

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION
REVISED MONITORING AND REPORTING PROGRAM 99-112 (REV. 1)

FOR
CITY OF MODESTO
WATER QUALITY CONTROL FACILITY
WASTEWATER LAND DISPOSAL OPERATIONS
STANISLAUS COUNTY

This Monitoring and Reporting Program (MRP) presents requirements for monitoring of wastewater influent, effluent, storage pond, groundwater and water supply. This MRP is issued pursuant to Water Code Section 13267. The Discharger shall not implement any changes to this MRP unless and until a revised MRP is issued by the Executive Officer.

Central Valley Water Board staff shall approve specific sampling locations prior to any sampling activities. All samples shall be representative of the volume and nature of the discharge. The time, date, and location of each sample shall be recorded on the sample chain of custody form.

Field testing instruments (such as those used to test pH, wind speed, precipitation and electrical conductivity) may be used provided that:

- 1 The operator is trained in proper use and maintenance of the instruments;
- 2 The instruments are calibrated prior to each monitoring event;
- 3 The instruments are serviced and/or calibrated by the manufacturer at the recommended frequency;
- 4 Field calibration reports are submitted as described in the "Reporting" section of this MRP.

DOMESTIC INFLUENT MONITORING

Influent samples shall be collected at the headworks prior to treatment. Grab samples will be considered to be representative of the influent. At a minimum, the Discharger shall monitor influent as specific below:

Constituent	Units	Sample Type	Sampling Frequency	Reporting Frequency
Influent flow	gpd	Meter Observation	Daily	Monthly
Monthly average influent flow	gpd	Calculated	Monthly	Monthly
BOD ₅ ¹	mg/L	Grab	Monthly	Monthly
Total dissolved solids	mg/L	Grab	Monthly	Monthly
Chloride	mg/L	Grab	Monthly	Monthly
Sodium	mg/L	Grab	Monthly	Monthly

¹ 5-day biochemical oxygen demand.

POND MONITORING

The Discharger shall monitor each of the treatment and storage ponds as specified below:

Constituent	Units	Sample Type	Sampling Frequency	Reporting Frequency
Dissolved oxygen ¹	mg/L	Grab	Weekly	Monthly
pH	Std.	Grab	Weekly	Monthly
Freeboard	0.1 feet	Observation	Weekly	Monthly
Berm condition	NA	Observation	Weekly	Monthly
Seepage ²	NA	Observation	Weekly	Monthly
Odors	NA	Observation	Weekly	Monthly

¹ Samples shall be collected at a depth of one foot from each pond in use, opposite the inlet.

² Pond containment berms shall be observed for signs of seepage or surfacing water along the exterior toe. If surfacing water is found, then a sample shall be collected and tested for total coliform organisms.

EFFLUENT WASTEWATER MONITORING

The Discharger shall collect effluent samples at the effluent commingling structure prior to discharge to the land application area. The report shall document whether cannery wastewater was being discharged at the time of sampling. At a minimum, effluent monitoring shall include the following:

Constituent	Units	Sample Type	Sampling Frequency	Reporting Frequency
Effluent flow				
Domestic wastewater	gpd	Meter	Daily	Monthly
Cannery wastewater	gpd	Meter	Daily	Monthly
Total flow	gpd	Meter	Daily	Monthly
pH	Std.	Grab	Weekly	Monthly
BOD ₅	mg/L	Grab	Weekly	Monthly
Total nitrogen	mg/L	Grab	Weekly	Monthly
Electrical conductivity	µmhos/cm	Grab	Weekly	Monthly
Total dissolved solids	mg/L	Grab	Weekly	Monthly
Fixed dissolved solids	mg/L	Grab	Weekly	Monthly
Chloride	mg/L	Grab	Weekly	Monthly
Sodium	mg/L	Grab	Weekly	Monthly

LAND APPLICATION AREA MONITORING

The Discharger shall monitor the land application areas **daily during operation**, and shall submit the results in the corresponding monthly monitoring reports. Evidence of erosion, field saturation, runoff, or the presence of nuisance conditions shall be noted in the report. The report shall also document any corrective actions taken based on observations made.

