

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

REVISED MONITORING AND REPORTING PROGRAM NO. R5-2011-0022
FOR
STANISLAUS COUNTY DEPARTMENT OF ENVIRONMENTAL RESOURCES
GEER ROAD CLASS III LANDFILL
POST-CLOSURE MAINTENANCE AND CORRECTIVE ACTION
STANISLAUS COUNTY

The Discharger shall comply with this Monitoring and Reporting Program, with Title 27, California Code of Regulations, Section 20005, et seq. (hereafter Title 27), and with the Standard Provisions and Reporting Requirements for Waste Discharge Requirements for Nonhazardous Solid Waste Discharges Regulated by Title 27 and/or Subtitle D (27 CCR §20005 et seq. and 40 CFR 258), dated April 2000, as ordered by Waste Discharge Requirements Order No. R5-2009-0051.

A. REQUIRED MONITORING REPORTS

<u>Monitored Medium/System</u>	<u>Parameters and Frequencies</u>
1. Groundwater Monitoring (Section D.1)	See Table I
2. Annual Monitoring Summary Report	Annually (Section E.5.)
3. Landfill Gas Monitoring (Section D.2)	See Table II
4. Leachate Monitoring (Section D.3)	See Table III
5. Surface Water Monitoring (Section D.4)	See Table IV
6. Facility Monitoring (Section D.5)	Per Section D.5
7. Response to a Release	Per Standard Provisions and Reporting Requirements

B. REPORTING

The Discharger shall submit semiannual monitoring reports with the data and information as required in this Monitoring and Reporting Program and as required in WDRs Order No. R5-2009-0051 and the Standard Provisions and Reporting Requirements. Reports that do not comply with the required format will be **REJECTED** and the Discharger shall be deemed to be in noncompliance with the waste discharge requirements. In reporting the monitoring data required by this program, the Discharger shall arrange the data in tabular form so that the date, the constituents, the concentrations, and the units are readily discernible. The data shall be summarized in such a manner so as to illustrate clearly the compliance with waste discharge requirements or the lack thereof. Data shall also be submitted in a digital format acceptable to the Executive Officer.

Each monitoring report shall include a compliance evaluation summary as specified in Section E. Reporting Requirements below.

Field and laboratory tests shall be reported in each monitoring report. Monthly, quarterly, semiannual, and annual monitoring reports shall be submitted to the Regional Water Board in accordance with the following schedule for the calendar period in which samples were taken or observations made.

<u>Sampling Frequency</u>	<u>Reporting Frequency</u>	<u>Reporting Periods End</u>	<u>Report Date Due</u>
Monthly	Semiannually	Last Day of Month	31 July 31 January
Quarterly	Semiannually	31 March } 30 June }	31 July
		30 September } 31 December }	31 January
Semiannually	Semiannually	30 June 31 December	31 July 31 January
		Annually	Annually
Every 5 Years	Every 5 years	31 December	31 January

The Discharger shall submit an Annual Monitoring Summary Report to the Regional Water Board covering the previous monitoring year. The annual report shall contain the information specified in E. Reporting Requirements, below, and a discussion of compliance with the waste discharge requirements and the Water Quality Protection Standard.

The Discharger shall monitor all Constituents of Concern (COCs) for all Monitoring Points for each monitored medium every fifth year (5-year sampling frequency). The last COC monitoring event occurred in May 2007. Subsequent COC monitoring efforts shall be carried out every fifth year thereafter beginning in **2012**, and reporting of five-year COCs will next be due on **31 January 2013**. The report for the COC monitoring shall be submitted with, or reported in, the Annual Report for that year.

The results of all monitoring conducted at the site shall be reported to the Regional Water Board in accordance with the reporting schedule above for the calendar period in which samples were taken or observations made.

C. WATER QUALITY PROTECTION STANDARD AND COMPLIANCE PERIOD

1. Water Quality Protection Standard Report

For each waste management unit (Unit), the Water Quality Protection Standard shall consist of all COCs, the concentration limit for each COC, the point of compliance, and all water quality monitoring points for each monitored medium.

The Water Quality Protection Standard for naturally occurring waste constituents consists of the COCs, the concentration limits, and the point of compliance and all monitoring points.

The Discharger submitted a water quality protection standard in the "Article 5 Technical Report" dated 13 October 1992 and Proposed Concentration Limits were submitted on 31 August 1999. Concentration limits proposed are listed in Table VII. However, the proposal was based on using MW-16S as the background well and MW-16S shows evidence of degradation due to landfill gas and inorganics. As required by Cease and Desist Order (CDO) R5-2011-0021, the Discharger shall propose new concentration limits and WQPS for the constituents listed in Table VII, utilizing MW-20S as the background well for the shallow zone.

The report shall:

- a. Identify all distinct bodies of surface and groundwater that could be affected in the event of a release from a Unit or portion of a Unit. This list shall include at least the uppermost aquifer and any permanent or ephemeral zones of perched groundwater underlying the facility.
- b. Include a map showing the monitoring points and background monitoring points for the surface water monitoring program, groundwater monitoring program, and the unsaturated zone monitoring program. The map shall include the point of compliance in accordance with §20405 of Title 27.
- c. Evaluate the perennial direction(s) of groundwater movement within the uppermost groundwater zones.

The Water Quality Protection Standard shall be certified by a California-registered civil engineer or geologist as meeting the requirements of Title 27. If subsequent sampling of the background monitoring point(s) indicates significant water quality changes due to either seasonal fluctuations or other reasons unrelated to waste management activities at the site, the Discharger may request modification of the Water Quality Protection Standard.

2. Constituents of Concern (COCs)

The COCs include all the waste constituents, their reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the Unit. The COCs for all Units at the facility are those listed in Tables I through IV for the specified monitored medium, and Table VI. The Discharger shall monitor all COCs

every five years, or more frequently as required in accordance with a Corrective Action Program.

- a. **Monitoring Parameters:** Monitoring parameters are COCs that are the waste constituents, reaction products, hazardous constituents, and physical parameters that provide a reliable indication of a release from a Unit. The monitoring parameters for all Units are those listed in Tables I through IV for the specified monitored medium.

