

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2004-0104
REVISED MONITORING AND REPORTING PROGRAM
FOR
CITY OF ROSEVILLE
ROSEVILLE LANDFILL
CLASS III LANDFILLS
POST-CLOSURE MAINTENANCE AND CORRECTIVE ACTION
PLACER COUNTY

This revised monitoring and reporting program (MRP) is issued pursuant to California Water Code section 13267 and incorporates requirements for facility maintenance and groundwater corrective action monitoring contained in:

1. *California Code of Regulations (CCR), title 27, division 2, subdivision 1* (Title 27);
2. Waste Discharge Requirements (WDRs) Order No. R5-2004-0104; and
3. August 1997 *Standard Provisions and Reporting Requirements* (SPRR).

Compliance with this MRP is ordered by the WDRs. The Discharger shall not implement any changes to this MRP unless incorporated into a revised MRP issued by the Executive Officer. Regulatory sections quoted in this MRP refer to CCR, Title 27 unless otherwise noted.

Monitoring requirements under this MRP are based on evidence of water quality impacts from "closed, abandoned, or inactive" (CAI) units under Title 27, section 20080(g). See WDR Finding 8. Saturated zone monitoring is required based on evidence of impacts to groundwater at the site. Landfill gas (LFG) monitoring is required to monitor the effectiveness of landfill gas controls in mitigating any potential threat to the unsaturated zone and groundwater. Surface water monitoring is required, but is limited to field parameter monitoring given that no impacts to surface water from the landfill have been historically detected and that the landfill is closed.

Pursuant to Title 27 sections 20080(g), 20415(b), and 20430(d), the Discharger shall maintain water quality monitoring systems for background and corrective action monitoring.

MONITORING SUMMARY TABLE

<u>Section</u>	<u>Requirement</u>	<u>Frequency</u>
A	Standard Observations	Monthly/Quarterly
B	Facility Monitoring:	
	1. Maintenance Inspections	Quarterly
	2. Storm Response	Within 7 Days After Significant Storm Event
	3. Site Winterization	Annually
C	Landfill Gas Monitoring	Quarterly ¹
D	Groundwater Monitoring Programs	
	1. Field Parameter	Semiannually
	2. Background	Semiannually

	3. Compliance	
	a. Corrective Action	Semiannually
	b. Constituents of Concern (COC)	Every 5 years ²
E	Surface Water Monitoring	
	1. Onsite Stream	Semiannually
	2. Storm Water	Per General Permit, as applicable
F	Reporting	
	1. Semiannual Report	Semiannually
	2. Annual Monitoring Summary	Annually
	3. COC Monitoring Report	Every 5 years
	4. Other Reports	See Section F.4
G	Table Attachments	
	1. Groundwater Monitoring Schedules	See Table G.1
	2. COC List	See Table G.2

1. May be reduced to semiannual with local approvals. See Table C.3, Footnote 1.
2. More frequent monitoring may be required to establish CLs for inorganic COCs or in response to a release. See Sections D.3.b.iv and F.4.b.ii.2).

A. STANDARD OBSERVATIONS

Standard Observations of the facility, including visual and olfactory monitoring, shall be performed in accordance with the Standard Provisions, as follows:

1. Monitoring Points –
 - a. Area B -- Landfill unit, unit perimeter, and adjacent creek
 - b. Area C/D – Same as above.
2. Monitoring List – See Definition 24, SPRR.
3. Monitoring Schedule –
 - a. Wet Season (October 1 to April 30) -- Monthly;
 - b. Dry Season (May 1 to September 30) -- Quarterly.
4. If Leachate Detected –
 - a. Any leachate seepage (or other physically significant evidence of a release from any of the units) detected during these inspections (or at any other time) shall be **immediately** reported to the Regional Board with written follow-up within 7 days.¹
 - b. If leachate or other waste enters the facility drainage system, representative samples of the discharge shall be collected and analyzed for all Table G.2 COCs. If a discharge to surface water occurs, the Discharger shall follow the response to release provisions of the Standard Provisions.²

1. See Provision 3, *Reports to be Filed with the Board, REPORTING REQUIREMENTS*, SPRR.
 2. See Requirements 2 and 3, *General, RESPONSE TO RELEASE, PROVISIONS FOR MONITORING*, SPRR.

See Sections F.1.c and F.1.f.i herein for reporting requirements.

B. FACILITY MONITORING

The Discharger shall conduct facility monitoring, including (but not necessarily limited to) visual monitoring, to ensure that all significant landfill facilities, including associated controls and monitoring systems, are functioning properly and are in adequate maintenance and repair. Any damage to the landfill facilities observed during these inspections shall be flagged and repaired in accordance with the Postclosure Maintenance Plan.

1. Monitoring Points

Facility monitoring shall include the landfill unit and associated controls and monitoring systems (e.g., landfill cover, precipitation and drainage controls, LFG monitoring system, groundwater monitoring wells, access roads).

2. Monitoring List and Schedule

Facility monitoring shall be conducted in accordance with the following schedule:

Table B.2

<u>Item</u>	<u>Inspection Frequency</u>	<u>Complete Repairs¹</u>
1. Regular Maintenance	Quarterly	Within 30 days
2. Storm Response	Within one week of significant storm event ²	Within two weeks of storm event
3. Site Winterization	By September 30 of each year	By October 31 of each year

¹. If necessary repairs cannot be completed within specified time frame, the Discharger shall, within 7 days, notify the Central Valley Water Board and provide a schedule for completing them.
². A “significant” storm event shall be one that produces 2.0 inches or more of precipitation within a 24-hour period, as measured at the Roseville Fire Station.

See Sections F.1.c and F.1.f.i herein for reporting requirements.