The Discharger shall perform the following routine monitoring and loading calculations for

each irrigation field during all months when land application occurs, and shall present the data in the Monthly and Annual Monitoring Reports. If irrigation does not occur during a reporting period, the monitoring report shall so indicate.

Parameter/Constituent	Units	Type of Sample	Sampling Frequency	Reporting Frequency
Precipitation	0.1 in	Rain gauge ¹	Daily	Monthly
Hydraulic loading rate (from each source)	in	Calculated ²	Daily	Monthly, Annually
Wastewater BOD ₅ loading rate as an irrigation cycle average	lb/ac/week	Calculated ^{3,4}	Daily	Monthly, Annually
Total nitrogen loading rate (including wastewater and applied biosolids and commercial fertilizers)	lb/ac/week	Calculated ^{3,5}	Daily	Monthly, Annually

¹ Data obtained from the nearest National Weather Service, California Irrigation Management Information System (CIMIS), or on-site rain gauge is acceptable.

² Rate shall be calculated for each irrigation field. Volumes can be estimated based on the daily flow rates for each field. Calculations and assumptions shall be clearly documented.

³ Rate shall be calculated for each irrigation field.

⁴ BOD₅ shall be calculated using the daily applied volume of wastewater, actual application area, the most recent wastewater effluent BOD₅ result, and the number of days per irrigation cycle.

⁵ Total nitrogen loading rates shall be calculated using the daily applied volume of wastewater, actual application area, the most recent wastewater effluent total nitrogen result, and the number of days per irrigation cycle. Loading rates for applied biosolids and commercial fertilizers shall be calculated using the actual load and application area.

At least once per week when wastewater is being applied to the land application areas, the application areas in use shall be inspected to identify any equipment malfunction or other circumstance that might allow wastewater or irrigation runoff to leave each irrigation field and/or create conditions that violate the Waste Discharge Requirements. A log of these inspections shall be kept at the facility and summarized for submittal with the monthly monitoring reports.

SOIL PROFILE MONITORING

A minimum of eight representative locations shall be established for soil profile monitoring of the fields where effluent and biosolids are applied.

Constituent	Units	Soil Profile Depth ¹	Sampling and Reporting Frequency ²
pH	Std.	4 feet	Annually
Total nitrogen	mg/L	4 feet	Annually
Electrical conductivity	µmhos/cm	4 feet	Annually
Cation exchange capacity	meq/100g	4 feet	Annually

Constituent	Units	Soil Profile Depth ¹	Sampling and Reporting Frequency ²
Title 22 metals ³	µg/L	4 feet	Annually

¹ Soil shall be collected at 1-foot increments.

² Each location shall be sampled during the month of August.

³ Arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, selenium, zinc.

GROUNDWATER MONITORING

Prior to sampling, depth to groundwater measurements shall be measured in each monitoring well to the nearest 0.01 feet. Groundwater elevations shall then be calculated to determine groundwater gradient and flow direction.

Low or no-purge sampling methods are acceptable, if described in an approved sampling and analysis plan. Groundwater monitoring for all monitoring wells shall include, at a minimum, the following:

Constituent	Units	Type of Sample	Sampling Frequency	Reporting Frequency
Depth to groundwater	0.01 feet	Measurement	Quarterly	Quarterly
Groundwater elevation ¹	feet	Calculated	Quarterly	Quarterly
Gradient magnitude	feet/feet	Calculated	Quarterly	Quarterly
Gradient direction	degrees	Calculated	Quarterly	Quarterly
Total coliform organisms	MPN/100 mL	Grab	Quarterly	Quarterly
pH	pH units	Grab	Quarterly	Quarterly
Electrical conductivity	µmhos/cm	Grab	Quarterly	Quarterly
TDS	mg/L	Grab	Quarterly	Quarterly
Sodium	mg/L	Grab	Quarterly	Quarterly
Chloride	mg/L	Grab	Quarterly	Quarterly
Nitrate nitrogen	mg/L	Grab	Quarterly	Quarterly
Iron	mg/L	Grab	Quarterly	Quarterly
Manganese	mg/L	Grab	Quarterly	Quarterly
Title 22 metals ²	µg/L	Grab	Annually	Annually

