

## INFORMATION SHEET

ORDER NO.  
CITY OF GRIDLEY  
GRIDLEY WASTEWATER TREATMENT PLANT  
BUTTE COUNTY

### Background

The City of Gridley (hereafter Discharger) owns and operates a wastewater treatment plant (WWTP) in Sections 3 and 4, T17N, R3E, MDB&M. The facility is currently operated under Waste Discharge Requirements (WDR) Order No. 99-089. The WWTP is on the east bank of the Feather River, approximately 3.3 miles east of the City of Gridley. The Discharger submitted a Report of Waste Discharge (RWD) on 11 January 2006 to expand the WWTP capacity from 1.05 million gallons daily (mgd) to 1.7 mgd. ~~The Discharger will tentatively begin construction of the expansion in September 2006 and plans to complete construction in June 2007.~~ The WWTP provides primary and secondary treatment in two aerated ponds and discharges effluent to four unlined percolation ponds.

The existing WWTP consists of headworks with flow meter, an aeration pond, a polishing pond, and four percolation ponds. The headworks consist of a 2-inch bar screen in an open channel configuration. The aeration pond has four 10 horsepower (hp) aerators and a 10,000 gallons per minute (gpm) Solar Bee mixer. Wastewater is treated in the aeration pond before being transferred to the polishing pond. The polishing pond is divided into two cells by a concrete baffle. The first cell is used as a partial mixing basin, and the second cell serves as a polishing/settling basin. The first cell has a 2,500 gpm Solar Bee mixer and provides total aeration. The second cell has a 2,500 gpm Solar Bee that only provides surface aeration. This allows for benthic decomposition and an odor cap on cell two. Clarified effluent from the polishing pond is directed to one or more of the four percolation ponds. The percolation ponds are unlined and provide 62.02 acre-feet of storage. The Discharger also operates two emergency storage ponds on the west bank of the Feather River, approximately 1 mile south of the WWTP. The emergency storage ponds have a capacity of 100 acre-feet (26.5 million gallons).

The WWTP accepts wastewater from Rio Pluma Prune Processing Facility. Rio Pluma is currently permitted through the Central Valley Regional Board to discharge up to 100,000 gallons per day of pretreated prune and raisin processing wastewater to the WWTP. The amount of processing wastewater that Rio Pluma is allowed to discharge will not increase. The Discharger adopted Chapter 13.06 of the City's Municipal Code, entitled *Industrial Wastewater Regulations*. The Chapter was patterned after the USEPA Model Pretreatment Ordinance. The Chapter authorizes the issuance of industrial wastewater discharge permits, authorizes establishment of numerical limits, and provides for monitoring, compliance, and enforcement activities. The Discharger has issued an Industrial User Permit to Rio Pluma, and has established effluent limitations for acceptance of the pretreated wastewater.

Under WDR Order No. 99-089, the Discharger is required to implement pretreatment provisions. The provisions require the Discharger to implement, as set forth in 40 CFR 403.5, the necessary legal authorities, programs, and controls to ensure that wastes are not

introduced to the treatment system which inhibit or disrupt treatment processes, treatment system operations, or sludge processes.

### **WWTP Expansion Project**

The Discharger submitted a RWD on 11 January 2006 to increase the daily average dry weather flow from 1.05 mgd to 1.7 mgd. The RWD indicated that wastewater flows have been increasing at an annual rate of approximately 7.5% per year since 1997. The Discharger estimates that wastewater flows will increase at a faster rate in the next 10 years due to 507 residential units and developments with approved tentative subdivision maps. The developments are expected to move into the construction phase during the 2006-2010 time frame.

The WWTP Expansion Project include:

1. Replacement of the current headworks with a new headworks facility that will consist of a spiral self-cleaning screen with 0.25-inch openings. The screen will be installed in a new concrete influent channel. A bypass channel with a manually cleaned 2-inch bar screen will also be provided to allow screening of influent to continue while the self-cleaning screen receives maintenance or is clogged.
2. Installation of a new magnetic flow meter upstream of the new headworks facility to measure influent flow. The flow meter will be equipped with an electronic chart recorder.
3. Modification of the aeration pond aerators and Solar Bee mixer. The four existing 10 hp aerators and the 10,000-gpm Solar Bee mixer will be replaced with four 30 hp aerators and a new 10,000 gpm Solar Bee mixer with a more reliable brushless motor design. The Solar Bee will be operated 24 hours a day and will have a long suction hose to draw water from the bottom.
4. Modification of the polishing pond Solar Bee mixers. The two existing 2,500-gpm Solar Bee mixers will be replaced with two new 10,000 gpm mixers. The first mixer will be fitted with a long suction hose to perform deep mixing and aeration to support additional BOD removal. The second mixer will be configured for surface aeration only to aid solids settling.
5. Upgrades to the interconnecting process piping and pond inlets/outlets to provide adequate hydraulic capacity for peak flows while maintaining 2 feet of freeboard in both the aeration and polishing ponds.

