SAN FRANCISCO BAY
REGIONAL WATER QUALITY CONTROL BOARD

MONITORING AND REPORTING PROGRAM
for
LAS GALLINAS VALLEY SANITARY DISTRICT BIOSOLIDS
MARIN COUNTY

I. MONITORING AND REPORTING PROGRAM OVERVIEW

This Monitoring and Reporting Program (Monitoring Program) describes requirements for monitoring biosolids and biosolids disposal and land application areas for Las Gallinas Valley Sanitary District (Discharger).

The Discharger is enrolled under General Waste Discharge Requirements for the Discharge of Biosolids to Land for Use as a Soil Amendment in Agricultural, Silvicultural, Horticultural, and Land Reclamation Activities, Order 2004-0012-DWQ (General Order) via a Notice of Applicability (NOA) letter. The enrollment conditionally authorizes the land application of biosolids, generated from the Discharger's wastewater treatment plant at 300 Smith Ranch Road, San Rafael, in Marin County (Facility), to agricultural areas on District property. The Discharger is responsible for compliance with the monitoring and reporting requirements specified in this Monitoring Program.

Monitoring and reporting responsibilities of waste dischargers are specified in California Water Code (Water Code) sections 13267(b), 13268, and 13383, which authorize the San Francisco Bay Regional Water Quality Control Board (Water Board) to establish monitoring, inspection, entry, reporting, and recordkeeping requirements. This Monitoring Program is issued pursuant to Water Code sections 13383 and 13267.

The monitoring reports are necessary to document the Discharger's compliance with biosolids management requirements including Title 40 of the Code of Federal Regulations (CFR), Part 503, the General Order, and the NOA, and the burden imposed in their preparation bears a reasonable relationship to the need for the reports and the benefits to be obtained from them. More specifically, the monitoring data are needed to evaluate biosolids disposal and land application practices to assure protection of public health and the environment. Mismanagement of biosolids could expose people to pathogens or other harmful constituents and could adversely affect beneficial uses of underlying groundwater, adjacent tidal wetlands, and adjacent surface waters including the San Pablo Bay. The biosolids disposal and land application locations are adjacent to the San Pablo Bay to the east and are separated from tidal action by constructed levees along the east and south boundaries.

Pursuant to Water Code sections 13383 and 13267, the Discharger shall implement this Monitoring Program and submit the monitoring reports described herein.

II. MONITORING AND REPORTING PROGRAM CHANGES

1. The Water Board Executive Officer may authorize changes to the monitoring and reporting practices specified in this Monitoring Program, in consideration of acceptable alternate means of monitoring, and the total inventory of monitoring data. Factors to be considered include the following: data quality, adequate characterization, compliance with requirements, and acceptable means for providing equivalent and adequate monitoring.
2. Requests for changes to monitoring frequencies, parameters, or reporting practices must be submitted to the Regional Water Board in writing, with an evaluation of accumulated data, complete description of proposed changes, and alternate means of monitoring.
3. The Discharger shall not implement changes to authorized monitoring and reporting practices until applicable changes are authorized in writing by the Executive Officer.

III. QUALITY ASSURANCE AND CONTROL

1. All samples shall be representative of the volume and nature of the discharge or matrix of material sampled. The Discharger shall use clean sample containers and sample handling, storage, and preservation methods in accordance with approved U.S. EPA analytical methods or as recommended by the selected analytical laboratory. All analytical samples shall be labeled and records maintained to show the name of the sampler, date, time, sample location, sample type, collection method, bottle type, and any preservative used for each sample. All samples collected for laboratory analyses shall be preserved as required and submitted to the laboratory within the required holding time appropriate for the analytical method used and the constituents analyzed.
2. All samples submitted to a laboratory for analysis shall be identified in a properly completed and signed chain of custody form containing the sampler, date, time, sample location, sample type, collection method, bottle type, and any preservative used for each sample. The chain of custody form shall also contain custody information, including the date, time, transport method, and to whom samples were relinquished.
3. Consistent with Water Code section 13176, data produced and reports submitted for compliance with the General Order must be generated by a laboratory with accreditation from the State Water Board, Division of Drinking Water, Environmental Laboratory Accreditation Program (ELAP), where accreditation is specific to the analyses required, or the laboratory must hold a valid certificate of accreditation for equivalent analytical test methods validated for the intended uses and approved by the State Water Board or regional water board. The laboratory must include quality assurance/quality control data in all data reports and submit electronic data as required by the State Water Board and regional water boards. Where technically feasible, laboratory reporting limits shall be lower than concentrations that implement applicable water quality objectives or limits for the constituents to be analyzed.

