STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION

STAFF REPORT FOR REGULAR MEETING OF NOVEMBER 19-20, 2015
Prepared on October 27, 2015

ITEM NUMBER: **20**

SUBJECT: **Cambria Community Services District's Advanced Water Treatment System / Emergency Water Supply Project, San Luis Obispo County**

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KEY INFORMATION

Location:	Approximately two miles north of Cambria along Highway 1
Type of Discharge(s):	Municipal Wastewater, Brine Waste, Stream Augmentation
Design Capacity:	700,000 gallons per day (GPD) Aquifer Re-injection, 65,000 GPD Brine, 90,000 GPD Creek Augmentation
Treatment:	Membrane Filtration (MF), Reverse Osmosis (RO), Ultraviolet (UV) & Chlorine Disinfection
Disposal:	Title 27 RO Brine
Reclamation	Recycled Title 22 Water Re-Injected to Aquifer, NPDES discharge for San Simeon Creek Augmentation
Existing Orders:	R3-2014-0047, R3-2014-0050, R3-2011-0033 (NPDES) No. CAG993001
Owner/Operator:	Cambria Community Services District

This Action: **Informational Item**

SUMMARY

On November 14, 2014, the Central Coast Regional Water Quality Control Board adopted Waste Discharge Requirements Order No. R3-2014-0050 for Title 22 recycled water reinjection and Order No. R3-2014-0047 for Title 27 reverse osmosis (RO) brine discharges to a surface impoundment for the Cambria Community Services District's (CCSD) emergency water supply project. Water Board staff also enrolled the CCSD under NPDES Order No. R3-2011-0223 (Low-Threat General Permit) for creek augmentation discharges The purpose of the project is to provide CCSD customers with a supplemental source of drinking water in order to prevent depletion of the San Simeon alluvial aquifer during the prolonged drought. The permitting process was expedited according to the Governor's emergency drought declarations in January and April 2014 by suspending California Environmental Quality Act (CEQA) review. The CCSD relies on groundwater for municipal drinking water supply and drought conditions have reduced the recharge of local aquifers. The CCSD currently serves a population of approximately 6,400 as well as a large number of tourists and visitors to the community.

DISCUSSION

Advanced Treatment System

The Emergency Water Supply project takes impaired groundwater underlying the property where the municipal wastewater treatment plant (WWTP) discharges effluent to percolation ponds and treats the water using membrane filtration (MF), reverse osmosis (RO), and an advanced oxidation process (AOP). The treated water is disinfected using UV and chlorine and then reinjected into the San Simeon alluvial aquifer.

The facility began startup operations on January 20, 2015, and ran a total of 59 days, operating weekdays only for eight hours per day, before shutting down on April 17, 2014. The facility was shut down ahead of schedule when it was discovered that nitrate concentrations in the treated water exceeded the permit discharge limitation of 2.3 mg/L as N.

Subsequent investigation revealed that the elevated nitrate was due to excessive nitrogen concentrations in the WWTP discharges to the percolation ponds. The project's influent supply well (9P7) experienced a spike of nitrate in April with the highest value being 9.9 mg/L on April 1, 2015. The facility was shut down that same month.

The maximum contaminant level (MCL) for nitrate in drinking water is 10 mg/L as N. Analysis of monitoring results for the entire period when the facility was running showed an average nitrate removal efficiency for the advanced treatment system of 41%.

The average water quality for treated, re-injected water during the January 20 to April 17, 2015 operational period was as follows:

Parameter	Average Concentration (mg/L[1])	Effluent Limit (mg/L)
Total Dissolved Solids	140	357
Chloride	20.5	70
Nitrate (as Nitrogen)	3.1, max = 6.3	2.3
Sulfate	0.94	43
Sodium	41.3	62
Boron	0.19	0.32

[1] milligrams per liter

During the initial operational period, the facility returned approximately 40 acre-feet of treated water into the aquifer, with a re-injection rate averaging 221,000 gallons per day.

The facility was restarted on September 22, 2015, following temporary alterations to WWTP operations which resulted in lower effluent nitrogen concentrations. The facility is currently operating eight hours per day, five days per week.

[1] milligrams per liter

Groundwater Quality

Monitoring results for the groundwater wells associated with the project reveal relatively small changes of chmical concentrations in area wells during advanced treatment system operations, with the exception being sodium.

