

California Regional Water Quality Control Board
North Coast Region

Monitoring and Reporting Program No. R1-2010-0102
[Rescinding and Replacing Monitoring and Reporting Program No. R1-2010-0062]
WDID No. 1B04028RSON

FOR

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This Monitoring and Reporting Program (MRP) is issued pursuant to California Water Code Section 13267(b) and specifies routine, pre and post injection monitoring and reporting requirements for groundwater and sub-slab vapor, and the submittal of monitoring reports. This MRP also specifies contingency monitoring and reporting requirements for both groundwater and sub-slab vapor, and requires that these contingency requirements be implemented when analytical results exceed specified threshold levels. The objectives of monitoring conducted under this MRP are to provide the Dischargers and Regional Water Board staff with information concerning contaminant trends in groundwater and sub-slab vapor, and to demonstrate compliance with the provisions of General Waste Discharge Requirements Order No. R1-2009-0105. The groundwater and sub-slab vapor sampling and analysis requirements specified below are summarized in Appendix 1 of this MRP.

Under the authority of the California Water Code Section 13267, the Dischargers named above are required to comply with the following:

GROUNDWATER AND SUB-SLAB VAPOR MONITORING

General Requirements

1. The depth to groundwater shall be measured to the nearest 0.01-foot prior to monitoring well purging and sampling. Groundwater elevations shall be reported in tabular form indicating the surveyed elevations of each well reference point, depth to groundwater from the reference point, and the actual groundwater elevation. The data generated from the elevation readings must be referenced to mean sea level.
2. All monitoring wells shall be purged of least three casing volumes of water, or until dry, prior to sampling. Monitoring wells shall be allowed to recharge to at least 80%

of the initial casing volume prior to sampling. All purge water shall be impounded pending analysis for proper disposal. An alternative well-purging protocol may be used upon the written approval of the Executive Officer.

3. Chemical analyses required by this MRP shall be conducted by laboratories certified by the California Department of Health Services.

Routine Monitoring

4. Groundwater samples shall be collected from all monitoring wells installed at the Site semi-annually, during the first and third calendar quarters, and analyzed for the full list of volatile organic compounds quantified by EPA Method 8260B (VOCs)¹, which is incorporated as Appendix 2 of this MRP.

Pre-Injection Monitoring

5. All upper-zone groundwater monitoring wells shall be sampled as described above prior to initiating sub-surface chemical injections and tested for the dissolved metals arsenic, iron, manganese, mercury, and vanadium; and for the water quality parameters alkalinity, chemical oxygen demand, total organic carbon, dissolved oxygen, oxidation-reduction potential, pH, and temperature.
6. Sub-slab vapor samples from vapor probe SVM-01 shall be collected prior to initiating sub-surface chemical injections and analyzed for hydrogen sulfide and VOCs. The protocol to be used for sub-slab vapor sampling shall be consistent with current California regulatory guidelines for sub-slab vapor sampling.² A work plan for installing SVM-01 and collecting vapor samples shall be submitted for Regional Water Board staff review and concurrence prior to sampling. All sub-slab vapor results shall be reported in micrograms per cubic meter.

Post-Injection Monitoring

7. Groundwater monitoring wells MW-UA-01, MW-UA-02, MW-UA-03, MW-UA-04, MW-UA-05, MW-UA-06, MW-UA-07, and PZ-UA-01 shall be sampled as described above two months and four months following the initial chemical injections, and semi-annually thereafter. The samples shall be tested for the dissolved metals arsenic, iron, and manganese; and for the water quality parameters alkalinity, chemical oxygen demand, total organic carbon, dissolved oxygen, oxidation-reduction potential, pH, and temperature.
8. Sub-slab vapor samples from probe SVM-01 and any additional vapor probes installed to assess subsurface conditions shall be collected two months and four months following the initial chemical injections, and semi-annually thereafter, and

¹ *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846)*, U.S. Environmental Protection Agency. <http://www.epa.gov/epawaste/hazard/testmethods/sw846/online/index.htm> .

² California regulatory guidelines include: 1) Appendix G from the *Interim Final Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air*. California Department of Toxic Substances Control. December 15, 2004, revision dated February 7, 2005; and 2) *Active Soil Gas Investigations Advisory*. California Regional Water Quality Control Board, Los Angeles Region and California Department of Toxic Substances Control. January 28, 2003.

shall be analyzed for hydrogen sulfide and VOCs. All sub-slab vapor sample results shall be reported in micrograms per cubic meter.

GROUNDWATER CONTINGENCY MONITORING PLAN

9. If post injection groundwater analytical results for either well MW-2, MW-3, MW-4, MW-5, or MW-6 exceed pre-injection levels for dissolved iron, manganese, or arsenic by a factor of two (200 %), that monitoring well shall be re-sampled within one month of receipt of the laboratory data, and semiannually thereafter. The samples shall be tested for the dissolved metals arsenic, iron, manganese, mercury, and vanadium; and for the water quality parameters alkalinity, chemical oxygen demand, total organic carbon, dissolved oxygen, oxidation-reduction potential, pH, and temperature.