C. LANDFILL GAS MONITORING

The Discharger shall monitor LFG to assess its ongoing potential as source of impacts to subsurface water-bearing media at the site, including the unsaturated zone and groundwater. Field meters shall be calibrated for each parameter before use. Field and calibration logs for each monitoring event shall be included in each monitoring report.

1. Monitoring Points

- a. Area B -- LFG-1 (SW perimeter)
- b. Area C/D – GP-7 (NE crown), LFG-4 (NE perimeter), LFGs-7 and 10 (southern perimeter), LFGs-3 and 11 (East-central perimeter)
- c. Any future (i.e., additional or replacement) permanent LFG monitoring wells installed at the site.

2. Monitoring List

- a. Field Parameters -- Ambient Temperature (°C, °F), Gas Pressure (psig)
- b. Major Gases – Methane (%), Carbon dioxide (%)
- c. VOCs (ppbv)

3. Monitoring Schedule

LFG monitoring shall be conducted in accordance with the following schedule:

Table C.3

<u>Parameter</u>	<u>Frequency</u>	<u>Method</u>
Field Parameters	Quarterly ¹	Field Meter
Major Gases	Quarterly ¹	Field Meter
VOCs ²	Semiannually	EPA Method TO-15 or 8260B

- 1. May be reduced to semiannual if more frequent monitoring not required by Local Enforcement Agency and the Discharger provides documentation in the semiannual monitoring report.
- 2. VOC sampling not required if probe has been previously sampled for VOCs under this Order and methane is currently detected at less than 5% by volume.

D. GROUNDWATER MONITORING

In implementing groundwater monitoring under this Order, the Discharger shall comply with WDR Monitoring Specifications E.1 through E.12 and all applicable monitoring provisions of the SPRR for each program listed below.³

1. Field Parameters (Sections 20415(e)(13, 15))

The Discharger shall implement field parameter monitoring, including, but not limited to, groundwater elevation monitoring, consistent with Section 20415(e). Groundwater elevation monitoring shall include measurement of the water elevation in each well and determination of the ground water flow rate and direction in the uppermost aquifer per Section 20415(e)(15). Groundwater elevation readings shall be taken prior to purging and sampling the well, and shall be measured within a period of time short enough to avoid temporal variations in groundwater flow that could preclude accurate determination of groundwater gradient and direction. Field parameter monitoring shall be conducted concurrent with the other groundwater monitoring programs under this MRP, as follows:

- a. Monitoring Point(s) – All wells (presently MWs-1 to 3; 5, 7A, 8, 9, 10A, 10B; and 12 to 16). See Section F.4.b.ii.1) and Attachment B.
- b. Monitoring List – All Table G.1.A monitoring parameters.
- c. Monitoring Schedule – Semiannually⁴

See Section F.1.e.ii for field parameter reporting.

3. See Provisions 1 through 6, *General, PROVISIONS FOR MONITORING*; and Provisions 1 through 7, *Sampling and Analytical Methods; PROVISIONS FOR MONITORING; SPRR*.

4. Section 20415(e)(15) prescriptive requirement for minimum quarterly groundwater elevation monitoring frequency not required for this site per Section 20080(g).

2. Background Monitoring (Sections 20415(b) and 20415(e))

The Discharger shall develop and implement a Background Monitoring Program for the site consistent with WDR Monitoring Specification E.1 and Title 27 Section 20415, including, but not necessarily limited to, subsections 20415 (b), (e)(6), and (e)(10). Background monitoring shall be conducted concurrent with the other groundwater monitoring programs under this Order.

- a. Monitoring Points -- At a minimum, the background monitoring points shall include:
 - i. Areas B and C/D: MWs-1, 2, and 3
 - ii. Burn Dump: MWs-12, 13, 14 and 16
- b. Monitoring List and Schedule – See Tables D.3.b.iii and G.1.B.
- c. Concentration Limits (CLs) – The Discharger shall develop and update CLs using available historical data and background monitoring data collected under this MRP. CLs for inorganic monitoring parameters shall be updated at least **annually**. For inorganic COCs for which there is insufficient historical data under the appropriate data analysis method (e.g., tolerance limits) to develop CLs, including five-year COCs, background monitoring shall be conducted at least **semiannually** until CLs have been developed for those constituents. .See Section 20415(e)(6) through 20415(e)(12).

3. Compliance Monitoring

a. Corrective Action (Sections 20415 and 20430)

The Discharger shall establish and implement a corrective action monitoring program for each unit consistent with WDR Monitoring Specification E.1 and applicable provisions of Section 20415 and Section 20430(d). The goals of corrective action monitoring shall be to:

- Complete evaluation monitoring, as necessary, per Section 20425;
- Track changes in water quality associated with the release, including any new constituents added through the COC monitoring program (Section D.3.b.iv); and
- Monitor the effectiveness of corrective action measures and progress of corrective action in returning to the WQPS.

i. Monitoring Points

- 1) Area B: MWs-9, 10A, 10B, 12 and 15
- 2) Area C/D: MW-2, 5, 8, 12, 13, 14 and 16
- 3) Burn Dump: MWs-6 and 7A

The corrective action program monitoring points shall also include the background wells for each unit specified in D.2.a and any future monitoring wells installed at the site for the purposes of corrective action monitoring.⁵

5. Title 27 requires the Discharger to install and operate a sufficient number of monitoring points, including

- ii. Monitoring List – See Table G.1.C.a, attached.
 The corrective action monitoring parameter list shall be updated, as necessary, to reflect the results of COC monitoring. See Section D.3.b.iv.
- iii. Monitoring Schedule

Table D.3.b.iii

<u>Parameter</u> ¹	<u>Units</u>	<u>Frequency</u>	<u>Data Analysis</u>
General Parameters	See Table G.1.C.a	Semiannually	Statistical
General Minerals	mg/L	Semiannually	Statistical
VOCs	µg/L	Semiannually	Nonstatistical
Dissolved Metals	µg/L	Annually ²	Statistical/Nonstatistical
Organochlorine Pesticides	µg/L	Every 2½ years	Nonstatistical

- 1. See Tables G.1 and G.2 for full list of constituents and EPA test methods.
- 2. More frequent monitoring may be required to establish CLs or in response to a release. See Sections D.3.b.iii and F.4.b.ii.2).