	GW Quality 2001-2012			GW Quality Jan - April 2015		
	SS3	9P7	16D1	SS3	9P7	16D1
Nitrate - N	0.8	4.8	12.1	0.51	4.1	13
TDS	357	501	769	357	410	790
Sodium	20	54	123	43	49	91
Chloride	21	72	170	19	54	148
Sulfate	43	56	85	45	48	99
Boron	0.2	0.2	0.3	0.19	0.23	0.33

Notice of Violation

On February 27, 2015, the Water Board issued a notice of violation (NOV) and Water Code section 13267 informational order to the CCSD for violations of all three of the project permits. The violations were related to brine impoundment operations and to an unauthorized change in the stream augmentation discharge location. The violations contained in the NOV were as follows:

Order No.	**Violation**
R3-2014-0047 (Title 27)	• Discharge of waste to areas outside the impoundment • Failure to measure and record the amount of impoundment freeboard • Failure to inspect all systems for the presence of liquid and record volume of leachate
R3-2014-0050 (Title 22)	• Failure to operate in compliance with the Operations Maintenance and Monitoring Program – moving the creek augmentation discharge point to from San Simeon to Van Gordon Creek.
R3-2011-0223 (NPDES)	• Discharging in a manner not described in the Notice of Intent • Violating the prohibition against causing scouring or erosion at the point of discharge • Violation of an effluent limitation by having detectable chlorine residual greater than or equal to 0.02 mg/L • Failure to sample the effluent on the first day of discharge and to contain the discharge until results of analysis show it is within effluent limits • Failure to perform monitoring within the first 24 hours of system start-up • Failure to submit a report on the start-up phase • Failure to submit a chemical additives report

The CCSD responded satisfactorily to the informational order on March 26, 2015.

Wastewater Treatment Plant

In February 2014, the CCSD and the Water Board entered into a settlement agreement resolving violations of waste discharge requirements by agreeing to suspend one half of the $226,826.60 liability pending the district's completion of an enhanced compliance action (ECA). The ECA required a complete evaluation of the WWTP, the submittal of an engineering report, and the completion and acceptance of a 10% design for proposed upgrades to the plant. The ECA was completed on schedule in June 2015.

One of the recommendations of the 10% design report was to reconfigure the WWTP aeration basins to allow the plant to denitrify wastewater. Following the spike in effluent nitrogen discovered in April 2015, the WWPT chief operator installed a temporary recycle/return line and turned off the air at the front end of the aeration basins in order to create the alternately anaerobic and aerobic conditions necessary to denitrify. This effort was largely successful at both relieving the nitrogen loading at well 9P7 and demonstrating the effectiveness of the 10% design concept. A consequence of temporarily configuring the WWTP to denitrify was that it necessarily required a lowering of dissolved oxygen (DO) levels in the effluent. The WWTP permit requires a minimum effluent DO level of 2.0 mg/L; however, concentrations have been closer to 1.0 mg/L since denitrification began. CCSD conferred in advance with Water Board staff about this eventuality.

The district has been actively pursuing available funding sources to implement denitrifying upgrades to the WWTP. CCSD has stressed that these upgrades are necessary to achieve the drought-related water-recycling discharge limits at the Emergency Water Treatment system. Water Board staff has been supportive of those efforts.

On August 26, 2015, Water Board staff met with district representatives to discuss long-term sustainable water and wastewater for the district. Long-term operation of the advanced treatment system will require completion of an environmental impact report to satisfy CEQA. Water Board staff stressed that the inclusion of a viable long-term disposal option for the treatment waste stream should be included in the EIR project alternatives. The continued use of the surface impoundment will likely not be sustainable for the project's anticipated flows and capacity. Water Board staff encouraged the district to begin working on a potential brine disposal alternative with San Simeon Community Services District as soon as possible.

Lagoon Discharges

The district enrolled in the Low-Threat General Permit to discharge membrane filtrate water to San Simeon Creek for the purposes of maintaining the water level in the downstream fresh-water lagoon. The Water Board issued a notice of applicability on December 8, 2104, for that enrollment.

On September 29, 2015, the district sent the Water Board a notice of intent to begin discharge to San Simeon Creek. The district provided analytical results on September 30, 2015, that indicate the membrane filtrate discharge meets the effluent limitations in the Low-Threat General Permit. The district stated in an email on September 29, 2015, it intended to begin discharge on September 30, 2015, and would be providing a start-up report within 15 days of the startup phase, as required in the Low-Threat General Permit. On October 20, 2015, Water Board staff asked the CCSD to confirm if discharge had begun and the status of a startup

report. On October 21, 2015, the CCSD responded to confirm discharge had begun on September 30, 2015. The correspondence also included an unsigned startup report. The report has not yet been submitted with the required signature acknowledging the validity of the statements and results contained in the report.

