

INFORMATION SHEET

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2011-XXXX
CITY OF PLYMOUTH WWTF
AMADOR COUNTY

Background

The City of Plymouth Wastewater Treatment Facility (WWTF) treats and disposes of domestic wastewater from residential and commercial units in the City of Plymouth, Far Horizons 49er Village RV Resort (RV Resort), and Amador County Fairgrounds. The WWTF serves an estimated population of 1,008 with a total of 625 equivalent dwelling units (EDUs), including 408 residential and 217 non-residential EDUs. In March 2010, the City of Plymouth received a new water supply (TDS 55 mg/L) from the Mokelumne River. This ended their history of using the local groundwater supply (TDS 325 mg/L) as the primary water source. The wells remain as a backup/emergency supply per the City's Drinking Water System Permit issued by the State Department of Health. The WWTF consists of two aerated ponds, one unaerated pond, chlorination facilities, a 185 acre-foot storage reservoir, and 85 acres of on-site Land Application Areas (LAAs). All of the ponds and the storage reservoir are unlined. Little Indian Creek is located topographically downgradient from the LAAs and an unnamed tributary passes through the LAAs. Secondary disinfected wastewater is applied to the LAAs.

Waste Discharge Requirements (WDRs) Order No. 5-01-095, adopted by the Central Valley Water Board on 27 April 2001, prescribes requirements for the WWTF, and allows a monthly average dry weather influent flow (ADWF) of 0.17 million gallons per day (mgd). The Discharger requested to increase the monthly ADWF limit from 0.17 to 0.185 mgd and allow year-round discharge to the LAAs.

Cease and Desist Order No. R5-2005-2006 (CDO) was adopted by the Central Valley Water Board on 27 January 2005 due to a series of violations. The violations listed in the CDO include: a) Tailwater from LAAs entered the 100-foot buffer zone and surface drainage courses; b) Wastewater applications during prohibited periods (winter); c) Dissolved oxygen less than 1.0 mg/L in wastewater ponds; d) Water quality exceedances for ammonia as nitrogen; e) Inadequate storage capacity; and f) Failure to submit monitoring reports on time and technical reports required by WDRs Order No. 5-01-095.

The Discharger submitted all the reports required by the CDO and completed a number of physical improvements in 2005 including additional pond aeration, stormwater diversion around the effluent storage reservoir, earthen berms along a portion of Little Indian Creek and its unnamed tributary. In addition, the sprinklers near the 100-foot buffer zone were deactivated; Field 6 was retrofitted to sprinkler heads instead of flood irrigation; an irrigation controller was installed for timed and volume irrigation; and maintenance of the LAAs has increased to prevent tailwater runoff to the surface water drainage course.

Modifications to the Wastewater System

In 2009, the Discharger received \$2.25 million in funding from the State Water Resources Control Board (SWRCB) for its Phase 1 Sewer Collection System Rehabilitation Project (Phase 1 project). Phase 1 project is intended to achieve compliance with WDRs and the

CDO by reducing inflow and infiltration through collection system rehabilitation, and restore the original permitted capacity of 0.17 mgd. The project includes:

1. Rehabilitation of 6,220 linear feet of sewer mains, sealing/repair of 48 manholes and installation of 1,450 linear feet of underdrain in the area of high groundwater.
2. Construction of a headworks facility, including a mechanical screen and solids compactor along with associated electrical and water supply facilities. A new influent meter was installed downstream of the headworks.
3. Replacement of the single 25-Hp aerator in Ponds 1 and 3 with two 20-Hp aerators and three 3-Hp aerators, respectively.
4. Replacement of the existing transfer pump with a new pump and addition of a standby pump. A new transfer meter was installed downstream of the transfer pumps.
5. Installation of a pipe bypass of Pond 1 to Pond 2. Distribution piping between ponds will allow shunting of water during potential process upsets or major construction/maintenance activities.
6. Removal of 146 tons of sludge from Pond 1.
7. Installation of a concrete sludge drying bed and portable pump for future sludge removal. The sludge drying bed was built with concrete and is piped so that supernatant drains back into Pond 2 to preclude infiltration of leachate to groundwater.

In December 2010, the Discharger completed the Phase 1 project.

Groundwater Conditions

The depth to groundwater ranges from less than 1 foot to 21 feet below the ground surface. Generally, groundwater flows from southeast to northwest.