SUB-SLAB VAPOR CONTINGENCY MONITORING AND REPORTING PLAN

10. The Dischargers shall submit written notification to Regional Water Board staff within ten days of receipt of the laboratory results if the sub-slab vapor levels of hydrogen sulfide and/or a VOC exceed the *California Human Health Screening Levels (CHHSLs)*³ for that constituent in indoor air after application of the appropriate default attenuation factor specified in the California regulatory guidelines for assessing the vapor intrusion pathway.⁴
11. If constituent levels in sub-slab vapor modified by the attenuation factor exceed the CHHSLs, the sub-slab vapor probe shall be re-sampled and analyzed within one month of receipt of the laboratory data, and at one month intervals thereafter. The analytical results shall be submitted within five days of their availability. Semi-annual sub-slab vapor monitoring may be resumed if the results from the latest two consecutive monthly analyses show that the constituents of concern are below screening levels.
12. If, after four months of contingency sampling, the last two sub-slab vapor analytical results exceed screening levels for any constituent of concern, a work plan for a site specific human health risk assessment shall be submitted within sixty days of receipt of the laboratory data.

REPORTING

Monitoring reports for groundwater and sub-slab vapor shall be submitted semi-annually in paper format to the Regional Water Board according to the following schedule:

³ Sub-slab vapor results shall be compared to the CHHSLs identified in "Table 2. *California Human Health Screening Levels for Indoor Air and Soil Gas*" in the guidance document: *Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties*. CalEPA Office of Environmental Health Hazard Assessment. January 2005.

⁴ *Interim Final Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air*. California Department of Toxic Substances Control. December 15, 2004, revision dated February 7, 2005.

<u>Reporting Period</u>	<u>Report Due Date</u>
October through March	April 30
April through September	October 31

Monitoring reports, laboratory analytical reports, and health risk assessment work plans and reports for the site shall also be submitted electronically to the State Water Resources Control Board's Geographic Environmental Information Management System database (GeoTracker) as required by Title 23, Division 3, Chapter 30, Article 2, Sections 3890-3895 of the California Code of Regulations.

Each semi-annual monitoring report shall include the following elements:

- A. A groundwater elevation map for each sampling event, showing the locations of monitoring wells, vapor monitoring points, former and current underground tanks, and other significant on-site structures and features.
- B. A contaminant isogram map for the most significant pollutant or pollutants detected during the monitoring events.
- C. Analytical data tables for permanent groundwater and vapor monitoring points, including both current and historical analytical results.
- D. Copies of the well purging and sampling field logs; chain of custody documents showing the time and date of collection and person collecting; and signed laboratory reports including quality control data and explanations of analytical anomalies, if any. Monitoring reports shall also identify the type of instruments that were used for field-measured data, and shall include copies of the pre and post-calibration records or provide other assurance for field data quality. These supporting documents may be included as appendices in the report.
- E. A discussion of the sub-slab vapor analytical results and the assessment of potential vapor intrusion to indoor air, including recommendations for additional investigation or mitigation measures to address any concerns about indoor air quality.

Ordered by _____
Catherine Kuhlman
Executive Officer
December 24, 2010

Sampling and Analysis Plan

MONITORING POINT	PRE-INJECTION MONITORING ⁽¹⁾	POST-INJECTION MONITORING ⁽²⁾	ROUTINE SEMI-ANNUAL MONITORING ⁽³⁾
Upper Zone Wells			
MW-UA-01	X	X	X
MW-UA-02	X	X	X
MW-UA-03	X	X	X
MW-UA-04	X	X	X
MW-UA-05	X	X	X
MW-UA-06	X	X	X
MW-UA_07	X	X	X
PZ-UA-01	X	X	X
MW-2	X		X
MW-3	X		X
MW-4	X		X
MW-5	X		X
MW-6	X		X
Lower Zone Wells			
MW-LA-01			X
MW-LA-02			X
MW-LA-03			X
MW-LA-04			X
MW-LA-06			X
PZ-LA-01			X
Sub-Slab Vapor Well			
SVM-01 ⁽⁴⁾	X	X	X

(1) Pre-injection Monitoring for groundwater shall include: a) Dissolved metals: arsenic, iron, manganese, mercury, and vanadium; and b) Water quality parameters: alkalinity, chemical oxygen demand, total organic carbon, dissolved oxygen, oxidation-reduction potential, pH, and temperature.

(2) Post-injection monitoring for groundwater shall include a) Dissolved metals: arsenic, iron, and manganese; and b) Water quality parameters: alkalinity, chemical oxygen demand, total organic carbon, dissolved oxygen, oxidation-reduction potential, pH, and temperature.

(3) Routine Semi-annual Monitoring for groundwater shall include the full list of volatile organic compounds quantified by EPA Method 8260B.

(4) Sub-Slab Vapor samples shall be analyzed for hydrogen sulfide and for the full list of volatile organic compounds quantified by EPA Method 8260B.