Title 27 Brine Impoundment

Waste Discharge Requirements (WDRs) Order No. R3-2014-0047 for the surface impoundment was adopted while the surface impoundment was still under construction; typically the WDRs are issued prior to construction and set the design requirements for the impoundment. The surface impoundment was constructed to hold and evaporate brine from the RO process. The CCSD and its consultants completed construction of the impoundment and associated components in December 2014. Prior to discharging RO brine to the surface impoundment, the CCSD was required to obtain financial assurance for closure and potential corrective actions and submit a construction quality assurance report (CQA Report) for review and approval by the Water Board.

The CCSD submitted financial assurance documentation for the surface impoundment closure on November 13, 2014, and for potential corrective actions on January 15, 2015. The Water Board issued a conditional approval letter on January 16, 2015, allowing the CCSD to start utilizing the surface impoundment. The CCSD discharged brine into the surface impoundment from January 20, 2015, to April 20, 2015. The Emergency Water Supply Project discharged approximately 1.19 million gallons of brine to the surface impoundment during the operating period; this represents 19 percent of the impoundment's capacity.

The CCSD submitted a CQA Report in December 2014. Water Board staff worked with the CCSD to clarify parts of the CQA Report and the CCSD submitted supplemental information in July 9, 2015. Water Board staff reviewed the CQA Report and issued a final approval letter on August 27, 2015.

Water quality within the surface impoundment was evaluated twice during the first half of 2015. The total dissolved solids in the impoundment ranged from 2,400 mg/L in March to 3,400 mg/L in June. For comparison, typical sea water has a TDS of approximately 35,000 mg/L. The brine never approached hazardous concentrations for any analyzed pollutant. There is no indication of groundwater impacts from the project based on initial groundwater data compared to pre-project data.

Noise and brine drift from the mechanical evaporators/blowers were reported from neighboring property owners soon after plant startup. The surface impoundment WDRs require that all waste remain on the impoundment liner system, including portions aerosolized by the evaporators. Water Board staff noted brine drift on two occasions during site inspections. Staff included brine drift as an area that needed to be addressed in the notice of violation issued to the CCSD on February 27, 2015. The CCSD agreed to cease blower operations until it can effectively evaluate drift and ensure that it meets containment requirements.

Water Board staff will continue to work with the CCSD to ensure the surface impoundment does not impact water quality. The CCSD has been responsive to Water Board staff questions and concerns related to the project and has addressed concerns in a timely manner. The CCSD continues to work towards managing the surface impoundment in compliance with WDRs Order No. R3-2014-0047.

Monitoring and Reporting Program - Revision

During a meeting with Water Board staff on June 11, 2015, the CCSD requested a review of the monitoring and reporting requirements (MRP) associated with Order No.R3-2014-0050, with an eye toward reducing costs. In response, Water Board staff evaluated the monitoring data that had been collected to date and checked the MRP for redundancies in the requirements. After consulting with Division of Drinking Water staff, Water Board staff determined that some relief from the initial monitoring and reporting requirements could be granted without diminishing the usefulness or quality of the data obtained from the monitoring. A revised MRP No. R3-2014-0050 became effective on October 7, 2015, after being signed by the Water Board's Executive Officer. The principal changes to the MRP involved the elimination of sampling from well 9P7 and from the membrane filter backwash water sent to the percolation ponds. The review of monitoring data showed analytical results from well 9P7, the MF water, and membrane backwash water were virtually identical. Continuous metering requirements at 9P7 and membrane backwash remained in place. Additionally, some of the monitoring frequencies were changed from grab samples to composite samples at the district's request.

TMDL Update

Central Coast Water Board staff posted a draft total maximum daily load (TMDL) report for public review on March 10, 2015. The TMDL project will address water body impairments due to nitrate, low dissolved oxygen, sodium, and chloride in San Simeon creek. We have postponed completion of the TMDL project and plan to resume when nitrogen reduction upgrade activities at the CCSD wastewater treatment plant are near completion.

CONCLUSION

Water Board staff will continue to work with the CCSD to ensure Advanced Water Treatment System continue to be protective of water quality.

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