The data analysis methods for Corrective Action monitoring shall include trend analysis (i.e. control charts, Mann-Kendall and/or time series plots) and an evaluation of the water chemistry by appropriate methods (i.e. Schoeller plots, ion balance, Stiff diagram etc). See WDR Monitoring Specification E.12.

- b. COC Monitoring (Sections 20420(g), 20425(e)(4))
 Concurrent with the other required monitoring programs under this MRP, the Discharger shall develop and implement a groundwater COC monitoring program in accordance with applicable provisions of Section 20415, 20420(g), and 20425(e)(4).
 - i. Monitoring Points – All (i.e., as listed in Sections D.2.a and D.3.b.i .
 - ii. Monitoring List -- All Table G.1.C.b COCs.
 - iii. Monitoring Schedule – By **15 December 2015** and at least every five years thereafter.⁶ Additional or more frequent COC monitoring may be required to establish CLs per Section D.2.c or in response to a release (see below).
 - iv. If Release Detected -- Any COC Monitoring Parameter for which there is confirmed evidence of a release (measurable or physical) shall be added to the Corrective Action Monitoring Parameter list under the Corrective Action monitoring program. In such cases, the Discharger shall also follow the Response to Release requirements of the WDRs and SPRR, as necessary. See WDR Monitoring Specification E.11.

See Section F.3 for COC reporting requirements.

background monitoring points, at appropriate locations and depths “. . . to yield ground water samples to provide the data needed to evaluate the effectiveness of the corrective action program.”

6. The last five-year COC monitoring event under previous WDRs was in the Second Half 2010.

E. SURFACE WATER MONITORING

The Discharger shall develop and implement background and compliance monitoring programs for surface water consistent with WDR Monitoring Specifications E.1 through E.12, as applicable to surface water monitoring.

1. Onsite Stream

a Monitoring Points

Surface water monitoring shall be conducted at the following locations in the onsite stream (Antelope Creek): S-1 (upstream), S-2 (between Areas B and C/D), and S-3 (downstream). See Attachment B: Site Map.

b Monitoring List – All Table G.1.A field parameters, except as follows:

- i. Elevation -- Monitor surface water elevation (or depth from reference point) based on measurement or observation.
- ii. Redox potential not required

c Monitoring Schedule -- Semiannually

2. Storm Water

Monitoring of storm water discharges from the site shall be conducted in accordance with the State Water Resources Control Board General Industrial Storm Water Permit (Water Quality Order No. 97-03-DWQ), if applicable to the facility.

The results of surface water monitoring (including any storm water monitoring under the General Storm Water Permit) shall be summarized in the monitoring reports submitted under this Order. If there was no water in the pond or stream during the monitoring period, or the Discharger did not obtain samples at one or more of the required monitoring points, the Discharger shall state the reasons and circumstances for not obtaining samples in the monitoring report.

F. REPORTING

1. Semiannual Reports

The Discharger shall report monitoring data and information as required in this MRP and as required under WDRs Order No. R5-2004-0104 and the SPRR. Reports shall be submitted **semiannually** and are due by 31 July and 31 January each year. Each semiannual monitoring report shall contain the following information:

a. Compliance Summary

A transmittal letter and compliance summary for the monitoring period as specified in the SPRR.⁷

b. Table of Contents

A table of contents that, at a minimum, identifies the major sections of the report that contain the information required under this Order (e.g., chapter and page numbers).

⁷. See Requirement 1, *Reports to be Filed with the Board, REPORTING REQUIREMENTS*, SPRR.

c. Standard Observations and Facility Monitoring

- i. A summary and certification of the completion of all Standard Observations. See Requirement 2h, *Reports to be Filed with the Board, REPORTING REQUIREMENTS, SPRR.*
- ii. A summary of the results of facility monitoring, including any significant damage noted and/or repairs conducted. If no inspection and/or repairs were conducted, the report shall so state, providing the reason and circumstances (e.g., no significant storm event during monitoring period).

Documentation of the above shall be provided in an appendix to the report, as specified in Section F.1.f.i.

d. Landfill Control Systems

A tabular summary of the results of LFG monitoring for the monitoring period at each LFG monitoring point specified in Section C.1 of this MRP. Also include a discussion as to the potential for any constituents detected in LFG (e.g., VOCs, CO₂) to impact subsurface water bearing media (i.e., soil pore water or groundwater) at the site.

e. Groundwater Monitoring Results

i. Monitoring Points

Tabular summary and/or geologic cross-section(s) based on installation logs, including well name or number; top casing elevation; total well depth; elevation and depth range of screened intervals/zones; water table elevation; and soil type within screened interval.

ii. Field Parameters

- 1) Tabular summaries of the results of monitoring for the monitoring period.
- 2) Groundwater elevation contour map(s) and/or flow net(s) showing gradient direction in the upper aquifer and any additional zone of saturation monitored;
- 3) A narrative discussion of the groundwater elevation monitoring results, including calculated gradient and flow velocity, times of highest and lowest elevations in the wells, and separation from wastes.

iii. Background

1) Data Screening

- ⇒ Outliers
- ⇒ Trends or other data disparities that might be evidence of release, upgradient source, or natural variability.

