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January 6, 2015

Ms. Kristen M. Ruffell
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1955 Workman Mill Road
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PALOS VERDES LANDFILL SECOND FIVE YEAR REVIEW REPORT - ROLLING HILLS ESTATES, CALIFORNIA (Site Code: 400116)

Dear Ms. Ruffell:

The Department of Toxic Substances Control (DTSC) has reviewed the subject Report and has found it to be acceptable. Therefore, the Report is approved.

Should you have any questions or comments, please feel free to contact me at Daniel.Zogaib@dtsc.ca.gov or at (714) 484-5483

Sincerely,

Daniel K. Zogaib

Daniel K. Zogaib
Project Manager
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cc: Karen Luo
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Palos Verdes Landfill
Second Five-Year Review
Rolling Hills Estates, California

Approved by:
Department of Toxic Substances Control
Cypress, California

January 6, 2015

Prepared by:

County Sanitation Districts of Los Angeles County
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1. INTRODUCTION

Pursuant to the Operation and Maintenance (O&M) Agreement (DTSC, 1998) between the County Sanitation Districts of Los Angeles County (Sanitation Districts) and the Department of Toxics Substances (DTSC) for the Palos Verdes Landfill (site, PVLF), remedial actions implemented at the site are reviewed every five years. DTSC is the primary regulatory agency overseeing the implementation and the performance review of the remedial activities at the PVLF. The first Five-Year Review for the PVLF was completed and approved by DTSC on November 4, 2009 (DTSC, 2009). This is the second five-year review of the PVLF and is a re-evaluation of the site's O&M records with respect to the facility performance since the last Five-Year Review.

2. BACKGROUND

The PVLF is located at 25706 Hawthorne Boulevard, Rolling Hills Estates, Los Angeles County, California (Figure 1) and covers approximately 291 acres. About 83 acres of the site are operated by the County of Los Angeles Department of Parks and Recreation as the South Coast Botanic Garden; 35 acres are operated by the City of Rolling Hills Estates as Ernie Howlett Park; and the remaining 173 acres, referred to as the Main Site, are operated by the Sanitation Districts with limited access to the public (Figure 2).

From the early 1900s until the 1950s, much of the area covered by the PVLF was operated as a diatomite mine. In 1952, Ben K. Kazarian and Sons (BKK) began landfill operations in the area now developed into the South Coast Botanic Garden. In 1957, the Sanitation Districts acquired the landfill from BKK and assumed landfill operations. The Sanitation Districts expanded the landfill and operated the facility until December 1980 when the landfill reached design capacity. A portion of the facility was permitted to receive hazardous waste and approximately 3 to 4 percent of the waste received at the landfill was considered hazardous. The types of hazardous waste accepted were primarily liquid wastes that included: acid wastes, solvents, alkaline wastes, tetraethyl lead sludge, chemical toilet wastes, hazardous tank bottoms, contaminated soil and sand, brine, pesticides, and other hazardous wastes (primarily refinery, oil field, and oil terminal wastes) (Sanitation Districts, 1997).

Volatile organic compounds (VOCs) were first detected in groundwater at the site in the early 1980s. As a result, a comprehensive Remedial Investigation (RI) and a Feasibility Study (FS) were conducted (Sanitation Districts, 1995a and 1995b). A Remedial Action Plan (RAP) was finalized in September 1995 (Sanitation Districts, 1995c) to implement a remedial action program at the site. The remedial action objectives established in the RI/FS and RAP include:

- Maintain and/or operate existing landfill control and monitoring facilities, including the landfill cover, and gas collection and groundwater containment systems; and
- Control offsite downgradient groundwater contamination from the landfill.

The recommended remedial actions for the site were implemented and certified by DTSC on April 13, 1999. Since the certification, DTSC reviews facility performance every five years to

ensure that remedial actions continue to be protective of human health and the environment. The first Five-Year Review of the remedial actions for the PVLF was approved in 2009 and found the environmental control systems effective and that the site is safe and well maintained. As a result, no additional remedial measures were recommended.

3. SITE ACTIVITIES FOLLOWING THE FIRST FIVE-YEAR REVIEW

Since the first Five-Year Review, the Sanitation Districts have continued to operate, maintain, monitor, optimize, and report the performance of the remedial measures implemented at the site. Table 1 provides a listing of specific O&M activities/projects that were implemented since 2007 at the site along with a listing of associated documentation. These documents have been reviewed to ensure that remedial action objectives are being fulfilled at the site. Also included in Table 1 is a list of ongoing monitoring activities routinely performed at the site.

Table 1 – O&M Activities/Project and Routine Monitoring Work

Activity	Document	Date
O&M Activities and Projects 2007-2013		
Redevelopment of Groundwater Extraction Wells E01-E13	Redevelopment, Abandonment & Regrouting Services for Groundwater Extraction and Monitoring Wells at Sanitation Districts Landfill Sites (work conducted by AES, 2008)	February 2007 through April 2007
Redevelopment of Groundwater Extraction Well E16	Daily Field Report and Well Development/Purge Log for E16 (work conducted by AES, 2009)	November 2009
Redevelopment of Groundwater Extraction Well E14	Daily Field Report and Well Development/Purge Log for E14 (work conducted by AES, 2010)	February 2010
Evaluation of Laboratory Procedures to Reduce Matrix Interference for the Analyses of Volatile Organic Compounds	PVLF Quarterly O&M Summary Reports	First Quarter through Fourth Quarter 2011
Addition of Groundwater Extraction Wells (E17 & E18) along Hawthorne Boulevard	Technical Design Memorandum to DTSC	April 2013
Installation of a John Zink Low Emissions Landfill Gas Flare	Contract Drawings - Palos Verdes Landfill Flare Station Improvements	September 2008 through October 2011
Demolition of the Palos Verdes Landfill Gas-to-Energy Facility	Contract Drawings – Palos Verdes Landfill Power Plant Demolition	Second Quarter 2013 (Ongoing)

Table 1 – O&M Activities/Project and Routine Monitoring Work (continued)

Activity	Document	Date
Routine Monitoring Work		
Surface Air and Subsurface Gas Monitoring	• Monthly Monitoring and Reporting Program for Boundary Gas Probes (submitted to Los Angeles County Department of Public Health) • Quarterly Palos Verdes Landfill Monitoring Report for Compliance with SCAQMD Rule 1150.1 (submitted to SCAQMD, cc: DTSC) • Quarterly South Coast Botanic Garden (Palos Verdes Landfill) Gift Shop Gas Monitoring Report (submitted to Los Angeles County Department of Public Works) • Annual Palos Verdes Landfill Flare Source Testing Report for Compliance with SCAQMD Rule 1150.1 (submitted to SCAQMD) • Palos Verdes Landfill (Facility ID 24520) Annual Monitoring Report for Compliance with SCAQMD Rule 1150.1 (submitted to SCAQMD, cc: DTSC)	Monthly, Quarterly, and Annually
Groundwater Monitoring	Palos Verdes Landfill Quarterly O&M Summary Reports (submitted to DTSC)	Quarterly
Storm Water Inspections/ Reporting	• Quarterly and annual site inspections (submitted to RWQCB) • Storm Water Annual reports (submitted to RWQCB)	Quarterly and Annually
Industrial Wastewater Monitoring	Industrial Wastewater Self-Monitoring Report (submitted to Sanitation Districts' Industrial Wastewater Section)	Quarterly and Semi-Annually

SCAQMD-South Coast Air Quality Management District
RWQCB-California Regional Water Quality Control Board, Los Angeles Region

In accordance with the work plan approved by DTSC on July 15, 2014 (Sanitation Districts, 2014), the scope of this five-year review includes an evaluation of groundwater, surface air, and subsurface gas monitoring data collected during the review period (January 2007 through December 2013) to determine the effectiveness of the environmental control systems in meeting the remedial action objectives. In addition, at the request of DTSC, the effectiveness of the storm water and industrial waste water monitoring programs in meeting permit requirements is also included in this review.

4. SITE INSPECTION

A site inspection was conducted for the second Five-Year Review on September 22, 2014. Dan Zogaib of DTSC conducted the inspection with Sanitation Districts' staff familiar with the site and its operation. The site inspection roster and inspection checklist are provided in Appendix A. The site inspection included physical examination of facilities at the Main Site, South Coast Botanic Garden, and Ernie Howlett Park.

The site inspection documentation, provided in Appendix A, describes the facilities and documents inspected and their condition and adequacy. The site inspection found facilities in good condition and O&M procedures and documentation appropriate for the operation of those facilities at the site.

5. O&M OVERVIEW AND COST SUMMARY

Review of O&M requirements, procedures, and costs is a component of the Five-Year Review process. A summary of O&M costs for the PVLF is presented in Table 2. These O&M expenditures ensure that all systems are operating as designed and functioning to control potential migration of landfill-related contaminants.

O&M activities related to groundwater, surface air, subsurface gas, storm water, and industrial wastewater activities are discussed in Section 6 of this review.

Table 2 - Summary of O&M Costs 2007-2013

Year	Total O&M Costs*
2007	$3,522,000
2008	$4,050,000
2009	$3,580,000
2010	$3,160,000
2011	$3,125,000
2012	$3,459,000
2013	$3,423,000

*All values rounded to the nearest $1,000

6. REMEDIAL SYSTEMS ASSESSMENT

Remedial facilities are in place at PVLF to contain or prevent the release of contaminants from the site. The remedial facilities and O&M are discussed for various media including groundwater, surface air, and subsurface gas, storm water, and industrial wastewater in

Sections 6.1 through 6.5, respectively. The media-specific data were analyzed in various ways to assess effectiveness.

