CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM R5-xxxx-xxxx

FOR
SYNAGRO WEST, LLC AND GARY SILVA, SR
SILVA RANCH BIOSOLIDS LAND APPLICATION SITES
SACRAMENTO COUNTY

This Monitoring and Reporting Program (MRP) is issued pursuant to Water Code Section 13267. The Discharger shall not implement any changes to this MRP unless and until the Central Valley Water Board adopts, or the Executive Officer issues, a revised MRP.

All samples shall be representative of the volume and nature of the discharge or matrix of material sampled. Except as specified otherwise in this MRP, grab samples will be considered representative of water, wastewater, soil, solids/sludges, and groundwater.

The time, date, and location of each sample shall be recorded on the sample chain of custody form. All analyses shall be performed in accordance with the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements*, dated 1 March 1991 (Standard Provisions). Field test instruments (such as those used to measure pH, electrical conductivity, dissolved oxygen, wind speed, and precipitation) may be used provided that:

1. The operator is trained in proper use and maintenance of the instruments;
2. The instruments are field calibrated at the frequency recommended by the manufacturer;
3. The instruments are serviced and/or calibrated by the manufacturer at the recommended frequency; and
4. Field calibration reports are submitted as described in the “Reporting” section of the MRP.

Laboratory analytical procedures shall comply with the methods and holding times specified in the following (as applicable to the medium to be analyzed):

- *Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater* (EPA);
- *Test Methods for Evaluating Solid Waste* (EPA);
- *Methods for Chemical Analysis of Water and Wastes* (EPA);
- *Methods for Determination of Inorganic Substances in Environmental Samples* (EPA);
- *Standard Methods for the Examination of Water and Wastewater* (APHA/AWWA/WEF); and
- *Soil, Plant and Water Reference Methods for the Western Region* (WREP 125).

Approved editions shall be those that are approved for use by the United States Environmental Protection Agency or the California Department of Public Health’s Environmental Laboratory Accreditation Program (ELAP). The Discharger may propose alternative methods for approval by the Executive Officer. Where technically feasible, laboratory reporting limits shall be lower than the applicable water quality objectives for the constituents to be analyzed.

If monitoring consistently shows no significant variation in a constituent concentration or parameter after at least 8 consecutive monitoring events, the Discharger may request this MRP be revised to reduce monitoring frequency. The proposal must include adequate technical justification for reduction in monitoring frequency. The Discharger shall not implement any changes to this MRP unless and until the Central Valley Water Board adopts, or the Executive Officer issues, a revised MRP.

A glossary of terms used in this MRP is included on the last page.

BIOSOLIDS MONITORING

Biosolids from each generator shall be sampled and analyzed as follows. Generator information shall include at a minimum, facility, mailing address, facility contact person, level of pathogen treatment (Class A or Class B), and description of vector attraction reduction achievement. Small generators are those that generate and/or land apply less than 350 dry tons per year (either during a cleanout project or by continuous wasting and disposal). Large generators are all others. Results for all chemical constituents shall be reported in mg/Kg on a dry weight basis. Composite samples may be used in lieu of grab samples if all required sample holding times are met.

For Generators Using Continuous Sludge Wasting and Disposal and for Pond Cleaning Projects:

Constituents	Sample Type	Units	Small Generator	Large Generator	Reporting Frequency
Metals (total) [1]	Grab	mg/Kg	1 per 6 months	1 per 200 dry tons; minimum of 1 per month	Monthly [4]
PCB arochlors, aldrin, dieldrin [2]	Grab	mg/Kg	1 per 6 months	1 per 500 dry tons; minimum of 1 per 6 months	Monthly [4]
Semi-volatile Organic [3]	Grab	mg/Kg	1 per 6 months	1 per 500 dry tons; minimum of 1 per 6 months	Monthly [4]
Percent Moisture	Grab	mg/Kg	1 per quarter	1 per 200 dry tons; minimum of 1 per month	Monthly [4]
Total Nitrogen	Grab	mg/Kg	1 per quarter	1 per 200 dry tons; minimum of 1 per month	Monthly [4]
Ammonia Nitrogen	Grab	mg/Kg	1 per quarter	1 per 200 dry tons; minimum of 1 per month	Monthly [4]