¹ Groundwater elevation shall be determined based on depth-to-water measurements using a surveyed measuring point elevation on the well and surveyed reference elevation.

² Arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, selenium, zinc.

WATER SUPPLY MONITORING

A sampling station shall be established where a representative sample of the municipal water supply can be obtained. Water supply monitoring shall include at least the following for each water source used during the previous year. As an alternative to annual water supply monitoring, the Discharger may submit results of the most current Department of Public Health Consumer Confidence Report.

<u>Constituent</u>	<u>Units</u>	<u>Sampling and Reporting Frequency</u>
Total dissolved solids	mg/L	Annually
Electrical conductivity	µmhos/cm	Annually
pH	Std.	Annually
Standard minerals ¹	mg/L	Annually

¹ Standard Minerals shall include, at a minimum, the following elements/compounds: boron, calcium, chloride, iron, magnesium, manganese, nitrogen, potassium, sodium, sulfate, total alkalinity (including alkalinity series), and hardness.

REPORTING

In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, sample type (e.g., influent, effluent, pond, etc.), and reported analytical result for each sample are readily discernible. The data shall be summarized in such a manner to clearly illustrate compliance with waste discharge requirements and spatial or temporal trends, as applicable. The results of any monitoring done more frequently than required at the locations specified in the Monitoring and Reporting Program shall be reported in the next scheduled monitoring report.

As required by the California Business and Professions Code Sections 6735, 7835, and 7835.1, all Groundwater Monitoring Reports shall be prepared under the direct supervision of a Registered Engineer or Geologist and signed by the registered professional.

A. Monthly Monitoring Reports

Monthly reports shall be submitted to the Regional Board by the **1st day of the second month** following the end of the reporting period (i.e. the January monthly report is due by 1 March). At a minimum, the reports shall include:

1. Tabulated results of influent, pond, effluent, and land application area monitoring.
2. Cumulative total effluent flow to the land application area from 1 January to date.
3. A site plan depicting the irrigation fields that were used during the month.
4. Tabulated cropping information for each irrigation field that includes at least:
 - a. The crop that will be grown in each field;
 - b. Planned and actual planting dates;
 - c. Planned and actual harvest dates;

- d. Typical maximum expected and actual yield at harvest in applicable crop units per acre;
 - e. Crop total nitrogen demand; and
 - f. Crop average evapotranspiration rate in inches.
5. Tabulated land application area monitoring data for each irrigation field. Calculations shall include weekly hydraulic loading, total nitrogen loading, and irrigation cycle average BOD loading and the cumulative monthly loading for the monitoring month. Calculations shall also include the cumulative hydraulic loading, total nitrogen loading, and irrigation cycle average BOD loading from January 1 to date from all sources. The total nitrogen loading rate shall be calculated separately for biosolids and commercial fertilizers using actual load analytical results and application areas.
 6. A summary of the daily pre-application inspection reports for the month.
 7. A comparison of the monitoring data to the discharge specifications and pond disposal limitations, and an explanation of any violation of those requirements.
 8. If requested by staff, copies of laboratory analytical report(s).
 9. A calibration log verifying calibration of all monitoring instruments and devices used to fulfill the prescribed monitoring program.