### **Effluent Disposal from Polishing Pond Polishing Pond Effluent Disposal**

The polishing pond effluent, under current treatment conditions, was analyzed and the results are as follows:

**TABLE 1  
 EXISTING POLISHING POND EFFLUENT QUALITY**

<u>Constituent</u>	<u>Units</u>	<u>6/16/2005</u>	<u>11/11/2005</u>	<u>11/18/2005</u>	<u>11/30/2005</u>	<u>Average</u>
pH	pH units	7.6	--	--	--	7.6
TDS	mg/L	420	431	446	419	429
TSS	mg/L	39	36	27	39	35.3
BOD	mg/L	30	52	57	71	52.5
Ammonia	mg/L	--	18.3	15.3	17.4	17.0
Nitrate as N	mg/L	--	<0.02	<0.02	<0.02	<0.02

With the proposed modifications to the existing aeration and polishing ponds, the RWD estimated that BOD and TSS concentrations in the polishing pond effluent would decrease to the following levels:

**TABLE 2  
POLISHING POND EFFLUENT QUALITY AFTER WWTP UPGRADED**

<u>Constituent</u>	<u>Units</u>	<u>Average</u>	<u>Maximum</u>
BOD	mg/L	<30	<45
TSS	mg/L	<30	<45

Note: Maximum values do not account for potential seasonal algae blooms.

The RWD included a water balance and capacity analysis to determine the land and storage requirements for polishing pond effluent disposal. Average daily flow to the plant in 2005 ranged from 0.69 mgd to 1.42 mgd. Anticipated flows to the WWTP are: 0.97 mgd in 2010, 1.3 mgd in 2015, and 1.7 mgd in 2025. The RWD states that the water balance indicated that the existing WWTP provides adequate capacity to maintain a minimum of 4 feet of freeboard in all six ponds, while storing all anticipated inflows at a polishing pond effluent inflow rate of 2.00-2 mgd, assuming the percolation capacity of the percolation ponds is 150 feet per year (3.07 gallons per day per square foot). Double-ring infiltrometer tests were performed during April and May 2006 on the four percolation ponds to determine infiltration rates. The percolation capacity varied from 1.35 to 74.81 gallons per day per square foot. The average infiltration rates are presented below.

**TABLE 3  
 AVERAGE INFILTRATION RATES FOR PERCOLATION PONDS**

<u>Pond</u>	<u>Average Infiltration Rate (inch/hour)</u>
3	1.5
4	1.7
5	0.8
6	1.9

Note: Average infiltration rate excludes a test location in Pond 3 and Pond 5 (low and high values, respectively).

## Geology and Soils

Subsurface soils in the percolation pond area consist primarily of fine sandy loam to a depth of 80 inches. Soil borings indicated the presence of silty sand to a depth of 17 feet. The RWD reported the saturated hydraulic conductivity ranging from  $8.0 \times 10^{-4}$  to  $1.4 \times 10^{-2}$  cm/sec. Based on soil boring data at the site, the emergency storage ponds are underlain with silty clay and clay to a depth of 8 feet.

## Surface Hydrology and Groundwater

The Feather River is approximately 300 feet west of the percolation ponds. Average annual rainfall at the WWTP varies between 20 to 50 inches per year. Groundwater depth in the vicinity of the WWTP averages between 10 to 25 feet below grade. Groundwater may be shallower depending upon the surface water level of the Feather River. The RWD reported that from 1984 through 2006, the water surface elevation of the Feather River was within 5 feet of the bottom of the percolation ponds on eight occasions.

In October 1997, a piezometer was installed near percolation Pond No. 6. To date, the Discharger has not reported any water present in the piezometer. On 2 March 2006, Central Valley Water Board staff inspected the WWTP and measured approximately 3 feet of water in the piezometer. The total depth of the piezometer was measured by hand to be approximately 11 feet 2 inches deep. At the time of the inspection, the Feather River was extremely high due to large amounts of rainfall in the days preceding the inspection. It is likely that the Feather River water surface elevation influences the surrounding groundwater table.

Water quality sampling of the Feather River was performed on 23 and 31 March 2006 and 24 February 2006. The Feather River flow rates were 12,000 cubic feet per second (cfs), 18,000 cfs, and 4,500 cfs, respectively. Sampling was performed 200 feet upstream and downstream of the treatment plant. Polishing pond eEffluent samples were also taken on the same day as samples were taken from the Feather River. The polishing pond effluent and Feather River samples were analyzed for total nitrogen, specific conductance, BOD, carbonaceous BOD, total Kjeldahl nitrogen, nitrate and nitrite, total coliform, and fecal coliform. The results showed minimal increases in coliform levels downstream of the treatment plant.

Groundwater elevation and potential mounding under the wastewater ponds are somewhat unknown. This permit requires the installation of piezometers between several of the disposal ponds to monitor groundwater elevations and any mounding that may occur. Installation of monitoring wells is also required. The Central Valley Water Board may reopen this Order to reconsider groundwater limitations and treatment processes if it is determined that the discharge from the WWTP is adversely impacting the underlying groundwater and/or the Feather River.