

INFORMATION SHEET

ORDER NO. R5-2008-

EAST BAY MUNICIPAL UTILITY DISTRICT
CAMANCHE DAM POWER HOUSE
SAN JOAQUIN COUNTY

East Bay Municipal Utility District (EBMUD) hereafter Discharger, owns and operates a hydroelectric generating Power House at 23900 E. Buena Vista Road, Clements, San Joaquin County. The Discharger submitted a Report of Waste Discharge (RWD) dated 21 September 2007 for treatment and land application of wastewater generated at the Camanche Dam Power House.

Background

Three hydro-powered turbine generators are operated at the Power House and are capable of producing up to 10 million kilowatts of electricity per year. Approximately 12,000 gallons per day (gpd) of wastewater is generated in the Power House. The Discharger treats the industrial wastewater to remove petroleum products (used for lubrication in the turbines) and discharges the treated effluent to the Mokelumne River downstream of Camanche Dam under a National Pollutant Discharge Elimination System (NPDES) permit.

The NPDES permit contains effluent limitations for copper and other analytes; because the Mokelumne River is listed as impaired for copper under the Clean Water Act (CWA), Section 303(d), increasingly stringent copper concentration discharge limits are imposed beginning 1 October 2008. The Discharger has reported copper concentrations upstream of the Power House that exceed the discharge limits that would be imposed on 1 October 2008 if the NPDES discharge were continued. The Discharger has attempted to reduce the concentration of copper in wastewater effluent, but has determined that it is technically infeasible to reduce copper to concentrations that will consistently comply with the new limits. Rather than attempt to improve treatment to reduce already low concentrations, the Discharger has elected to switch the discharge from surface water to land and will construct an Evaporation/Percolation (EP) Pond.

Wastewater Treatment

Wastewater is generated from several sources in the Power House generally through cooling, lubricating, heat exchange, and liquid seals. Several sources of cooling water are entirely contained within jackets and have no contact with bearings or lubricating oil. That water is directly discharged to the Mokelumne River. The wastewater that can become contaminated with petroleum hydrocarbons (lubricating oil) and copper through use in the Power House is collected in a sump, skimmed to remove oil, pumped to an oil separation pond for additional skimming, and discharged. Historically, the discharge has been to the Mokelumne River; the Discharger will switch the discharge point to the EP Pond. A standby-unlined pond with a capacity of 85,000 gallons is located adjacent to the oil separation pond and is used when the oil separation pond undergoes scheduled maintenance. Discharge to the standby-unlined pond can result in petroleum being discharged to the environment and this Order requires

improvements to be completed within one year of adoption of this Order to control the petroleum discharge.

In addition to treating the wastewater, the Discharger has completed improvements in the Power House to minimize the quantity of wastewater generated. The flow rate has been reduced from over 90,000 gpd to an average of less than 15,000 gpd. Since January 2004 the flow rate has averaged 12,000 gpd.

The Discharger has changed copper or bronze equipment to reduce the concentration of copper in wastewater. The work resulted in a reduction of median copper values from 8.5 to 6.6 ug/L. Copper concentrations in water upstream of the Power House are generally approximately equal to the concentrations downstream of the Power House (after the wastewater has been discharged). In the years from 2004 through 2007, upstream concentrations ranged from 1.11 to 3.37 ug/L, downstream concentrations ranged from 3.67 to 0.97 ug/L. Removal of petroleum hydrocarbons from the wastewater has been effective, consistently removing the contaminant to below the analytical method detection limit (1.0 to 2.6 mg/L). The discharge to the standby-unlined pond may be of concern because one of two oil skimmers is taken out of service when the oil separation pond is cleaned and the wastewater is discharged to the standby-unlined pond.

Wastewater Disposal

Wastewater will be disposed of by evaporation and percolation from the EP Pond. Because the wastewater is of high quality, no additional treatment is required. Although wastewater copper concentrations are sometimes slightly higher than groundwater concentrations, groundwater quality will be protected through attenuation processes as the wastewater infiltrates.

Percolation capacity was determined by performing three double-ring infiltrometer tests on 16 and 17 November 2005. Infiltration rates were determined to vary from 0.16 to 0.55 in/hr. The infiltration data was used in preparation of a water balance that forecast the EP Pond would go dry in August during a 100-year return annual precipitation event. Stormwater that falls on the facility infiltrates or runs off, eventually discharging into the Mokelumne River. Only precipitation that falls directly on the EP Pond was included in the water balance.

The Power House is equipped with a septic tank that pumps to a sump. Clarified water is discharged to a leach pit. The system is not permitted by the San Joaquin County Environmental Health Department but is required to be by June 2008.