3. Concentration Limits

For a naturally occurring COC, the concentration limit for each COC shall be determined as follows:

- a. By calculation in accordance with a statistical method pursuant to §20415 of Title 27(e)(8); or
- b. By an alternate statistical method meeting the requirements of §20415(e)(8)(E) of Title 27.

Concentration limits for groundwater proposed by the Discharger in 1999 are listed in Table VII. Currently, background groundwater monitoring well MW 16S is impacted with sporadic low-level detections of VOCs. Therefore, the well is not currently representative of background conditions. Monitoring well MW-20S is directly north of the landfill and is outside the impacts associated with landfill gas, and is more representative of background water quality. Current concentration limits for the landfill are listed in Table VII. CDO R5-2011-0021 requires that the Discharger calculate updated concentration limits.

4. Point of Compliance

The point of compliance for the water standard at each Unit is a vertical surface located at the hydraulically downgradient limit of the Unit that extends through the uppermost aquifer underlying the Unit.

5. Monitoring Points

Surface Water:

- a. At the point of discharge from the sedimentation basin; and
- b. Within the Tuolumne River: at specific sampling locations identified in the Tuolumne River Surface Water Sampling and Analysis Plan (SAP). At a minimum, two sampling locations shall be established in the vicinity of MW-23. Samples shall be taken from quiet water which is not in the main body of the river (e.g., a side pool or eddy).

Groundwater:

At groundwater monitoring wells whose classification and monitoring frequency are specified in the following table.

<u>Well Type</u>	<u>Group I Wells: Quarterly Sampling Frequency</u>	<u>Group II Wells: Semiannual Sampling Frequency</u>
Background	N/A	MW-20S
Detection Monitoring (shallow zone)	N/A	MW-7S, MW-10S, MW-12S, MW-13S, MW-16S, MW-18S, MW-19S, MW-21S, MW-22S, MW-14S (after replacement)
Detection Monitoring (deep zone)		MW-7D, MW-18D, MW-19D, MW-21D, MW-22D
Point of Compliance (shallow zone)	MW-2S, MW-3S, MW-4S, MW-5S, MW-8S, MW-9S	MW-1S, MW-11S, MW-17S
Point of Compliance (deep zone)	MW-1D, MW-2D, MW-3D, MW-4D,	MW-17D
Corrective Action Monitoring (shallow zone)	MW-15S, MW-23S	N/A
Corrective Action Monitoring (deep zone)	MW-15D, MW-23D	N/A
Other Off-Site Monitoring	N/A	If access granted by landowner: Streeter domestic wells (2); Pinewood Meadows domestic wells (2)

Additional groundwater monitoring wells installed subsequent to adoption of this Revised MRP shall be added to Group I and sampled on a quarterly basis until adoption of revised WDRs. At that time, an assessment will be made as to whether each well will be assigned to Group I or Group II.

Landfill Gas:

At landfill gas monitoring probes and extraction wells specified in the following table. Additional landfill gas probes and wells installed subsequent to adoption of this Revised MRP shall be added to the monitoring program specified herein.

Well Identification

RW-01D	RW-01S	RW-02D
RW-02S	RW-03D	RW-03S
RW-04	RW-05D	RW-05S
RW-06D	RW-06S	RW-07
RW-08	RW-09	RW-10
RW-11D	RW-11S	RW-12D
RW-12S	RW-13	RW-14D
RW-14S	RW-15	RW-16
RW-17	RW-18	RW-19
RW-20	EW-1	EW-2
EW-3	EW-4	EW-5
EW-6	EW-7	EW-8
EW-9	EW-10	EW-11
EW-12S	EW-12D	EW-13
EW-14	EW-15	EW-16
EW-17	EW-18	EW-19
EW-20	EW-21	EW-22
EW-23	EW-24	EW-25
EW-26	EW-27	EW-28
EW-29	EW-30	EW-31
EW-32	EW-33	EW-34
EW-35	EW-36	EW-37
EW-38	EW-39	EW-40
EW-41	EW-42	EW-43
EW-44	EW-45	EW-46
EW-47	EW-48	EW-49
EW-50	EW-51	EW-52
EW-53	EW-54	EW-55
EW-56	EW-57	EW-58
EW-59	EW-60	EW-61
EW-62	EW-63	

6. Compliance Period

The compliance period for each Unit shall be the number of years equal to the active life of the Unit plus the closure period. The compliance period is the minimum period during which the Discharger shall conduct a water quality monitoring program subsequent to a release from the Unit. The compliance period shall begin anew each time the Discharger initiates an evaluation monitoring program.

D. MONITORING

The Discharger shall comply with the detection and corrective action monitoring program provisions of Title 27 for groundwater, surface water, and the unsaturated zone. All monitoring shall be conducted in accordance with a Sample Collection and Analysis Plan that is due by the date shown in section G.12.D, Provisions, of the Waste Discharge Requirements R5-2009-0051. The submitted Sample Collection and Analysis Plan must include quality assurance/quality control standards and must be submitted for review and approval, as described in the Waste Discharge Requirements R5-2009-0051.

All point of compliance monitoring wells established for the detection and corrective action monitoring programs shall constitute the monitoring points for the groundwater Water Quality Protection Standard. All detection monitoring and corrective action program groundwater monitoring wells, unsaturated zone monitoring devices, leachate, and surface water monitoring points shall be sampled and analyzed for monitoring parameters and COCs as indicated and listed in Tables I through IV.

Method detection limits and practical quantitation limits shall be reported. All peaks and trace concentrations must be reported, including those that cannot be quantified and/or specifically identified. Metals shall be analyzed in accordance with the methods listed in Table VI.

The Discharger may use alternative analytical test methods, including new USEPA approved methods, provided the methods have method detection limits equal to or lower than the analytical methods specified in this Monitoring and Reporting Program.

1. Groundwater Monitoring

The Discharger shall operate and maintain a groundwater monitoring system that complies with the applicable provisions of §20405, §20415, §20420, §20425 and §20430 of Title 27 in accordance with approved Detection, Evaluation and Corrective Action Monitoring Programs, where appropriate. The monitoring system shall be certified by a California-licensed professional civil engineer or geologist as meeting the requirements of Title 27. The Discharger shall collect, preserve, and transport groundwater samples in accordance with the approved Sample Collection and Analysis Plan.