4. Monitoring must be conducted according to test procedures approved under 40 CFR part 136 for the analyses of pollutants unless another method is required under 40 CFR chapter 1, subchapter N. Monitoring must be conducted according to sufficiently sensitive test methods approved under 40 CFR part 136 for the analysis of pollutants or pollutant parameters or as required under 40 CFR chapter 1, subchapter N. For the purposes of this paragraph, a method is sufficiently sensitive when:

    a. The method minimum level (ML) is at or below the level of the most stringent effluent limitation established in the permit for the measured pollutant or pollutant parameter, and either the method ML is at or below the level of the most stringent applicable water quality criterion for the measured pollutant or pollutant parameter or the method ML is above the applicable water quality criterion but the amount of the pollutant or pollutant parameter in the facility's discharge is high enough that the method detects and quantifies the level of the pollutant or pollutant parameter in the discharge; or

    b. The method has the lowest ML of the analytical methods approved under 40 CFR part 136 or required under 40 CFR chapter 1, subchapter N, for the measured pollutant or pollutant parameter.

    In the case of pollutants or pollutant parameters for which there are no approved methods under 40 CFR part 136 or otherwise required under 40 CFR chapter 1, subchapter N, monitoring must be conducted according to an appropriate test procedure for such pollutants or pollutant parameters. (40 CFR parts 122.21(e)(3), 122.41(j)(4), 122.44(i)(1)(iv).)

5. Data generated using field tests are exempt pursuant to California Water Code Section 13176. Field instruments may be used to test field parameters (such as for pH, electrical conductivity, and dissolved oxygen) provided that the operator is trained in the proper use of the instrument and each instrument is serviced and/or calibrated at the recommended frequency by the manufacturer and in accordance with manufacturer instructions. Field calibration reports shall be maintained for at least 3 years.

6. All sample and analysis field logs, laboratory reports, and quality assurance/quality control data shall be reported with the sample results to which it applies. The reports shall include applicable information such as the method, equipment, analytical detection, quantitation limits, recovery rates, an explanation for any recovery rate that is outside method specifications, results of method blanks, results of matrix spikes and surrogate samples, and the frequency of quality control analysis. Sample results shall be reported unadjusted for blank results or spike recovery. In cases where contaminants are detected in the quality assurance/quality control samples (e.g., laboratory blanks), the accompanying sample results shall be appropriately flagged.

IV. MONITORING STATIONS

1. **Monitoring Station Definitions**. Stations to be used for sampling and observations in accordance with this Monitoring Program shall be described in each monitoring report submitted in response to this Monitoring Program. The station description shall include the matrix being monitored at that station and the location.
2. **Monitoring Station Changes**. Changes to approved monitoring stations may be authorized by the Executive Officer in order to accommodate changes in operations or to provide improved monitoring. Requests for changes to the monitoring stations must be submitted to the Water Board in writing, with a detailed explanation of the purpose of the proposed station changes. Proposed changes to monitoring stations must be approved in writing from the Executive Officer prior to implementation.
3. **Site Plan Showing All Monitoring Stations**. The Discharger shall develop a legible plan view drawing that clearly depicts the locations of all biosolids management areas, all monitoring stations, and relevant land use features such as buildings, access roads, property boundaries, and surface water drainage systems. A copy of this drawing shall be included with all reports submitted in response to this Monitoring Program.

V. MONITORING REQUIREMENTS

A. BIOSOLIDS MONITORING

The Discharger shall sample and analyze biosolids as follows. Results for chemical constituents shall be reported in milligrams per kilogram (mg/kg) on a dry-weight basis. Whenever possible and appropriate, composite sampling should be conducted (e.g., for metals).