Although storm water and industrial wastewater systems are not considered remedial systems, an assessment of these facilities is included in Sections 6.4 and 6.5, respectively.

6.1 GROUNDWATER

The PVLF was found to be the source of two plumes of groundwater contamination during the RI; one along Hawthorne Boulevard and a second along Crenshaw Boulevard. Although groundwater directly downgradient of the site is not in a designated groundwater basin (RWQCB, 1994) and its future use as a drinking water supply is unlikely due to limited aquifer thickness and naturally poor water quality, remedial measures were taken to ensure these groundwater plumes are contained at the site. The remedial measures included the installation of a groundwater containment system at the PVLF, which currently consists of a subsurface cement-bentonite barrier and 18 groundwater extraction wells (Figure 3). The system is monitored by a network of 32 groundwater monitoring wells (Figure 2). These wells provide coverage of groundwater flow paths from the site and additional coverage beyond the extent of contamination defined during the RI/FS. The objective of the groundwater monitoring program is to ensure these groundwater plumes are controlled by the groundwater containment system. Table 3 lists all of the existing monitoring wells by location.

Table 3 Current Groundwater Monitoring Program Wells

Onsite Near Crenshaw Blvd.	Offsite Near Crenshaw Blvd.	Onsite Near Hawthorne Blvd.	Offsite Near Hawthorne Blvd.	Onsite Near the Northeast Main Site Boundary	Offsite Near the Northeast Main Site Boundary	Background Upgradient
M38A	M36A	M06A	M26A	M30B	M66B	M56B
M39A	M37A	M06B	M49A	M33B	M67B	M58B
M53B	M69B	M07A	M51B	M35B		M60B
	M70B	M07B	M63B			M62B
	M71B	P410	M64B			
	M72B	P411	PV3			
	M52B*					
	M59B*					

* Routine sampling of offsite wells SW08 and SW09 near Crenshaw Boulevard were replaced by wells M52B and M59B in third quarter 2010 pursuant to a request from DTSC.

Based on the results of the RI, a group of 12 VOCs and one metal was selected as being indicative of landfill-related contamination, referred to as constituents of concern (COCs).

These COCs include benzene, chlorobenzene, methylene chloride, trichloroethylene (TCE), tetrachloroethylene (PCE), vinyl chloride, 1,1-dichloroethane (1,1-DCA), 1,2-dichloroethane (1,2-DCA), 1,1-dichloroethylene (1,1-DCE), trans-1,2-dichloroethylene (trans-1,2-DCE), cis-1,2-dichloroethylene (cis-1,2-DCE), 1,2-dichloropropane, and arsenic (metal).

During the first Five-Year Review, an assessment of groundwater data indicated that arsenic, which was identified as a COC at the conclusion of the RI, is not related to the landfill but indicative of the groundwater chemistry and mobilization of naturally-occurring arsenic deposits. As such, the evaluation of groundwater data for this second Five-Year Review is focused on VOCs that are found to be indicative of landfill containment.

Groundwater monitoring is conducted at the PVLF on a quarterly basis to assess containment system performance. The sampling parameters and frequency of analyses are presented in Table 4. Currently, groundwater samples collected in the first quarter of the calendar year are analyzed for an extensive list of water quality parameters including general mineral and physical parameters, metals, VOCs, SVOCs, and pesticides. In the remaining three quarters, groundwater samples are analyzed for general mineral and physical parameters and COCs identified in the RI.

Table 4 Groundwater Monitoring Parameters and Frequency

Parameter	Quarterly	Annually
General Physical And Mineral	X (Except Manganese)	X
Heavy Metals	Arsenic Only	X
Soluble Biological Oxygen Demand	X	X
Soluble Chemical Oxygen Demand	X	X
Total Organic Carbon	X	X
Hydrocarbons By EPA Method 8015	X	X
Volatile Organic Compounds	X	X
Semi Volatile Organic Compounds		X
Pesticides		X

In this second Five-Year Review, two criteria are used to evaluate potential trends in landfill-related VOC data:

- Summary Table Analysis
- Statistical Analysis

6.1.1 SUMMARY TABLE ANALYSIS

Water quality summary tables have been prepared to evaluate groundwater VOC data (see Appendix B). The data are divided into the first Five-Year Review (1987 through 2006) and the second Five-Year Review (2007 through 2013). A summary table has been prepared for each of the thirty-four VOCs plus 1,4-dioxane that are sampled/analyzed quarterly and/or annually in accordance with the groundwater monitoring program. Although 1,4-dioxane is a semi-volatile organic compound and was not monitored prior to second quarter 2002, it is an emerging compound that was added to the groundwater monitoring program at the request of DTSC. In this second Five-Year Review, 1,4-dioxane is included in the summary tables for evaluation as a landfill-related COC.

Tables B-1 through B-35 (Appendix B) list the number of samples analyzed with the minimum, maximum, and average results including the number of non-detects for each well. For averaging, ½ the detection limit was used for non-detected results. The percentage of samples in the second Five-Year Review period with concentrations greater than the maximum detection limit or the maximum concentrations detected in the first Five-Year Review period was calculated and listed in Tables B-1 through B-35 as "Criterion %". As in the first Five-Year Review, a criterion percentage greater than 10 (evaluation criterion) indicates a possible increasing trend. Constituents that meet this criterion and were not already identified as a COC are flagged for further evaluation.

Four of the thirty-five constituents evaluated met the 10 percent (10%) evaluation criterion. These include[1]: chlorobenzene, cis-1,2-DCE, 1,4-dioxane, and TCE; all of which have already been identified as COCs for the site. No additional VOCs were identified as constituents of concern warranting further evaluation. Of the four COCs that met the 10% evaluation criterion, chlorobenzene and 1,4-dioxane are parent compounds while cis-1,2-DCE and TCE are daughter compounds. As discussed extensively in the first Five-Year Review, many of the compounds identified as COCs at the PVLF are breakdown products of other parent compounds[2]. Accordingly, an increasing trend in a parent compound (i.e., chlorobenzene and 1,4-dioxane) in downgradient offsite wells is used as the criterion to evaluate the effectiveness of the site groundwater containment system.

During the second Five-Year Review period, two monitoring wells located in the vicinity of Crenshaw Boulevard, had detections that met the criterion. Well M70B met the criterion for chlorobenzene and well M69B met it for 1,4-dioxane. It is noted that while these parent compounds meet the 10% criterion, the results are not consistent for all offsite wells and all parent compounds. For example, while one parent compound detected in an offsite well might meet the criterion, other parent compounds detected at that well do not. Similarly,

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[1] Toluene has also met the 10% evaluation criterion. However, as previously discussed in the first Five-Year Review, detections of BTEX compounds (benzene, toluene, ethyl benzene, and xylene) appear to be from a local source unrelated to the landfill and are therefore not flagged for further evaluation.

[2] Parent VOCs that have already been identified as one of the 12 COCs include benzene, chlorobenzene, methylene chloride, PCE, and 1,2-dichloropropane.

while one offsite well might meet the criterion for one parent compound, other nearby offsite wells do not meet the criterion for the same parent compound. Table 5 lists the landfill-related parent compounds (chlorobenzene and 1,4-dioxane) that met the 10% evaluation criterion in downgradient offsite monitoring wells.

Table 5 Parent Compound COCs and Additional Compounds that Meet 10% Evaluation Criterion in Offsite Downgradient Wells

Constituent	Well	Location	Evaluation Criterion (Percent)
COCs			
Chlorobenzene	M70B	Downgradient/Crenshaw	23.3%
Additional Parent Compounds			
1,4-Dioxane	M69B	Downgradient/Crenshaw	44.8%

6.1.2 STATISTICAL ANALYSIS

The evaluation criterion used to further evaluate the effectiveness of the site groundwater containment system is the Mann Kendall Test for Trend (Gilbert, 1987). The Mann-Kendall Test for Trend is the statistical analysis method used to analyze groundwater quality to determine if the data exhibit any trends during the second Five-Year Review period. A significance level of 5% is used for the Mann Kendall Test for Trend statistical analysis. A minimum number of samples with constituent detections is necessary in order to uses this statistical trend method. If there are fewer than 10 total samples and if multiple sampling events occurred in a relatively short period of time (for the constituents with few samples), the trend analysis is not applicable. Similarly, if more than 50 percent of the sample results were non-detects, the trend analysis is not applicable.

The Mann Kendall Test for Trend was performed on the following parent compounds and the results are presented in Table 6.

- All five COC parent compounds including: benzene, chlorobenzene, methylene chloride, PCE, and 1,2-dichloropropane; and

- 1,4-dioxane, the additional parent compound that was added as a landfill-related COC at the request of DTSC.

The monitoring wells, listed in Table 6, have been grouped according to their location at the site as follows:

- Wells located offsite and downgradient in the vicinity of the Crenshaw Plume,
- Well located offsite and downgradient in the vicinity of the Hawthorne Plume, and
- Wells located offsite near the northeast Main Site boundary (i.e. other offsite wells).