The Discharger shall assess the groundwater flow rate and direction in the uppermost aquifer and in any zones of perched water and in any additional zone of saturation

monitored pursuant to this Monitoring and Reporting Program, and report the results semiannually, including the times of highest and lowest elevations of the water levels in the wells.

Hydrographs of each well shall be submitted showing the elevation of groundwater with respect to the elevations of the top and bottom of the screened interval and the elevation of the pump intake. Hydrographs of each well shall be prepared semiannually and submitted annually.

Groundwater samples shall be collected from the point-of-compliance wells, background wells, and any additional wells added as part of the approved groundwater monitoring system. Samples from all monitoring wells listed in Section C.5 shall be collected and analyzed for the monitoring parameters in accordance with the methods and frequency specified in Table I.

The monitoring parameters shall also be evaluated each reporting period with regards to the cation/anion balance, and the results shall be graphically presented using a Stiff diagram, a Piper graph, or a Schueller plot. Samples for the COCs specified in Table I shall be collected and analyzed in accordance with the methods listed in Table VI every five years.

2. Landfill Gas Monitoring Program

The Discharger shall operate and maintain a landfill gas monitoring system that complies with the applicable provisions of §20415, §20420 and §20430 of Title 27 in accordance with approved Detection and Corrective Action Monitoring Programs, where appropriate. The monitoring system shall be certified by a California-licensed professional civil engineer or geologist as meeting the requirements of Title 27.

Samples shall be collected from the monitoring points listed in Section C.5 and analyzed for the monitoring parameters in accordance with the methods and frequency specified in Table II. The Discharger shall collect, preserve, and transport landfill gas samples in accordance with the approved Sample Collection and Analysis Plan.

In the event of a shutdown of the landfill gas extraction system, the Discharger shall notify Board staff via e-mail, fax, or telephone within 24 hours of knowledge and shall provide weekly status updates. This requirement excludes shutdown events where the landfill gas system restarts itself or whether the system is restarted manually within 24 hours. All shutdowns, regardless of the type of restart, shall be summarized in the semiannual reports.

Landfill gas monitoring reports shall be included with the semiannual reports and shall include an evaluation of potential impacts of landfill gas on the unsaturated zone beneath and adjacent to the landfill and compliance with the Water Quality Protection Standard.

3. Leachate Monitoring Well/Leachate Seep Monitoring

Leachate which seeps to the surface from the Unit shall be sampled and analyzed for the Monitoring Parameters and COCs listed in Table III when recoverable liquid is present. The quantity of leachate shall be estimated and reported as Leachate Flow Rate (in gallons/day). Also, refer to Reporting Requirements Section E.4, which lists the reporting requirements for seepage from the landfill.

The two existing leachate monitoring wells shall also be sampled and analyzed for the Monitoring Parameters and COCs listed in Table III when recoverable liquid is present. The depth of leachate shall be measured and reported.

4. Surface Water Monitoring (Tuolumne River and Sedimentation Basin)

The Discharger shall install and operate a surface water detection monitoring system, where appropriate, that complies with the applicable provisions of §20415 and §20420 of Title 27 in accordance with an approved Detection Monitoring Program.

For all monitoring points and background monitoring points assigned to surface water detection monitoring, samples shall be collected and analyzed for the monitoring parameters in accordance with the methods and frequency specified in Table IV. The Tuolumne River surface water monitoring program shall begin in July 2011.

Only the surface water monitoring samples collected from the sediment basin discharge shall be analyzed for the COCs specified in Table IV every five years.

All monitoring parameters shall be graphed to show historical trends at each sample location.

5. Facility Monitoring

- a. Facility Inspections: Annually, prior to the anticipated rainy season, but no later than **30 September**, the Discharger shall conduct an inspection of the facility. The inspection shall assess damage to the drainage control system, groundwater monitoring equipment (including wells, etc.), and shall include the Standard Observations contained in Section E.3.f. Any necessary construction, maintenance, or repairs shall be completed by **31 October**. By **15 November** of each year, the Discharger shall submit an annual report describing the results of the inspection and the repair measures implemented, including photographs of the problem and repairs.
- b. Storm Events: The Discharger shall inspect all precipitation, diversion, and drainage facilities for damage **within 7 days** following major storm events. Necessary repairs shall be completed **within 30 days** of the inspection. The Discharger shall report any damage and subsequent repairs within 45 days of completion of the repairs, including photographs of the problem and repairs.

- c. Standard Observations: The Discharger shall conduct Standard Observations for the waste management unit, for the perimeter of the landfill module, and for the receiving waters. The standard observations shall include those elements identified in Section E.3.f and shall be performed at the required frequencies.

6. Corrective Action Monitoring

A release from the landfill has resulted in groundwater and unsaturated zone degradation. The Discharger has implemented a corrective action program that includes a groundwater extraction, treatment, and injection system (GWETS) and a landfill gas extraction (LFG) and treatment system. The corrective action monitoring program shall be implemented to demonstrate the effectiveness of the corrective action. A discussion of the effectiveness of the corrective action shall be included in the annual reports. Corrective action monitoring shall include the groundwater monitoring required above; monitoring of the influent, midpoint, and effluent of the GWETS system; the LFG probe monitoring required above; and LFG treatment system monitoring of the influent to the LFG plant required above.

The Discharger shall collect and analyze all data necessary to assess the success of corrective actions. This assessment shall include an evaluation of the spatial distribution and concentration of each COC throughout the zone affected by the release. In conjunction with the assessment the Discharger shall monitor groundwater, surface water, and the unsaturated zone to evaluate changes in water quality resulting from the corrective action. Based on the data collected the corrective action may be revised, or discontinued.

Groundwater monitoring shall be accomplished with the same parameters and schedule as specified in Table I, as described above. The Discharger shall determine at each sampling whether there is a statistically significant increase over water quality protection standards for each parameter and constituent analyzed, or a statistically significant change from the last sample round.

