sup>st</sup> century and beyond”. In other words, the processes that result in extreme sea level rise are considered unlikely in the short-term but remain a possibility over longer-term time horizons. Thus, the Commission continues to believe that understanding and evaluating the implications of this extreme scenario is critical for this project which will still be in operation towards the end of this century.

As discussed throughout the staff report, sea level rise planning is critical when considering new, expensive, complex, and long-lasting infrastructure that is meant to serve the public. This includes understanding and planning for worst case scenarios, and the 2018 OPC State SLR Guidance recommends evaluating the higher sea level rise projections for projects with a long lifetime and which have low adaptive capacity in part to avoid making decisions that would place significant infrastructure in vulnerable areas and close off adaptation options if higher worst-case scenarios of sea level rise come to pass. While the new NOAA projections provide additional certainty and slightly lower projections for the short-term, the report still points to the possibility for high and extreme amounts of sea level rise towards the end of the proposed Poseidon operating life and beyond. Thus, the Commission does not believe that the new NOAA report provides information that substantively changes the overall understanding of the risks posed by sea level rise to the project area.”

## Section II.I – Protection of Marine Life and Water Quality:

Page 106, add the following regarding Marine Protected Areas after the first paragraph:

“The entrainment study identified Poseidon’s source water area – i.e., the extent of ocean and estuarine water in which marine life would be subject to

entrainment – as extending several dozen **along about 50** miles up and down coast from Huntington Beach. This area encompasses a number of habitat types, including those within at least nine State Marine Conservation Areas (SMCAs) and State Marine Reserves (SMRs).<sup>1</sup> ~~which were established to protect unique species and habitats and to serve as a network of protected areas through which species could move.~~ **California established its MPA network in large part to provide refugia for a variety of marine organisms and to establish a series of “stepping stones,” to provide connectivity among these MPAs and allow organisms from one MPA to drift with the currents to populate other MPAs. In its 2013 staff report, Commission staff raised the question of how Poseidon’s proposed intake would affect the connectivity among the area’s MPAs. Poseidon responded by stating that its analysis showed that of all the fish larvae that would be killed due to its facility’s entrainment, only a small percentage would originate from MPAs. Importantly, though, that analysis and response did not evaluate the more critical concern of identifying what percentage of the larvae providing that connectivity between different MPAs would be killed due to the intake<sup>2</sup> – that is, if 5% of the larvae produced in one MPA provide 100% of the connectivity to the next MPA, entraining a relatively small proportion of those contributing 5% larvae could represent a substantial decrease in connectivity, thus reducing the effectiveness of the MPA network. The Regional Board’s more recent 2021 analysis describe the relative distances of these MPAs from Poseidon’s proposed intake location, but did not further evaluate this potentially significant cumulative impact that would result from Poseidon’s project. Overall, the entrainment study identified more than 50 species that would be subject to entrainment, with about a dozen of those species representing the vast majority of those entrained.”**

Page 125, add figures to third column of second-to-last and last rows, as shown:

Upper Los Cerritos, Phase 2	58	24 - <u>58</u>	Speculative	c, d
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<sup>1</sup> **MPAs within Poseidon’s source water body include Point Vicente State Marine Conservation Area (“SMCA”), Abalone Cove SMCA, Bolsa Bay SMCA, Bolsa Chica SMCA, Upper Newport Bay SMCA, Crystal Cove SMCA, Laguna Beach State Marine Reserve (“SMR”), Laguna Beach SMCA, and Dana Point SMCA.**

<sup>2</sup> **See September 9, 2016 letter to Coastal Commission Board from Dr. Robert Warner, Research Professor of Marine Biology, Department of Ecology, Evolution, and Marine Biology, University of California, Santa Barbara.**

Total Near-term and Future:	331	~141.3 - <u>175.3</u>	These totals do not account for accumulated deficit and temporal loss (see Exhibit 14).
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Page 127, add to within first paragraph:

“However, this Year 15 period is also about the same time that Bolsa Chica is expected to go through significant adverse impacts due to climate change and sea level rise, and when it will likely require substantial changes in its design and management – for example, new or modified inlet structures, changes to berm and infrastructure configurations, etc. As a result, the approximately 50 credits Poseidon expects it to provide could decline, potentially creating a mitigation shortfall again. The timing and manner in which changes at Bolsa Chica could affect Poseidon’s proposed mitigation credits is highly uncertain. If Bolsa Chica is managed to adapt to changing conditions, it is possible that Poseidon could maintain credits for more years than shown in this scenario. This would reduce the credit deficit faster and potentially even eliminate it before the end of the 50-year period shown on the table. However, the opposite is also true – habitat conversions or management changes at Bolsa Chica could happen sooner than the 15 years illustrated in this scenario, thus increasing the credit deficit. **As stated above, timing and types of changes that could occur at Bolsa Chica are highly uncertain. For example, it is also possible that habitat-related changes will not be as significant or will occur later than expected. To illustrate this example, staff also calculated an additional deficit scenario that assumed the mitigation in Bolsa Chica would be maintained and fully successful from Years 9 to 50 of Poseidon’s operations. In this scenario, there would be no mitigation declines due to climate change effects and no mitigation reduction due to conflicts between mitigation requirements and other Bolsa Chica management goals. In that scenario, Poseidon’s peak deficit would reach the same -608 credits, though the deficit would end at Year 28 of operations. While this scenario would represent an improvement, it would still result in many years of unmitigated marine life impact and thus does not ensure that marine resources are “maintained and enhanced” as required by the Coastal Act.** These results also assume that there are no unresolved conflicts between Poseidon’s need to manage the sites to provide mitigation credits and the need of the other involved entities to manage the sites for multiple purposes – for example, that Poseidon is able to fully implement the channel enhancements at Bolsa Chica without interfering with endangered species nesting sites that may be in the same area.”

**Section II.N – Environmental Justice**

Page 188, add after second full paragraph:

**“A follow-up September 2021 study by SCWD determined that costs at its proposed Doheny desalination facility would be \$1,479 per acre-foot in 2021 dollars and \$1,807 per acre-foot at its expected start of operations in 2027 (both including the MWD subsidy described previously), with MWD water expected to cost \$1,545 in 2027.**

**As noted above, Poseidon’s current 2022 costs, including the necessary MWD subsidy, are expected to be about \$2,300 per acre-foot. If applied to the current rate of water use per capita in Orange County – about 104 gallons per person per day<sup>3</sup> – a household of four people would pay about \$1071 per year for that water, or about \$90 per month. The actual cost would likely be less, however, since it is expected that Poseidon’s water would be “melded” with several other less expensive water supply sources provided to area ratepayers, though the eventual cost would also depend on how the area’s consumer water rates incorporate the as-of-yet unknown costs for the additional treatment and distribution systems needed to inject, then withdraw and treat Poseidon’s water as part of the Orange County groundwater system.”**

Page 190, add after first full paragraph:

**“These expected higher costs also raise questions related to the proposed project’s economic feasibility. The 2015 ISTAP study described in Section II.A above, which served as part of the consideration of feasible alternative intake methods, included an evaluation of the expected costs of those alternatives as compared to Poseidon’s currently proposed open water intake. This evaluation was based in part on determining at what future year OCWD would be “willing to pay” the additional costs involved in constructing those alternatives. The study showed that it would be several decades before OCWD would be willing to pay the additional costs for those alternative intakes; however, it also showed that the current costs for Poseidon’s water exceed the “willingness to pay” amount identified for the currently proposed open intake system – i.e., the study noted that OCWD would be willing to pay up to \$1,639 per acre-foot by 2018 (using a 3% discount rate) and up to \$2,189 per acre-foot by 2024 (using a 7% discount rate). Poseidon’s currently expected costs exceed both of these projected amounts, thereby raising concerns about the project’s economic acceptability to OCWD.”**

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<sup>3</sup> See, for example, Orange County Business Council, OC Community Indicators 2020-21, available at: <https://www.ocbc.org/wp-content/uploads/2020/09/2020-Community-Indicators-Report.pdf>