In 2003, the Discharger installed two upgradient and four downgradient monitoring wells with depths from 15 feet to 26 feet below ground surface. One upgradient well (MW-4) had a high average concentration of 5,393 mg/L for TDS. The other upgradient well had the lowest TDS concentrations for all wells due to location next the Little Indian Creek. The two upgradient wells do not appear suitable to serve as background wells. Therefore, a new background well is necessary to determine the background water quality.

The WWTF receives wastewater from the RV Resort and Amador County Fairgrounds which contains formaldehyde, zinc, and/or phenol due to the use of deodorants in holding tanks, and portable toilets. The Discharger has been monitoring formaldehyde, zinc, ammonia and total phenol annually in groundwater since 2005. Most total phenol concentrations were non-detectable. The zinc average concentrations ranged from 8 to 92 µg/L, which are less than the California Drinking Water Standard Secondary Maximum Contaminant Levels of 5,000 µg/L for

zinc. The groundwater formaldehyde average concentrations ranged from 12 to 60 µg/L, which are less than the USEPA Health Advisory Level of 1,000 ug/L. Although the RV waste chemical impacts appear to be minimal, source control could be achieved through educational outreach to the RV park/fairground customers. This Order requires the Discharger to submit a best practicable treatment and control (BPTC) evaluation and implementation plan for source control.

Basin Plan, Beneficial Uses, and Regulatory Considerations

Surface water drainage is to Little Indian Creek, a tributary of the Cosumnes River. The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (Basin Plan) designates beneficial uses, establishes water quality objectives, contains implementation plans and policies for protecting waters of the basin, and incorporates by reference plans and policies adopted by the State Water Resources Control Board.

Antidegradation

State Water Resources Control Board Resolution No. 68-16 ("Policy with Respect to Maintaining High Quality Waters of the State") (hereafter Resolution 68-16) prohibits degradation of groundwater unless it has been shown that:

1. The degradation is limited and will provide social and economical benefit to the people of the State;
2. The degradation will not unreasonably affect present and anticipated future beneficial uses;
3. The degradation is not expected to result in water quality less than that prescribed in state and regional policies, including violation of one or more water quality objectives; and
4. The discharger employs BPTC to minimize degradation.

Resolution 68-16 prohibits degradation of groundwater quality as it existed in 1968, or at any time thereafter that groundwater quality was better than in 1968, other than degradation that was previously authorized. An antidegradation analysis is required for a new discharge location, and/or an increased volume of waste and/or an increased concentration of waste constituents.

Degradation of groundwater by some of the typical waste constituents released with discharge from a municipal wastewater utility after best practicable source control, treatment, and control is consistent with providing social and economical benefit to the people of the State. The technology, energy, water recycling, and waste management advantages of municipal utility service 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 the valley and foothill 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.

The Discharger has been monitoring groundwater quality at the current WWTF site since 2003. Based on the data available, it is not possible to determine pre-1968 groundwater quality. Therefore, determination of compliance with Resolution 68-16 for this facility must be based on existing background groundwater quality.

In August 2010, the Discharger submitted an *Antidegradation Analysis* with a simplified groundwater model, which used MW-4 as a background well. However, since MW-4 does not appear to provide samples that are representative of background water quality, this Order requires the Discharger to (1) install a new background groundwater monitoring well; (2) submit a *Background Groundwater Quality Report*, and (3) complete the *Antidegradation Analysis*.

Since the change to a new low-salinity water supply in March 2010, the effluent average TDS concentration has been reduced from 564 mg/L (August 2005 through December 2009) to 355 mg/L (March 2010 through May 2011). Although the discharge may cause degradation of groundwater quality, it will likely not cause exceedance of a Water Quality Objective and the Discharger has implemented BPTC to reduce salinity.

RV waste chemicals can be detrimental to bacteria in biological treatment process, inhibit the WWTF operation and also pose a threat to the quality of groundwater. To protect the municipal and domestic use of groundwater, it is appropriate to adopt following numerical limits for groundwater: 1,000 µg/L for formaldehyde, 2,000 µg/L for total phenol and 5,000 µg/L for total zinc. With an effluent limit of 600 µg/L for formaldehyde, the Discharger should be able to comply with the groundwater limits without additional treatment.

