

INFORMATION SHEET

R5-2008-_____
CITY OF PORTERVILLE WWTF
TULARE COUNTY

Background

The City of Porterville (hereafter Discharger or City) owns and operates a Wastewater Treatment Facility (WWTF) that serves the people of Porterville and the nearby community of Porter Vista. The WWTF is currently regulated by Waste Discharge Requirements (WDR) Order No. R5-2001-103 and Cease and Desist Order No. R5-2001-104.

The WWTF is an activated sludge treatment plant consisting of a headworks with mechanical and manual screens, aerated grit chambers, two "clarators" with primary aerator and aeration chambers, two primary clarifiers, two aeration basins, four secondary clarifiers, a chlorine contact tank, a blower room, sludge thickeners (Dissolved Air Flotation units), four anaerobic sludge digesters, and a biosolids transfer station. The design capacity of the WWTF is 8 million gallons per day (mgd). The permitted monthly average daily discharge flow is 5.3 mgd (in 2006 the monthly average daily discharge flows were between 4.3 and 5.1 mgd). WWTF generates secondary treated effluent. The WWTF does not chlorinate to disinfect the treated effluent unless required to handle algae blooms.

Prior to 1987 sludge was stored in unlined sludge drying beds at the WWTF and the treated effluent was discharged to 12-acres of percolation basins at the WWTF or used to irrigate approximately 100 acres of farmland adjacent to the WWTF. In the 1990s this ceased and the effluent and sludge was transported approximately 4.5 miles to lands south and west of the municipal airport, where the sludge is stored in soil cement lined sludge drying beds and the treated effluent is used to irrigate fodder and fiber crops or allowed to percolate in a 43-acre disposal field. In the past up to 75% of the total effluent was discharged to the 43-acre disposal field for percolation. The percolation of effluent in the disposal field increased the groundwater gradient and, in turn, groundwater flow velocity in the vicinity of the Landfill. As a result, the City's continued discharge to the area has the potential to increase area groundwater to levels that would threaten or adversely affect the Landfill and groundwater quality. Current WDRs prohibits the Discharger from discharging effluent to the disposal field in a manner that contributes to the flooding and migration of waste constituents from the Teapot Dome Landfill. In addition, the Discharger was directed to decrease percolation of effluent and increase the amount of reclaimed water used for irrigation.

The City's current Reclamation Area consists of approximately 980 acres with about 401 acres used for irrigation with recycled effluent (the rest of the Reclamation Area is dry farmed). The Discharger plans to complete infrastructure improvements on approximately 220 additional acres for a total of 620 acres available for irrigation, 30 acres of which are owned by Mr. Robert Nuckols.

Solids and Biosolids Disposal

Sludge is thickened and stored in the sludge digesters then is transferred via an underground pipeline approximately 4.5 miles to the sludge drying beds adjacent to the municipal airport. Currently the dried sludge is stockpiled in one of the lined sludge drying beds and hauled to a

composting facility for disposal. In July 2007, the Discharger submitted a Notice of Intent (NOI) for coverage under the Boisolids General Order to land apply boisolids for use as a soil amendment on approximately 440 acres of land in the City's Reclamation Area. According to the Operations Plan submitted with the NOI the biosolids will be spread in October. Following application a crop will be planted on the fields in November either alfalfa, oat hay, or oat hay followed by sudan grass. According to the Operations Plan the fields that are used for biosolids will not be irrigated with effluent for one year following application. Current sludge production is about 1,100 tons of dried sludge per year, which requires an estimated 65 to 70 acres of land each year. The Discharger estimates that, at an average daily flow of 8 mgd, sludge production would be about 1,300 tons/year.

Groundwater Conditions

Regional groundwater in the area is encountered between 50 and 100 feet below ground surface (bgs) and flows to the southwest, according to information in Lines of Equal Elevation of Water in Wells in Unconfined Aquifer, published by Department of Water Resources in Spring 2004.

In 1993 the Discharger established a groundwater-monitoring network around the WWTF and the Reclamation Area. Additional monitoring wells were installed in 2001 as part of the hydrogeologic investigation required under the conditions of WDRs Order No. R5-2001-103 and CDO No. R5-2001-104.