2) Plots and Graphical Summaries.

- ⇒ Scale plots for the range of data shown after excluding outliers.
- ⇒ Plots (including lines and symbols) should be clearly discernible and distinguishable.

3) Data Analysis Methods

- ⇒ Describe or reference procedure for determining/updating CLs

⇒ Provide or reference list of updated CLs

iv. Compliance -- Corrective Action

1) Show results in tabular summaries⁸

⇒ Include CLs and flag exceedances

⇒ Show nondetect result relative to DL (e.g., "<0.3").

2) Evaluate nature and extent of impacts

⇒ Identify and discuss exceedances

– New exceedances and results of confirmation testing

– Previous exceedances in same or other source media (e.g., LFG)

– Potentially related exceedances (e.g., parent or daughter compounds)

⇒ Water chemistry analysis, including cation/anion balance and illustrative plots (e.g., Piper, Trilinear, Schueller, and/or Stiff plot)

⇒ Contaminant contour maps showing distribution and extent of impacts for representative constituents

3) Evaluate Corrective Action progress and effectiveness

⇒ Provide for representative constituents and monitoring points

⇒ Provide time series plots and other graphical methods (e.g., best fit, Mann-Kendall, Sen's Slope)

⇒ Discuss any trends and any changes in water quality chemistry

⇒ Discuss effectiveness of Corrective Action measures (e.g., landfill cover, LFG controls) and need for additional measures and/or monitoring wells.

f. Appendix Items

i. Standard Observations and Facility Monitoring Results

1) Field logs,

2) Site map showing location of area of concern

3) Photos

ii. Field meter calibration logs;

iii. Field and laboratory test sheets (hard copy not required, but must be included in electronic copy of report);

iv. Copies of other relevant reports or data (e.g., results of soil gas/LFG monitoring required by Local Enforcement Agency); and

v. Compact disk (CD), including:

1) Copy of monitoring report in (preferably combined) PDF format

2) Excel spreadsheet of monitoring data for monitoring period

8. Tables of water quality monitoring data shall include appropriate headers, showing monitoring point, sampling date, chemical group, constituent, units, analytical result, laboratory limits (MDL and PQL), flag, data type (statistical or nonstatistical), and updated CL.

2. Annual Monitoring Summary Report

An Annual Monitoring Summary Report (Annual Report) summarizing monitoring results for the prior year shall also be prepared and submitted in accordance with this Order, including the MRP and SPRR (Requirement 4, *Reports to be Filed with the Board, REPORTING REQUIREMENTS*). The report may be submitted as part of the Second Semiannual Report for each year. The Annual Report shall include the following information:

a. Table of Contents

b. Compliance Summary

A comprehensive discussion of the compliance record, including any necessary repairs, improvements, and/or corrective action measures implemented or planned to bring the Discharger into full compliance with the WDRs and WQPS.

c. Year End Summary

- i. Written summary of the monitoring results for the year (including water quality chemistry analysis), indicating any changes made or observed since the previous annual report.
- ii. Tabular and graphical summaries of the monitoring results for the year, including representative time series plots.

d. Appendix Items

- i. A copy of the Sample Collection and Analysis Plan required under the SPRR (see Requirement 1, *General, Provisions for Monitoring*).
- ii. Electronic copies of the following on CD
 - 1) Historical monitoring data for the site, as follows:
 - ⇒ Provide for at least previous 10 years (or for as long as monitoring has been conducted at each monitoring point).
 - ⇒ Use tabular format specified in F.1.e.iii.1)
 - ⇒ Provide for all water bearing media
 - ⇒ Include results of FP monitoring, as feasible (i.e., groundwater elevation, estimated flow direction and gradient);
 - 2) The monitoring report in (preferably combined) PDF format.⁹

3. COC Monitoring Report

The five-year COC monitoring report shall be submitted in the semiannual report for the monitoring period in which five-year COC sampling was conducted. The COC monitoring report shall be submitted by the applicable due date specified in Table F.5 below. Consistent with Section D.3.b.iii (Footnote 6) above, the first COC Monitoring Report under this Order shall be submitted by **31 January 2016**.

⁹. In *combined* PDF format, major sections of report are assembled as separate PDF files (native or scanned) using PDF writer software.

4. Other Reports

- a. Notifications -- Required notifications under Title 27 (e.g., tentative release, leachate seep, extended repairs) shall be submitted within 7 days of event unless otherwise specified under this Order or the SPRR.
- b. Updated Water Quality Protection Standard (WQPS) Report -- An updated WQPS Report shall be submitted concurrent with, or as part of, the next semiannual monitoring report due after submission of the five-year COC monitoring report above. The first WQPS Report under this Order shall therefore be submitted by **31 July 2016** and then every five years thereafter.

The WQPS for a given water-bearing media shall consist of all constituents of concern (COCs), concentration limits (CLs) for each COC, monitoring points and point of compliance (POC), and the compliance period, as follows:

- i. COCs (Section 20395)

The COC list shall 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 monitored water-bearing media at the site (i.e., groundwater and surface water) shall be as listed in Table G.2 herein.

- ii. Concentration Limits (Section 20400)

CLs shall be developed for each COC consistent with the data analysis methods outlined in WDR Monitoring Specifications E.7 through E.9.

- 1) Unsaturated Zone – not currently established¹⁰
- 2) Groundwater -- CLs based on the First Semester 2011 monitoring report are specified in Table G.2 herein. For other inorganic COCs, see Section D.2.c.
- 3) Surface Water – not currently established (monitoring limited to field parameters)

- iii. Monitoring and Compliance Points (Section 20405)

- 1) Monitoring Points

- ⇒ Unsaturated Zone – not currently established¹⁰
- ⇒ Groundwater – All wells (presently MWs-1 to 3; 5, 6, 7A, 8, 9, 10A, 10B; 12 to 16)
- ⇒ Surface Water – All stations (i.e., S-1 through S-3).

