

CENTRAL COAST REGIONAL WATER QUALITY CONTROL BOARD

NOTICE OF CHANGES AND OPPORTUNITY TO COMMENT

concerning

PROPOSED ORDER R3-2023-0033 WASTE DISCHARGE AND WATER RECLAMATION REQUIREMENTS

PURE WATER SOQUEL GROUNDWATER REPLENISHMENT REUSE PROJECT

SOQUEL CREEK WATER DISTRICT SANTA CRUZ COUNTY

NOTICE IS HEREBY GIVEN that the Central Coast Regional Water Quality Control Board (Central Coast Water Board) is accepting comments on updated language in proposed Order R3-2023-0033, *Waste Discharge and Water Reclamation Requirements, Pure Water Soquel Groundwater Replenishment Reuse Project*. Details regarding these changes are included herein. You may download the proposed permit from the Central Coast Water Board's website at:

http://www.waterboards.ca.gov/centralcoast/board_decisions/tentative_orders

SUMMARY OF CHANGES

While preparing responses to public comments received on the proposed permit, Central Coast Water Board staff identified a discrepancy in the anticipated nitrate concentration of the advanced treated recycled water (product water) reported in the title 22 engineering report versus the concentration reported in the final antidegradation analysis technical report. While investigating the discrepancy in the reported nitrate concentration, Soquel Creek Water District identified a mistake in the chloride concentration reported in the title 22 engineering report and final antidegradation analysis. These discrepancies and resulting updates are described below.

Attachment 1: A direct transcription of the changes to the proposed Permit.

Attachment 2: Technical memorandum describing the discrepancy in nitrate concentration, and the change to the anticipated chloride concentration.

Attachment 3: Updated final antidegradation analysis.

Changes Related to Nitrate Concentration

The anticipated nitrate concentration reported in the antidegradation report of 3.5 mg/L nitrate as N (nitrate-N) was based on a previous iteration of the treatment plant design, which utilized alternative treatment process steps. This previous design would have resulted in a higher nitrate concentration in the product water relative to the final design that is ultimately being implemented.

The final design that is being developed for Pure Water Soquel is anticipated to have a product

water nitrate-N concentration of 1.67 mg/L, as described in Table 8-6 of the title 22 engineering report. The antidegradation analysis summary in Table 11-11 of the title 22 engineering report accurately reflects the anticipated product water nitrate-N concentration as 1.7 mg/L. Additionally, table 11-11 also includes a revised estimated consumed assimilative capacity of 0.27 percent based on an anticipated nitrate-N concentration of 1.67 mg/L. This is lower than the 0.57 percent estimate in the antidegradation report using a product water concentration of 3.5 mg/L nitrate-N. Soquel Creek Water District has submitted a revised antidegradation report to reflect these changes, included as Attachment 3 to this notice.

As a result of these changes, staff has updated the findings included in the Fact Sheet of the proposed permit regarding compliance with the State Water Resources Control Board's Antidegradation Policy. Specifically, changes were made to section 3.5, pages F-17 and F-18 to reflect the revised estimates of nitrate concentration and assimilative capacity. A direct transcription of the changes to the proposed permit is included in Attachment 1. A memorandum from the design and build engineering firm for Pure Water Soquel, Black & Veatch, describing the anticipated nitrate concentrations in the product water is included as Attachment 2.

The findings included in the Fact Sheet of the proposed permit that was released for public comments were based product water concentration of 3.5 mg/L nitrate-N. At this concentration, the project complies with applicable laws, plans, and policies. As described in the final antidegradation report, beneficial uses are protected, water quality objectives are complied with, degradation to ambient water quality is minimal, and the project would only consume 0.57 percent of available assimilative capacity. At the currently anticipated product water concentration of 1.67 mg/L nitrate-N, the water quality impacts of the project are even further reduced.

Changes Related to Chloride Concentration

The title 22 engineering report and antidegradation reports inadvertently reported the chloride concentration of the reverse osmosis (RO) permeate prior to product water post-treatment, which add chemicals to the water that include chloride. The anticipated chloride concentration after product water post-treatment should be 33.0 mg/L, not the 3.1 and 10.1 mg/L described in the antidegradation and title 22 engineering reports, respectively. A technical memorandum describing the anticipated chloride concentration in the product water is included in Attachment 2.

Although the new chloride concentration is higher than previously reported, it is still lower than the ambient concentration of 46.0 mg/L in the target injection aquifer, Purisima Unit A. Because the product water will have a lower concentration than ambient groundwater, the project is still expected to improve water quality with respect to chloride, and assimilative capacity will be gained not consumed, as was the case at the previously reported lower concentration. As such, staff has not made any changes made to the findings in the proposed permit. An errata to the title 22 engineering report has been approved by the Division of Drinking Water, and a revised antidegradation report was submitted to the Central Coast Water Board reflecting the change in chloride concentration.