Table 6 Mann-Kendall Trend Analysis

Well	Parent Compound					Other Parent Compound
	Benzene	Chlorobenzene	Methylene Chloride	Tetrachloroethylene	1,2-Dichloropropane	1,4-Dioxane
Downgradient Offsite - Crenshaw Plume Area						
M36A	NA	NA	NA	--	NA	--
M37A	NA	NA	NA	D	NA	--
M69B	NA	--	NA	D	NA	D
M70B	NA	I	NA	--	NA	I
M71B	NA	NA	NA	NA	NA	NA
M72B	NA	NA	NA	NA	NA	--
SW8	NA	NA	NA	NA	NA	NA
SW9	NA	NA	NA	NA	NA	NA
M52B	NA	NA	NA	NA	NA	NA
M59B	NA	NA	NA	NA	NA	NA
Downgradient Offsite - Hawthorne Plume Area						
M26A	NA	NA	NA	NA	NA	NA
M49A	NA	--	NA	NA	NA	I
M51B	NA	NA	NA	NA	NA	NA
M63B	NA	NA	NA	NA	NA	D
M64B	NA	NA	NA	NA	NA	NA
PV3	NA	NA	NA	NA	NA	--
Other Offsite Wells						
M66B	NA	NA	NA	NA	NA	NA
M67B	NA	NA	NA	NA	NA	NA

I - Increasing concentration trend D - Decreasing concentration trend "--" - No trend
Data represents recent trend from January 1, 2007 to December 31, 2013.
NA - More than 50 percent of samples are non-detect or less than 10 samples available for analysis.

6.1.2.1 CRENSHAW PLUME

During the second Five-Year Review period, offsite monitoring wells in the Crenshaw Plume area show no increasing trends for parent compounds except at well M70B where increasing trends for chlorobenzene and 1,4-dioxane were found. It is noted that all detections at well M70B were below the maximum contaminant level (MCL) for chlorobenzene (70 µg/L) and that detections were between 2 µg/L and 8.1 µg/L during the second Five-Year Review period. In addition, 1,4-dioxane, which does not have a MCL, was detected at low levels between 2.3 µg/L and 14.4 µg/L with a minimum detection or detection limit of <2.0 µg/L and maximum detection or detection limit of <20 µg/L (see Table B-23 in Appendix B) during the second Five-Year Review period.

6.1.2.2 HAWTHORNE PLUME

During the second Five-Year Review period, no offsite monitoring wells in the Hawthorne Plume area showed increasing trends for parent compounds except at well M49A where an increasing trend for 1,4-dioxane was found. At well M49A, 1,4-dioxane was detected between 189 µg/L and 294 µg/L. However, the minimum value for 1,4-dixoane was <20 µg/L during the second Five-Year Review period (see Table B-23 in Appendix B).

6.1.2.3 OTHER OFFSITE WELLS

Offsite monitoring wells M66B and M67B are located northeast of the Main Site between the Hawthorne and Crenshaw Plumes. No increasing trends were observed in these wells during the second Five-Year Review period.

6.1.3 GROUNDWATER CONCLUSIONS

As specified in Section 6.1, two criteria are used to evaluate trends in the water quality data. A potential increasing trend in an offsite downgradient monitoring well is indicated if both of the following criteria are met:

1. Criterion percentage for a detected parent compound is 10% or greater; and
2. The Mann-Kendall Test for Trend for the detected parent compound indicates an increasing trend

During the second Five-Year Review period, no VOCs detected in offsite downgradient wells met the criteria listed above except for chlorobenzene, which was detected at downgradient well M70B. Based on the analysis described herein, chlorobenzene may be on an increasing trend at well M70B, however, it is important to note that it was detected at very low concentrations between 2 µg/L and 8.1 µg/L, which are well below its MCL of 70 µg/L. Aside from chlorobenzene, virtually all of the constituents of concern (VOCs and 1,4-dioxane) evaluated remain undetected or have decreased significantly since the RI. Overall, the data indicates that the groundwater containment system is functioning as intended in controlling the size and magnitude of the groundwater plumes. The groundwater directly downgradient of the site is not in a designated groundwater basin (RWQCB, 1994) and its

future use as a drinking water supply is unlikely due to limited aquifer thickness and naturally poor water quality. Nevertheless, the Sanitation Districts will continue to optimize operation and maintenance of the groundwater containment systems at the site to ensure ongoing control and containment of the groundwater plumes.

6.2 SURFACE AIR

Surface air monitoring at the PVLF is regulated primarily by the South Coast Air Quality Management District's (SCAQMD) Rule 1150.1. The specific requirements of Rule 1150.1 include: ambient air monitoring, integrated surface gas monitoring, wellhead pressure monitoring, landfill gas component leak testing, and boiler and flare emissions testing. Subsurface gas monitoring is also required and includes boundary probe monitoring and monitoring of the landfill gas header lines. The PVLF Rule 1150.1 Compliance Plan (amended April 1, 2011) describes how the objectives of Rule 1150.1 are met at the site. This section of the second Five-Year Review describes surface air monitoring (i.e., ambient air monitoring, integrated surface gas monitoring, wellhead pressure monitoring, component leak testing, and combustion efficiency testing) at the site. Subsurface gas monitoring is described in Section 6.3.

6.2.1 AMBIENT AIR MONITORING

Ambient air monitoring samples are collected at two locations on the Main Site, one upwind representing background conditions and the other downwind representing potential landfill gas emissions (Figure 4). The samples are analyzed for TOC (as methane) and Toxic Air Contaminants (TACs) and the results used to assess potential landfill gas emissions in the ambient air. Monitoring takes place on a quarterly basis and is conducted during two consecutive 12-hour periods. The monitoring results are provided in quarterly and annual reports submitted to the SCAQMD and DTSC.

6.2.1.1 SAMPLING

Ambient air was sampled quarterly during the second Five-Year Review period (2007 through 2013). A total of fifty-six 12-hour ambient air samples were collected from the upwind and downwind monitoring locations and the samples were analyzed for TACs and TOC (as methane). The 12-hour data were then combined to produce 24-hour averages. The combined 12-hour data resulted in twenty-eight 24-hour averages, which were then compared to first Five-Year Review data. During the first Five-Year Review period, a total of fifty-four 12-hour ambient air samples were collected from each location and the 12-hour data was combined to produce a total of twenty-seven 24-hour averages. The number of samples analyzed, concentration ranges and averages, and the number of non-detects for the first and second Five-Year Review periods are summarized in Table 7.

Table 7 Summary of Ambient Air Monitoring

Constituent	First Five-Year Review[a]										Second Five-Year Review[a]									
	Upwind (24 Hour)[b]					Downwind (24 Hour)[b]					Upwind (24 Hour)[b]					Downwind (24 Hour)[b]				
	No. Analyzed	Min	Max	Avg[c]	No. ND	No. Analyzed	Min	Max	Avg[c]	No. ND	No. Analyzed	Min	Max	Avg[c]	No. ND	No. Analyzed	Min	Max	Avg[c]	No. ND
Methylene Chloride, ppbv	54	< 0.02	0.45	0.13	40	54	< 0.2	0.49	0.14	35	56	< 0.2	1.3	0.12	6	56	< 0.2	1.5	0.13	6
Chloroform, ppbv	54	< 0.03	0.2	0.06	5	54	< 0.02	0.09	0.03	16	56	< 0.02	0.15	0.05	2	56	< 0.02	0.15	0.03	5
1,1,1-Trichloroethane, ppbv	54	< 0.02	0.1	0.04	1	54	< 0.02	0.11	0.04	3	56	< 0.02	0.03	0.01	50	56	< 0.02	0.03	0.01	52
Carbon Tetrachloride, ppbv	54	0.08	0.11	0.09	0	54	0.08	0.11	0.09	0	56	0.07	0.12	0.09	0	56	0.08	0.12	0.09	0
1,1-Dichloroethene, ppbv	54	< 0.02	< 0.04	< 0.02	54	54	< 0.02	< 0.04	< 0.02	54	56	< 0.02	< 0.02	< 0.02	56	56	< 0.02	< 0.02	< 0.02	56
Trichloroethylene, ppbv	53	< 0.02	0.13	0.04	14	54	< 0.02	7.6	0.23	11	56	< 0.02	0.08	0.02	24	56	< 0.02	0.4	0.04	28
Tetrachloroethylene, ppbv	53	< 0.02	0.19	0.06	7	54	< 0.02	0.79	0.09	6	56	< 0.02	0.07	0.03	11	56	< 0.02	0.18	0.04	9
Chlorobenzene, ppbv	54	< 0.02	< 0.11	< 0.05	54	54	< 0.02	0.43	0.03	53	56	< 0.02	< 0.21	< 0.04	56	56	< 0.02	< 0.21	< 0.04	56
Vinyl Chloride, ppbv	54	< 0.02	< 0.11	< 0.03	54	54	< 0.02	0.02	0.01	53	56	< 0.02	< 0.02	< 0.02	56	56	< 0.02	< 0.02	< 0.02	56
1,1-Dichloroethane, ppbv	54	< 0.02	< 0.04	< 0.02	54	54	< 0.02	< 0.04	< 0.02	54	56	< 0.02	< 0.1	< 0.02	56	56	< 0.02	< 0.1	< 0.02	56
1,2-Dichloroethane, ppbv	54	< 0.02	< 0.42	< 0.37	54	54	< 0.02	< 0.42	< 0.37	54	56	< 0.02	0.04	0.02	43	56	< 0.02	0.14	0.02	45
Benzene, ppbv	54	< 0.11	1.1	0.38	23	54	< 0.11	2.1	0.4	25	56	< 0.07	0.5	0.16	10	56	< 0.07	0.47	0.16	11
Toluene, ppbv	54	< 0.11	1.9	0.71	1	54	< 0.1	3.3	0.69	3	56	< 0.06	1.3	0.36	3	56	< 0.06	1.4	0.37	1
Ethylbenzene, ppbv	54	< 0.06	0.26	0.1	13	54	< 0.06	2.4	0.15	10	56	< 0.02	0.22	0.06	14	56	< 0.02	0.19	0.06	13
Acetonitrile, ppbv	54	< 0.21	0.25	0.29	48	54	< 0.21	0.27	0.29	47	56	< 0.21	< 1	< 0.66	56	51	< 0.66	< 0.66	< 0.66	51
1,2-Dibromoethane, ppbv	54	< 0.02	< 0.11	< 0.03	54	54	< 0.02	< 0.11	< 0.03	54	56	< 0.02	< 1	< 0.09	56	56	< 0.02	< 1	< 0.09	56
Benzyl Chloride, ppbv	54	< 0.04	< 1.1	< 0.66	54	54	< 0.04	< 1.1	< 0.66	54	56	< 0.1	< 1	< 0.26	56	56	< 0.1	< 1	< 0.26	56
Xylene[d], ppbv	54	< 0.2	1.23	0.45	4	54	< 0.12	3.76	0.52	9	56	< 0.12	0.93	0.24	23	56	< 0.12	0.85	0.23	27
Dichlorobenzene[e], ppbv	54	< 0.12	0.09	0.24	46	54	< 0.12	0.08	0.24	47	56	< 0.06	0.06	0.16	51	56	< 0.06	0.03	0.16	52
TOC (as methane), ppmv	54	< 2	6.7	2.89	5	54	< 2	9.4	3.12	4	56	< 2	4.7	2.30	16	56	< 2	5.3	2.34	14