- a. **Groundwater Extraction and Treatment System Monitoring:** The efficiency of the GWETS shall be monitored. The GWETS plant includes prefilters to remove minerals and two granulated activated carbon (GAC) units in series to remove organics. The Discharger shall record the cumulative flow going into the system on a weekly basis. The three established sampling ports shall be monitored for concentrations of VOCs in water. Sampling port SP-13 is the influent monitoring point to the GWETS plant. Sampling port SP-14 is the midpoint between the two GAC vessels. Sampling port SP-15 is the effluent monitoring point and is located at the discharge point of the secondary GAC vessel. Sample analyses and frequency of monitoring are as follows:

<u>Sample Location</u>	<u>Analytical Methods</u>	<u>Frequency of Sampling</u>
SP-13, Influent	USEPA 8260B and TDS	Every 40 days
SP-14, Mid-point	USEPA 8260B	Every 40 days

SP-15, Effluent USEPA 8260B and TDS Every 40 days

When breakthrough of VOCs is noted at monitoring point SP-14 (the midpoint between GAC vessels) or at SP-15 (the effluent monitoring point), then the Discharger shall take immediate steps to complete the carbon vessel change-out.

The analytical results, mass of VOCs removed for the reporting period, cumulative mass of VOCs removed, volume of water treated for the reporting period, and the cumulative flow recorded in gallons shall be reported with the semi-annual/annual reports. However, whenever breakthrough occurs the Discharger shall notify the Regional Water Board within 72 hours of the discovery.

E. REPORTING REQUIREMENTS

1. The Discharger shall retain records of all monitoring information, including all calibration and maintenance records, all original strip chart recordings of continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order. Records shall be maintained throughout the life of the facility including the post-closure period.
 - a. Such legible records shall show the following for each sample:
 - b. Sample identification and the monitoring point or background monitoring point from which it was taken, along with the identity of the individual who obtained the sample;
 - c. Date, time, and manner of sampling;
 - d. Date and time that analyses were started and completed, and the name of the personnel and laboratory performing each analysis;
 - e. Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used;
 - f. Calculation of results; and
 - g. Results of analyses, and the MDL and PQL for each analysis.
2. A transmittal letter explaining the essential points shall accompany each report. At a minimum, the transmittal letter shall identify any violations found since the last report was submitted and shall identify if the violations were corrected or not. If no violations have occurred since the last submittal, then this information must be stated in the transmittal letter. The transmittal letter must provide a discussion of any violations found since the last report was submitted, must provide a description of the actions taken or planned for correcting those violations, must include any references to previously submitted time schedules, and must state if a schedule is contained in the accompanying report or not. The transmittal letter must also include the Discharger's signed certification statement.

3. Each monitoring report shall include a compliance evaluation summary. The summary shall contain at least:
 - a. For each monitoring point and background monitoring point addressed by the report, a description of:
 - 1) The time of water level measurement;
 - 2) The type of pump - or other device - used for purging and the elevation of the pump intake relative to the elevation of the screened interval;
 - 3) The method of purging (the pumping rate; the equipment and methods used to monitor field pH, temperature, and conductivity during purging; the calibration of the field equipment; results of the pH, temperature, conductivity, and turbidity testing; and the method of disposing of the purge water) to remove all portions of the water that was in the well bore while the sample was being taken;
 - 4) The type of pump - or other device - used for sampling, if different than the pump or device used for purging; and
 - 5) A statement that the sampling procedure was conducted in accordance with the approved Sampling and Analysis Plan.
 - b. A map or aerial photograph showing the locations of observation stations, monitoring points, and background monitoring points.
 - c. For each groundwater body, a description and graphical presentation of the gradient and direction of groundwater flow under/around the Unit, and the groundwater flow rate, based upon water level elevations taken prior to the collection of the water quality data submitted in the report.
 - d. Laboratory statements of results of all analyses evaluating compliance with requirements.
 - e. An evaluation of the effectiveness of the leachate monitoring and control facilities, and of the run-off/run-on control facilities.
 - f. A summary and certification of completion of all Standard Observations for the Unit(s), for the perimeter of the Unit, and for the receiving waters. Standard observations shall be conducted **monthly** during the wet season (1 October to 30 April) and **quarterly** during the dry season (1 May to 30 September). Standard The Standard Observations shall include:
 - 1) For the Unit:
 - a) Evidence of ponded water at any point on the facility (show affected area on map);
 - b) Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and
 - c) Evidence of erosion and/or of day-lighted refuse.

- d) Existence of desiccation cracks on the side slopes
- 2) Along the perimeter of the Unit:
 - a) Evidence of liquid leaving or entering the Unit, estimated size of affected area, and flow rate (show affected area on map);
 - b) Evidence of odors - presence or absence, characterization, source, and distance of travel from source; and
 - c) Evidence of erosion and/or of day-lighted refuse.
- 3) For receiving waters:
 - a) Floating and suspended materials of waste origin - presence or absence, source, and size of affected area;
 - b) Discoloration and turbidity - description of color, source, and size of affected area;
 - c) Evidence of odors - presence or absence, characterization, source, and distance of travel from source;
 - d) Evidence of water uses - presence of water-associated wildlife;
 - e) Flow rate; and
 - f) Weather conditions - wind direction and estimated velocity, total precipitation during recent days and on the day of observation.
- g. A landfill gas monitoring report that presents the following:
 - 1) A discussion of the landfill gas monitoring results;
 - 2) An evaluation of the distribution and concentration of landfill gases in the landfill waste mass and the underlying vadose zone;
 - 3) An evaluation of the effectiveness of the landfill gas extraction system; and
 - 4) For the landfill gas extraction system: a listing of the dates of shutdown, length of time shutdown, how the system was re-started, the cause of the shutdown, and steps that have been taken to prevent such a shutdown in the future.

The report shall include tabulated data for all field and monitoring parameters and, for the wells monitored for VOCs, time vs. concentration graphs showing the concentration of total VOCs in each well, as well as a separate graph for each non-methane organic compound (i.e., benzene, toluene, 1,1 dichloroethane, tetrachloroethylene, trichloroethylene, vinyl chloride, Cis 1,2 dichloroethene) detected in the landfill gas well.

