

26 February 2024

Jo Anne Kipps
Fresno, CA

Patrick Pulupa, Executive Officer
Central Valley Water Quality Control Board

Via email to: RB5S-NPDES-Comments@waterboards.ca.gov

Copy to: Michael.Nilsen@waterboards.ca.gov

Comments — Tentative WDR Order and NPDES permit for City of Portola Wastewater Treatment Plant, Plumas County

This letter presents my comments on the subject tentative order. I am a California registered civil engineer and worked 12 years in the Central Valley Regional Water Quality Control Board's Fresno office, mostly in the WDR Program.

The tentative order's Flow Schematic, Attachment C, depicts two aeration ponds operated in series discharging to five stabilization ponds typically operated in series. Flow from the terminal pond flow can be chlorinated then dechlorinated prior to entering a polishing/percolation pond (the "six-acre pond"), which discharges to a wetland that drains to the Feather River. Attachment C's second page is an aerial view of the Facility annotated to identify its ponds, three groundwater monitoring wells, as well as municipal supply wells and an adjacent municipal wastewater treatment facility.

Recommendation: Consider identifying Attachment C's facility site map as a separate attachment.

The Facility's eight ponds cover 22.4 acres. Their combined volume, almost 32 million gallons (MG), provide 64 days of detention at the 0.5 mgd permitted discharge flowrate. The tentative order characterizes the permeability of soils underlying the decades-old pond treatment system as "unknown." However, the leakage rate from the 22.4-acre pond area can be approximated using influent flow data during periods when no flow was reported to the wetland from the six-acre pond.

For example, influent flows totaled 66 MG from 3/26/22 to 1/22/23 when no flow was reported to the wetland. During this period, all effluent disposal is mostly through percolation and some by evaporation. Not accounting for evaporative losses and precipitation gains, leakage from Facility's eight ponds during this period was 9,800 gallons/acre/day. The leakage rate will obviously be higher when the acreage is decreased during the weeks when the six-acre pond was empty.

Recommendation. Please consider revising the tentative order to provide the results of water balance calculations to approximate the pond system's leakage rate which, essentially, is the discharge's hydraulic loading to groundwater. This value will likely be multiple times greater

than annual average precipitation. If not in this tentative order, then in future NPDES permit renewals that regulate unlined wastewater treatment/storage ponds and effluent percolation ponds. Better yet, request dischargers to characterize hydraulic loadings to groundwater from all sources in their NPDES permit renewal applications.

The current order required the Discharger to submit multiple technical reports concerning groundwater; its groundwater monitoring requirements are relatively robust for a Central Valley NPDES permit. Unfortunately, they do not specify yearly standard mineral samples for iron and manganese be filtered to yield results for dissolved concentrations. Monitoring data available from eSMR show iron and manganese typically above their water quality objectives, likely due to the lack of filtration. The tentative order carries over this error by not specifying filtration for iron and manganese like it does in Land Discharge Monitoring Requirements section. It adds quarterly monitoring for two new parameters, "Metals, total recoverable" (arsenic, lead, and nickel) and "Metals, filtered" (copper, iron, manganese, zinc).

Recommendation: Because dissolved arsenic has a water quality objective to protect groundwater beneficial use for domestic and municipal supply, please include arsenic in the list of filtered metals. And, include quarterly monitoring for bicarbonate alkalinity and hardness as these constituents, along with total organic carbon, are indicators of organic loading to groundwater. Also, because chloride is an excellent tracer of effluent in groundwater, consider requiring quarterly monitoring for chloride.

The tentative order describes the findings of a 2021 Groundwater Study that evaluated five years of quarterly monitoring data from the Facility's three monitoring wells. Groundwater passing through the three wells occurs at shallow depths ranging from about 3.7 to 6.8 feet below ground surface. At times, it also contains total coliform organisms in concentrations exceeding 2.2 MPN/100 mL, the water quality objective. This would appear to be sufficient justification to require all effluent discharged to the six-acre pond to be chlorinated to meet the tentative order's coliform effluent limitations for surface water discharge. However, the tentative order forgoes requiring implementation of this best practicable treatment or control measure pending results of a new groundwater monitoring requirement for E. coli. The resulting data should aid in assessing the extent to which groundwater pathogens are attributable to the effluent discharge to the six-acre pond, as well as to the use of unlined sewage treatment ponds.

In any event, concentrations of coliform in groundwater passing through all three monitoring wells in excess of the water quality objective indicates groundwater has little or no assimilative capacity for coliform. Without an adequate vertical separation distance between pond invert and highest anticipated groundwater, use of unlined sewage treatment ponds and discharge of undisinfected effluent to the six-acre pond likely contribute to this apparent coliform degradation.

Recommendation: Please revise the tentative order to provide information on pond invert elevations and estimated vertical separation distances between pond invert and highest anticipated groundwater.

The tentative order's summary of the Groundwater Study's explanation for the presence of ammonia in downgradient wells includes the following sentence: "Lower dissolved oxygen values observed in the downgradient wells in comparison to the upgradient concentrations may further support the former explanation [of ammonia in effluent converting to nitrate], since the lower dissolved oxygen concentrations could be due to where in the nitrogen cycle dissolved oxygen is reduced in the conversion of ammonia (from the ponds) to nitrate."

