



State Water Resources Control Board
Division of Drinking Water

February 12, 2020

Cathleen Goodwin
North Coast Regional Water Quality Control Board
5550 Skylane Boulevard, Suite A
Santa Rosa, CA 95408

CITY OF SANTA ROSA SUMMARY AND COMPILATION OF TITLE 22
ENGINEERING REPORTS FOR PRODUCTION, DISTRIBUTION, AND USE OF
RECYCLED WATER (4990004-701)

Dear Ms. Goodwin,

This letter transmits Division of Drinking Water's (DDW's) conditional acceptance for the City of Santa Rosa (City) Summary and Compilation of Title 22 Engineering Reports for Production, Distribution, and Use of Recycled Water for Santa Rosa Regional Water Reuse System (Engineering Report) dated December 2019. The Engineering Report consists of a summary and compilation of all engineering reports that currently exists and will remain in the Santa Rosa Recycled Water Reuse Program.

The City owns and operates the Regional Water Reuse System's Laguna Treatment Plant. The Laguna Treatment Plant has a design treatment capacity of 21.3 million gallons per day (MGD) for average daily dry weather flow, 47.3 MGD for peak month wet weather flow, and 64 MGD for peak weekly wet weather flow. The Laguna Treatment Plant produces disinfected tertiary recycled water for distribution for the following users:

Table with 3 columns: Users, Use Type, City's Program Responsibility. Rows include City of Santa Rosa urban users and Regional agricultural users.

E. JOAQUIN ESQUIVEL, CHAIR | EILEEN SOBECK, EXECUTIVE DIRECTOR

Users	Use Type	City's Program Responsibility
Geysers recharge project	Injection to geothermal reservoir to enhance steam production	Transmission to Geysers recharge project site
Town of Windsor	Pasture, crop, vineyard, parks, playground irrigation, residential irrigation (dual plumbed), toilet and urinal flushing (dual plumbed)	Transmission to the Town of Windsor's recycled water system
City of Rohnert Park urban users	Landscape irrigation, impoundments (fountains or other decorative water features), dual plumbing, cooling tower, construction water, dust control, surface cleaning, sewer flushing by City of Rohnert Park staff	Transmission to the City of Rohnert Park's recycled water system

DDW recommends the following requirements be incorporated into the City of Santa Rosa's National Pollutant Discharge Elimination System permit or Notice of Applicability, including any necessary additions to the Monitoring and Reporting Program:

1. Laguna Treatment Plant's tertiary filters are approved to operate at a loading rate above 5 gal/ft²-min as described in a letter dated February 20, 2014, "Authorization for Increased Filter Loading Rate for Tertiary Filters" provided by the North Coast Regional Water Board (see the Engineering Report Appendix R). In order to maintain compliance with the filtration rate requirements during high filter loading rate operation, the City must comply with the following:
 - a. The SOP (*standard operating procedure required in the 2/20/14 letter*) shall always remain available in the Laguna Treatment Plant control room.
 - b. Any updates or revisions to the SOP shall be approved by CDPH (*now known as DDW*) before the updates or revisions are adopted.
 - c. The maximum tertiary filter flow shall not exceed 90.7 million gallons per day and instantaneous filter rates shall not exceed 8.0 gal/ft²-min.
 - d. Combined filter effluent shall not exceed any of the following:
 - i. An average of 1.5 NTU within a 24-hour period;
 - ii. 2.5 NTU more than 5 percent of the time within a 24-hour period; and
 - iii. 5 NTU at any time.
 - e. Turbidity performance compliance shall be determined using the recorded combined filter effluent turbidity taken at intervals of not more than 1.2 hours.
 - f. Regular turbidity monitoring for each individual filter shall be conducted in accordance with the current, CDPH-approved SOP for filter loading rates above 5 gal/ft²-min.

- a. Since a media filter is used upstream, the Laguna Water Reclamation Facility UV system must be operated to deliver a minimum UV dose of 100 mJ/cm² at all times.
- b. The equations below must be used as part of the automatic UV disinfection control system for calculating UV dose and should be specified as a permit provision for the Laguna Water Reclamation Facility¹.

$$\text{Dose} = (0.86) * (\text{FF}) * (\text{EOLL}) * 10^{-3.28 - 0.91 * \log \text{Flow} + 2.32 * \log \text{UVT} + 1.34 * \log P}$$

Where:

Dose= Delivered UV dose per bank (mJ/cm²)

FF = 0.95 Fouling Factor based upon a cleaning frequency of once every 12 hours

UVT = % UV transmittance at 254 nm (%)

Flow = Flow rate per lamp [gallons per minute (gpm)/lamp], with gpm/lamp calculated as gpm divided by the number of lamps in one bank

EOLL = End of Lamp Life factor is assumed to be 0.85 at 10,000 hours for the PROLAMP bulbs

P = percent power

- c. Under normal operational conditions, adequate redundancy shall be provided. If adequate reliability features can be demonstrated and implemented via an approved operations and maintenance plan, four banks per channel shall only be used when needed, provided the UV dose is 100 mJ/cm² or greater.
- d. The UV lamps shall be maintained below the maximum value of 10,000 hours of operation.
- e. To maintain a Fouling Factor of 0.95, clean/wipe the quartz sleeves once every twelve hours.
- f. Flow meters and UVT monitors must be properly calibrated to ensure proper disinfection.
- g. UVT meter must be inspected and checked against a reference bench-top unit weekly to document accuracy.
- h. If the on-line analyzer UVT reading varies from the bench-top spectrophotometer UVT reading by 2% or more, the on-line UVT analyzer must be recalibrated by a procedure recommended by the manufacturer.
- i. Flow meters measuring the flow through a UV reactor must be verified to determine accuracy at least monthly via checking the flow reading against other flow determination methods.