PUBLIC HEARING

A public hearing to consider adoption of the proposed permit for the production and discharge of advanced treated recycled water to the Santa Cruz Mid-County groundwater basin will be held during the Central Coast Water Board meeting scheduled for:

December 14-15, 2023
Central Coast Water Board Offices
895 Aerovista Place - Suite 101
San Luis Obispo, CA 93401

The final meeting agenda and staff report will be available at least 10 days before the Board meeting, at:

https://www.waterboards.ca.gov/centralcoast/board_info/agendas/

The agenda will provide the specific date this item will be considered during the Board meeting, indicate the anticipated order of all agenda items, and may include staff revisions to the proposed permit.

SUBMISSION OF WRITTEN COMMENTS

Persons interested in providing written comments **on the changes described in this notice** are encouraged to submit comments by electronic mail. **Comments submitted on topics outside the scope of the changes described herein will not be considered.** Comments must be received by **5:00 p.m. on Tuesday, November 21, 2023**. Comments received after the deadline will not be accepted and will not be included in the administrative record absent a ruling by the Central Coast Water Board Chair. Any person requesting to submit late comments must demonstrate good cause for the late submission and the Chair must find that accepting the late submission will not prejudice the Central Coast Water Board or the Discharger. All interested persons and the Discharger may speak at the public meeting and are expected to orally summarize their written submittals. Oral comments will be limited in time by the Chair.

Written comments are to be sent to the Waste Discharge Requirements Unit by email (must be no more than 15 megabytes) RB3-WDR@Waterboards.ca.gov or by mail to:

Waste Discharge Requirements Unit
Central Coast Water Board
895 Aerovista Place, Suite 101
San Luis Obispo, CA 93401

Please also indicate in the subject line **“Comment Letter – Pure Water Soquel”**

Please direct any questions about this notice to the Waste Discharge Requirements Unit at RB3-WDR@Waterboards.ca.gov.

FUTURE NOTICES

The Central Coast Water Board will hold the public meeting at the time and place noted above. Any change in the date, time, and place of the Board meeting will be noticed through the e-mail distribution list and posted on the Central Coast Water Board’s website. Any person desiring to receive future notices concerning changes to the notice of public meeting and consideration of adoption must sign up for the e-mail distribution list. To sign up for the e-mail distribution email list, access the Central Coast Water Board E-mail Subscription form, select the box for ‘Board Meeting Agenda,’ and provide the required information. The subscription form is located at:

https://www.waterboards.ca.gov/resources/email_subscriptions/reg3_subscribe.html

Please bring the above information to the attention of anyone you know who would be interested in this matter.

ATTACHMENT 1

Changes to proposed Order R3-2023-0033, Waste Discharge and Water Reclamation Requirements for the Pure Water Soquel Groundwater Replenishment Reuse Project, Soquel Creek Water District, based on updated information on the nitrate and chloride concentrations, are show below. Additions to the text are shown as redline and omissions shown using ~~strikeout~~.

3.5. ANTIDegradation Policy.

On October 28, 1968, the State Water Board established California's antidegradation policy in State Water Board Resolution 68-16, *Statement of Policy with Respect to Maintaining High Quality of Waters in California*.¹ Resolution No. 68-16 (Antidegradation Policy) establishes a two-step process to demonstrate compliance with the policy. The first step requires demonstrating that that any change in water quality (1) will be consistent with maximum benefit the people of the state, (2) will not unreasonably affect present and anticipated beneficial use of such water, and (3) will not result in water quality less than that prescribed in state policies (e.g., water quality objectives in the Basin Plan). The second step is to prescribe waste discharge requirements that require best practicable treatment and control of the discharge to ensure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State will be maintained. The Central Coast Water Board's Basin Plan implements, and incorporates by reference, the Antidegradation Policy.

The Recycled Water Policy requires that proponents of groundwater recharge projects utilizing recycled water submit antidegradation analyses to the appropriate Regional Water Board to demonstrate compliance with the Antidegradation Policy. For projects located within a basin without a salt and nutrient management plan accepted by a Regional Water Board, or any applicable water quality control plan based on an accepted salt and nutrient management plan, the Recycled Water Policy, in Sections 8.2.4.2 and 8.2.5, says that a detailed antidegradation analysis is required. Because there is no salt and nutrient management plan in the Santa Cruz Mid-County Basin, Soquel Creek Water District was required to submit the detailed antidegradation analysis described in this Fact Sheet. This analysis requires the project proponent to demonstrate that the project will utilize less than 10% of the basin's available assimilative capacity for salts and nutrients.