(a) First Five-Year Review data collected quarterly June 2000 - November 2006; Second Five-Year Review data collected quarterly March 2007 - October 2013
(b) Combination of two consecutive 12-hour periods
(c) Used 1/2 detection limit to calculate average unless all results were detected or all were non-detected
(d) Xylene is total of m-, p-, and o-xylenes
(e) Dichlorobenzene is total of m-, o-, and p-dichlorobenzenes.
ppbv - parts per billion by volume; ppmv - parts per million by volume; Min - minimum; Max - maximum; Avg - average; ND - non-detect; "<" - less than detection limit; NA - constituent not analyzed
TOC (as methane) - total organic compounds as methane

6.2.1.2 SUMMARY TABLE ANALYSIS

In order to assess the continued effectiveness of the landfill gas collection system in controlling emissions, a comparison of upwind and downwind ambient air sampling results from the first Five-Year Review and the second Five-Year Review was made. Comparing the average concentration of TACs and TOC (as methane) detected during both review periods indicates that upwind and downwind sample results are comparable. For upwind samples, the average TAC concentrations are similar for the first and second Five-Year Review periods with the exception of 1,2-dichloroethane, which was only detected during the second Five-Year Review and acetonitrile, which was only detected during the first Five-Year Review. Although 1,2-dichloroethane was detected in the second Five-Year Review at the upwind location, the average concentration was 0.02 ppbv, which is lower than the average detection limit of the first Five-Year Review. The detection of TACs in upwind samples is indicative of background ambient air conditions and not of any potential landfill gas emissions.

When comparing downwind ambient air sampling results, the average TAC concentrations are similar for the first and second Five-Year Review periods. The TAC concentrations from the second Five-Year Review are in most instances slightly lower than those in the first Five-Year Review. However, 1,2-dichloroethane was detected in the second Five-Year Review period but not detected in the first Five-Year Review. Similar to the upwind location, 1,2-dichloroethane was detected in the second Five-Year Review at a level below the average detection limit of the first Five-Year Review. Additionally, the average concentration of acetonitrile was slightly elevated at the downwind location during the second Five-Year Review. The elevated average can be attributed in part to the detection of acetonitrile in a downwind sample taken in July 2012. The Modified Z-score statistical technique was used to determine whether the July 2012 acetonitrile concentration was an outlier of the data set. A review of Modified Z-score results for acetonitrile confirmed the July 2012 concentration and four other concentrations were outliers. These outliers were subsequently removed from the data set and the resultant levels for acetonitrile were all below the detection limit.

Average TOC (as methane) concentrations for both upwind and downwind locations are also similar with a slight reduction in concentrations found during the second Five-Year Review. The comparisons of upwind and downwind ambient air monitoring data indicate that ambient air is of equal or better quality than during the first Five-Year Review.

6.2.1.3 TAC PATTERN

Another measure of the potential effects of the landfill on ambient air is a comparison of the upwind and downwind TAC concentrations. Higher TAC concentrations downwind of the landfill as compared to upwind could indicate the possibility of ongoing landfill emissions. To further validate the conclusions drawn from the Summary Table Analysis, the Mann-Whitney (Wilcoxon Rank Sum) non-parametric test (MW) was used to determine if the upwind and downwind data were significantly different.

The MW is an analysis of variance based on the relative rank of each result. This procedure is unaffected by unequal variances and non-detected values, and is used when there are ties among all observations. Higher MW values indicate differences between data sets that are less likely due to random chance. A MW value corresponding to a probability of just one chance in twenty or less ($p \leq 0.05$) could indicate a difference that may not be explained by random chance. Table 8 shows the statistical comparison between upwind and downwind locations for TACs and TOC (as methane) in the second Five-Year Review. No constituents were determined to increase or decrease significantly between the upwind and downwind locations at the 0.05 significance level indicating that landfill emissions are well controlled at the site.

Table 8 Mann-Whitney (Wilcoxon Rank Sum) Statistical Comparison

Compound	Comparison Statistics[a]	
	MW[b]	Significant at 0.05
Methylene Chloride, ppbv	-0.39	No
Chloroform, ppbv	-5.04	No
1,1,1-Trichloroethane, ppbv	-0.76	No
Carbon Tetrachloride, ppbv	-0.29	No
1,1-Dichloroethene, ppbv	ND	ND
Trichloroethylene, ppbv	0.38	No
Tetrachloroethylene, ppbv	1.22	No
Chlorobenzene, ppbv	ND	ND
Vinyl Chloride, ppbv	ND	ND
1,1-Dichloroethane, ppbv	ND	ND
1,2-Dichloroethane, ppbv	-0.03	No
Benzene, ppbv	-0.29	No
Toluene, ppbv	-0.16	No
Ethylbenzene, ppbv	-0.08	No
Acetonitrile, ppbv	1.33	No
1,2-Dibromoethane, ppbv	ND	ND
Benzyl Chloride, ppbv	ND	ND
Xylene[c], ppbv	-0.42	No
Dichlorobenzene[c], ppbv	-0.18	No
TOC as Methane, ppmv	0.04	No

(a) Second Five-Year Review data collected quarterly (2007 to 2013) (28 sampling events)
(b) Mann-Whitney (Wilcoxon Rank Sum) non-parametric test (MW). A MW value corresponding to a probability of just one chance in twenty ($p \leq 0.05$) provides some evidence that the difference may not be explained by random chance.
(c) Xylene is total of m-, p- and o-xylenes; Dichlorobenzene is total of m-, o-, and p-dichlorobenzenes
(d) Used 1/2 detection limits to calculate the mean; ND - indicates not detected (e) ppmv - parts per million by volume; ppbv - part per billion by volume

Methane is the primary constituent of concern in landfill gas and has been used as an indicator of landfill emissions by the SCAQMD and the USEPA. The previous Mann-Whitney analysis indicates that methane levels at upwind and downwind locations are not different and, as discussed in section 6.2.1.4 below, are consistent with background levels found in an urban environment. The lack of methane emissions also indicates that landfill gas emissions are well controlled at the site.

6.2.1.4 COMPARISON TO AMBIENT AIR BACKGROUND

Elevated TAC levels in site ambient air data above regional background ambient air levels could indicate potential emissions from the landfill. Background ambient air TAC levels from vehicular and stationary sources in the South Coast Air Basin were summarized by the SCAQMD in their Multiple Air Toxics Exposure Study (MATES-III) (SCAQMD, 2008). The study included air sampling at ten fixed sites, once every three days over a two-year period (2004 through 2006). The regional air quality data results from the MATES-III study can be compared with site ambient air monitoring results for the second Five-Year Review period to provide an indication of the effectiveness of landfill gas containment facilities.

Average annual values from the MATES-III study for the 12 constituents common to the SCAQMD Rule 1150.1 Compliance Plan core group are presented in Table 9.

