INFORMATION SHEET

ORDER R5-2013-__
YOCHA DEHE WINTUN NATION
SEKA HILLS OLIVE MILL
LAND BASED DISCHARGE
YOLO COUNTY

Facility Description

The Yocha Dehe Wintun Nation ("Discharger") owns and operates the Seka Hills Olive Mill facility located along State Highway 16, in Yolo County. The facility currently consists of an olive oil milling structure, a 20 acre olive orchard, 103 acres of seasonal crop land, and 60 acres of fallow grassland used for cattle grazing. Approximately 12 acres of the fallow grassland is currently used as a Land Application Area (LAA) for the discharge of wastewater from olive milling operations. The facility was constructed in late 2011 and began olive oil milling operations in 2012.

In July 2012, the Executive Officer issued a Revised Notice of Applicability to the Discharger for coverage under the *Conditional Waiver of Waste Discharge Requirements for Small Food Processors and Small Wineries within the Central Valley Region* (Order R5-2009-009-0060). The Conditional Waiver allows the discharge to land of up to 100,000 gallons of olive oil mill process wastewater annually.

Processing occurred during the olive harvest season, typically from August through January each year. During the mill's first operating season, the facility crushed approximately 700 tons of olives, plus three tons of oranges, lemons, and pomegranates to make specialty food-grade oils. Approximately 100,000 gallons of wastewater generated during the 2012 milling season was discharged to the 12-acre LAA, while an additional 131,000 gallons of wastewater was hauled off-site to a permitted disposal facility. On 5 March 2012, a Report of Waste Discharge was submitted to allow an increase of wastewater treatment and land application as a result of planned increase in olive oil milling activities at the facility. Additional information to complete the Report of Waste Discharge was provided in April 2013.

Current Wastewater Process and Land Application Areas

Wastewater at the facility is generated from fruit washing, while supplemental water is added to assist with oil extraction, facility wash-down, equipment cleaning and maintenance. Clean-in-place (CIP) water for periodic cleaning of olive oil storage tanks and equipment contains potassium hydroxide and citric acid for cleaning and sanitation. The facility currently does not treat wastewater or have a water softening system. All process wastewater is managed separately from storm water runoff for the facility.

Process wastewater is currently stored in 10,000 gallon aboveground polyethylene storage tanks, and then transferred using a 2,000-gallon water truck for spray-application to the 12-acre LAA. The 12-acre LAA does not receive supplemental irrigation.

Planned Facility Expansion

The Discharger is planning to increase olive oil milling production to crush up to 3,700 tons of olives and 18 tons of other fruits annually. The Discharger proposes to generate an average daily flow of 13,333 gallons during a typical 120 day milling season from August through January, equating to 1.6 million gallons per year at full build-out. The peak daily flow is approximately 26,500 gallons per day at operational full capacity.

As part of the facility expansion, the Discharger will increase the availability of additional LAAs to accommodate wastewater discharge. In 2011, a 20-acre medium-density olive orchard was planted, but to date has not been used for wastewater discharge. The 20-acre olive orchard will be used as an LAA in 2013, with periodic use of up to 60 acres of fallow grassland only to accommodate flow extremes. In 2014, available LAAs will be increased with the inclusion of 23 additional acres of olives 80 acres of almonds. Discharge rates and flow-weighted average concentrations will be increased incrementally as orchard areas mature and increase uptake of nutrients. Supplemental irrigation water for the LAAs will be provided from a nearby irrigation well and surface water diverted from Cache Creek. Supplemental irrigation water will be used to meet crop demands and to provide dilution.

Wastewater and Groundwater Characterization and Anti-Degradation Analysis

The facility has only been in operation for one milling season. Wastewater effluent analyses conducted during the 2012 milling season indicated that wastewater quality was highly variable and high in fixed dissolved solids (FDS), total dissolved solids (TDS), and biochemical oxygen demand (BOD). During the initial 2012 milling season, wastewater FDS concentrations averaged 4,600 milligrams per Liter (mg/L), TDS concentrations averaged 15,000 mg/L, and BOD concentrations averaged 21,825 mg/L.

A baseline groundwater study was conducted around the proposed LAAs in February 2013. Shallow groundwater was encountered at depths ranging from 15 feet below ground surface (bgs) to 29.2 feet bgs and is expected to flow north-northeast consist with local surface drainage and topography.

The table below provides a comparison of estimated flow-weighted average concentrations of the combination of process wastewater and supplemental irrigation water with analytical results from groundwater samples collected in February 2013. Due to the limited extent of wastewater discharge in 2012, these groundwater data represent baseline pre-discharge shallow groundwater quality. Constituents of concern that have the potential to degrade groundwater include salts (primarily TDS, sodium, and chloride), nitrate, and other minerals (sodium, manganese, and iron):

Constituent	Concentrations (mg/L)		
	Wastewater and Supplemental Irrigation [1]	Baseline Groundwater	Protective Water Quality Limit
Chloride	42	7.9 – 93	106 [2] – 600 [3]
Sodium	35	38 – 78	69 [2]
Total Kjeldahl Nitrogen	6 [4]	0.51 – 0.85	--
Nitrate Nitrogen	0.5	4.2 – 10	10 [5]
Boron	1.3	0.2 – 1.0	0.7 [2]
TDS	510	270 - 560	450 [2] to 1,500 [3]
FDS	350	210 – 440	--
Dissolved Manganese	0.01	<0.01 – 0.16	0.05 [6]
Dissolved Iron	0.05	<0.1	0.3 [6]

[1] Projected flow-weighted annual average - flow-weighted concentration of wastewater blended with supplemental irrigation water once all 123 acres of LAAs are available for use, unless otherwise noted.