¹ A letter dated September 5, 2014, to DDW documented the City's UV system control equation to deliver a dose of 100 mJ/cm². This equation is shown in a different mathematical format for the purpose of programming, but delivers the same results as the equation shown in the CDPH letter dated August 29, 2012.

- j. The Laguna Water Reclamation Facility should be operated in accordance with an approved operations plan, which specifies clearly the operational limits and responses required for critical alarms. The operations plan should be submitted and approved prior to issuance of the operating permit. A copy of the approved operations plan should be maintained at the treatment plant and be readily available to operations personnel and regulatory agencies. A quick reference plant operations data sheet should be posted at the treatment plant and include the following information:
 - i. The alarm set points for secondary and tertiary turbidity, high and low flow, UV dose and transmittance, UV lamp operation hours, and power.
 - ii. The values of secondary and tertiary turbidity, high and low flow, UV dose and transmittance, UV lamp operation hours, and power when flow must be diverted to waste.
 - iii. The values of high daily and weekly median total coliform when flow must be diverted to waste.
 - iv. The required frequency of calibration for all meters measuring turbidity, flow, UV transmittance, and power.
 - v. The required frequency of mechanical cleaning/wiping and equipment inspection.
 - vi. The UV lamp age tracking procedures and replacement intervals.
 - k. The Laguna Water Reclamation Facility Trojan UV4000 UV systems must be operated with a built-in automatic reliability feature that must be triggered when the system is below the target UV dose. If the measured UV dose goes below the minimum UV dose, the UV reactor in question must alarm and startup the next available UV lamp bank or reactor.
 - l. Conditions that should divert flow include inability to meet the UV dose of 100 mJ/cm² at full power and all four banks on.
 - m. Equivalent or substitutions of equipment are not acceptable without an adequate demonstration of equivalent disinfection performance.
9. Submit an update to the UV Operations and Maintenance Plan to DDW within four (4) months of the date of receipt of this letter. The update must include the following:
 - a. Improvements to UV channel cleaning practices and other measures that will prevent biological growth in the UV channels.
 - b. Finalize the "Laguna Water Reclamation Facility UV System Operations and Maintenance Plan Final Draft" dated November 2012 (Engineering Report Appendix R) to incorporate results of subsequent reprogramming.
10. Disinfected tertiary recycled water must be monitored at least once daily for total coliform bacteria. The samples shall be taken downstream of the UV disinfection treatment process and must be analyzed by an ELAP accredited laboratory.

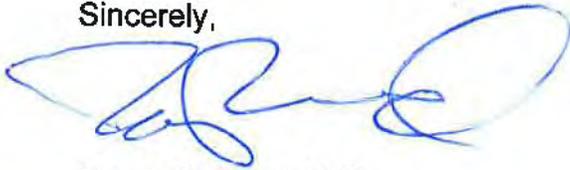
11. Operating records shall be maintained at the reclamation plant or a central depository within the operating agency. These shall include: all analyses specified in the reclamation criteria; records of operational problems, plant and equipment breakdowns, and diversions to emergency storage or disposal; all corrective or preventive action taken. File monthly with the North Coast RWQCB.
12. Process or equipment failures triggering an alarm shall be recorded and maintained as a separate record file. The recorded information shall include the time and cause of failure and corrective action taken.
13. Any discharge of untreated or partially treated wastewater to the use area or delivered to the Geysers recharge project, Town of Windsor, and City of Rohnert Park shall be reported immediately by telephone to the North Coast RWQCB, DDW-Sonoma district office, and the local health officer.
14. In accordance with Title 22 section 60321, sampling for total coliform bacteria shall be done at least once daily. The median concentration of total coliform bacteria measured in the disinfected effluent shall not exceed an MPN of 2.2 per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed and the number of total coliform bacteria does not exceed an MPN of 23 per 100 milliliters in more than one sample in any 30-day period. No sample shall exceed an MPN of 240 total coliform bacteria per 100 milliliters. Report daily values, rolling seven-day median values, and maximum monthly values. Daily result of total coliform bacteria sampling must be reported as individual reported value for each operational UV channel or a maximum reported value of all operational UV channels. Reporting geometric mean of operating channels as a daily value is not an acceptable method for compliance with Title 22 regulations.
15. Provide a monthly report to DDW for twelve (12) consecutive months following the receipt of this letter. Should any exceedances occur, including by process or equipment failures, provide a discussion in the report. Record the time and cause of failure, alarms or diversion procedures triggered, and corrective action taken.
16. Prior to delivery of recycled water, notification of new user sites for dual plumbed use areas will be provided to DDW for review and approval as required by Title 22 sections 60313-60316.
17. New types of recycled water uses must be addressed by submittal of a revision or update to the Engineering Report.
18. Submit revisions and updates to the Engineering Report and any applicable appendices to DDW to reflect changes in operations and recycled water program management.
19. Any updates or changes to the Engineering Report must also be made in any application or documents submitted to the Regional Water Quality Control Board.

Cathleen Goodwin
North Coast RWQCB

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February 12, 2020

Sincerely,



Randy Barnard, P.E.
Recycled Water Unit Chief
Recycled Water Unit
Division of Drinking Water

cc:

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