STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION

STAFF REPORT FOR REGULAR MEETING OF JANUARY 26-27, 2017
Prepared on December 30, 2016

ITEM NUMBER: **17**

SUBJECT: **Status of City of Santa Barbara's Desalination Project**

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KEY INFORMATION

Location:	525 East Yanonali Street, Santa Barbara, CA 93103
Place ID/Type:	222443/Publicly Owned Treatment Works
Type of Discharge:	Treated secondary wastewater and desalination brine
Permitted Flow:	11 million gallons per day (MGD) of treated wastewater and 12.5 MGD of desalination brine.
Water Reclamation:	Order No. 97-44
Type of Treatment:	Secondary treatment system for waste water treatment plant and reverse osmosis for desalination facility.
Disposal Method:	Treated wastewater is discharged through an 8,720-foot ocean outfall. When the desalination facility is operational, brine discharge is comingled with wastewater and discharged through the same outfall.
Existing Orders:	Order No. R3-2010-0011, as amended January 29, 2015.
This Action:	**Information item regarding status of desalination facility**

SUMMARY

On January 29, 2015, the Central Coast Water Board amended the City's NPDES permit to allow operation of the City's desalination facility. In adopting the amended NPDES permit, the Water Board found that the desalination facility was an "existing" facility and therefore not subject to design requirements for "new" facilities. However, the amended NPDES permit included additional requirements for the City to utilize screens to reduce impingement and entrainment caused by the open ocean intake system, to fund a restoration project, and to evaluate the feasibility of subsurface intake and potable reuse options.

Regarding the requirement to fund a restoration project, the City gave $500,000 to the State Coastal Conservancy to facilitate the completion of a project that will restore the Upper Devereux Slough, a productive waterbody that drains to the Santa Barbara Channel.

Regarding the requirement to evaluate the feasibility of subsurface intake and potable reuse options, Water Board staff approved the City's plan to evaluate such options on October 20, 2015. Santa Barbara ChannelKeeper objected to staff's approval, which is discussed in this

staff report. The City has continued work to bring the desalination facility on-line, and the City plans to provide an update to the Water Board at the Water Board's May 17, 2017 meeting in San Luis Obispo.

DISCUSSION

This information item is to inform the Central Coast Water Board regarding the status of reopening the Charles E. Meyer Seawater Desalination Facility, and the status of subsurface intake and potable reuse alternative work studies that the City will present at the May 11-12, 2017 Central Coast Water Board meeting. The City of Santa Barbara owns and operates the Charles E. Meyer Seawater Desalination Facility, which is located adjacent to the City's El Estero Wastewater Treatment Plant (WWTP). The discharges from the WWTP and the desalination facility are combined and discharge offshore through an 8,720-foot ocean outfall. The desalination facility is permitted to discharge up to 12.5 million gallons per day (MGD) of desalination brine. The desalination facility was placed in standby mode in 1996 and has not been used since that time. Because of the extreme drought, the City's primary drinking water supply, Lake Cachuma, is down to approximately seven percent capacity and the City is in severe rationing. The City has been working to place the desalination facility back into production to address the significant water shortage and expects to have the facility operational by March 2017. The City has been replacing pumps and pipes for the permitted production capacity of 10,000 acre-feet/year (AFY), although it has put in reverse osmosis trains to operate at an initial start-up of 3,125 AFY as per its 2011 Long-Term Water Supply Plan.

On January 29, 2015, the Central Coast Water Board amended the City's NPDES permit to allow operation of the desalination facility. In adopting the amended NPDES permit, the Water Board found that the desalination facility was an "existing" facility per the State Water Board's Ocean Plan[1]. The "existing" facility designation, versus a "new" facility designation, is important because it determines design requirements. The existing desalination facility uses an open ocean intake system. Open ocean intake systems cause limited mortality of marine life through entrainment and impingement of organisms. Per the Ocean Plan, "new" facilities may be required to use more modern "subsurface" intake systems, which eliminate entrainment and impingement. Since this desalination facility is an existing system, the City is not required to install a more modern subsurface intake system. However, although the 2015 NPDES permit amendment designated the desalination facility as "existing," the amendment also included additional requirements, including requiring the City to utilize screens to reduce impingement and entrainment caused by the open ocean intake system, to fund a restoration project, and to evaluate the feasibility of subsurface intake and potable reuse options. Specifically, Provision VI.C.6.c.iii required the City to submit a feasibility study work plan, analyzing "a range of alternatives, including subsurface intake and potable reuse options," by August 31, 2015, and for the City to report the results of these analyses and the Discharger's intended implementation actions to the Central Coast Water Board, by June 30, 2017.

Work Studies for Subsurface Intake Technologies and Potable Reuse Options

[1] As defined in the Ocean Plan, "existing facilities" are "desalination facilities that have been issued an NPDES permit and all building permits and other governmental approvals necessary to commence construction," and where "the owner or operator has relied in good faith on those previously-issued permits and approvals and commenced construction of the facility beyond site grading prior to January 28, 2016." (Ocean Plan, § III.M.1.b.(1).)