Constituents	Sample Type	Units	Small Generator	Large Generator	Reporting Frequency
Nitrate nitrogen	Grab	mg/Kg	1 per quarter	1 per 200 dry tons; minimum of 1 per month	Monthly [4]
Total Phosphorus	Grab	mg/Kg	1 per quarter	1 per 200 dry tons; minimum of 1 per month	Monthly [4]
Total Potassium	Grab	mg/Kg	1 per quarter	1 per 200 dry tons; minimum of 1 per month	Monthly [4]
Total Solids	Grab	%	1 per quarter	1 per 200 dry tons; minimum of 1 per month	Monthly [4]
Fecal Coliform	Grab	MPN/gram	1 per quarter	1 per 200 dry tons; minimum of 1 per month	Monthly [4]

[1] Include at least the following metals: arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc.
[2] Using SW 846 Method 8080.
[3] Using EPA Method 8270.
[4] Include analytical data in the monthly monitoring report for the month in which monitoring occurred. For months in which no monitoring takes place, the Monthly Monitoring Report shall so state.

If, for a particular biosolids generator, it can be demonstrated that the biosolids material exhibits consistent chemical character over a period of at least two years, the applicable sampling schedule may be reduced by one-half upon written approval of a Biosolids Monitoring Data Summary Report. The report shall contain tabulated analytical data summaries for all biosolids monitoring data for the previous three years.

For Generators with Stockpile Disposal Projects:

Constituents	Sample Type	Unit	Number of Samples	Reporting Frequency
Metals (total) [1]	Composite	mg/Kg	1 per 200 dry tons; minimum of 1 per month	Monthly [4]
PCB arochlors, aldrin, dieldrin [2]	Composite	mg/Kg	1 per 500 dry tons; minimum of 1 per 6 months	Monthly [4]
Semi-volatile Organic [3]	Composite	mg/Kg	1 per 500 dry tons; minimum of 1 per 6 months	Monthly [4]
Percent Moisture	Composite	mg/Kg	1 per 200 dry tons; minimum of 1 per month	Monthly [4]
Total Nitrogen	Composite	mg/Kg	1 per 200 dry tons; minimum of 1 per month	Monthly [4]

Constituents	Sample Type	Unit	Number of Samples	Reporting Frequency
Ammonia Nitrogen	Composite	mg/Kg	1 per 200 dry tons; minimum of 1 per month	Monthly [4]
Nitrate nitrogen	Composite	mg/Kg	1 per 200 tons; minimum of 1 per month	Monthly [4]
Total Phosphorus	Composite	mg/Kg	1 per 200 tons; minimum of 1 per month	Monthly [4]
Total Potassium	Composite	mg/Kg	1 per 200 tons; minimum of 1 per month	Monthly [4]
Total Solids	Grab	%	1 per quarter	1 per 200 dry tons; minimum of 1 per month
Fecal Coliform	Grab	MPN/gram	1 per quarter	1 per 200 dry tons; minimum of 1 per month

[1] Include at least the following metals: arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, selenium, and zinc.
[2] Using SW 846 Method 8080.
[3] Using EPA Method 8270.
[4] Include analytical data in the monthly monitoring report for the month in which monitoring occurred. For months in which no monitoring takes place, the Monthly Monitoring Report shall so state.

The analytical data shall be presented in the monthly monitoring report(s) for the month(s) in which application of the biosolids occurs. For months in which no application takes place, the Monthly Monitoring Report shall so state.

ROUTINE FIELD MONITORING

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

1. Pre-application Oversight:
   a. Identify generator(s) whose biosolids are to be applied.
   b. Define crop to be planted.
   c. Calculate allowable loading rate based on soil nitrogen residual data from the previous fall and most recent plant available nitrogen (PAN) and moisture content data for the generator(s)' biosolids.
   d. 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.

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 WDRs that has received biosolids in the last 12 calendar months. 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 depth intervals: 0 to 1 foot, 2 to 3 feet, and 5 to 6 feet below the ground surface. Each 12-inch sample shall be thoroughly mixed to create a composite sample representative of the depth interval, and shall be analyzed as follows:

Constituents	**Units**	**Sampling Frequency** [3]	**Reporting Frequency**
Soil Classification (USCS and USDA)	---	Annually	Annually
pH	Std Units	Annually	Annually
Total Solids [1]	% total weight	Annually	Annually
Total Alkalinity [1]	mg/Kg as CaCO3	Annually	Annually
Cation Exchange Capacity [1]	meq/100 grams	Annually	Annually
Electrical Conductivity	µmhos/cm	Annually	Annually
Chloride [2]	mg/L	Annually	Annually
Iron [2]	mg/L	Annually	Annually
Manganese [2]	mg/L	Annually	Annually

[1] To be reported on a dry weight basis; show calculations.
[2] Analysis shall be performed on the extract obtained from the Waste Extraction Test using distilled water as the extractant.
[3] Samples shall be collected in the fall (fourth quarter). Sampling must occur at the same time each year.