- 2) Compliance Points

- ⇒ Point of Compliance (POC) Wells
 - All downgradient and cross gradient landfill unit perimeter wells, including MW-15 (Area B); MWs-5 and 8 (Area C/D); and MW-7A (Burn Dump).

¹⁰. Discharger shall amend the WQPS to include unsaturated zone if one or more VOCs are detected in soil gas at concentration(s) that are likely (due to gas partitioning) to impact or threaten to impact soil pore water beyond the landfill footprint.

- Any future wells that meet the above criteria.
- ⇒ Other Compliance Wells
 - All upgradient landfill perimeter wells potentially within the reducing zone of the landfill (i.e., MWs-2 and 3);
 - All impacted wells beyond the POC, currently including MWs-9, 10A, 10B and 12 (Area B); MWs-13, 14 and 16 (Area C/D); and MW-6 (burn dump).
 - Any future wells that meet either of the above criteria.

iv. Compliance Period (Section 20410)

The landfill compliance period, applicable to all water-bearing media, is the minimum period during which the Discharger shall conduct a water quality monitoring program subsequent to a release from the Unit. It is equal to the active life of the Unit plus the closure period. The landfill began operations in 1967 and closed in 1995. The compliance period is therefore 28 years.¹¹ Beginning with the year after landfill closure, the compliance would end in the year 2023.

The WQPS shall include all water-bearing media for which there is evidence of impacts or threatened impacts per section 20080(g).

5. Reporting Schedule

The semiannual and annual reports shall be submitted to the Board in accordance with the following schedule for the calendar period in which samples were taken or observations made:

Table F.5

<u>Report</u>	<u>End of Reporting Period</u>	<u>Date Report Due</u>
First Semiannual	30 June	31 July
Second Semiannual	31 December	31 January
Annual Report	31 December	31 January

Required notifications under Title 27 (e.g., tentative release, leachate seep, extended repairs) shall be submitted within 7 days of event unless otherwise specified under this Order or the SPRR.

The Discharger shall implement the above monitoring program on the effective date of this Program. The transmittal letter accompanying monitoring reports submitted under this Order shall, as required under the SPRR (Provision 5, *General Requirements, REPORTING REQUIREMENTS*), contain a statement by the discharger, or the discharger's authorized

¹¹. If the landfill is in corrective action at the scheduled end of the compliance period, the compliance period shall be extended until the discharger can demonstrate that the Unit has been in continuous compliance with its WQPS for a period of at least three consecutive years, including proof period under Section 20430(f).

agent, under penalty of perjury, that to the best of the signer's knowledge the report is true, accurate and complete.

Ordered by: _____ Original Signed By _____
PAMELA C. CREEDON, Executive Officer
22 August 2011

(Date)

Attachments
JDM: 22 August 2011

**Table G.1
 Groundwater Monitoring Schedules**

A. Field Parameter Monitoring¹			
All Wells			
<u>Monitoring Parameter</u>	<u>Units</u>	<u>Frequency</u>	<u>Data Analysis</u>
Dissolved Oxygen (DO)	mg/L	Semiannually	n/a
Elevation, Groundwater	feet MSL	Semiannually	n/a
Oxidation-Reduction (Redox) Potential	millivolts	Semiannually	n/a
pH	pH units	Semiannually	n/a
Specific Conductance	µS/cm	Semiannually	n/a
Temperature	°C, °F	Semiannually	n/a
Turbidity	NTU	Semiannually	n/a

1. Field parameter monitoring shall be conducted concurrent with other required groundwater monitoring programs under this Order.

B. Background Monitoring¹			
Background Wells			
<u>Monitoring Parameter</u>	<u>Units</u>	<u>Frequency</u>	<u>Data Analysis</u>
See Tables G.1.A, G.1.C.a, and G.1.C.b			

1. Background monitoring shall include field parameter and compliance monitoring conducted at background wells.

C. Compliance Monitoring			
a. Corrective Action^{1,2}			
Background and Compliance Wells			
<u>Monitoring Parameter</u>	<u>Units</u>	<u>Frequency</u>	<u>Data Analysis</u>
<i>General Parameters:</i>			Tolerance Interval
Alkalinity, Total	mg/L ³	Semiannually	Nonparametric
Dissolved Oxygen (DO)	mg/L	Semiannually	Nonparametric
Chemical Oxygen Demand (COD)	mg/L ³	Semiannually	Nonparametric
pH	pH units	Semiannually	Nonparametric
Specific Conductance	µS/cm	Semiannually	Nonparametric
Total Dissolved Solids (TDS)	mg/L	Semiannually	Nonparametric
Total Hardness	mg/L ³	Semiannually	Nonparametric