- h. A discussion about the effectiveness of the Corrective Action Program including comparison of the current data with historical data, trends, and the status of the GWETS, including sampling data, flow rates, and effectiveness.

4. The Discharger shall report by telephone any seepage from the disposal area immediately after it is discovered. A written report shall be filed with the Regional Water Board within seven days, containing at least the following information:
 - a. A map showing the location(s) of seepage;
 - b. An estimate of the flow rate;
 - c. A description of the nature of the discharge (e.g., all pertinent observations and analyses);
 - d. Verification that samples have been submitted for analyses of the Monitoring Parameters and COCs listed in Table III of this MRP, and an estimated date that the results will be submitted to the Regional Water Board; and
 - e. Corrective measures underway or proposed, and corresponding time schedule.

5. The Discharger shall submit an Annual Monitoring Summary Report to the Regional Water Board covering the reporting period of the previous monitoring year. This report shall contain:
 - a. All monitoring parameters and COCs shall be graphed to show historical trends at each monitoring point and background monitoring point, for all samples taken within at least the previous ten calendar years. Each such graph shall plot the concentration of one or more constituents for the period of record for a given monitoring point or background monitoring point, at a scale appropriate to show trends or variations in water quality. The graphs shall plot each datum, rather than plotting mean values. For any given constituent or parameter, the scale for background plots shall be the same as that used to plot downgradient data. Graphical analysis of monitoring data may be used to provide significant evidence of a release.
 - b. All historical monitoring data, including data for the previous year, shall be submitted in tabular format and in a digital MS Excel file (.xls) in a format acceptable to the Regional Water Board. Data for all field, monitoring, and constituents of concern must be included. Detected and non-detected constituents must be included along with the sample date, well number, analytical method, constituent, MDL, PQL, and qualifiers. The Regional Water Board regards the submittal of data in hard copy and in digital format as "...the form necessary for..." statistical analysis [Title 27 CCR Section 20420(h)], that facilitates periodic review by the Regional Water Board.
 - c. A comprehensive discussion of the compliance record, and the result of any corrective actions taken or planned which may be needed to bring the Discharger into full compliance with the waste discharge requirements.
 - d. A written summary of the monitoring results, indicating any changes made or observed since the previous annual report.

- e. A comprehensive evaluation of the effectiveness of the Corrective Action Program, including graphs showing trends for all historical and current data for each detected constituent in all wells listed as corrective action wells in this MRP must be provided. The evaluation shall include the status of landfill gas controls, and landfill gas monitoring data for the probes and gas extraction wells.
- 1) For the GWETS, all data, flow rates, annual volumetric flow, and cumulative volumetric flow shall be reported and tabulated. The annual GWETS plant run time, down time, and duration of downtime shall be reported in hours of operation, hours not in operation, and percent of total time in full operation. At a minimum, the plant shall operate 95% of the time over the course of a calendar year. The cumulative pounds of VOCs removed for the year and over the life of the project by the GWETS shall be reported.
 - 2) In reporting the progress of the corrective action, the annual monitoring report must provide the total volumetric flow into the landfill gas treatment (LFG) system, the mass of halogenated VOCs destroyed for the year, and a trend analysis of halogenated VOCs constituents (not total VOCs) in groundwater at each monitoring point over the life of the LFG treatment system. The annual LFG plant run time, down time, and duration of downtime shall be reported in hours in operations, hours not in operation, and percent of total time in full operation. At a minimum, the plant shall be operating 95% of the time over the course of a calendar year.
 - 3) In reporting the progress of the corrective action, the annual report must include contaminant contour maps for specific VOCs in groundwater. Separate contour maps must be provided for vinyl chloride, tetrachloroethene (PCE), trichloroethylene, 1,1-DCE, 1,1-dichloroethane (DCA), 1,2-DCA, cis-1,2-dichloroethene (DCE), trans-1,2-DCE, and similar halogenated VOC constituents. Separate maps shall be provided for the deep wells and for the shallow wells. Summary maps showing contours of totalized VOCs do not meet the aforementioned requirements.
 - 4) The Discharger shall report any modifications to the Corrective Action Program intended to improve the effectiveness, and shall also report any major maintenance such as replacement/addition of pumps, piping, and dates of carbon change-outs.

This Monitoring and Reporting Program shall be implemented beginning **1 July 2011**.

I, KENNETH D. LANDAU, Assistant Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 8 April 2011.

Original Signed By:

Ordered by:

PAMELA C. CREEDON, Executive Officer

8 April 2011

(Date)

**TABLE I
 GROUNDWATER MONITORING PROGRAM**

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
Field Parameters		
Groundwater Elevation	Ft. & hundredths, MSL	1
Temperature	° C	1
Electrical Conductivity	µmhos/cm	1
pH	pH units	1
Turbidity	Turbidity units	1
Eh	Millivolts	1
Monitoring Parameters		
Total Dissolved Solids (TDS)	mg/L	1
Chloride	mg/L	1
Carbonate	mg/L	1
Bicarbonate	mg/L	1
Nitrate - Nitrogen	mg/L	1
Sulfate	mg/L	1
Calcium	mg/L	1
Arsenic (dissolved)	µg/L	1
Iron (dissolved)	µg/L	1
Lead (dissolved)	µg/L	1
Magnesium	mg/L	1
Manganese	mg/L	1
Potassium	mg/L	1
Sodium	mg/L	1
Volatile Organic Compounds (USEPA Method 8260, see Table V)	µg/L	1
Constituents of Concern (see Table VI)		
Total Organic Carbon	mg/L	5 years
Inorganics (dissolved)	µg/L	5 years
Volatile Organic Compounds (USEPA Method 8260B, extended list)	µg/L	5 years
Semi-Volatile Organic Compounds (USEPA Method 8270C)	µg/L	5 years
Chlorophenoxy Herbicides (USEPA Method 8151A)	µg/L	5 years
Organophosphorus Compounds (USEPA Method 8141A)	µg/L	5 years

¹ Quarterly or Semiannually—see Section C.5 for frequency for each well.

