Neill, Ben@Waterboards

From: Neill, Ben@Waterboards
Sent: Wednesday, January 20, 2016 2:51 PM
To: 'Peter MacLaggan'
Cc: Outwin-Beals, Brandi@Waterboards; Dan Connally; Tenggardjaja, Kimberly@Waterboards; Barker, David@Waterboards
Subject: Hydrodynamic Dilution Analysis

Hi Peter,

Poseidon submitted a report entitled *Hydrodynamic Dilution Analysis for the Carlsbad Desalination Project Operating at Sixty Million Gallons per Day Production Rate* (Dilution Analysis), dated September 3, 2015, as Appendix C to the application for renewal of the NPDES permit for the Claude "Bud" Lewis Carlsbad Desalination Plant (Facility) owned by Poseidon Resources (Channelside) LLC (Poseidon). This report provides details of a hydrodynamic dilution analysis related to a potential increase in production capacity of the Facility. The Dilution Analysis concludes that a minimum monthly initial dilution of 3.25:1 is required to ensure compliance with receiving water standards for salinity in the Pacific Ocean.

Several of the assumptions made as part of the Dilution Analysis are inconsistent with the requirements of the *Water Quality Control Plan for Ocean Waters of California* (Ocean Plan).
The San Diego Water Board has reviewed the Dilution Analysis and provides the following comments:

Comment #1: The Dilution Analysis incorrectly incorporates currents.

Section III.C.4.d of the Ocean Plan states:

> "For the purpose of this Plan, minimum initial* dilution is the lowest average initial* dilution within any single month of the year. Dilution estimates shall be based on observed waste flow characteristics, observed receiving water* density structure, and the assumption that no currents, of sufficient strength to influence the initial* dilution process, flow across the discharge structure."

Since currents were incorporated into the dilution model, the resulting dilution factor is not based on the conservative assumptions in section III.C.4.d of the Ocean Plan. Poseidon will need to conduct the Dilution Analysis again, setting the current to zero. Also, the San Diego Water Board requests that Poseidon also run the Dilution Analysis setting the waves and wind to zero to ensure that the Dilution Analysis considers the most conservative scenario.

Comment #2: The Dilution Analysis fails to provide sufficient information to support the assumption that the temperature of the pre-diluted brine will be the same as the temperature of the Pacific Ocean.

The Dilution Analysis assumes a temperature difference of 0 degrees Celsius between the pre-diluted brine and the Pacific Ocean. Poseidon must provide additional information to support this assumption.

Comment #3: The Dilution Analysis fails to provide sufficient information in support of the effluent inputs for salinity from the Facility.

The Dilution Analysis assumes that the operating scenario included an effluent salinity of 42 ppt after blending with the brine from the Facility. Poseidon must provide additional information to support this assumption.

Comment #4: The Dilution Analysis fails to provide sufficient information to determine when the momentum-induced velocity of the discharge ceases to produce significant mixing of the waste.

The Ocean Plan defines Initial Dilution as follows:

> “For shallow water submerged discharges, surface discharges, and nonbuoyant discharges, characteristic of cooling water wastes and some individual discharges, turbulent mixing results primarily from the momentum of discharge. Initial dilution, in these cases, is considered to be completed when the momentum induced velocity of the discharge ceases to produce significant mixing of the waste, or the diluting plume reaches a fixed distance from the discharge to be specified by the Regional Board, whichever results in the lower estimate for initial dilution.”

The Dilution Analysis was based on a specified fixed distance of 200 meters to evaluate initial dilution. Consistent with the definition of Initial Dilution in the Ocean Plan, Poseidon must provide additional information regarding the location where the momentum induced velocity of the discharge ceases to produce significant mixing of the waste.

It’s important to note that the San Diego Water Board will be unable to complete its draft of the NPDES permit for the Facility until such time as the revised Dilution Analysis has been submitted. Please let me know if you have any questions regarding this email.

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