The expansion of the WWTF will accommodate an approximate one percent annual wastewater flow increase over the next twelve years. Sufficient reasons exist to accommodate this growth as long as the Discharger verifies its antidegradation analysis and selects and implements BPTC measures within a reasonable timeframe. It is also appropriate to allow some groundwater degradation as long as it is consistent with the Basin Plan and Resolution No. 68-16 because social and economic prosperity of local communities and associated industry is of benefit to the people of California. This Order establishes terms and conditions of discharge to ensure that the discharge does not impact present and anticipated uses of groundwater and includes groundwater limitations that apply water quality objectives established in the Basin Plan to protect beneficial uses of the underlying groundwater. This Order also requires a groundwater quality evaluation, and requires groundwater monitoring to quantify any water quality impacts. Following completion of the work required by the time schedule contained in the Provisions, this Order will be reopened, if necessary, to reconsider effluent limitations and other requirements to comply with Resolution 68-16. Based on the existing record, the discharge is consistent with the antidegradation provisions of Resolution 68-16.

Title 27 Exemption

State regulations that prescribe procedures for detecting and characterizing the impact of waste constituents from waste management units on groundwater are found in Title 27 CCR Section 20380. Title 27 conditionally exempts certain activities from its provisions. To qualify for an exemption, the activity must meet, and continue to meet, specified preconditions. Section 20090 of Title 27 contains conditional exemptions that are relevant to the discharge:

- (a) Sewage – Discharges of domestic sewage or treated effluent which are regulated by WDRs, or for which WDRs have been waived, and which are consistent with applicable water quality objectives, and treatment or storage facilities associated with municipal wastewater treatment plants, provided that residual sludges or solid waste from wastewater treatment facilities shall be discharged only in accordance with the applicable SWRCB-promulgated provisions of this division.*

- (b) Wastewater – Discharges of wastewater to land, including but not limited to evaporation ponds, percolation ponds, or subsurface leach fields if the following conditions are met:*
 - (1) the applicable regional water quality control board has issued WDRs, or waived such issuance;*

 - (2) the discharge is in compliance with the applicable water quality control plan;*
and

 - (3) the wastewater does not need to be managed according to Chapter 11, Division 4.5, Title 22 of this code as a hazardous waste.*

The discharge authorized herein and the treatment and storage facilities associated with the discharge, except for discharges of residual sludge and solid waste, are exempt from the requirements of Title 27, CCR as follows:

- a. Treatment Ponds 1, 2 and 3 are exempt from Title 27 pursuant to Section 20090(a) because they are treatment ponds associated with a municipal domestic wastewater treatment plant.

- b. The secondary effluent storage reservoir and LAAs are exempt from Title 27 pursuant to Section 20090 (a) and (b) because they are associated with municipal wastewater treatment plants and because (1) Central Valley Water Board is issuing WDRs; (2) the discharge is in compliance with the Basin Plan. This Order requires the Discharger to install a new background monitoring well and submit a *Background Groundwater Quality Report and an Antidegradation Analysis* to determine if degradation is occurring and if that degradation is consistent with the Antidegradation Policy. The reports will be used to determine whether additional treatment and/or improved containment are needed to ensure compliance with the Basin Plan. Because compliance with the Basin Plan cannot be determined immediately, this Order includes a compliance schedule for completion of

those tasks. The treated effluent discharged to the effluent storage reservoir and LAAs does not need to be managed as hazardous waste.

Discharge Prohibitions, Specifications and Provisions

The Discharger's water balance capacity analysis indicates that the WWTF will provide the following capacities:

<u>Influent Flow Measurement</u>	<u>Influent Flow Limit</u>
Total Annual Flow ¹	82.5 MG
<u>Average Daily Dry Weather Flow ^{2, 3}</u>	0.185 mgd

¹ Based on the calendar year (January through December).

² Dry weather is defined as the months of July through September, inclusive.

³ As determined by the total influent flow for the dry weather period divided by 92.

Three spray fields with earthen berms are allowed for year-round land application.

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

The Provisions require submittal of certain technical reports to improve sampling techniques, install a new background monitoring well, evaluate groundwater quality, complete anti-degradation analysis, and implement BPTC measures for source control of RV waste chemicals.

The Monitoring and Reporting Program is designed to verify compliance with effluent limitations, groundwater limitations, and operational requirements of the WDRs.