Basin Plan, Beneficial Uses, and Regulatory Considerations

Surface water from the WWTF is to the Mokelumne River between Camanche Reservoir and the Delta. The beneficial uses are agricultural supply; water contact recreation; non-contact

water recreation; warm freshwater habitat; cold freshwater habitat; migration of aquatic organisms; spawning, reproduction, and/or early development; and wildlife habitat
The Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Fourth Edition (Basin Plan), designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin. Beneficial uses often determine the water quality objectives that apply to a water body. For example, waters designated as municipal and domestic supply must meet the Maximum Contaminant Levels (MCLs) for drinking waters. The Basin Plan sets forth the applicable beneficial uses (industrial, agricultural, and domestic and municipal supply in this instance) of groundwater, procedure for application of water quality objectives, and the process for and factors to consider in allocating waste assimilation capacity.

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. Policies and procedures for complying with this directive are set forth in the Basin Plan.

Resolution 68-16 is applied on a case-by-case, constituent-by-constituent basis in determining whether a certain degree of degradation can be justified. It is incumbent upon the Discharger to provide technical information for the Regional Board to evaluate that fully characterizes:

- All waste constituents to be discharged;
- The background water quality of the uppermost layer of the uppermost aquifer;
- The background quality of other waters that may be affected;
- The underlying hydrogeologic conditions;
- Waste treatment and control measures;
- How treatment and control measures are justified as best practicable treatment and control;
- The extent the discharge will impact the quality of each aquifer; and
- The expected degree of degradation below water quality objectives.

In allowing a discharge, the Regional Water Board must comply with CWC Section 13263 in setting appropriate conditions. The Regional Water Board is required, relative to the groundwater that may be affected by the discharge, to implement the Basin Plan and consider the beneficial uses to be protected along with the water quality objectives essential for that purpose. The Regional Board need not authorize the full utilization of the waste assimilation capacity of the groundwater (CWC 13263(b)) and must consider other waste discharges and factors that affect that capacity.

Certain wastewater constituents are not fully amenable to waste treatment and control and it is reasonable to expect some impact on groundwater quality. Some degradation for certain constituents is consistent with maximum benefit to the people of California because the technology, energy, water recycling, and waste management advantages of hydroelectric power generation facility far outweigh the environmental impact that would be required to replace lost power generation. Economic prosperity of local communities is of maximum benefit to the people of California, and therefore sufficient reason to accommodate wastewater discharge provided terms of reasonable degradation are defined and met. The proposed Order authorizes some degradation consistent with the maximum benefit to the People of the State but does not authorize pollution (i.e., violation of any water quality objective).

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 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 is acceptable under Title 27 regulations.

Discharges of wastewater to land is exempt from the requirements of Title 27 if the applicable Regional Water Board has issued WDRs, the discharge is in compliance with the applicable water quality control plan, and the wastewater does not need to be managed according to Chapter 11, Division 4.5, Title 22 of the California Code of Regulations as a hazardous waste.

Proposed Order Terms and Conditions

Discharge Prohibitions and Specifications

The proposed Order's Effluent Limitations for total oil and grease and total copper are based on groundwater quality protection. The oil and grease limit is the same as the limit in the NPDES Order. The Discharger has complied with the limit. The copper limit is 0.020 mg/L. The concentration of copper (both total and dissolved) in effluent samples have been lower than the effluent limit. The discharge specifications regarding dissolved oxygen and freeboard are consistent with Regional Board policy for the prevention of nuisance conditions and overtopping, and are applied to all such facilities.

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 of civil administrative liability where appropriate.

The proposed Order includes influent/effluent monitoring requirements and wastewater pond monitoring. In order to adequately characterize the effluent, the Discharger is required to monitor for petroleum hydrocarbons, fixed dissolved solids, and copper. Monitoring of copper and petroleum concentrations in soil at the bottom of the EP Pond is required on an annual basis. To ensure that storage ponds do not create nuisance conditions, the Discharger is required to monitor dissolved oxygen weekly.

The Discharger must monitor wastewater for constituents expected to be present in the discharge, capable of reaching groundwater, and violating groundwater limitations if treatment, control, and environmental attenuation proves inadequate.

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. However, information is presently insufficient to develop final recycled water and groundwater limitations, so the proposed Order contains interim limitations. Additional information must be developed and documented by the Discharger as required by schedules set forth in the proposed Order. As this additional information is obtained, decisions will be made concerning the best means of assuring the highest water quality possible and that could involve substantial cost. It may be appropriate to reopen the Order if applicable laws and regulations change, but the mere possibility that such laws and regulations may change is not sufficient basis for reopening the Order. The CWC requires that WDRs implement all applicable requirements.

TRO: 4/2/08