In the most recent groundwater monitoring reports first-encountered groundwater was between 35 and 50 feet in the monitoring wells around the WWTF and between 45 and 110 feet in the monitoring wells around the Reclamation Area. Groundwater flow in recent years has generally been to the west-southwest except in the area around the percolation ponds where, due to mounding, groundwater flows away from the ponds in all directions.

Groundwater in the area is generally of good to excellent quality, except for nitrates, with EC and TDS values around 300 to 600 $\mu\text{mhos/cm}$ and 200 to 400 mg/L, respectively. Based on the data supplied, groundwater in the vicinity of the Reclamation Area has been degraded for nitrogen and salts as a result of past discharges from the WWTF. Groundwater nitrate concentrations in the vicinity of the percolation ponds are between 12.4 mg/L and 18 mg/L, expressed as nitrogen, and exceed the primary maximum contaminant limit (MCL) for nitrate of 10 mg/L. In addition, groundwater in the vicinity of the percolation ponds contains EC, sodium, and chloride at or near concentrations that could be harmful to salt sensitive crops such as citrus and stone fruit, which are grown in the area. The continued percolation of effluent, with nitrogen concentrations that exceed water quality objectives will likely contribute and may further exacerbate nitrogen impacts in the area.

Compliance History

The Discharger submits monthly, quarterly, and annual self-monitoring reports (SMRs) in compliance with the Monitoring and Reporting Program. The Discharger has noted its SMRs that the monthly average EC of the effluent occasionally exceeds 900 umhos/cm, and believes that it is the result of returning decant water from the sludge drying beds.

Cease and Desist Order No. R5-2001-104 (CDO), adopted on 27 April 2001, required the Discharger to perform a series of tasks according to a time schedule. Tasks required under the CDO include (a) provide effluent disposal capacity sufficient to comply with the terms and conditions of WDRs Order No. R5-2001-103 at the permitted monthly average discharge rate of 5.3 mgd including cessation of hydraulic impacts on the Teapot Dome landfill, (b) adoption and implementation of an industrial sewer pretreatment program, (c) conduct a hydrogeologic investigation to investigate the extent of impacts to groundwater quality in violation or threatened violation of groundwater limitations, and (d) evaluate cleanup alternatives and select a cost effective cleanup action for approval that achieves compliance and assures sustained compliance with groundwater limitations.

The Discharger completed the tasks identified in the CDO, except for parts of Task 5 (evaluate, select, and propose cost-effective cleanup actions for sustained compliance with groundwater limitations). The Discharger failed to submit a cleanup proposal, but rather has implemented several management practices intended to prevent further degradation of groundwater, including increasing the land available for irrigation, and decreasing the amount of effluent allowed to percolate. Rescission of the CDO is considered in a separate Order.

Basin Plan, Beneficial Uses, and Regulatory Considerations

The Basin Plan indicates the greatest long-term problem facing the entire Tulare Lake Basin is increasing salinity in groundwater, a process accelerated by man's activities and particularly affected by intensive irrigated agriculture. The Basin Plan recognizes that degradation is unavoidable until there is a long-term solution to the salt imbalance. The Regional Water Board encourages proactive management of waste streams by dischargers to control addition of salt through use, and has established an incremental EC limitation of 500 µmhos/cm or a 1,000 µmhos/cm, as the measure of the maximum permissible addition of salt constituents through use.

Discharges to areas that may recharge good quality groundwaters shall not exceed an EC of 1,000 µmhos/cm, a chloride content of 175 mg/L, or boron content of 1.0 mg/L.

Antidegradation

The antidegradation directives of State Water Board Resolution No. 68-16, "Statement of Policy With Respect to Maintaining High Quality Waters in California," or "Antidegradation Policy" require that waters of the State that are better in quality than established water quality objectives be maintained "consistent with the maximum benefit to the people of the State."