TABLE II
LANDFILL GAS (LFG) MONITORING PROGRAM

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>
LFG Plant Field Parameters		
Atmospheric Temperature	°F	Monthly
Atmospheric Pressure	PSIG	Monthly
Temperature into LFG Plant	°F	Monthly
Pressure into the LFG plant	mm of Hg vacuum	Monthly
Totalized flow and flow rate into the LFG Plant	Cubic feet & CFM	Monthly
Total halogenated VOCs into the LFG Plant	µg/cm ³	Monthly ¹
LFG Plant Influent Monitoring Parameters		
Volatile Organic Compounds (USEPA Method TO-15) ¹	µg/cm ³	Semiannually
Methane	%	Semiannually
Field and Monitoring Parameters for all LFG Extraction Wells and Monitoring Probes		
Weather Conditions		Monthly
Atmospheric Temperature	°F	Monthly
Atmospheric Pressure	mm of Hg	Monthly
Gas Temperature at each well		Monthly
Before adjustment	°F	Monthly
After adjustment	°F	Monthly
Gas Pressure at each well		
Initial static pressure in wellhead	inches H ₂ O	Monthly
Adjusted static pressure in wellhead	inches H ₂ O	Monthly
Gas concentrations at each well		
Methane	% by volume	Monthly
Carbon Dioxide	% by volume	Monthly
Oxygen	% by volume	Monthly
Remainder gas	% by volume	Monthly
Monitoring Parameters for LFG Extraction Wells RW-11D, RW-12D, RW-14D, EW-22, and EW-59		
Volatile Organic Compounds (USEPA Method TO-15) ¹	µg/cm ³	Semiannually

¹ The Discharger shall measure total halogenated VOCs using field instrument with appropriate lamp.

TABLE III
LEACHATE MONITORING WELL AND LEACHATE SEEP MONITORING

<u>Parameter</u>	<u>Units</u>
Field Parameters	
Leachate Depth (for leachate wells only)	Inches
Total Flow (for seeps only)	Gallons
Flow Rate (for seeps only)	Gallons/Day
Electrical Conductivity	$\mu\text{mhos/cm}$
pH	pH units
Monitoring Parameters (for leachate wells and seeps)	
Total Dissolved Solids (TDS)	mg/L
Chloride	mg/L
Carbonate	mg/L
Bicarbonate	mg/L
Nitrate - Nitrogen	mg/L
Sulfate	mg/L
Calcium	mg/L
Magnesium	mg/L
Potassium	mg/L
Sodium	mg/L
Volatile Organic Compounds	$\mu\text{g/L}$
(USEPA Method 8260B, see Table V)	

TABLE IV
SURFACE WATER DETECTION MONITORING PROGRAM

<u>Parameter</u>	<u>Units</u>	<u>Frequency</u>	
		<u>Sedimentation Basin</u>	<u>Tuolumne River</u>
Field Parameters			
Temperature	oC	Twice Annually ¹	Monthly ²
Electrical Conductivity	µmhos/cm	Twice Annually ¹	Monthly ²
pH	pH units	Twice Annually ¹	Monthly ²
Turbidity	Turbidity units	Twice Annually ¹	Monthly ²
Monitoring Parameters			
Total Dissolved Solids (TDS)	mg/L	Twice Annually ¹	Monthly ²
Total Suspended Solids (TSS)	mg/L	Twice Annually ¹	Monthly ²
Carbonate	mg/L	Twice Annually ¹	Monthly ²
Bicarbonate	mg/L	Twice Annually ¹	Monthly ²
Chloride	mg/L	Twice Annually ¹	Monthly ²
Nitrate - Nitrogen	mg/L	Twice Annually ¹	Monthly ²
Sulfate	mg/L	Twice Annually ¹	Monthly ²
Calcium	mg/L	Twice Annually ¹	Monthly ²
Copper	mg/L	N/A	Monthly ²
Magnesium	mg/L	Twice Annually ¹	Monthly ²
Potassium	mg/L	Twice Annually ¹	Monthly ²
Sodium	mg/L	Twice Annually ¹	Monthly ²
Volatile Organic Compounds (USEPA Method 8260B, see Table V)	µg/L	Twice Annually ¹	Monthly ²
Constituents of Concern (see Table VI)			
Total Organic Carbon	mg/L	5 years	N/A
Inorganics (dissolved)	µg/L	5 years	N/A
Volatile Organic Compounds (USEPA Method 8260B, extended list)	µg/L	5 years	N/A
Semi-Volatile Organic Compounds (USEPA Method 8270C)	µg/L	5 years	N/A
Chlorophenoxy Herbicides (USEPA Method 8151A)	µg/L	5 years	N/A
Organophosphorus Compounds (USEPA Method 8141A)	µg/L	5 years	N/A

¹ For the sedimentation basin, the Discharger shall collect surface water samples during the first storm of the rainy season that produces significant flow discharging from the sedimentation basin, and during one other storm event that produces significant flow discharging from the sedimentation basin.

² For the Tuolumne River, the Discharger shall collect surface water samples in accordance with the SAP monthly from July through November, inclusive.

TABLE V
MONITORING PARAMETERS FOR DETECTION MONITORING

Surrogates for Metallic Constituents:

pH
Total Dissolved Solids
Electrical Conductivity
Chloride
Sulfate
Nitrate nitrogen

Constituents included in VOC analysis (USEPA Method 8260B):