<u>Monitoring Parameter</u>	<u>Units</u>	<u>Frequency</u>	<u>Data Analysis</u>
<i>General Minerals:</i>			Statistical
<i>Major Anions:</i>			Tolerance Interval
Bicarbonate Alkalinity	mg/L ³	Semiannually	Nonparametric
Chloride	mg/L	Semiannually	
Nitrate – Nitrogen	mg/L	Semiannually	
Sulfate	mg/L	Semiannually	
<i>Major Cations:</i>			Tolerance Interval
Calcium	mg/L	Semiannually	
Magnesium	mg/L	Semiannually	
Potassium	mg/L	Semiannually	
Sodium	mg/L	Semiannually	
<i>Dissolved Metals:⁴</i>			
<i>Common:</i>			Tolerance Interval
Iron	µg/L	Annually	Nonparametric
Manganese	µg/L	Annually	Nonparametric
<i>Heavy:</i>			
Arsenic	µg/L	Annually	Nonparametric
Lead	µg/L	Annually	Nonparametric
Mercury	µg/L	Annually	Nonparametric
<i>Other:</i>			
Molybdenum	µg/L	Annually	Nonparametric
<i>VOCs:⁵</i>			Nonstatistical
<i>Alcohols:</i>			
Tert-Amyl methyl ether	µg/L	Semiannually	
Tert-Butyl alcohol	µg/L	Semiannually	
Tert-Butyl ethyl ether	µg/L	Semiannually	
Isobutyl alcohol	µg/L	Semiannually	
di-Isopropyl ether	µg/L	Semiannually	
Methyl tert-butyl ether (MTBE)	µg/L	Semiannually	
<i>Benzene Compounds:</i>			
<i>BTEX:</i>			
Benzene	µg/L	Semiannually	
Ethylbenzene	µg/L	Semiannually	
Toluene	µg/L	Semiannually	
Xylenes (total)	µg/L	Semiannually	
<i>Halogenated:</i>			
<i>Common:</i>			
1,1-Dichloroethane (1,1-DCA)	µg/L	Semiannually	

<u>Monitoring Parameter</u>	<u>Units</u>	<u>Frequency</u>	<u>Data Analysis</u>
1,2-DCA	µg/L	Semiannually	
1,1-DCE	µg/L	Semiannually	
Tetrachloroethene (PCE)	µg/L	Semiannually	
1,1,1-Trichloroethane (TCA)	µg/L	Semiannually	
1,1,2-TCA	µg/L	Semiannually	
Trichloroethene (TCE)	µg/L	Semiannually	
1,1,1,2-Tetrachloroethane	µg/L	Semiannually	
1,1,2,2-Tetrachloroethane	µg/L	Semiannually	
Vinyl chloride	µg/L	Semiannually	
<i>Industrial Solvents:</i>			
<i>Common:</i>			
Carbon disulfide	µg/L	Semiannually	
Methyl ethyl ketone (MEK: 2-Butanone)	µg/L	Semiannually	
<i>Interferences:</i>			
<i>Common:</i>			
Acetone	µg/L	Semiannually	
Methyl bromide (Bromomethene)	µg/L	Semiannually	
Methylene chloride	µg/L	Semiannually	
<i>Organochlorine Pesticides:</i>			Nonstatistical
Dieldrin	µg/L	Every 2½ years	
α-BHC	µg/L	Every 2½ years	
γ-BHC (Lindane)	µg/L	Every 2½ years	
Endrin	µg/L	Every 2½ years	
Heptachlor	µg/L	Every 2½ years	
Heptachlor epoxide	µg/L	Every 2½ years	
b. COC Monitoring¹			
All Wells			
All Table G.2 COCs not listed in Table G.1.C.a above.	See Table G.2	Every 5 years	Statistical/ Nonstatistical

1. Monitoring program shall be conducted concurrently with other required groundwater monitoring programs under this Order.
2. Compliance (i.e., corrective action and COC) monitoring programs shall include background monitoring required to meet monitoring goals and performance standards per MRP Sections D.3.a and D.3.b.
3. Report units for this constituent as “mg/L as CaCO₃”.
4. Samples shall be filtered prior to performing dissolved inorganics analysis.
5. Unknown chromatographic peaks shall be reported, along with an estimate of the concentration of the unknown analyte per Provision 7, *Sampling and Analytical Methods, PROVISIONS FOR MONITORING, SPRR*.

Table G.2
Constituents of Concern (COCs),
Approved USEPA Analytical Methods, & Concentration Limits

A. Inorganic COCs				
<u>Constituent of Concern</u>	<u>USEPA Test Method</u>	<u>Concentration Limit</u>		
		<u>Unsaturated Zone¹</u>	<u>Ground-water</u>	<u>Surface Water¹</u>
<i>General Parameters (mg/L, except as noted):</i>				
Alkalinity, Total ²	2320B	----	120	----
Chemical Oxygen Demand (COD) ²	410.4	----	---- ³	----
Dissolved Oxygen, mg/L	360.1		---- ³	
pH, pH units	150.1		---- ³	
Specific Conductance, µS/cm	120.1		---- ³	
Total Dissolved Solids (TDS)	2540C	----	220	----
Total Hardness ²	2340B	----	77	----
<i>General Minerals:</i>				
<i>Major Anions</i>				
Alkalinity, Bicarbonate ²	2310B	----	120	----
Chloride	300	----	9.9	----
Sulfate	300	----	34.0	----
Nitrate – Nitrogen	300	----	60.9	----
<i>Major Cations:</i>				
Calcium	200.7/6010	----	19.3	----
Sodium	200.7/6010	----	19.0	----
Magnesium	200.7/6010	----	9.6	----
Potassium	200.7/6010	----	3.5	----
<i>Dissolved Metals, µg/L:</i>				
<i>Common:</i>				
Iron	200.9/200.8	----	409	----
Manganese	200.7/6010	----	12.0	----
Aluminum	200.7/6010	----	318	----
Barium	200.7/6010	----	97.1	----
Sulfide	9030B	----	PQL	----