[2] Lowest Agricultural Water Quality Goal.

[3] Upper end of Secondary Maximum Contaminant Level range.

[4] Includes estimated TKN concentration of 1.0 mg/L in supplemental irrigation water.

[5] Primary Maximum Contaminant Level.

[6] Secondary Maximum Contaminant Level.

Upon completion of the planned wastewater flow and LAA expansion, the flow-weighted average FDS, chloride, and sodium concentrations are expected to be similar to the pre-discharge groundwater quality. Because of evapotranspiration, the discharge has the potential to degrade groundwater quality, but should not cause exceedance of a water quality objective.

Flow-weighted average manganese and iron concentrations are similar to pre-discharge groundwater quality. Because manganese and iron are present in the wastewater and supplemental irrigation water, evapotranspiration has the potential to degrade groundwater quality, but should not cause exceedance of a water quality objective. The Discharger is proposing to maintain low BOD loading rates, which should prevent reducing conditions that could dissolve and mobilize additional manganese or iron in LAA soils. This Order sets a BOD loading rate limit that is consistent with the Discharger's proposed loading rate to minimize the degradation potential.

This Order requires that nitrogen loading from all sources be limited at each stage of orchard maturity to maximize nitrogen uptake and minimize the potential for nitrate to migrate to groundwater in excess of the water quality objective.

Basin Plan, Beneficial Uses, and Regulatory Considerations

The olive mill facility is located within the Lower Cache Creek Hydraulic Area of the Valley Putah-Cache Hydraulic Unit (511.30). Regional surface drainage is to the north, parallel with Brooks Creek, which trends northeasterly and then turns east where it connects with Cache Creek. The *Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region, Fourth Edition for The Sacramento River Basin and the San Joaquin River Basin* (Basin Plan), designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin. The receiving water for this discharge is groundwater and the applicable beneficial uses as set forth in the Basin Plan are: municipal and domestic supply, agricultural supply, industrial service supply, and industrial process supply.

Antidegradation

State Water Resources Control Board (State Board) Resolution 68-16 (the Antidegradation Policy) allows the degradation of groundwater quality if the Central Valley Water Board determines that:

1. The degradation is consistent with the maximum benefit to the people of the State.

2. The degradation will not unreasonably affect present and anticipated future beneficial uses.

3. The degradation does not cause exceedance of one or more water quality objectives.

4. The discharger employs best practicable treatment and control to minimize degradation.

The Discharger has implemented the following treatment and control measures to limit groundwater degradation:

a. Use of desalinated water for the process water supply, which provides high quality water and eliminates the need for water softening;

b. Blending of wastewater with high quality supplemental irrigation water;

c. Full containment of wastewater in engineered storage tanks;

d. Nitrogen loading at agronomic rates considering both the crops grown and the maturity of the orchard trees;

e. Limiting BOD loading rates to prevent anaerobic conditions that could mobilize metals; and

f. Use of closed-loop boilers to capture and recirculate boiler blowdown.

Based on the forgoing, these measures appear to constitute best practicable treatment or control. Because this is a new discharge and background groundwater quality has only been preliminarily defined, additional groundwater and wastewater effluent monitoring is needed to evaluate whether further treatment or control is necessary to ensure compliance with the Antidegradation Policy. This Order requires evaluation and implementation of additional measures as needed.

Flow and Effluent Limitations

Effectively immmediately, discharge from the olive mill to the LAAs shall not exceed 0.6 million gallons per year, which will be inceased up to 1.6 million gallons in 2017 as orchard area LAAs mature and increase nutrient uptake. For 2013, wastewater discharge limits for the 20-acre olive orchard LAA include a daily maximum loading rate BOD limit of 50 lbs/ac/day, and an annual flow-weighted FDS concentration average of 800 mg/L. Beginning in 2014, wastewater discharge limits for the combined 123-acres of orchard LAAs include a daily maximum loading rate BOD limit of 50 lbs/ac/day, and an annual flow-weighted FDS concentration average of 400 mg/L. Annual average nitrogen loading rate shall not exceed agronomic rates.

A discharge of wastewater that overloads soils with nutrients and organics can result in anaerobic conditions in the soil profile, which in turn creates organic acids and decreases soil pH. Under conditions of low soil pH (below 5), iron and manganese compounds in the soil can solubilize and leach into groundwater. Overloading the land application areas is preventable. Based on wastewater quality, the soil is expected to provide adequate buffering of acidic or basic wastewater.

Groundwater Limitations

The groundwater limitations of the WDRs state that the discharge shall not cause an exceedance of water quality objective in groundwater. Compliance with this requirement will be determined based on the installation and monitoring of a network of shallow groundwater monitoring wells surrounding the LAAs.

The Order requires quarterly groundwater monitoring and reporting, and submittal of annual reports. The annual reports will include a comprehensive evaluation of the effectiveness of the past year's wastewater application operations in terms of odor control and groundwater protection, including consideration of application management practices (e.g., waste constituent and hydraulic loadings, application cycles, drying times, and cropping practices), and groundwater monitoring data. Each annual report will also include tabular and graphical summaries of total loading rates for BOD, total nitrogen, and fixed dissolved solids, a description of salinity control methods implemented in the calendar year and a quantification of the reductions achieved as compared to previous years, and a discussion of compliance and corrective actions taken, as well as any planned or proposed actions needed to maintain discharge compliance with the waste discharge requirements.