Acetone	Ethylbenzene
Acrylonitrile	2-Hexanone (Methyl butyl ketone)
Benzene	Hexachlorobutadiene
Bromochloromethane	Hexachloroethane
Bromodichloromethane	Methyl bromide (Bromomethene)
Bromoform (Tribromomethane)	Methyl chloride (Chloromethane)
Carbon disulfide	Methylene bromide (Dibromomethane)
Carbon tetrachloride	Methylene chloride (Dichloromethane)
Chlorobenzene	Methyl ethyl ketone (MEK: 2-Butanone)
Chloroethane (Ethyl chloride)	Methyl iodide (Iodomethane)
Chloroform (Trichloromethane)	Methyl tertiary butyl ether (MTBE)
Dibromochloromethane (Chlorodibromomethane)	4-Methyl-2-pentanone (Methyl isobutylketone)
1,2-Dibromo-3-chloropropane (DBCP)	Naphthalene
1,2-Dibromoethane (Ethylene dibromide; EDB)	Styrene
o-Dichlorobenzene (1,2-Dichlorobenzene)	Tertiary amyl methyl ether
m-Dichlorobenzene (1,3-Dichlorobenzene)	Tertiary butyl alcohol
p-Dichlorobenzene (1,4-Dichlorobenzene)	1,1,1,2-Tetrachloroethane
trans-1,4-Dichloro-2-butene	1,1,2,2-Tetrachloroethane
Dichlorodifluoromethane (CFC-12)	Tetrachloroethylene (Tetrachloroethene;
1,1-Dichloroethane (Ethylidene chloride)	Perchloroethylene)
1,2-Dichloroethane (Ethylene dichloride)	Toluene
1,1 -Dichloroethylene (1,1 -Dichloroethene; Vinylidene chloride)	1,2,4-Trichlorobenzene
cis- 1,2-Dichloroethylene (cis- 1,2-Dichloroethene)	1,1,1-Trichloroethane (Methylchloroform)
trans-1,2-Dichloroethylene (trans-1,2-Dichloroethene)	1,1,2-Trichloroethane
1,2-Dichloropropane (Propylene dichloride)	Trichloroethylene (Trichloroethene)
cis- 1,3-Dichloropropene	Trichlorofluoromethane (CFC- 11)
trans- 1,3-Dichloropropene	1,2,3-Trichloropropane
Di-isopropylether (DIPE)	Vinyl acetate
Ethanol	Vinyl chloride
Ethyltertiary butyl ether	Xylenes

TABLE VI
CONSTITUENTS OF CONCERN & APPROVED USEPA ANALYTICAL METHODS

Inorganics (dissolved):	USEPA Method
Aluminum	6010
Antimony	7041
Barium	6010
Beryllium	6010
Cadmium	7131A
Chromium	6010
Cobalt	6010
Copper	6010
Silver	6010
Tin	6010
Vanadium	6010
Zinc	6010
Iron	6010
Manganese	6010
Arsenic	7062
Lead	7421
Mercury	7470A
Nickel	7521
Selenium	7742
Thallium	7841
Cyanide	9010B
Sulfide	9030B
Volatile Organic Compounds (USEPA Method 8260):	
Acetone	1,2-Dichloroethane (Ethylene dichloride)
Acetonitrile (Methyl cyanide)	1,1 -Dichloroethylene (1, I-Dichloroethene; Vinylidene chloride)
Acrolein	
Acrylonitrile	cis- 1,2-Dichloroethylene (cis- 1,2-Dichloroethene)
Allyl chloride (3-Chloropropene)	trans- 1,2-Dichloroethylene (trans- 1,2-Dichloroethene)
Benzene	1,2-Dichloropropane (Propylene dichloride)
Bromochloromethane (Chlorobromomethane)	1,3-Dichloropropane (Trimethylene dichloride)
Bromodichloromethane (Dibromochloromethane)	2,2-Dichloropropane (Isopropylidene chloride)
Bromoform (Tribromomethane)	1,1 -Dichloropropene
Carbon disulfide	cis- 1,3-Dichloropropene
Carbon tetrachloride	trans- 1,3-Dichloropropene
Chlorobenzene	Di-isopropylether (DIPE)
Chloroethane (Ethyl chloride)	Ethanol
Chloroform (Trichloromethane)	Ethyltertiary butyl ether
Chloroprene	Ethylbenzene
Dibromochloromethane (Chlorodibromomethane)	Ethyl methacrylate
1,2-Dibromo-3-chloropropane (DBCP)	Hexachlorobutadiene
1,2-Dibromoethane (Ethylene dibromide; EDB)	Hexachloroethane
o-Dichlorobenzene (1,2-Dichlorobenzene)	2-Hexanone (Methyl butyl ketone)
m-Dichlorobenzene (1,3-Dichlorobenzene)	Isobutyl alcohol
p-Dichlorobenzene (1,4-Dichlorobenzene)	Methacrylonitrile
trans- 1,4-Dichloro-2-butene	Methyl bromide (Bromomethane)
Dichlorodifluoromethane (CFC 12)	Methyl chloride (Chloromethane)
1,1 -Dichloroethane (Ethylidene chloride)	Methyl ethyl ketone (MEK; 2-Butanone)

Methyl iodide (Iodomethane)	1,1,2,2-Tetrachloroethane
Methyl t-butyl ether (MTBE)	Tetrachloroethylene (Tetrachloroethene; Perchloroethylene; PCE)
Methyl methacrylate	Toluene
4-Methyl-2-pentanone(Methyl isobutyl ketone)	1,2,4-Trichlorobenzene
Methylene bromide (Dibromomethane)	1,1,1 -Trichloroethane, Methylchloroform
Methylene chloride (Dichloromethane)	1,1,2-Trichloroethane
Naphthalene	Trichloroethylene (Trichloroethene; TCE)
Propionitrile (Ethyl cyanide)	Trichlorofluoromethane (CFC- 11)
Styrene	1,2,3-Trichloropropane
Tertiary amyl methyl ether	Vinyl acetate
Tertiary butyl alcohol	Vinyl chloride (Chloroethene)
1,1,1,2-Tetrachloroethane	Xylene (total)

Semi-Volatile Organic Compounds (USEPA Method 8270 - base, neutral, & acid extractables):