Table 9 - Background Ambient Air TAC Comparison

Constituent	Palos Verdes Landfill Ambient Air[a]		South Coast Air Basin[c]
	Upwind (24 Hour)[b]	Downwind (24 Hour)[b]	
	Average[d]	Average[d]	Average[d]
Benzene, ppbv	0.16	0.16	0.55
Carbon Tetrachloride, ppbv	0.09	0.09	0.09
Chloroform, ppbv	0.05	0.03	0.03
Methylene Chloride, ppbv	0.12	0.13	0.28
p-Dichlorobenzene, ppbv	0.06	0.06	0.02
Tetrachloroethylene, ppbv	0.03	0.04	0.06
Trichloroethylene, ppbv	0.02	0.04	0.01
Vinyl Chloride, ppbv	< 0.02	< 0.02	< 0.20
Toluene, ppbv	0.36	0.37	1.83
Xylene, ppbv	0.24	0.23	1.10
1,2-Dibromoethane, ppbv	< 0.09	< 0.09	< 0.20
1,2-Dichloroethane, ppbv	0.02	0.02	< 0.10

(a) Second Five-Year Review data collected quarterly (2007 to 2013) (28 sampling events)
(b) Combination of two consecutive 12-hour periods
(c) South Coast Air Basin Data derived from MATES-III Study Table VI-2 (SCAQMD, 2008)
(d) Used 1/2 detection limits to calculate average unless all results were detected or all were non-detected.
(e) ppbv - part per billion by volume; "<" - less than detection limit

During the second Five-Year Review period, upwind and downwind ambient air average concentrations were generally lower than the MATES-III concentrations. However, the average upwind concentration for chloroform, and both upwind and downwind average concentrations for p-dichlorobenzene and trichloroethylene (TCE) were greater than their respective MATES-III average concentrations. In addition, 1,2-dichloroethane was detected in upwind and downwind ambient air samples at an average concentration of 0.02 parts per billion by volume (ppbv), while the MATES-III data had no 1,2-dichloroethane detections. However, the average MATES-III detection limit for 1,2-dichloroethane was 0.10 ppbv, which is greater than the detected values in site data.

As previously shown, upwind and downwind concentrations for these compounds are not statistically different. This comparison shows no unusual TAC levels, and upwind and downwind site concentrations are typically lower than South Coast Air Basin regional levels.

6.2.2. INTEGRATED SURFACE GAS MONITORING

Integrated surface gas monitoring is conducted quarterly at the Main Site and South Coast Botanic Garden in compliance with the SCAQMD Rule 1150.1 Compliance Plan. Samples are collected from two hundred and seven, 50,000 square-foot monitoring grids that cover the entire landfill surface area (Figure 5). Within each grid a composite sample is collected using a Toxic Vapor Analyzer or other approved instrument while traversing the grid in a systematic pattern. All of the collected samples are analyzed for TOC (as methane) and a subset from select grids is also analyzed for TACs. Additionally, TOC (as methane) is measured quarterly in surface gas samples concurrent with TAC analysis. These TOC (as methane) results are used as an additional check for potential surface gas emissions.

From April 2000 to June 2011, the SCAQMD Rule 1150.1 action level for TOC (as methane) in integrated surface gas samples was 50 parts per million by volume (ppmv). The SCAQMD amended Rule 1150.1 on April 1, 2011 and revised the action level to 25 parts per million by volume (ppmv). The revised action level became effective as of July 1, 2011. Currently, if integrated surface gas TOC (as methane) concentrations exceed 25 ppmv, corrective actions are taken to control emissions from the affected area(s) within the timelines specified in the SCAQMD Rule 1150.1 Compliance Plan. Integrated surface gas monitoring results and a description of corrective actions implemented, are included in quarterly and annual reports provided to the SCAQMD and DTSC.

Ernie Howlett Park does not have an active gas collection system and monitoring for evidence of surface gas emissions is not required. The Sanitation Districts do not own or operate Ernie Howlett Park[3] and the SCAQMD Rule 1150.1 Compliance Plan issued to the Sanitation Districts does not apply to the park (SCAQMD, 2000).

[3] The park is owned and operated by the City of Rolling Hills Estates.

6.2.2.1 SAMPLING

During the second Five-Year Review period, approximately 3,900 samples from the Main Site and 1,800 samples from the South Coast Botanic Garden were analyzed for TOC (as methane). In addition, 38 samples from the Main Site and 20 samples from the South Coast Botanic Garden were analyzed for TACs. By comparison, during the first Five-Year Review period (1994 to 2006) over 13,800 samples from the Main Site and over 5,600 samples from the South Coast Botanic Garden were analyzed for TOC (as methane), and 61 samples from the Main Site and 43 samples from the South Coast Botanic Garden were analyzed for TACs.

The number of samples analyzed, concentration ranges and averages, and the number of non-detects for the first and second Five-Year Review periods are presented in Table 10 for the Main Site and South Coast Botanic Garden. Data are also summarized for comparison to SCAQMD Rule 1150.1 Compliance Plan criteria.

6.2.2.2 SUMMARY TABLE ANALYSIS

The SCAQMD Rule 1150.1 Compliance Plan TOC (as methane) action level is 25 ppmv for integrated surface gas samples collected since the third quarter of 2011 and 50 ppmv for samples collected between July 1994 and June 2011 . During the second Five-Year Review period (2007 to 2013), the maximum TOC (as methane) concentration detected at the Main Site was 13.8 ppmv, which is well below the TOC (as methane) action level of 25 ppmv. During the same period, the South Coast Botanic Garden had two TOC (as methane) detections above the 25 ppmv action level at concentrations of 72 ppmv and 123.9 ppmv. However, in both instances corrective actions were implemented and TOC (as methane) concentrations returned to background ambient air levels within 10 days after performing maintenance to the landfill cover in accordance with SCAQMD Rule 1150.1 Compliance Plan requirements.

For comparison purposes, during the first Five-Year Review period (1994 to 2006), the maximum TOC (as methane) concentration detected at the Main Site was 42 ppmv (below the 50 ppmv action level), and the South Coast Botanic Garden maximum concentration was 170 ppmv, which triggered the implementation of corrective actions to restore the area to background ambient air levels. The maximum TOC (as methane) concentrations at the Main Site and South Coast Botanic Garden detected during the second Five-Year Review are lower than the maximum levels detected during the first Five-Year Review period. This is an indication of the continued effectiveness of the environmental control systems in controlling potential landfill gas emissions.

The comparison of integrated surface gas data from both Five-Year Review periods to the SCAQMD Rule 1150.1 Compliance Plan criteria further indicates that landfill gas emissions are well controlled at the site. It should be noted that the Sanitation Districts are in compliance with SCAQMD Rule 1150.1 Compliance Plan integrated surface gas criteria.

Table 10 Summary of Integrated Surface Gas Monitoring

Constituent	First Five-Year Review[a]										Second Five-Year Review[a]									
	Main Site[c]					South Coast Botanic Garden[c]					Main Site[c]					South Coast Botanic Garden[c]				
	No. Analyzed	Min	Max	Avg	Criterion %[d]	No. Analyzed	Min	Max	Avg	Criterion %[d]	No. Analyzed	Min	Max	Avg	Criterion %[d]	No. Analyzed	Min	Max	Avg	Criterion %[d]
TOC (as methane), ppmv	13,839	1	42	2.4	0	5,630	0.45	170	3.4	0	3,976	0.7	13.8	2.3	0	1,820	1.1	123.9	3.0	0
Constituent	**First Five-Year Review[b]**										**Second Five Year Review[b]**									
	Main Site[c]					South Coast Botanic Garden[c]					Main Site[c]					South Coast Botanic Garden[c]				
	No. Analyzed	Min	Max	Avg[e]	No. ND	No. Analyzed	Min	Max	Avg[e]	No. ND	No. Analyzed	Min	Max	Avg[e]	No. ND	No. Analyzed	Min	Max	Avg[e]	No. ND
Methylene Chloride, ppbv	61	< 0.02	7.9	0.47	30	43	< 0.2	8.2	0.53	22	38	< 0.2	0.33	0.13	4	20	< 0.2	3	0.24	1
Chloroform, ppbv	61	< 0.02	0.21	0.05	33	43	< 0.04	0.17	0.05	22	38	< 0.02	0.08	0.03	5	20	< 0.02	0.08	0.03	2
1,1,1-Trichloroethane, ppbv	61	< 0.02	2.7	0.4	5	43	< 0.04	1.5	0.4	3	38	< 0.02	0.05	0.02	25	20	< 0.02	0.03	0.01	16
Carbon Tetrachloride, ppbv	61	< 0.1	0.2	0.1	3	43	< 0.1	0.2	0.1	1	38	0.07	0.12	0.09	0	20	0.08	0.11	0.09	0
1,1-Dichloroethene, ppbv	61	< 0.01	< 0.4	< 0.07	61	43	< 0.01	< 0.2	< 0.08	43	38	< 0.02	< 0.02	< 0.02	38	20	< 0.02	< 0.02	< 0.02	20
Trichloroethylene, ppbv	61	< 0.02	0.53	0.09	27	43	< 0.02	0.27	0.08	26	38	< 0.02	0.21	0.06	4	20	< 0.02	0.12	0.05	1
Tetrachloroethylene, ppbv	61	< 0.1	1.5	0.26	3	43	< 0.1	1.9	0.28	4	38	0.02	0.16	0.07	0	20	0.02	0.27	0.06	0
Chlorobenzene, ppbv	61	< 0.02	1.1	0.09	58	43	< 0.02	1.1	0.11	41	38	< 0.02	0.02	0.02	37	20	< 0.02	< 0.21	< 0.05	20
Vinyl Chloride, ppbv	61	< 0.01	0.07	0.07	57	43	< 0.01	< 0.4	< 0.15	43	38	< 0.02	< 0.02	< 0.02	38	20	< 0.02	< 0.02	< 0.02	20
1,1-Dichloroethane, ppbv	61	< 0.01	0.07	0.03	60	43	< 0.01	< 0.2	< 0.07	43	38	< 0.02	< 0.1	< 0.02	38	20	< 0.02	< 0.1	< 0.02	20
1,2-Dichloroethane, ppbv	61	< 0.01	0.02	0.11	59	43	< 0.01	0.02	0.1	40	38	< 0.1	< 0.11	< 0.10	38	20	< 0.1	< 0.11	< 0.10	20
Benzene, ppbv	61	< 0.1	2.7	0.77	15	43	< 0.11	3.4	0.88	7	38	0.11	0.79	0.30	0	20	< 0.1	0.79	0.26	3
Toluene, ppbv	61	< 0.42	6.5	1.95	9	43	< 0.2	9.2	2.22	4	38	< 0.42	2.1	0.71	13	20	< 0.42	2.1	0.74	8
Ethylbenzene, ppbv	45	< 0.08	0.7	0.22	9	28	< 0.08	1.3	0.27	4	38	< 0.1	0.3	0.11	21	20	< 0.08	0.33	0.10	13
Acetonitrile, ppbv	61	< 0.16	0.17	1.05	60	43	< 0.21	0.21	1.21	42	38	< 0.17	< 1	< 0.65	38	20	< 0.42	< 0.66	< 0.65	20
1,2-Dibromoethane, ppbv	61	< 0.01	< 1.1	< 0.16	61	43	< 0.01	< 0.4	< 0.16	43	38	< 0.02	< 0.21	< 0.06	38	20	< 0.02	< 1	< 0.11	20
Benzyl Chloride, ppbv	61	< 0.04	< 2.1	< 0.77	61	43	< 0.21	< 1.1	< 0.84	43	38	< 0.1	< 0.42	< 0.22	38	20	< 0.1	< 1	< 0.25	20
Xylene[f], ppbv	61	< 0.32	12.5	1.44	13	43	< 0.32	13.8	1.77	9	38	< 0.49	1.32	0.45	25	20	< 0.49	1.51	0.52	14
Dichlorobenzene[f], ppbv	61	< 0.12	0.26	0.39	56	43	< 0.12	1.2	0.47	38	38	< 0.16	< 1.05	< 0.53	38	20	< 0.16	< 1.05	< 0.56	20
TOC (as methane), ppmv	27	< 2	6	2.98	2	12	< 2	6.4	3.3	2	38	< 2	3.2	2.30	3	20	< 2	3.9	2.55	1