Table 1. Biosolids Monitoring

Constituent	Units[1]	Sample Frequency
EPA Priority Pollutant List	mg/kg, µg/kg	Once every five years
Polycyclic Aromatic Hydrocarbons (PAHs)	µg/kg	Once every five years
Volatile Organic Compounds (VOCs)	µg/kg	Once every five years
Metals[2]	mg/kg	Once per year
Cyanide	mg/kg	Once per year
PCB arochlors, aldrin, dielfrin[3]	µg/kg	Once per year
Semi-volatile organics (SVOCs)[4]	µg/kg	Once per year
Total nitrogen	mg/kg	Once per year
Ammonia nitrogen (as N)	mg/kg	Once per year

Constituent	Units[1]	Sample Frequency
Nitrate nitrogen (as N)	mg/kg	Once per year
Total phosphorous (as P)	mg/kg	Once per year
Total potassium	mg/kg	Once per year
pH	s.u.	Once per year
Salinity	mg/kg	Once per year
Total solids content	%	Once per year
Percent moisture	%	Once per year

[1] mg/kg = milligram per kilogram; µg/kg = microgram per kilogram; MPN/100 g = most probable number per 100 grams; s.u. = standard units; % = percent

[2] Metals include arsenic, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, silver, and zinc.

[3] PCB arochlors, aldrin, dielfrin: The General Order specifies SW 846 Method 8080.

[4] SVOCs: The General Order specifies EPA Method 8270.

Monitoring for additional constituents may be warranted based on the Biosolids and Site Characterization Report.

B. ROUTINE FIELD MONITORING

The Discharger shall establish and implement an inspection and application oversight program to monitor and control biosolids application rates and ensure compliance with the NOA and General Order. Each discrete application field shall be managed and monitored as follows:

1. Pre-application Oversight:
    a. Define crop to be planted.
    b. Calculated allowable loading rate based on soil nitrogen residual data from the previous fall and most recent plant available nitrogen (PAN) and moisture content data.
    c. Document communication of allowable loading rates to spreader operator.
2. Pre-application Inspection:
    a. Verify that setbacks are clearly delineated.
    b. Verify that runoff controls are in place and functional.
    c. Verify that culverts are blocked (where applicable).
3. Application Oversight:
    a. Verify compliance with setbacks and allowable loading rate.
    b. Verify compliance with soil incorporation requirements.

4. Post-application Oversight:
    a. Confirm with irrigation manager requirements to control runoff for the specified period after application.
    b. Calculate actual biosolids and PAN loading rates.
    c. Note anticipated dates of planting, irrigation, and harvest.

C. SOIL MONITORING

The Discharger shall establish an annual soil sampling program as follows: two background sampling locations outside of the land application areas (e.g., within application setback areas) and, at least six sampling locations within each discrete land application area identified in the NOA. Sampling locations shall be distributed to be representative of each subarea and predominant soil type.

Soil samples shall be collected from each sampling location at the following depths intervals: 0 to 3 inches, 4 to 12 inches, and 13-24 inches below ground surface. The top organic layer of soil must be removed prior to taking sample. Each sample shall be thoroughly mixed to create a composite sample representative of the depth interval and shall be analyzed as specified in the following table. Annual samples shall be collected in the fall (fourth quarter) and must occur at the same time each year.

Table 2. Soil Monitoring

Constituent/Parameter	Units[1]	Sample Frequency
Soil Classification (USCS and USDA)	--	Annually
Total Solids	%	Annually
Total Alkalinity[2]	mg/kg as $CaCO_3$	Annually
Cation Exchange Capacity[2]	meq/100 grams	Annually
Electrical Conductivity	mg/kg, mg/L	Annually
Chloride[3]	mg/L	Annually
pH	s.u.	Annually
Metals[2, 3, 4]	mg/kg, mg/L	Annually

[1] % = percent; mg/kg = milligrams per kilogram; $CaCO_3$ = calcium carbonate; meq/100 grams = milliequivalents per 100 grams soil; mg/L = milligrams per liter; s.u. = standard units

[2] For specified constituents, results shall be reported on a dry-weight basis; show calculations.

[3] For specified constituents, analysis shall be performed on the extract obtained from the Waste Extraction Test using distilled water as the extractant.

[4] Metals include arsenic, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, silver, and zinc.