STORM WATER MONITORING

Storm water samples shall be obtained from each of the storm water retention ponds defined in the Waste Discharge Requirements (WDRs) when water is present. Grab samples will be considered representative. Storm water monitoring shall include, at a minimum, the following:

Constituent	Units	Type of Sample	Sampling Frequency	Reporting Frequency
pH	Std.	Grab	Monthly	Monthly
Total Dissolved Solids	mg/L	Grab	Monthly	Monthly
Nitrate Nitrogen	mg/L	Grab	Monthly	Monthly
Ammonia Nitrogen	mg/L	Grab	Monthly	Monthly
Standard Minerals [1]	mg/L	Grab	Monthly	Monthly
Metals [2]	mg/L	Grab	Monthly	Monthly

[1] Standard Minerals shall include, at a minimum, the following: chloride, iron, manganese, and sodium.
[2] Metals shall include cadmium, copper, lead, nickel, and zinc.

SURFACE WATER MONITORING

Surface water samples shall be obtained from Browns Creek, Hadselville Creek, and Laguna Creek that are representative of surface water quality upstream and downstream of the biosolids application site. A representative upstream sample shall be taken at a point immediately upstream from the biosolids application site and not influenced by storm water runoff from the fields on which biosolids has been applied. A representative downstream sample shall be taken at a point downstream of the biosolids application. Surface water samples shall be collected anytime during the wet weather months (1 October through 31 March) when flowing water is present in the creeks. If no water is present, then the Annual Report shall so state. Surface Water monitoring shall include, at a minimum, the following:

Constituent	Units	Type of Sample	Sampling Frequency	Reporting Frequency
pH	Std.	Grab	Annual	Annual
Total Dissolved Solids	mg/L	Grab	Annual	Annual
Nitrate Nitrogen	mg/L	Grab	Annual	Annual
Ammonia	mg/L	Grab	Annual	Annual

Constituent	Units	Type of Sample	Sampling Frequency	Reporting Frequency
Nitrogen				
Standard Minerals [1]	mg/L	Grab	Annual	Annual
Metals [2]	mg/L	Grab	Annual	Annual

[1] Standard Minerals shall include, at a minimum, the following: chloride, iron, manganese, and sodium.
[2] Metals shall include cadmium, copper, lead, nickel, and zinc.

The analytical data and a map identifying the sample locations shall be presented in the Annual Report.

REPORTING

All regulatory documents, submissions, materials, data, monitoring reports, and correspondence should be converted to a searchable Portable Document Format (PDF) and submitted electronically. Documents that are less than 50MB should be emailed to:

centralvalleysacramento@waterboards.ca.gov

Documents that are 50 MB or larger should be transferred to a CD, DVD, or flash drive and mailed to the following address:

Central Valley Regional Water Quality Control Board
ECM Mailroom
11020 Sun Center Drive, Suite 200
Rancho Cordova, California 95670

To ensure that your submittals are routed to the appropriate staff, the following information block should be included in any correspondence used to transmit documents to this office:

Silva Ranch Biosolids Land Application, Sacramento County		
Program: Non-15 Compliance	Order: R5- XXXX -XXXX	CIWQS Place ID: xxxxxxxx

In reporting monitoring data, the Discharger shall arrange the data in tabular form using the format provided in the example tables, which are part of this MRP, or in another approved format so that the date, sample type (e.g., biosolids, soil, 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 and stamped by the registered professional.