Soquel Creek Water District completed a detailed antidegradation analysis to evaluate consistency with the Antidegradation Policy and the Recycled Water Policy. In conducting the antidegradation analysis, Soquel Creek Water District first compiled water quality data from wells located in the project area and screened in the target injection aquifers. This compilation included both recent water quality data and historical water quality data from as far back as 1968. Soquel Creek Water District then compared the background groundwater quality data to anticipated advanced treated recycled water quality to evaluate if the project would negatively impact water quality. Results of this comparison showed that the concentrations in recycled water will be lower than ambient groundwater concentrations for all constituents except for nitrate. With the

¹ The Antidegradation Policy can be found at the following webpage:
https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/1968/rs68_016.pdf

exception of nitrate, the analysis showed that the Project will result in an overall improvement in water quality in the project area and neither water quality objectives nor beneficial uses will be impacted.

For nitrate, the project is expected to marginally degrade water quality because concentration of nitrate in recycled water is anticipated to be ~~1.67~~ ~~3-5~~ mg/L as N compared to the current ambient concentration of 0.06 mg/L as N. However, the water quality objective for the drinking water beneficial uses for nitrate is 10 mg/L, and, therefore, the project is not anticipated to unreasonably affect beneficial uses or result in water quality that is inconsistent with water quality objectives.

The assimilative capacity evaluation focused on total dissolved solids (TDS), chloride, and nitrate, consistent with the direction from the Recycled Water Policy, which requires the evaluation in the context of a salt and nutrient management plan. To evaluate the amount of assimilative capacity consumed, Soquel Creek Water District first calculated the amount of assimilative capacity available. This was done by comparing background water quality to water quality objectives, after scaling these water quality values by the volume of water in each of the aquifer units. This analysis indicated that there was assimilative capacity available for all three constituents.

The amount of assimilative capacity consumed was evaluated by comparing the anticipated product water quality from the AWPf to the background groundwater concentrations previously calculated. Because the TDS and chloride concentration in the product water are anticipated to have **substantially** lower concentrations relative to background groundwater, these constituents improved groundwater quality and increased assimilative capacity. The results for nitrate indicate that the project would consume ~~0.27%~~ ~~0.57%~~ of assimilative capacity, based on a comparison of background groundwater quality to injectate water quality and after scaling by the volume of injectate relative to the volume of water in each of the aquifer units. This analysis confirms that less than 10% of the basin's assimilative capacity will be utilized by this project and that beneficial uses will be protected.

Soquel Creek Water District also evaluated the potential that the injection of advanced treated recycled water may cause problematic geochemical interactions in the aquifer that could degrade water quality. Three geochemical evaluations were conducted, including mineralogical assessments, laboratory experiments, and computer simulations. These geochemical evaluations primarily focused on the potential for the mobilization of metals such as arsenic, manganese, and iron. Results of the geochemical evaluations indicate that, although the Project may result in the mobilization of some metals, the increases in concentrations relative to ambient conditions is expected to be short-lived and/or small in magnitude. None of the metals included in the evaluation exceeded relevant water quality standards. The geochemical evaluation concluded that, with appropriate product water stabilization, the Project is unlikely to cause geochemical interactions that will result in water quality less than that established in relevant state policies or unreasonably affect beneficial uses.

Pursuant to second provision of the Antidegradation Policy, the Permit serves as WDRs

that require the best practicable treatment or control (BPTC) of the discharge that is necessary to ensure that: (1) a condition of pollution or nuisance will not occur and (2) the highest water quality consistent with the maximum benefit to the people the state will be maintained. The Permit requires BPTC in the form of advanced treatment that uses multiple treatment components to convert secondary-treated wastewater effluent into high quality recycled water. In the case of nitrate, the concentration is anticipated to be reduced from 9.3 mg/L in secondary influent to 1.67 ~~3.5~~ mg/L in the product water. This BPTC implements the requirements of the Uniform Statewide Recycling Criteria (CCR title 22, Division 4, Ch. 3) and the Basin Plan.

Considering the foregoing, the Central Coast Water Board finds that this Permit is consistent with Antidegradation Policy and with the Recycled Water Policy. Groundwater recharge with recycled water for later extraction and use in accordance with the Recycled Water Policy and the state and federal water quality laws is to the benefit of the people of the State of California.

Compliance with this Permit will protect present and anticipated beneficial uses of groundwater, ensure attainment of water quality prescribed in applicable policies, and avoid any conditions of pollution or nuisance. Although this Permit may allow some degradation of water quality, the Permit does not authorize the Project to cause exceedances of water quality goals or objectives for the basin.