Waters can be of high quality for some constituents or beneficial uses and not others. Policy and procedures for complying with this directive are set forth in the Basin Plan. Degradation of groundwater by some of the typical waste constituents released with discharge from a municipal wastewater utility after effective source control, treatment, and control is consistent with maximum benefit to the people of the State. The technology, energy, water recycling, and waste management advantages of municipal utility service far exceed any benefits derived from a community otherwise reliant on numerous concentrated individual wastewater systems, and the impact on water quality will be substantially less. Economic prosperity of valley communities and associated industry is of maximum benefit to the people of the State, and therefore sufficient reason to accommodate growth and groundwater degradation provided terms of the Basin Plan are met.

Constitutes of concern that have the potential to degrade groundwater include, in part, nutrients and salts. However, the discharge will likely not degrade the beneficial uses of groundwater because:

- a. For nitrogen, shallow groundwater already contains nitrate concentrations in excess of water quality objectives as a result of previous discharges and agricultural practices in the area. The WDRs would include provisions requiring the Discharger to evaluate its wastewater management practices and submit a comprehensive Wastewater Management plan for the Reclamation Area intended to maximize the nitrogen utilization of the crops and preclude further degradation of groundwater.
- b. For salinity, the Basin Plan contains effluent limits for EC of SW + 500 $\mu\text{mhos/cm}$, 1,000 $\mu\text{mhos/cm}$ max that considered antidegradation when adopted. With an EC of about 868 $\mu\text{mhos/cm}$, the treated effluent meets the Basin Plan limit for SW + 500 $\mu\text{mhos/cm}$. The WDRs would set an effluent limitation for EC of 500 $\mu\text{mhos/cm}$ over source or a maximum of 1,000 $\mu\text{mhos/cm}$, whichever is less and a chloride limit of 175 mg/L and should therefore not unreasonably degrade the beneficial uses of groundwater with respect to salinity.

Treatment Technology and Control

The Discharger provides treatment and control of the discharge that incorporates:

- a. secondary treatment;
- b. disinfection (when required);
- c. pretreatment monitoring and compliance assessment;
- d. recycling of wastewater for crop irrigation;
- e. soil cement lined sludge drying beds;
- f. appropriate biosolids handling and treatment for reuse;
- g. an operation and maintenance (O&M) manual; and
- h. certified operators to insure proper operation and maintenance.

Title 27

Title 27, CCR, section 20005 et seq. (Title 27) contains regulations to address certain discharges to land. Title 27 establishes a waste classification system, specifies siting and construction standards for full containment of classified waste, requires extensive monitoring of groundwater and the unsaturated zone for any indication of failure of containment, and specifies closure and post-closure maintenance requirements. Generally, no degradation of groundwater quality by any waste constituent in a classified waste is acceptable under Title 27 regulations.

Discharges of domestic sewage and treated effluent can be treated and controlled to a degree that will not result in unreasonable degradation of groundwater. For this reason, they have been conditionally exempted from Title 27. Treatment and storage facilities for sludge that are part of the WWTF are considered exempt from Title 27 under section 20090(a), provided that the facilities not result in a violation of any water quality objective. However, residual sludge (for the purposes of the proposed Order, sludge that will not be subjected to further treatment by the WWTF) is not exempt from Title 27. Solid waste (e.g., grit and screenings) that results from treatment of domestic sewage and industrial waste also is not exempt from Title 27. This residual sludge and solid waste are subject to the provisions of Title 27.

Accordingly, the municipal discharge of effluent and the operation of treatment or storage facilities associated with a municipal wastewater treatment plant can be allowed without requiring compliance with Title 27, but only if resulting degradation of groundwater is in accordance with the Basin Plan.

CEQA

The Discharger certified an Environmental Impact Report (EIR) in February 1992 for expansion of the WWTF to a capacity of 8 mgd, in accordance with the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000, et, seq.) and the State CEQA guidelines (Title 14, Division 6, California Code of Regulations, as amended). The Regional Water Board, as a responsible agency under CEQA, reviewed the EIR for the project relative to water quality. This Order contains requirements that will mitigate or avoid environmental effects on water quality.