(a) First Five-Year Review TOC (as methane) field data Routes: monthly July 1994 - January 2000, and March 2000; Grids: quarterly 2Q 2000 - 4thQ 2006; Second Five-Year Review TOC (as methane) data Grids: quarterly 1stQ 2007 - 4thQ 2013
(b) First Five-Year Review TAC laboratory data Select Routes: monthly July 1994 - August 1997; Select Grids: quarterly 2ndQ 2000 - 4thQ 2006; Second Five-Year Review TAC data Select Grids: quarterly 1stQ 2007 - 4thQ 2013
(c) Main Site: Routes 25-172, Grids 1-137, PP-A to PP-E; South Coast Botanic Garden: Routes 173-229, Grids 138-200, PP-F and PP-G (see Figure 5; routes not shown)
(d) Percent at criteria is the number of action level detections not corrected pursuant SCAQMD Compliance Plan criteria
(e) Used 1/2 detection limits to calculate average or median unless all results were detected or all were non-detected
(f) Xylene is total of m-,p- and o-xylenes; Dichlorobenzene is total of m-, o-, and p-dichlorobenzenes
(g) ppmv - parts per million by volume; ppbv - part per billion by volume; Min - minimum; Max - maximum; Avg - average; "<" - less than detection limit

A comparison of first Five-Year Review and second Five-Year Review integrated surface gas TAC concentrations is useful to determine changes in the composition of surface gas and to identify TAC patterns indicative of landfill gas emissions. For the Main Site, the average concentrations of TACs detected during the second Five-Year Review period were all less than the concentrations of TACs detected during first Five-Year Review, as shown in Table 10. Similarly, the average concentrations of TACs detected at the South Coast Botanic Garden during the second Five-Year Review were less than during the first Five-Year Review period.

In addition, integrated surface gas TAC results were reviewed to determine whether a pattern indicative of landfill gas exists. Integrated surface gas samples are analyzed according to SCAQMD Rule 1150.1 compliance plan. Concentrations of nineteen TACs are presented in Table 10, seventeen of which are TACs in the SCAQMD Rule 1150.1 core group that represents landfill gas compounds of concern to regulatory agencies relative to public health (Sanitation Districts, 2003). The TAC concentrations detected during the first and second Five-Year Review periods are substantially lower than levels typically found in landfill gas. Additionally, for those compounds which are characteristic of landfill gas, the average concentrations do not show a pattern indicative of landfill gas emissions.

6.2.2.3 COMPARISON TO AMBIENT AIR BACKGROUND

Integrated surface gas TAC concentrations above regional background ambient levels could indicate potential landfill gas emissions. Background ambient air TAC levels from vehicular and stationary sources in the South Coast Air Basin were summarized by SCAQMD in their Multiple Air Toxics Exposure Study (MATES-III) (SCAQMD, September 2008). The MATES-III study included air sampling at ten fixed sites once every three days for a two-year period (April 2004 through March 2006). The regional air quality data results from the MATES-III program can be compared with site integrated surface gas monitoring results to provide an indication of the effectiveness of landfill gas containment facilities.

Average annual values from the MATES-III study for the 12 constituents common to the SCAQMD Rule 1150.1 Compliance Plan core group are presented in Table 11. Average TAC concentrations in integrated surface gas are generally comparable with the MATES-III average concentrations and most compounds are lower. The comparison of integrated surface gas average TAC concentrations with the MATES-III regional ambient air data illustrates the effectiveness of the PVLF environmental control systems in controlling surface gas emissions.

Table 11 Background Ambient Air Comparison to Integrated Surface Gas

Constituent	Palos Verdes Landfill Integrated Surface Gas[a]		South Coast Air Basin[b]
	Main Site	South Coast Botanic Garden	
	Average[c]	Average[c]	Average[c]
Benzene, ppbv	0.30	0.26	0.55
Carbon Tetrachloride, ppbv	0.09	0.09	0.09
Chloroform, ppbv	0.03	0.03	0.03
Methylene Chloride, ppbv	0.13	0.24	0.28
p-Dichlorobenzene, ppbv	<0.22	<0.23	0.02
Tetrachloroethylene, ppbv	0.07	0.06	0.06
Trichloroethylene, ppbv	0.06	0.05	0.01
Vinyl Chloride, ppbv	<0.02	<0.02	<0.20
Toluene, ppbv	0.71	0.74	1.83
Xylene, ppbv	0.45	0.52	1.10
1,2-Dibromoethane, ppbv	<0.06	<0.11	<0.20
1,2-Dichloroethane, ppbv	<0.10	<0.10	<0.10

(a) Integrated surface gas TAC data Select Grids: quarterly 1stQ 2007 - 4thQ 2013
(b) South Coast Air Basin Data derived from MATES-III Study Table VI-2 (SCAQMD, 2008)
(c) Used 1/2 detection limits to calculate average unless all results were detected or all were non-detected.
ppbv - part per billion by volume; "<" - less than detection limit

6.2.3 WELLHEAD PRESSURE MONITORING

Wellhead pressure monitoring is conducted at each landfill gas collector located at the Main Site and South Coast Botanic Garden in compliance with the SCAQMD Rule 1150.1 Compliance Plan. SCAQMD amended Rule 1150.1 on April 1, 2011 to incorporate requirements from the California Air Resources Board (CARB) Rule and added wellhead pressure monitoring. The amended requirements became effective after July 1, 2011. Monitoring is conducted by measuring the gauge pressure at the wellhead of each active gas collector (Figure 8) on a monthly basis. If a positive pressure reading is measured at the wellhead under normal operating conditions, actions are taken to restore vacuum (negative pressure) to the gas collector within the timelines specified in the SCAQMD Rule 1150.1 Compliance Plan. Wellhead pressure results, as well as any corrective actions that were implemented, are included in quarterly and annual reports submitted to the SCAQMD and DTSC.

The gas collection system consists of vertical gas collection wells and horizontal gas trenches (gas collectors) installed throughout the landfill. These wells and trenches are connected through a network of header line pipes, and a vacuum is applied to create a negative pressure gradient around each gas collector. The landfill gas is drawn from the refuse into the collection system thereby controlling potential surface air emissions. Currently, there are 462

active gas collection wells at the site including approximately 4,194 linear feet of gas collection trenches. There are a total of 389 active gas collectors on the Main Site and 73 active gas collectors on the South Coast Botanic Garden.

The collected landfill gas is combusted in the ultra-low emission (ULE) flare located in the northwest corner of the Main Site alongside Hawthorne Boulevard. The ULE flare began operation in October 2011. Flare Station No. 2 (Figure 6), which consists of six flares, serves as a backup facility when the ULE flare is undergoing maintenance. A Gas-to-Energy facility located in the northwest corner of the Main Site alongside Hawthorne Boulevard operated from 1988 to 2011. Operation was discontinued due to declining landfill gas production at the site and the Gas-to-Energy facility was decommissioned in October 2011.

6.2.3.1 SAMPLING

As described above, compliance with the SCAQMD Rule 1150.1 wellhead pressure monitoring was not required at the PVLF prior to July 1, 2011. However, the Sanitation Districts had already implemented monitoring of wellhead pressures at the site as part of the on-going gas collection and control system operation and maintenance program. Landfill technicians inspect the gas collection and control system apparatus on a routine basis. The monitoring of gas header lines and gas collectors for flowrate, gauge pressure, oxygen concentration, methane concentration, and temperature is performed on a minimum monthly basis. When problems are identified, operational adjustments or repairs are made to restore normal operating conditions. The sampling protocol utilized to collect wellhead pressure data for the maintenance program is similar to the current SCAQMD Rule 1150.1 Compliance Plan sampling protocol for wellhead pressure monitoring so the data can be used in comparisons.