ATTACHMENT 2



Subject:	Chloride, Nitrate and TDS Concentrations in Purified Water	Date:	11/3/23
Client:	Soquel Creek Water District	Project No.:	404790
Project Name:	Pure Water Soquel Facilities Project	File No.:	N/A

To:	Melanie Mow Schumacher
From:	Barney Simmons & Lee Portillo

Dear Melanie,

In response to your request for additional information regarding the projected potential Chloride, Nitrate, and Total Dissolved Solids (TDS) levels in the purified water on the Pure Water Soquel project we note the following:

1. As the treatment design for the Pure Water Soquel Program evolved, the concentrations of constituents in the purified water changed. The main pretreatment process and the final post treatment process were changed during the design phase, which modified the purified water quality. Purified water concentrations in the initial design were superseded by the concentrations in the final design. Both designs fully met regulatory requirements, however their finished water quality varied due to the different treatment processes.
2. The data used to prepare Table 6-2 for the Final Draft Anti-Degradation Report (March 2023) was modeled by Black & Veatch and the data was prepared with a preliminary iteration of the treatment process design. At that time the pre-treatment was a nitrifying biologically aerated filter (N-BAF) and the post treatment process utilized calcium hydroxide for stabilization, which does not contribute chloride concentrations to the finished water. Thus, following post treatment the resulting projected finished water quality for this previous treatment train was Chloride = 3.1 mg/L, Nitrate = 3.5 mg/L as N and TDS = 92 mg/L.
3. The updated Table 6-2 data for the Revised Final Draft Anti-Degradation report (November 2023) was modeled by Black & Veatch and the data was prepared with the current treatment process. The current design utilizes ozone addition as pretreatment. This pretreatment does not nitrify ammonia; therefore, the resulting nitrate feed concentration is significantly lower. The final design also utilizes the addition of calcium chloride with sodium hydroxide, instead of calcium hydroxide for post treatment stabilization. As a result, the modeled RO permeate chloride was 10.1 mg/L with approximately 23 mg/L of chloride to be added during post treatment. Following post treatment, the resulting projected finished water quality for the current and final treatment train for Chloride = 33 mg/L, Nitrate = 1.67 mg/L as N, and TDS = 101 mg/L.
4. Additional details regarding the projected chloride and nitrate concentrations in our current and final process model:
 - The assimilative capacity data in Table 11-11 of the Pure Water Soquel Title 22 Engineering Report (March 2023) is based off the same data referred to in item 3 of this memo. However, Table 11-11 utilized the non-post treated RO permeate value of chloride = 10.1 mg/L. The

11/3/23

- projected finished water quality after post treatment is chloride = 33 mg/L, Nitrate = 1.67 mg/L as N, and TDS = 101 mg/L.
- As shown in Table 8-6 of the Title 22 Engineering Report nitrate concentration is 1.67 mg/L as N. This projection is based on several conservative assumptions from the historical plant data; for example, we assumed the maximum total nitrogen influent concentration of 50 mg/L as N in the source water from the SCWWTF and the maximum observed feed water temperature of 20 degrees C, and modeled end of life, 5-year-old RO membranes, which provide a lower rejection than new membranes. All together this represents a very conservative projection, and our expectation is that the nitrate concentration in the purified water will be below 1.67 mg/L as N when Pure Water Soquel is operational.
 - The nitrate concentration noted in Table 5-37 of the Title 22 Engineering Report is < 3.6 mg/L as N. As noted in the table heading, this table is a summary of the design criteria for the UVAOP system, meaning the values provided to the supplier of the UV system to allow them to size their system appropriately and ensure public health. It therefore assumes additional safety factors for the purpose of sizing the treatment equipment; it is a conservative design limit for the purpose of the process warranty, not an estimate of anticipated product water concentration for the duration of the facility.
 - We understand that a purified water nitrate concentration of 3.5 mg/L as N was used in the final draft anti-degradation report (March 2023). This concentration comes from the preliminary iteration of the treatment plant design which utilized N-BAF as a pre-treatment (See item 2 of this memo). N-BAF filters convert a proportion of the ammonia in the source water to nitrate, which would have resulted in a slightly higher nitrate concentration in the purified water. The final design of the Pure Water Soquel project is reflected in the Title 22 Engineering Report and does not include the N-BAF pre-treatment; thus, it has the lower nitrate concentration of 1.67 mg/L as N.

Regards,

Barney Simmons
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SimmonsBD@bv.com

Lee Portillo
Senior Process Technologist
PortilloLM@bv.COM

ATTACHMENT 3

Revised final antidegradation analysis. Please use this link to view or download documents:
<https://www.soquelcreekwater.org/DocumentCenter/View/2352/Revised-Final-Draft-PWS-Antidegradation-Report-110323>