Proposed Order Terms and Conditions

Discharge Prohibitions, Specifications and Provisions

The proposed Order prohibits discharge to surface waters and water drainage courses and cross connection between potable water and well water piping with recycled water piping.

The proposed Order would set a monthly average daily flow limit of 5.3 mgd. With effluent limits for BOD₅ and TSS of 40 mg/L monthly average and 80 mg/L daily maximum, consistent with the Basin Plan. To increase flows up to 8.0 mgd the proposed Order requires that the Discharger shall submit a technical report and certification documenting that it has completed

necessary improvements to add additional land to its irrigation plan and has sufficient disposal capacity to comply with the terms and conditions of this Order.

The proposed Order would establish an effluent limitation for EC of 500 $\mu\text{mhos/cm}$ over source or a maximum of 1,000 $\mu\text{mhos/cm}$, whichever is less, and a chloride limit of 175 mg/L that reflects Regional Water Board policy for managing the salts within the Tulare Lake Basin, and includes a Provision to conduct a salinity evaluation and prepare a Salinity Control Plan to manage and control the salinity of its discharge.

The discharge specifications regarding dissolved oxygen and freeboard are consistent with Regional Water Board policy for the prevention of nuisance conditions, and are applied to all such facilities. Due to the shallow depth of the percolation ponds and the rapid infiltration rates of the soil, monitoring for dissolved oxygen in the ponds is only required if offensive odors are detected.

In order to protect public health and safety, the proposed Order requires the Discharger to comply with the provisions of Title 22 and to implement best management practices with respect to recycled water application (application at reasonable rates considering the crop, soil, and climate).

The proposed Order would prescribe groundwater limitations that implement water quality objectives for groundwater from the Basin Plan. The limitations require that the discharge not cause or contribute to exceedances of these objectives or natural background water quality, whichever is greatest.

The proposed Order includes Provisions to prepare a salinity control plan to control the salinity of its discharge and submit a comprehensive Wastewater Management Plan to evaluate its recycling practices and the potential for use of extracted groundwater from areas beneath the Reclamation Area that have elevated concentrations of waste constituents to ensure that groundwater quality is restored and protected. The evaluation shall also establish best practicable treatment or control measures, including the possibility of treating wastewater to remove nitrogen, to comply with the groundwater limitations in this Order and ensure that beneficial uses of groundwater will be maintained. The technical report shall include a time schedule to implement the identified measures.

Monitoring Requirements

Section 13267 of the CWC authorizes the Regional Board to require monitoring and technical reports as necessary to investigate the impact of a waste discharge on waters of the state. In recent years there has been increased emphasis on obtaining all necessary information, assuring the information is timely as well as representative and accurate, and thereby improving accountability of any discharger for meeting the conditions of discharge. Section 13268 of the CWC authorizes assessment civil administrative liability where appropriate.

The proposed Order includes effluent monitoring requirements and Reclamation Area monitoring. In order to adequately characterize wastewater, the Discharger is required to monitor for BOD₅, pH, EC, TDS, nitrogen, and other constituents.

The proposed Order also includes groundwater monitoring around the WWTF, Reclamation fields, sludge drying beds, and percolation area. Since 2001 the Discharger has implemented several management practices to prevent further groundwater degradation. Due to significant improvements made to date in the reclamation program including increasing land available for effluent irrigation and reduced reliance on percolation this Order proposes to reduce the number of monitoring wells to be sampled as part of the groundwater monitoring program.

The Discharger must monitor groundwater for waste constituents expected to be present in the discharge, and capable of reaching groundwater, and violating groundwater limitations if its treatment, control, and environmental attenuation, proves inadequate. For each constituent of concern, the Discharger must, as part of each monitoring event, compare concentrations of constituents found in each monitoring well (or similar type of groundwater monitoring device) to the background concentration or to prescribed numerical limitations to determine compliance.

Reopener

The conditions of discharge in the proposed Order were developed based on currently available technical information and applicable water quality laws, regulations, policies, and plans, and are intended to assure conformance with them. It may be appropriate to reopen the Order if applicable laws and regulations change.

DKP/KC: 1/14/08