Acenaphthene	Diallate
Acenaphthylene	Dibenz[a,h]anthracene
Acetophenone	Dibenzofuran
2-Acetylaminofluorene (2-AAF)	Di-n-butyl phthalate
Aldrin	3,3'-Dichlorobenzidine
4-Aminobiphenyl	2,4-Dichlorophenol
Anthracene	2,6-Dichlorophenol
Benzo[a]anthracene (Benzanthracene)	Dieldrin
Benzo[b]fluoranthene	Diethyl phthalate
Benzo[k]fluoranthene	p-(Dimethylamino)azobenzene
Benzo[g,h,i]perylene	7,12-Dimethylbenz[a]anthracene
Benzo[a]pyrene	3,3'-Dimethylbenzidine
Benzyl alcohol	2,4-Dimethylphenol (m-Xylenol)
Bis(2-ethylhexyl) phthalate	Dimethyl phthalate
alpha-BHC	m-Dinitrobenzene
beta-BHC	4,6-Dinitro-o-cresol (4,6-Dinitro-2-methylphenol)
delta-BHC	2,4-Dinitrophenol
gamma-BHC (Lindane)	2,4-Dinitrotoluene
Bis(2-chloroethoxy)methane	2,6-Dinitrotoluene
Bis(2-chloroethyl) ether (Dichloroethyl ether)	Di-n-octyl phthalate
Bis(2-chloro-1-methylethyl) ether (Bis(2-chloroisopropyl) ether; DCIP)	Diphenylamine
4-Bromophenyl phenyl ether	Endosulfan I
Butyl benzyl phthalate (Benzyl butyl phthalate)	Endosulfan II
Chlordane	Endosulfan sulfate
p-Chloroaniline	Endrin
Chlorobenzilate	Endrin aldehyde
p-Chloro-m-cresol (4-Chloro-3-methylphenol)	Ethyl methanesulfonate
2-Chloronaphthalene	Famphur
2-Chlorophenol	Fluoranthene
4-Chlorophenyl phenyl ether	Fluorene
Chrysene	Heptachlor
o-Cresol (2-methylphenol)	Heptachlor epoxide
m-Cresol (3-methylphenol)	Hexachlorobenzene
p-Cresol (4-methylphenol)	Hexachlorocyclopentadiene
4,4'-DDD 4,4'-DDE	Hexachloropropene
4,4'-DDT	Indeno(1,2,3-c,d)pyrene
	Isodrin

Isophorone	N-Nitrosomethylethylamine (MethylethylNitrosamine)
Isosafrole	N-Nitrosopiperidine
Kepone	N-Nitrosopyrrolidine
Methapyrilene	5-Nitro-o-toluidine
Methoxychlor	Pentachlorobenzene
3-Methylcholanthrene	Pentachloronitrobenzene (PCNB)
Methyl methanesulfonate	Pentachlorophenol
2-Methylnaphthalene	Phenacetin
1,4-Naphthoquinone	Phenanthrene
1-Naphthylamine	Phenol
2-Naphthylamine	p-Phenylenediamine
o-Nitroaniline (2-Nitroaniline)	Polychlorinated biphenyls (PCBs; Aroclors)
m-Nitroaniline (3-Nitroaniline)	Pronamide
p-Nitroaniline (4-Nitroaniline)	Pyrene
Nitrobenzene	Safrole
o-Nitrophenol (2-Nitrophenol)	1,2,4,5-Tetrachlorobenzene
p-Nitrophenol (4-Nitrophenol)	2,3,4,6-Tetrachlorophenol
N-Nitrosodi-n-butylamine (Di-n-butylNitrosamine)	o-Toluidine
N-Nitrosodiethylamine (DiethylNitrosamine)	Toxaphene
N-Nitrosodimethylamine (DimethylNitrosamine)	2,4,5-Trichlorophenol
N-Nitrosodiphenylamine (DiphenylNitrosamine)	0,0,0-Triethyl phosphorothioate
N-Nitrosodipropylamine (N-Nitroso-N-dipropylamine; Di-n-propylNitrosamine)	sym-Trinitrobenzene

Chlorophenoxy Herbicides: (USEPA Method 8151A):

2,4-D (2,4-Dichlorophenoxyacetic acid)
Dinoseb (DNBP; 2-sec-Butyl-4,6-dinitrophenol)
Silvex (2,4,5-Trichlorophenoxypropionic acid; 2,4,5-TP)
2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)

Organophosphorus Compounds (USEPA Method 8141A):

Atrazine
Chlorpyrifos
0,0-Diethyl
0-2-pyrazinyl phosphorothioate (Thionazin)
Diazinon
Dimethoate
Disulfoton
Ethion Methyl parathion (Parathion methyl)
Parathion
Phorate
Simazine

**TABLE VII
 GROUNDWATER CONCENTRATION LIMITS**

<u>Constituent</u>	<u>Units</u>	<u>Concentration Limit</u>
Specific Conductance (EC)	µmhos/cm	973
pH	pH Units	6.0 to 7.8
Total Dissolved Solids (TDS)	mg/L	739
Chloride	mg/L	155
Sulfate	mg/L	83
Nitrate as N	mg/L	55
Total Alkalinity	mg/L	TBD
Total Organic Carbon	mg/L	TBD
Carbonate	mg/L	5.0
Alkalinity, Bicarbonate	mg/L	141
VOCs (EPA 8260B)	µg/L	MDL
SVOCs (EPA 8270C)	µg/L	MDL
Organochlorine Pesticide (EPA 8081A)	µg/L	MDL
Polychlorinated Biphenyls (EPA 8082)	µg/L	MDL
Chlorophenoxy Herbicides (EPA 8151)	µg/L	MDL
Organophosphorus Compounds (EPA 8141A)	µg/L	MDL
Aluminum, dissolved	mg/L	TBD
Antimony, dissolved	mg/L	TBD
Arsenic, dissolved	mg/L	TBD
Barium, dissolved	mg/L	TBD
Beryllium, dissolved	mg/L	TBD
Cadmium, dissolved	mg/L	TBD
Chromium, dissolved	mg/L	TBD
Chromium VI+, dissolved	mg/L	TBD
Cobalt, dissolved	mg/L	TBD
Copper, dissolved	mg/L	TBD
Iron, dissolved	mg/L	115
Lead, dissolved	mg/L	TBD
Manganese, dissolved	mg/L	11
Mercury, dissolved	mg/L	TBD
Nickel, dissolved	mg/L	TBD
Selenium, dissolved	mg/L	TBD
Silver, dissolved	mg/L	TBD
Sulfide, dissolved	mg/L	TBD
Thallium, dissolved	mg/L	TBD
Tin, dissolved	mg/L	TBD
Vanadium, dissolved	mg/L	TBD
Zinc, dissolved	mg/L	73

Notes: MDL = Laboratory Method Detection Limit
 TBD = To be determined