D. GROUNDWATER MONITORING

The groundwater monitoring program applies to the groundwater monitoring wells tabulated below and any wells subsequently installed under the Water Board's direction.

Table 3. Groundwater Monitoring Well Network

Parcel	Monitoring Well
155-011-33	MW-01
155-011-33	MW-02
155-011-33	MW-03
155-011-33	MW-04
155-011-14	MW-05
155-011-14	MW-06
155-011-14	MW-07
155-011-14	MW-08
155-011-13	MW-09
155-011-13	MW-10
Dedicated Land Disposal Area	G-1
Dedicated Land Disposal Area	G-3
Dedicated Land Disposal Area	G-4
Dedicated Land Disposal Area	G-5

On July 27, 2021, the Discharger submitted a *Monitoring Well Installation Work Plan* (Work Plan) to the Water Board for review and approval. The Water Board issued comments on the Work Plan on December 15, 2021. A revised Work Plan must be approved prior to Work Plan implementation. Upon completion and development of groundwater monitoring wells installed in accordance with an approved Work Plan, the Discharger shall implement the following groundwater monitoring program for all monitoring wells. Once installed, all new wells shall be added to this Monitoring Program and all wells shall be sampled and analyzed according to the schedule below.

Prior to purging, groundwater elevations shall be measured, and the wells shall be purged of at least three well volumes until temperature, pH, and electrical conductivity have stabilized prior to sampling. Depth to groundwater shall be measured to the nearest 0.01 feet. Water table elevations shall be calculated and used to determine groundwater gradient and direction of flow. Samples shall be collected using approved EPA methods. Groundwater monitoring shall include, at a minimum, constituents specified in the table below. Groundwater elevation shall be determined on depth to

water measurements using a surveyed measuring point elevation on the well and a surveyed reference elevation.

Table 4. Groundwater Monitoring

Constituent/Parameter	Units[1]	Type of Sample	Sample Frequency[2]
Depth to groundwater	0.01 feet	Measurement	Quarterly for first year; semi-annually thereafter
Groundwater elevation	0.01 feet	Calculated	Quarterly for first year; semi-annually thereafter
Gradient magnitude	feet/feet	Calculated	Quarterly for first year; semi-annually thereafter
Gradient direction	Degrees	Calculated	Quarterly for first year; semi-annually thereafter
pH	s.u.	Grab	Quarterly for first year; semi-annually thereafter
Electrical conductivity	µmhos/cm	Grab	Quarterly for first year; semi-annually thereafter
Chloride	mg/L	Grab	Quarterly for first year; semi-annually thereafter
Nitrate as Nitrogen	mg/L-N	Grab	Quarterly for first year; semi-annually thereafter
Nitrite as Nitrogen	mg/L-N	Grab	Quarterly for first year; semi-annually thereafter
Sulfate	mg/L	Grab	Quarterly for first year; semi-annually thereafter
Metals[3]	mg/L	Grab	Quarterly for first year; semi-annually thereafter
Alkalinity	mg/L as $CaCO_3$	Grab	Quarterly for first year; semi-annually thereafter
Total Dissolved Solids (TDS)	mg/L	Grab	Quarterly for first year; semi-annually thereafter
Total Kjeldahl Nitrogen (TKN)	mg/L	Grab	Quarterly for first year; semi-annually thereafter
Total Phosphorous	mg/L	Grab	Quarterly for first year; semi-annually thereafter
Sulfide	mg/L	Grab	Quarterly for first year; semi-annually thereafter
Cyanide	mg/L	Grab	Quarterly for first year; semi-annually thereafter
Ammonia	mg/L	Grab	Quarterly for first year; semi-annually thereafter
Total Organic Carbon (TOC)	mg/L	Grab	Quarterly for first year; semi-annually thereafter

Constituent/Parameter	Units[1]	Type of Sample	Sample Frequency[2]
Total Nitrogen	mg/L	Calculated	Quarterly for first year; semi-annually thereafter
Fecal coliform[4]	MPN/100 mL	Grab	Quarterly for first year; semi-annually thereafter

[1] s.u. = standard units; µmhos/cm = micromhos per centimeter; mg/L = milligrams per liter; $CaCO_3$ = calcium carbonate

[2] Semi-annual samples should be collected at the end of the dry and wet seasons.