<u>Constituent of Concern</u>	<u>USEPA Test Method</u>		<u>Concentration Limit</u>	
<i>Heavy:</i>				
Arsenic	200.9/200.8	----	3.0	----
Cadmium	200.7/6010	----	13.7	----
Chromium	200.7/6010	----	6.9	----
Hexavalent Chromium	218.6/1636	----	---- ³	----
Lead	200.9/200.8	----	1.2	----
Mercury	7470A	----	PQL	----
<i>Other:</i>				
Antimony	200.7/6010	----	PQL	----
Beryllium	200.7/6010	----	MDL	----
Boron	200.7/6010	----	---- ³	----
Cobalt	200.7/6010	----	PQL	----
Copper	200.7/6010	----	6.6	----
Cyanide	335.4/9010	----	MDL	----
Molybdenum	200.7/6010	----	5.9	----
Nickel	200.9/200.8	----	2.7	----
Selenium	200.9/200.8	----	5.6	----
Silver	200.7/6010	----	PQL	----
Thallium	200.7/6010	----	MDL	----
Tin	200.7/6010	----	155	----
Vanadium	200.7/6010	----	17.1	----
Zinc	200.7/6010	----	22.8	----

1. CLs not required for this media absent evidence of impacts or threat per Section 20080(g).
2. Report units for this constituent as "mg/L as CaCO₃".
3. CLs not yet developed for this constituent due to Insufficient monitoring data.

B. Organic COCs		
VOCs, µg/L ¹		
<i>Alcohols:</i>	8260B	MDL
Tert-Amyl methyl ether		
Tert-Butyl alcohol		
Tert-Butyl ethyl ether		
Isobutyl alcohol		

<u>Constituent of Concern</u>	<u>USEPA Test Method</u>	<u>Concentration Limit</u>
di-Isopropyl ether		
Methyl tert-butyl ether (MTBE)		
<i>Benzene Compounds:</i>	8260B	MDL
<i>BTEX:</i>		
Benzene		
Ethylbenzene		
Toluene		
Xylenes (total)		
<i>Other:</i>		
n-Butylbenzene		
sec-Butylbenzene		
tert-Butylbenzene		
Bromobenzene		
Chlorobenzene		
1,2,4-Trimethylbenzene		
1,3,5-Trimethylbenzene		
n-Propylbenzene		
o-Dichlorobenzene (1,2-DCB)		
m-Dichlorobenzene (1,3-DCB)		
1,2,4-Trichlorobenzene		
Bromochloromethane		
Bromodichloromethane		
Bromoform (Tribromomethane)		
Chloroethane		
1,2-Dibromoethane (Ethylene dibromide; EDB)		
Dibromochloromethane (Chlorodibromomethane)		
trans-1,2-DCEMethyl chloride (Chloromethane)		
p-Dichlorobenzene (1,4-DCB)		
<i>CFCs:</i>	8260B	MDL
Carbon Tetrachloride (Freon-10)		
Chloroform (Freon-20)		

<u>Constituent of Concern</u>	<u>USEPA Test Method</u>	<u>Concentration Limit</u>
Dichlorodifluoromethane (Freon-12)		
Trichlorofluoromethane (Freon-11)		
Trichlorotrifluoroethane (Freon-113)		
<i>Hologenated:</i>	8260B	MDL
<i>Common:</i>		
1,1-Dichloroethene (DCE)		
Cis-1,2- DCE		
Trans-1,2-DCE		
1,1-Dichloroethane (1,1-DCA)		
1,2-DCA		
Tetrachloroethene (PCE)		
1,1,1-Trichloroethane (TCA)		
1,1,2-TCA		
Trichloroethene (TCE)		
1,1,1,2-Tetrachloroethane		
1,1.2,2-Tetrachloroethane		
Vinyl chloride		
<i>Trihalomethanes:</i>		
Bromochloromethane		
Bromodichloromethane		
Bromoform (Tribromomethane)		
1,2-Dibromoethane (Ethylene dibromide; EDB)		
Dibromochloromethane (Chlorodibromomethane)		
<i>Other:</i>		
Methyl chloride (Chloromethane)		
Chloroethane		
<i>Industrial Solvents, Common:</i>	8260B	MDL
Carbon disulfide		
Methyl ethyl ketone (MEK: 2-Butanone)		
<i>Interferences, Common:</i>	8260B	MDL
Acetone		

<u>Constituent of Concern</u>	<u>USEPA Test Method</u>	<u>Concentration Limit</u>
Methyl bromide (Bromomethene)		
Methylene chloride		
<i>Miscellaneous:</i>	8260B	MDL
Acetonitrile		
Acrolein		
Acrylonitrile		
Chloroprene		
trans-1,4-Dichloro-2-butene		
Ethyl methacrylate		
Hexachlorobutadiene		
Hexachloroethane		
2-Hexanone (Methyl butyl ketone)		
Iodomethane (Methyl iodide)		
Methacrylonitrile		
Methylene bromide (Dibromomethane)		
4-Methyl-2-pentanone (Methyl isobutylketone)		
Naphthalene		
2-Nitropropane		
Propionitrile		
Styrene		
<i>Props:</i>	8260B	MDL
1,2-Dichloropropane		
1,3-Dichloropropane		
2,2-Dichloropropene		
1,1-Dichloropropene		
cis-1,3-Dichloropropene		
1,2,3-Trichloropropane		
1,2-Dibromo-3-chloropropane		
trans-1,3-Dichloropropene		
3-Chloropropene (Allyl chloride)		