B. Quarterly Monitoring Reports

The Discharger shall establish a quarterly sampling schedule for groundwater monitoring such that samples are obtained approximately every three months. Quarterly monitoring reports shall be submitted to the Board by the 1st day of the second month after the quarter (i.e. the January-March quarter is due by May 1st) each year. The Quarterly Monitoring Reports shall include the following:

1. Tabulated results of groundwater monitoring;
2. A narrative description of all preparatory, monitoring, sampling, and analytical testing activities for the groundwater monitoring. The narrative shall be sufficiently detailed to verify compliance with the WDR, this MRP, and the Standard Provisions and Reporting Requirements. The narrative shall be supported by field logs for each well documenting depth to groundwater; parameters measured before, during, and after purging; method of purging; calculation of casing volume; and total volume of water purged;
3. For each monitoring event:
 - a. Calculation of groundwater elevations, determination of groundwater flow direction and gradient on the date of measurement, comparison of previous flow direction and gradient data, and discussion of seasonal trends if any; and
 - b. A narrative discussion of the analytical results for all groundwater locations monitored including spatial and temporal trends, with reference to summary data tables, graphs, and appended analytical reports (as applicable).
4. A comparison of the monitoring data to the groundwater limitations and an explanation of

any violation of those requirements;

5. Summary data tables and graphs of historical and current water table elevations and analytical results;
6. A scaled map showing relevant structures and features of the facility, the locations of monitoring wells and any other sampling stations, and groundwater elevation contours referenced to mean sea level datum; and
7. Copies of laboratory analytical report(s) for groundwater monitoring.

C. Annual Report

An Annual Report shall be submitted to the Regional Board by **1 February** each year. The Annual Report shall include the following:

1. Tabulated results from annual monitoring of the effluent, land application area, soil profiling, groundwater, and water supply for the year;
2. Tabulated total annual influent flow, average monthly influent flows for each month of the year, and the average influent dry weather flow;
3. Tabulated total annual effluent flow and average monthly effluent flows for each month of the year;
4. A digital database (Microsoft Excel) containing historic groundwater and effluent data;
5. An evaluation of the performance of the WWTF, including discussion of capacity issues, infiltration and inflow rates, nuisance conditions, and a forecast of the flows anticipated in the next year;
6. Total hydraulic loading rate, BOD loading rate, and total nitrogen loading rate applied to each irrigation field for the calendar year with supporting data and calculations and comparison to crop evapotranspiration rate and nitrogen demand.
7. A nitrogen mass balance (from all sources) for the calendar year with supporting data and calculations for each field. Include description of the types of crops planted and dates of planting and harvest for each field. If the mass balance indicates that nitrogen has been applied in excess of the agronomic rate, include a discussion of any corrective action performed during the year and a detailed plan and schedule for additional corrective actions that will be implemented to ensure future compliance with the land application area specifications of the WDRs.
8. An evaluation of the groundwater quality beneath the site and determination of Compliance with Groundwater Limitations D.1 of the WDRs based on statistical analysis for each constituent monitored for each compliance well in accordance with the approved *Groundwater Limitations Compliance Assessment Plan*. Include all calculations and data input/analysis tables derived from use of statistical software as applicable.
9. A discussion of compliance and the corrective actions taken, as well as any planned or proposed actions needed to bring the discharge into full compliance with the waste discharge requirements;

10. A discussion of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program; and
11. A forecast of influent flows, as described in Standard Provision No. E.4;

A transmittal letter shall accompany each self-monitoring report. The letter shall include a discussion of all violations of the WDRs or this MRP during the reporting period and actions taken or planned for correcting each violation. If the Discharger has previously submitted a report describing corrective actions taken and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory. Pursuant to Section B.3 of the Standard Provisions and General Reporting Requirements, the transmittal letter shall contain a statement by the Discharger or the Discharger's authorized agent certifying under penalty of perjury that the report is true, accurate and complete to the best of the signer's knowledge.

The Discharger shall implement the above monitoring program as of the date of this Order.

Ordered by: Original signed by Andrew Altevogt for
PAMELA C. CREEDON, Executive Officer
28 August 2014
(Date)