Over 35,100 wellhead pressure readings were taken at the Main Site gas collectors and over 6,800 wellhead pressure readings were taken at the South Coast Botanic Garden gas collectors during the second Five-Year Review period (2007 to 2013). By comparison, during the first Five-Year Review period (1994 to 2006) over 50,600 wellhead pressure readings were taken at the Main Site gas collectors and over 10,900 wellhead pressure readings were taken at the South Coast Botanic Garden gas collectors. The number of wellhead pressure readings taken and the pressure ranges and averages are presented in Table 12.

6.2.3.2 SUMMARY TABLE ANALYSIS

There were sixty-three (63) positive pressure readings at the Main Site wellheads and eleven (11) positive pressure readings at the South Coast Botanic Garden wellheads during the second Five-Year Review period. Each positive pressure reading triggered the implementation of corrective actions necessary to restore vacuum (negative pressure) to the gas collector within 5 days, as specified in the SCAQMD Rule 1150.1 Compliance Plan. By comparison, during the first Five-Year Review period (1994 to 2006), there were 390 positive pressure readings measured at the Main Site wellheads and 19 positive pressure readings measured at the South Coast Botanic Garden wellheads. These positive pressure wellhead

levels returned to negative pressure (vacuum) after performing operational adjustments to the collectors.

Table 12 Wellhead Pressure Monitoring Summary

Period	Gauge Pressure (inches of water column)									
	Main Site					South Coast Botanic Garden				
	No. of Readings	Min	Max	Avg	Criterion %[(c)]	No. Analyzed	Min	Max	Avg	Criterion %[(c)]
First Five-Year Review[(a)]	50,648	-70	30	-11.3	0	10,906	-14	0.3	-1.0	0
Second Five-Year Review[(b)]	35,123	-69	1	-9.8	0	6,892	-15	0.01	-0.9	0

(a) First Five-Year Review data: monthly July 1994 - December 2006
(b) Second Five-Year Review data: monthly January 2007 - December 2013
(c) Criterion % is number of action level detections not corrected pursuant SCAQMD Compliance Plan time frame requirements
Negative values indicate gas collectors are under vacuum.
Min = minimum; Max = maximum; Avg = average

The decline in positive pressure wellhead readings from the first Five-Year Review to the second Five-Year Review is an indication of the effectiveness of the landfill gas collection system and decline in landfill gas production. It should be noted that the Sanitation Districts are in compliance with SCAQMD Rule 1150.1 Compliance Plan criteria regarding wellhead monitoring as indicated in the "Criterion %" column in Table 12. Compliance with the wellhead monitoring criteria ensures effective gas collection system performance and control of landfill gas emissions.

6.2.4 COMPONENT LEAK CHECK MONITORING

On April 1, 2011, the SCAQMD amended Rule 1150.1 to incorporate requirements from California Air Resources Board (CARB) Rule. The amended rule requires that all landfill gas control components under positive pressure be monitored for methane leaks on a quarterly basis, except for gas-to-energy facilities where monitoring may be conducted prior to scheduled maintenance or planned outage periods. The amended requirements became effective after July 1, 2011.

6.2.4.1 SAMPLING

In accordance with the SCAQMD Rule 1150.1 Compliance Plan, component leak check monitoring of landfill gas control components (under positive pressure) began after July 1, 2011, and quarterly monitoring was initiated in the third quarter of 2011. Component leak check monitoring of the boilers was not required since decommissioning of the Gas-to-Energy Facility was scheduled to occur in October 2011. Approximately 24,050 leak check

monitoring samples were collected from flare components under positive pressure during the second Five-Year Review period and analyzed for TOC (as methane) in compliance with SCAQMD Rule 1150.1 Compliance Plan criteria. Any exceedances are documented in quarterly and annual reports submitted to the SCAQMD and DTSC.

6.2.4.2 SUMMARY TABLE ANALYSIS

The SCAQMD Rule 1150.1 Compliance Plan component leak check requirement specifies a TOC (as methane) action level of 500 ppmv for gas control components under positive pressure. Methane detections at or above the action level occurred a total of 16 times, or in approximately 0.10 percent of the total number of samples collected (Table 13). Each detection above the action level triggered the implementation of corrective actions to repair the leak and return methane levels to below the SCAQMD Rule 1150.1 Compliance Plan action level within 10 days. It should be noted that the Sanitation Districts are in compliance with SCAQMD Rule 1150.1 Compliance Plan criteria regarding component leak check monitoring as indicated in the "Criterion %" column in Table 13. Compliance with the leak check monitoring criteria ensures enhanced gas collection system performance and the effective control of surface gas emissions.

Table 13 Component Leak Check Summary

Flares[(a)]			
No. Analyzed	**No. of Detections**	**Percent of Total Samples Detected**	**Criterion %[(b)]**
24,050	16	0.1%	0

(a) Gas treatment Ultra-low Emissions (ULE) flare and Flare Station No. 2
(b) Criterion percent is number of action level detections not corrected pursuant Compliance Plan time frame requirements

6.2.5 BOILER AND FLARE EMISSIONS TESTING

The destruction efficiency of the landfill gas control devices (i.e., boilers and flares) is monitored in compliance with the SCAQMD Rule 1150.1 Compliance Plan. Collected landfill gas is currently combusted in an ULE flare. Flare Station No. 2, which consists of six flares, serves as a backup facility for the combustion of landfill gas when the ULE flare is undergoing maintenance. Source tests are conducted annually for the ULE flare to assess the destruction efficiency in compliance with the SCAQMD Rule 1150.1 Compliance Plan. Each of the six backup flares is also source tested with one backup flare being tested each year on a rotating basis. The locations of the ULE flare and Flare Station No. 2 are shown in Figure 6.

Prior to October 2011, collected landfill gas was combusted in the PVLF Gas-to-Energy facility located in the northwest corner of the Main Site alongside Hawthorne Boulevard. Flare Station No. 2 served as a backup facility for the combustion of landfill gas when the Gas-to-Energy Facility was undergoing maintenance. The Gas-to-Energy Facility began operation in December 1988. Landfill gas was combusted in one of two landfill gas-fired

boilers to produce steam, which in turn was used to power a steam turbine to produce electricity. The electricity produced was sold to Southern California Edison (SCE) for use in the local power grid network. In 2011, the average net power output from the facility was 2.1 megawatts (MW). As described in Section 6.2.3, due to the decline in landfill gas production at the site, the Sanitation Districts decommissioned the Gas-to-Energy facility in October 2011 and replaced it with an ultra-low emission (ULE) flare.

As of 2013, the composition of landfill gas delivered to the ULE flare was approximately (by volume) 11 percent methane, 10 percent carbon dioxide, 14 percent oxygen, and 63 percent nitrogen, with trace levels of VOCs. VOCs are destroyed through combustion, in the gas control facilities (i.e., boilers and flares).

Between November 2000 and March 2011, compliance with the SCAQMD Rule 1150.1 Compliance Plan for gas control facilities was demonstrated by achieving less than 20 parts per million by volume (ppmv) or greater than 98 percent (98%) by weight destruction efficiency for total non-methane hydrocarbon. SCAQMD amended Rule 1150.1 in April 2011 to incorporate requirements from the California Air Resources Board (CARB) Rule and revised the criteria to include a destruction efficiency of at least 99 percent (99%) by weight for methane.

6.2.5.1 SAMPLING

During the second Five-Year Review period 40 source test samples were collected from the flares and 15 from the boilers. By comparison, during the first Five-Year Review period, 40 source test samples were collected from the flares and 24 source test samples were collected from the boilers. The number of source test samples analyzed, concentration ranges and averages, and the number of non-detects for the first and second Five-Year Review periods are presented in Table 14. Any exceedances of regulated parameters are documented in quarterly and annual reports submitted to the SCAQMD and DTSC.