<u>Constituent of Concern</u>	<u>USEPA Test Method</u>	<u>Concentration Limit</u>
<i>Other Organic COCs:</i>		
<i>Semi-VOCs:</i>	8270B ²	MDL
Acenaphthene		
Acenaphthylene		
Acetophenone		
2-Acetylaminofluorene (2-AAF)		
4-Aminobiphenyl		
Anthracene		
Benzo[a]anthracene (Benzanthracene)		
Benzo[b]fluoranthene		
Benzo[k]fluoranthene		
Benzo[g,h,i]perylene		
Benzo[a]pyrene		
Benzyl alcohol		
Bis(2-ethylhexyl) phthalate		
Bis(2-chloroethoxy)methane		
Bis(2-chloroethyl) ether (Dichloroethyl ether)		
Bis(2-chloro-1-methylethyl) ether (Bis(2-chloroisopropyl) ether; DCIP)		
4-Bromophenyl phenyl ether		
Butyl benzyl phthalate (Benzyl butyl phthalate)		
p-Chloroaniline		
p-Chloro-m-cresol (4-Chloro-3-methylphenol)		
2-Chloronaphthalene		
2-Chlorophenol		
4-Chlorophenyl phenyl ether		
Chrysene		
o-Cresol (2-methylphenol)		
m-Cresol (3-methylphenol)		
p-Cresol (4-methylphenol)		
Dibenz[a,h]anthracene		
Dibenzofuran		
Di-n-butyl phthalate		
3,3-Dichlorobenzidine		
2,4-Dichlorophenol		
2,6-Dichlorophenol		
Diethyl phthalate		
p-(Dimethylamino)azobenzene		
7,12-Dimethylbenz[a]anthracene		

<u>Constituent of Concern</u>	<u>USEPA Test Method</u>	<u>Concentration Limit</u>
3,3'-Dimethylbenzidine		
2,4-Dimehtylphenol (m-Xylenol)		
Dimethyl phthalate		
m-Dinitrobenzene		
4,6-Dinitro-o-cresol (4,6-Dinitro-2-methylphenol)		
2,4-Dinitrophenol		
2,4-Dinitrotoluene		
2,6-Dinitrotoluene		
Di-n-octyl phthalate		
Diphenylamine		
Ethyl methanesulfonate		
Famphur		
Fluoranthene		
Fluorene		
Hexachlorobenzene		
Hexachloropropene		
Indeno(1,2,3-c,d)pyrene		
Isophorone		
Isosafrole		
Kepone		
Methapyrilene		
3-Methylcholanthrene		
Methyl methanesulfonate		
2-Methylnaphthalene		
1,4-Naphthoquinone		
1-Naphthylamine		
2-Naphthylamine		
o-Nitroaniline (2-Nitroaniline)		
m-Nitroaniline (3-Nitroaniline)		
p-Nitroaniline (4-Nitroaniline)		
Nitrobenzene		
o-Nitrophenol (2-Nitrophenol)		
p-Nitrophenol (4-Nitrophenol)		
N-Nitrosodi-n-butylamine (Di-n-butylnitrosamine)		
N-Nitrosodiethylamine (Diethylnitrosamine)		
N-Nitrosodimethylamine (Dimethylnitrosamine)		
N-Nitrosodiphenylamine (Diphenylnitrosamine)		
N-Nitrosodipropylamine (N-Nitroso-N-dipropylamine; Di-n-propylnitrosamine)		

<u>Constituent of Concern</u>	<u>USEPA Test Method</u>	<u>Concentration Limit</u>
N-Nitrosomethylethylamine (Methylethylnitrosamine)		
N-Nitrosopiperidine		
N-Nitrosopyrrolidine		
5-Nitro-o-toluidine		
Pentachlorobenzene		
Pentachloronitrobenzene (PCNB)		
Pentachlorophenol		
Phenacetin		
Phenanthrene		
Phenol		
p-Phenylenediamine		
Polychlorinated biphenyls (PCBs; Aroclors)		
Pronamide		
Pyrene		
Safrole		
1,2,4,5-Tetrachlorobenzene		
2,3,4,6-Tetrachlorophenol		
o-Toluidine		
2,4,5-Trichlorophenol		
0,0,0-Triethyl phosphorothioate		
sym-Trinitrobenzene		
<i>Organochlorine Pesticides:</i>	808A	MDL
Aldrin		
α -BHC		
β -BHC		
γ -BHC (Lindane)		
δ -BHC		
Chlorobenzilate		
α -Chlordane		
γ -Chlordane		
Chlodane – not otherwise specified		
DBCP		
4,4'-DDD		
4,4'-DDE		
4,4'-DDT		
Diallate		

<u>Constituent of Concern</u>	<u>USEPA Test Method</u>	<u>Concentration Limit</u>
Dieldrin		
Endosulfan I		
Endosulfan II		
Endosulfan sulfate		
Endrin		
Endrin aldehyde		
Endrin ketone		
Heptachlor		
Heptachlor epoxide		
Hexachlorocyclopentadiene		
Isodrin		
Methoxychlor		
Toxaphene		
<i>Polychlorinated Biphenols:</i>	8082	MDL
Aroclor 06		
Aroclor 22		
Aroclor 232		
Aroclor 242		
Aroclor 248		
Aroclor 254		
Aroclor 260		
<i>Organophosphorus Pesticides:</i>	84A	MDL
Chlorpyrifos		
Diazinon		
Dimethioate		
Disulfoton		
Ethion		
Famphur		
Malathion		
Parathion		
Parathion-ethyl		
Parathion-methyl		
Phorate		

<u>Constituent of Concern</u>	<u>USEPA Test Method</u>	<u>Concentration Limit</u>
<i>Chlorinated Herbicides:</i>	85A	MDL
2,4-D (2,4-Dichlorophenoxyacetic acid)		
Dicamba		
Dinoseb (DNBP; 2-sec-Butyl-4,6-dinitrophenol)		
MCPA		
MCPP		
Silvex (2,4,5-Trichlorophenoxypropionic acid; 2,4,5-TP)		
2,4,5-T (2,4,5-Trichlorophenoxyacetic acid)		
Pentachlorophenol		

1. Unknown chromatographic peaks shall be reported, along with an estimate of the concentration of the unknown analyte per Provision 7, *Sampling and Analytical Methods, PROVISIONS FOR MONITORING*, SPRR.
2. USEPA Method 8270 - base, neutral, & acid extractables.