Recommendation: The last line should be corrected to read: "...dissolved oxygen is ~~reduced~~ consumed in the ~~conversion~~ biological oxidation of ammonia (from the ponds) to nitrate."

Another explanation for downgradient groundwater containing lower concentrations of dissolved oxygen compared to upgradient, as well as relatively low concentrations of nitrate, may be attributable to the decomposition of organic matter from uncontrollable sources (i.e., from Feather River flood flows and decomposition of riparian vegetation). And, it may also signal localized organic loading from the Facility's unlined sewage treatment ponds and effluent discharge to the six-acre pond (especially, it appears, in the network's RGW-002). Now that the tentative order will require groundwater monitoring for dissolved forms of iron, manganese, and arsenic, future data will reveal whether the discharge's organic loading is excessive and causing or contributing to cause exceedances of water quality objectives for iron, manganese, and arsenic.

The tentative order requires the Discharger to submit within 18 months of order adoption the Best Practicable Treatment or Control Report and Antidegradation Re-Evaluation that was originally required by the current order.

Recommendation: If the approved workplan did not include characterizing the current discharge's annual loading to groundwater of wastewater / effluent and of BOD and total nitrogen, then consider requesting the Discharger to include this information in its Report.

The tentative order proposes to impose new effluent limitations for nitrate plus nitrite applicable to the surface water discharge (D-001). It states, "These effluent limitations ... assure the treatment process adequately nitrifies and denitrifies the waste stream to protect the beneficial use of municipal and domestic supply" (F-53).

The tentative order's Reasonable Potential Analysis for nitrate plus nitrite uses a Maximum Effluent Concentration (MEC) of 0.6 mg/L, presumably as nitrogen (N). This low value does not reflect that the Facility's treatment process "adequately nitrifies and denitrifies the waste stream." The elevated ammonia concentrations in Facility effluent indicate the treatment process provides adequate mineralization of organic nitrogen to ammonia. The

elevated ammonia coupled with low nitrate indicates the treatment process does not adequately nitrify the ammonia to nitrate, hence the low nitrate concentrations. If the treatment process adequately nitrified **and** denitrified the wastewater, then the results of total nitrogen monitoring of the six-acre pond would be typically less than 1 mg/L. However, results ranged from 1.9 to 32 mg/L from 2019 through 2023, and almost 60% of the results exceeded 10 mg/L.

Recommendation: Please reconsider the appropriateness of imposing the new effluent limitations for nitrate plus nitrite, as the Facility's decades-old pond-treatment system does not provide reliable treatment for nitrogen removal. If the intent of the new effluent limitations is to ensure the discharge to surface water will not cause an instream incursion of the water quality standard for nitrate plus nitrite, then consider applying the numerical limits to total nitrogen instead.

Miscellaneous Comments

The tentative order classifies the beneficial uses of underlying groundwater as "Potential" (F-10).

Comment: The tentative order's Attachment C identifies municipal drinking water supply wells in the discharge area. Please explain why the tentative order does not recognize the beneficial uses of area groundwater as "Existing."

The current order requires monitoring of effluent at two locations only when discharging from the six-acre pond to the wetland. The first monitoring location, EFF-001, for total coliform follows chlorination. The second location, EFF-002, is between the six-acre pond's outfall and "the receiving water" and is monitored for flow and for conventional, non-conventional, and priority pollutants. It specifies 24-hour-composite samples for BOD and TSS and grab samples for the rest. The tentative order more-or-less carries over the current order's effluent monitoring requirements, and adds a few more, including 24-hour-composite sampling for Dissolved Organic Carbon (DOC).

Comment. The six-acre pond's 5 MG capacity provides 10 detention days at 0.5 mgd wastewater flow. As such, grab samples of the pond's discharge should be considered adequately composited and representative of the discharge. Unless required by federal regulations or policies, please explain why the MRP requires 24-hour-compositing sampling of EFF-002 for BOD, TSS, and DOC.

The tentative order corrects a major oversight by the current order by establishing a new discharge point (D-002) to the six-acre pond and a corresponding monitoring location (LND-001).

The current and tentative orders require groundwater monitoring results for ammonia to be reported as NH_4 , but groundwater ammonia data in eSMR is reported as N. Reporting ammonia as N makes it easier to compare to other nitrogen forms also expressed as N.

Comment: Please confirm that the Discharger's reporting of groundwater ammonia is as nitrogen, and revise Table E-8 Groundwater Monitoring Requirements to require ammonia results expressed as N.

The tentative order requires monthly monitoring of all ponds for dissolved oxygen, but does not specify monitoring to be performed in the morning hours when concentrations of dissolved oxygen are lowest due to nocturnal algae respiration. Without specifying monitoring to occur in the morning, the resulting data will be of limited use for assessing compliance with Section C.4.a.v.iii. This requirement is contained in most WDRs for POTWs with pond discharges prepared by WDR Program staff and, as such, should not pose an undue burden on the operator.

Recommendation: Please amend the pond monitoring requirements to specify dissolved oxygen monitoring to be performed between the hours of 8:00 a.m. and 10:00 a.m.

The tentative order states, "Presently, the maximum TSS value set by the State of California for lagoon effluent is 95 mg/L (F-16)."

Question: What is the reference for this value?

Thank you for your time and consideration.



JO ANNE KIPPS