The City submitted the Subsurface Desalination Intake and Potable Reuse Feasibility work plans prior to the August 2015 due date, and the Water Board Executive Officer accepted them on October 20, 2015 (see Attachment 1). The work plans and work studies were reviewed through a public process with the Technical Advisory Panel (TAP) as described in the following link:
http://www.nwri-usa.org/santa-barbara-panel.htm
Water Board staff has reviewed the plans, studies, public comments, and TAP reviews, which evaluated subsurface intake technology alternatives and project sites as well as potable reuse alternatives.

The City evaluated the following six different subsurface intake technology alternatives in the Subsurface Desalination Intake Feasibility Study:
1. Vertical wells
2. Lateral beach wells (onshore infiltration galleries)
3. Horizontal collector wells (i.e., Ranney wells)
4. Slant wells
5. Subsurface infiltration galleries – offshore
6. Horizontal directionally drilled wells (i.e., Neodren)

For each of these intake technologies the City considered potential project sites (East Beach, West Beach, Leadbetter Beach) based on their proximity to the City's desalination plant and the existing intake pipeline and the availability of existing geotechnical data. The work study describes how all six subsurface intake alternatives went through technical evaluation to determine the maximum yields achievable at each project site. The City also evaluated several scenarios for direct and indirect potable reuse in the Potable Reuse Feasibility workplan and study. Several of the scenarios incorporate the desalination facility reverse osmosis technology for further treatment of El Estero WWTP effluent.

The main concern during public comments on the City's work plans and studies were that the City used an initial technological screening criterion of the permitted replacement capacity (10,000 AFY) of the desalination facility rather than the intended startup capacity (3,125 AFY). Based on this criterion, a technology that could not produce 10,000 AFY would not be further evaluated for estimated implementation schedule and cost, and social and environmental feasibility. Santa Barbara Channelkeeper asked the Central Coast Water Board to reconsider its approval of the City's intake feasibility workplan because evaluated alternatives were based on the permitted capacity of 10,000 AFY rather than the City's anticipated start-up capacity of 3,125 AFY (Attachment 2). Central Coast Water Board staff's response to Santa Barbara Channelkeeper's comments reiterated our reasons for approving the City's work plans (Attachment 3). Water Board staff expects the City to use the operational design capacity when evaluating alternatives, rather than a temporary, start-up capacity. Both the Coastal Commission and the Water Board permitted the desalination facility for a design capacity of 10,000 acre-feet per year (or 12.5 million gallons per day), and the City should logically use that capacity in evaluating alternatives.

The end of Attachment 3 notes that we had planned to schedule an informational update on Santa Barbara desalination at the September 22-23, 2016 Central Coast Water Board meeting in Santa Barbara. Santa Barbara Channelkeeper could not attend that meeting so we postponed the informational update to this January 26-27, 2017 meeting. After the Santa Barbara City Council reviews the studies in March 2017, the City plans to present the results of the studies and its intended actions to the Central Coast Water Board at the May 2017 meeting in San Luis Obispo. The City is expected to discuss the technically feasible maximum yield from

a variety of subsurface intake and potable reuse alternatives and whether the alternatives could, independently or combined, potentially replace the screened intake at the desalination facility. The City has stated that the alternatives considered in these work studies will also support a future update to the City's 2011 Long-Term Water Supply Plan, although it is the City's choice whether to proceed with subsurface intake alternatives to the screened open ocean intake since the desalination facility is an existing facility under the Ocean Plan. The City has stated that it will revisit water supply alternatives, including desalination and potable reuse, when decisions on future water needs (e.g., Lake Cachuma allocations) are known. The City is also waiting on State Water Board development of permitting conditions for direct potable reuse before deciding to proceed further with these technologies. In the meantime the City has upgraded its non-potable waste water recycling facility and capacity at El Estero and is working on a $30 million treatment upgrade to the El Estero WWTP that could increase future recycling capability. Additional information regarding the City's desalination facility and updated progress status can be found at the following link:
http://www.santabarbaraca.gov/gov/depts/pw/resources/system/sources/desalination.asp

As part of the 2015 permit amendment, the City gave $500,000 to the State Coastal Conservancy for the restoration of the Upper Devereux Slough near the University of California at Santa Barbara. The project, which has recently broken ground, will facilitate the restoration of up to 113 acres of tidal and freshwater wetlands and connected uplands in the slough. The restoration project will increase the capacity and resiliency of the Devereux Slough system to sea level rise by expanding and enhancing the tidal wetland ecosystem, which drains to the Santa Barbara Channel. For further information on this restoration project please see the following link:
http://scc.ca.gov/webmaster/ftp/pdf/sccbb/2016/1603/20160324Board03C_Upper_Devereux_Slough_Planning

CONCLUSION

On October 20, 2015, Water Board staff approved the City's plan to evaluate alternatives to its open ocean intake based on the desalination facility permitted operational capacity. Since then the City of Santa Barbara has continued to work toward making its desalination facility operational. The City plans to provide a progress update to the Central Coast Water Board at the Water Board's May 17, 2017 meeting.

ATTACHMENTS

1. Central Coast Water Board letter approving work plans dated October 20, 2015
2. Comment letter from Santa Barbara Channelkeeper dated March 17, 2016 (includes additional attachments)
3. Central Coast Water Board letter to Santa Barbara Channelkeeper dated July 21, 2016