A. Monthly Monitoring Reports

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

1. A scaled site map depicting each discrete field, property boundaries, roads, on-site structures, surface water bodies, drainage features, and runoff controls (as applicable);

2. The results of biosolids monitoring for each generator whose waste were applied to land during the month. Specifically, tabulated data for each generator shall be provided using the attached Biosolids Monitoring Results form (or approved revision thereof). Laboratory analytical reports need not be included, but must be provided upon request;

3. The results of routine field monitoring. Specifically, tabulated information for each discrete application field used during the month shall be provided using the attached Field Monitoring Results form (or approved revision thereof);

4. For each biosolids generator and discrete application field, a comparison of monitoring data to the discharge specifications and an explanation of any violation of those requirements;

5. If no biosolids were applied during the month, a letter report certifying that fact; and

6. The results of storm water monitoring.

B. Annual Report

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

1. The monthly monitoring report for the last month of the calendar year.

2. For each biosolids generator, a summary of all analytical data and verification of compliance with the biosolids monitoring requirements. Include all Biosolids Monitoring Results forms.

3. For each discrete application field, a chronological log of dates of biosolids application, irrigation, precipitation, and runoff control operations. Specifically, tabulated information for each discrete application field shall be provided using the attached Field Activities Summary form (or approved revision thereof).

4. 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.

5. 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.

6. A storm water monitoring summary report including:

    a. The contents of the regular storm water monitoring report for the last sampling event of the year;
    b. Tabular summaries of all data collected during the year; and
    c. Dates when storm water runoff was released to surface waters and/or used for irrigation, and the volume discharged on each day.

7. A surface water monitoring summary report including:

    a. Tabular summaries of all data collected during the year;
    b. A map showing the location of the surface water sampling stations; and
    c. A comparison of the upstream data to the downstream data and discussion on whether storm water runoff from the fields where biosolids has been applied has impacted surface water quality of the creek.

8. 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.

9. A discussion of any data gaps and potential deficiencies or redundancies in the monitoring system or reporting program.

A letter transmitting the self-monitoring reports shall accompany each report. The letter shall clearly indicate the Discharger's name, facility or site name, county, monitoring period, and type of report (i.e., monthly, quarterly, or annual). The letter shall include a discussion of any requirement violations during the reporting period and actions taken or planned for correcting noted violations, such as operation or facility modifications. If the discharger has previously submitted a report describing corrective actions and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory. Pursuant to the Standard Provisions and Reporting Requirements, the transmittal letter shall contain a statement by the Discharger or the discharger's authorized agent, under penalty of perjury, that to the best of the signer's knowledge, the report is true, accurate, and complete.

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

Ordered by: _____
PAMELA C. CREEDON, Executive Officer

_____
(Date)

LLA: 121117

GLOSSARY

BOD_5	Five-day biochemical oxygen demand
CaCO3	Calcium carbonate
DO	Dissolved oxygen
EC	Electrical conductivity at 25° C
FDS	Fixed dissolved solids
NTU	Nephelometric turbidity unit
TKN	Total Kjeldahl nitrogen
TDS	Total dissolved solids
TSS	Total suspended solids
Continuous	The specified parameter shall be measured by a meter continuously.
24-hr Composite	Samples shall be a flow-proportioned composite consisting of at least eight aliquots over a 24-hour period.
Daily	Every day except weekends or holidays.
Twice Weekly	Twice per week on non-consecutive days.
Weekly	Once per week.
Twice Monthly	Twice per month during non-consecutive weeks.
Monthly	Once per calendar month.
Bimonthly	Once every two calendar months (i.e., six times per year) during non-consecutive months.
Quarterly	Once per calendar quarter.
Semiannually	Once every six calendar months (i.e., two times per year) during non-consecutive quarters.
Annually	Once per year.
mg/L	Milligrams per liter
mL/L	Milliliters [of solids] per liter
µg/L	Micrograms per liter
µmhos/cm	Micromhos per centimeter
gpd	Gallons per day
mgd	Million gallons per day
MPN/100 mL	Most probable number [of organisms] per 100 milliliters
MTF	Multiple tube fermentation

BIOSOLIDS MONITORING RESULTS

Generator Information

Owner Name _____

Facility Name _____

RWQCB Region _____

County _____

NPDES Permit No. _____

WDRs Order No. _____

Project Information

Project Type _____ Pond cleanout _____ Continuous wasting/drying
_____ Drying bed cleanout _____ Stockpile Disposal

Estimated Project Duration _____ to _____

Estimated Total Mass [4] _____ dry tons this calendar year

Required EPA Certification Frequency _____

Stabilization Method _____

Pathogen Reduction Method [8] _____

Vector Attraction Reduction Option [9] _____

Sampling Information

[1] Lab Sample ID						
[2] Sampler's Sample ID						
[3] Sampler						
Sample Date						
Analysis Date						