[3] Metals include arsenic, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, silver, and zinc.

[4] Fecal coliform reported as most probable number of colony-forming units per 100 milliliters

VI. REPORTING REQUIREMENTS

All monitoring reports should be converted to a searchable Portable Document Format (PDF) and submittal electronically. All electronic files shall be submitted via the Water Board's centralized WDR monitoring report email address: WDR.Monitoring@waterboards.ca.gov.

A transmittal letter shall accompany each monitoring report. The letter shall include a discussion of all violations during the reporting period and actions taken or planned for correction of 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. 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.

In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, sample type (e.g., biosolids, soil, ground water monitoring, 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 this Monitoring Program shall be reported in the next scheduled monitoring report.

Laboratory analysis reports need to be included in the monitoring reports; all laboratory reports must be retained for a minimum of three years. For a discharger conducting any of its own analyses, reports must also be signed and certified by the chief of the laboratory.

Monitoring information shall include the method detection limit (MDL) and the reporting limit (RL) or practical quantitation limit (PQL). If the regulatory limit for a given constituent is less than the RL (or PQL), then any analytical results of that constituent that are below the RL (or PQL) but above the MDL shall be reported and flagged as estimated.

All monitoring reports that involve planning, investigation, evaluation or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to California Business and Professions Code section 6735, 7835, and 7835.1.

A. PRE-APPLICATION REPORT

A Pre-Application Report shall be submitted for each field prior to the application of biosolids in accordance with the General Order and this Monitoring Program. A Pre-Application Report shall be submitted at least 30 days prior to the date of the proposed application. The Pre-Application Report shall be signed by the Discharger (in this case the Discharger is both the owner/operator of the biosolids application operation and the property owner).

B. ANNUAL REPORT

An Annual Report shall be prepared and submitted by February 1 each year. The Annual Report shall include the following:

1. A summary of all analytical data and verification of compliance with the biosolids monitoring requirements.
2. For each discrete application field, a chronological log of dates of biosolids application, irrigation, precipitation, and runoff control operations. Specifically, information demonstrating compliance with the routine field monitoring reuqirements.
3. For each discrete application field:
    a. Total cumulative metals loading rates as of the end of the previous calendar year;
    b. Calculation of the total metals and nitrogen loading rates for the year;
    c. The cumulative metals loading rates since biosolids land application began; and
    d. The cumulative metals loading rates to date as a percentage of the cumulative metals loading limits.
4. A report of soil monitoring, including:
    a. Sampling and analysis activities, including a scaled map of sampling locations;
    b. Tabulation of all soil analytical results;
    c. Historical time vs. concentration plots for each constituent at each sampling interval;
    d. A discussion of any observed spatial or temporal variation; and
    e. Whether pH adjustment is needed and, if so, how and when the adjustment will be made.

5. A groundwater monitoring summary report including:
    a. Tabular and graphical summaries of all data collected during the year;
    b. An evaluation of the groundwater quality beneath the site;
    c. 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;
    d. A discussion of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program; and
    e. The results for all groundwater analyses conducted in the year.
6. A copy of calibration log page(s) verifying calibration of all hand-held monitoring instruments performed during the year.
7. For the duration of the research project *Unregulated Organic Chemicals in Biosolids: Prioritization, Fate and Risk Evaluation for Land Applications*, EPA Grant Number R840245, for which the Discharger is a participating site, the annual report shall include a status update on research project work associated with the Discharger site.

MONITORING PROGRAM CERTIFICATION

The Discharger shall implement this Monitoring and Reporting Program as of the effective date given below.

I, Thomas Mumley, Interim Executive Officer, hereby certify that this Monitoring and Reporting Program:

1. Has been developed in accordance with the procedure set forth in the Board's Resolution No. 73-16 in order to obtain data and document compliance with waste discharge requirements for the subject wastewater systems.
2. May be reviewed at any time subsequent to the effective date upon written notice from the Executive Officer or request from the Discharger, and revisions will be ordered by the Executive Officer.
3. Is effective on the following date: <effective date> .

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Thomas Mumley
Interim Executive Officer