Analytical Result	**Wet Basis**	**Dry Basis**	**Wet Basis**	**Dry Basis**	**Wet Basis**	**Dry Basis**	**Wet Basis**	**Dry Basis**	**Wet Basis**	**Dry Basis**	**Wet Basis**	**Dry Basis**
Fecal coliform, MPN/g												
Total solids, percent												
Total nitrogen, mg/Kg												
Ammonia nitrogen, mg/Kg												
Nitrate nitrogen, mg/Kg												
Total phosphorus, mg/Kg												
Total potassium, mg/Kg												

Nitrogen Loading Rate

[5] Mineralization rate, percent												
[6] Volatilization factor, percent												
[7] Units conversion factor												
PAN, lbs/ton												

Footnotes

[1] Sample ID assigned by the analytical laboratory.

[2] Sample ID from chain of custody form.

[3] Specify whether sampling was performed by Synagro or generator/generator's contractor.

[4] Estimated mass to be land applied at this site.

[5] Equals 20% for aerobically digested; 30 % for aerobically digested; 25 % for aerobically/anaerobically digested; 40% for lime-stabilized.

[6] Equals 50% for surface application; 100% for subsurface injection.

[7] Equals 0.002 lbs/ton per mg/Kg.

[8] Specify in detail. For example: "Class B - anaerobic digestion for ___ to ___ days at ___ to ___ degrees F (range for past month)".

[9] Specify in detail. For example: "Option 1 - volatile solids reduction greater than 38%; VS in = ___, VS out = ___".

OWNER NAME _____
FACILITY NAME _____

Sampling Information

[1] Lab Sample ID			
[2] Sampler's Sample ID			
[3] Sampler			
Sample Date			
Analysis Date			

Metals Analyses

	Wet Basis	Dry Basis	Wet Basis	Dry Basis	Wet Basis	Dry Basis
Arsenic, mg/Kg						
Cadmium, mg/Kg						
Copper, mg/Kg						
Lead, mg/Kg						
Mercury, mg/Kg						
Molybdenum, mg/Kg						
Nickel, mg/Kg						
Selenium, mg/Kg						
Zinc, mg/Kg						
Semi-volatile organic compounds, detections only (mg/Kg)						
PCBs/aldrin/dieldrin, detections only (mg/Kg)						

Regulatory Limits				
40 CFR 503 (dry wt. basis)		22 CCR (wet wt. basis)		
mg/Kg	mg/Kg	mg/L	mg/L	mg/Kg
Table 1	Table 3	STLC	10 x STLC	TTLC
75	41	5	50	500
85	39	1	10	100
4,300	1,500	25	250	2,500
840	300	5	50	1,000
57	17	0.2	2.0	20
75		350	3,500	3,500
420	420	20	200	2,000
100	36	1	10	100
7,500	2,800	250	2,500	5,000

MONTHLY FIELD MONITORING RESULTS

Month _____ **Year** _____

Field Information

Field ID No.				
Gross Acreage				
Net Acreage				
Crop				
Anticipated Planting Date				
Anticipated Harvest Date				
Anticipated Irrigation Date(s)				
Next Allowable Runoff Date				

Source Information

Source ID Code	Owner Name	Facility Name

Biosolids Application Information (tonnage per field)

Day of Month	Source ID	Wet Wt.	Dry Wt.	Wet Wt.	Dry Wt.	Wet Wt.	Dry Wt.	Wet Wt.	Dry Wt.
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
Total Application (tons)									
Application Rate (tn/ac)									
PAN Application (lb)									
PAN Rate (lb/ac)									
Phosphorus Rate (lb)									
Phosphorus Rate (lb/ac)									
Potassium Rate (lb)									
Potassium Rate (lb/ac)									

ANNUAL FIELD ACTIVITIES SUMMARY

Year _____ **Field ID Number** _____

Gross Acreage _____
Net Acreage _____
Crop _____
Actual Planting Date _____
Actual Harvest Date _____

Month	Date	Biosolids Applied wet tn	Biosolids Applied dry tn	PAN Applied tn/ac	P Applied tn/ac	K Applied tn/ac	Irrigation gallons	Irrigation inches	Precipitation inches	Runoff Control Status
Totals										