Table 14 Summary of Flare and Boiler Exhaust Gas Sampling

Constituent	First Five-Year Review[a]										Second Five-Year Review[a]									
	Flares[b]					Boilers[c]					Flares[d]					Boilers[d]				
	No. Analyzed	Min	Max	Avg[h]	No. ND	No. Analyzed	Min	Max	Avg[h]	No. ND	No. Analyzed	Min	Max	Avg[h]	No. ND	No. Analyzed	Min	Max	Avg[h]	No. ND
Methylene Chloride, ppbv	40	< 0.02	3.3	0.43	33	24	<0.02	2.7	0.52	19	40	< 0.05	0.63	0.07	35	15	< 0.05	0.06	0.08	10
Chloroform, ppbv	40	< 0.02	< 0.3	< 0.09	40	24	<0.05	0.33	0.09	18	40	< 0.05	0.07	0.03	39	15	< 0.05	< 0.06	< 0.05	15
1,1,1-Trichloroethane, ppbv	40	< 0.02	1.5	0.07	39	24	<0.02	<1	< 0.16	24	40	< 0.05	< 0.05	< 0.05	40	15	< 0.05	< 0.06	< 0.05	15
Carbon Tetrachloride, ppbv	40	< 0.02	< 0.3	< 0.07	40	24	<0.02	0.1	0.06	22	40	< 0.05	0.05	0.03	39	15	< 0.05	< 0.06	< 0.05	15
1,1-Dichloroethene, ppbv	40	< 0.02	< 0.5	< 0.09	40	24	<0.02	<1	< 0.18	24	40	< 0.05	0.1	0.03	37	15	< 0.05	< 0.06	< 0.05	15
Trichloroethylene, ppbv	40	< 0.05	0.52	0.07	35	24	<0.02	2.2	0.26	18	40	< 0.05	0.06	0.03	39	15	< 0.05	< 0.06	< 0.05	15
Tetrachloroethylene, ppbv	40	< 0.05	0.32	0.07	35	24	<0.02	0.99	0.15	19	40	< 0.05	0.08	0.04	37	15	< 0.05	< 0.06	< 0.05	15
Chlorobenzene, ppbv	39	<0.02[f]	0.15[f]	0.09	35	24	<0.02	0.1	0.13	19	40	< 0.05	11	0.66	34	15	< 0.05	< 0.26	< 0.09	15
Vinyl Chloride, ppbv	39	<0.02[f]	<0.5[f]	< 0.09	39	24	<0.02	<1	< 0.18	24	40	< 0.05	3.7	0.28	34	15	< 0.05	< 0.06	< 0.05	15
1,1-Dichloroethane, ppbv	40	< 0.02	< 0.5	< 0.10	40	24	<0.02	<1	< 0.18	24	40	< 0.05	< 0.25	< 0.10	40	15	< 0.05	< 0.06	< 0.05	15
1,2-Dichloroethane, ppbv	40	< 0.03	< 1.1	< 0.82	40	24	<0.05	<1.1	< 0.69	24	40	< 0.05	0.08	0.05	38	15	< 0.05	< 0.25	< 0.10	15
Benzene, ppbv	39	<0.03[f]	2[f]	0.78	25	24	<0.28	1.8	0.63	14	40	< 0.07	89	4.00	23	15	< 0.07	0.31	0.17	5
Toluene, ppbv	40	< 0.25	6.2	0.74	21	23	<0.53[g]	6.4[g]	1.15	8	40	< 0.11	15	0.86	17	15	< 0.28	1.9	0.69	4
Ethylbenzene, ppbv	38	< 0.05	0.66	0.12	27	20	<0.05	6.2	0.41	13	40	< 0.05	9.1	0.55	29	15	< 0.05	0.47	0.14	5
Methyl tert butyl Ether, ppbv	38	< 0.04	0.21	0.55	37	20	<0.04	0.22	0.6	19	40	< 0.1	< 0.24	< 0.18	40	15	< 0.1	< 0.55	< 0.19	15
Acetonitrile, ppbv	38	< 0.52	0.61	0.92	32	24	<0.52	0.81	1.47	19	40	< 1.6	4	0.91	39	15	< 1.7	< 1.7	< 1.70	15
Freon 11 (CCL3F), ppbv	38	< 0.02	0.16	0.05	29	20	<0.05	0.13	0.05	13	40	< 0.05	0.14	0.03	33	15	< 0.05	0.19	0.05	11
1,2-Dibromoethane, ppbv	40	< 0.02	< 0.5	< 0.11	40	24	<0.02	<5.2	< 0.55	24	40	< 0.05	< 2.6	< 0.23	40	15	< 0.05	< 0.52	< 0.19	15
1,3-Butadiene , ppbv	38	< 0.04	< 0.53	< 0.13	38	20	<0.04	<0.11	< 0.09	20	40	< 0.09	36	1.46	36	15	< 0.08	0.09	0.05	14
cis-1,2-Dichloroethylene, ppbv	37	<0.02[f]	0.08[f]	0.04	36	20	<0.02	<0.27	< 0.09	20	40	< 0.05	4.3	0.33	35	15	< 0.05	< 0.06	< 0.05	15
Benzyl Chloride, ppbv	40	< 0.04	< 5.2	< 2.11	40	24	<0.04	<2.7	< 1.88	24	40	< 0.31	< 2.6	< 0.62	40	15	< 0.5	< 1	< 0.61	15
Xylene[e], ppbv	40	< 0.32	1.5	0.51	25	23	<0.2[g]	1.6[g]	0.6	11	40	< 0.2	5.9	0.60	32	15	< 0.2	1.82	0.65	7
Dichlorobenzene[e], ppbv	40	< 0.12	0.05	0.84	39	24	<0.12	<8.1	< 2.18	24	40	< 0.16	5.61	0.77	36	15	< 0.16	< 2.52	< 0.81	15

(a) First Five-Year Review data: flares December 1994 - December 2006; boilers December 1994 - September 2006; Second Five-Year Review data: flares June 2007 - November 2013; boiler June 2007 - March 2011
(b) Gas treatment flares at Flare Station No. 2
(c) Gas-to-Energy facility combustion boilers 501 and 502
(d) Gas treatment flares at the Ultra-low Emission (ULE) flare and Flare Station No. 2; Gas-to-Energy facility combustion boiler 501
(e) Xylene is total of m-, p-, and o-xylenes; Dichlorobenzene is total of m-, o-, and p-dichlorobenzenes
(f) Initial results inconsistent with duplicate results of 0.7 ppbv for chlorobenzene, 6.0 ppbv for benzene, 0.26 ppbv for vinyl chloride, and 0.23 ppbv for cis-1,2-dichloroethylene. These outliers were removed from the analysis
(g) Duplicate sample did not confirm initial results of 160 ppbv for toluene and 25.9 ppbv for xylene. These outliers were removed from the analysis
(h) Used 1/2 detection limits to calculate average unless all results were detected or all were non-detected
(i) ppmv - parts per million by volume; ppbv - part per billion by volume; Min - minimum; Max - maximum; Avg - average; "<" - less than detection limit; NA - constituent not analyzed

6.2.5.2 COMBUSTION EFFICIENCY REVIEW

Boiler and flare emissions test data for samples collected since 1994 were reviewed for compliance with the SCAQMD Rule 1150.1 Compliance Plan requirements. In all cases, the average destruction efficiencies achieved a total non-methane hydrocarbon concentration of less than 20 ppmv or were determined to be greater than 98% for total non-methane hydrocarbons in accordance with SCAQMD Rule 1150.1 Compliance Plan limits. For the period starting November 2011, flare emissions were also tested for methane destruction efficiencies and were determined to be greater than 99% for all emission tests except one performed on a backup flare in November 2011. The methane destruction efficiency for this backup flare measured 96 percent as determined by the source test results. However, after performing maintenance to the flare and re-testing the emissions, the methane destruction efficiency was confirmed to be greater than 99%. It should be noted that during the initial test this backup flare met the destruction efficiency requirement for total non-methane hydrocarbons and VOCs and no excess emissions of these constituents occurred. The average destruction efficiency for the PVLF gas control facilities is greater than 98% by weight for total non-methane hydrocarbons since 1994, and greater than 99% for methane since November 2011 when the methane destruction efficiency testing was first required.

6.2.5.3 SUMMARY TABLE ANALYSIS

VOC concentrations detected in exhaust gas samples collected during combustion efficiency testing are summarized in Table 14. VOC concentrations for the first and second Five-Year Review periods can be compared by reviewing the average concentration results. For boiler and flare samples, the second Five-Year Review average concentrations were either 1) lower than the first Five-Year average concentrations, 2) detected at concentrations below the first Five-Year Review detection limits, or 3) not detected during either the first or second Five-Year Review periods.

Note that nine VOCs (toluene, ethylbenzene, 1,3-butadiene, xylene, dichlorbenzene, chlorobenzene, vinyl chloride, benzene, and cis-1,2-dichlorotheylene) detected during two flare source tests, one conducted in November 2008 and the other conducted in November 2011, had higher maximum concentrations than during the first Five-Year Review. These maximum concentration values are apparent data set outliers. For the November 2008 source test, the replicate sample results were inconsistent, which was indicative of possible sample contamination. The Modified Z-score statistical technique was used to determine whether the November 2008 test results for the nine VOCs were outliers. A review of the modified Z-score statistic for each of the nine VOCs confirmed that the maximum values were outliers. In November 2011, a backup flare source test found the destruction efficiency for methane to be low with the flare operating at less than peak performance. As such, exhaust gas samples taken during the test yielded higher maximum concentrations for the nine VOCs. It should be noted that the VOC destruction efficiency requirement was met during the November 2011 emission test so no excess VOC emissions occurred. Consequently, these higher maximum concentrations were determined to be outliers and were not included in the calculation of average values in Table 14 but were included in the concentration ranges.

6.2.6 SURFACE AIR CONCLUSIONS

Routine surface air monitoring includes ambient air monitoring, integrated surface gas monitoring, wellhead pressure monitoring, component leak check monitoring, and boiler and flare emissions testing. Second Five-Year Review period routine surface air monitoring data were compared with data collected during the first Five-Year Review period to document the ongoing effectiveness of landfill gas control and to ascertain if landfill conditions have changed. Additionally, integrated surface gas sampling results, wellhead pressure monitoring results, destruction efficiency of flares and boilers, and component leak check monitoring results were reviewed for compliance with SCAQMD Rule 1150.1 Compliance Plan criteria.

The results of the second Five-Year Review ambient air and integrated surface gas monitoring indicate that air quality, measured above the surface of the landfill, has improved since first Five-Year Review period. TAC concentrations in ambient air samples upwind and downwind of landfill are statistically the same. Also, TAC concentrations in ambient air samples and integrated surface gas samples are comparable to local background ambient air. Current integrated surface gas monitoring, wellhead pressure monitoring, and component leak checking have continually been in compliance with SCAQMD Rule 1150.1 Compliance Plan requirements. Combustion efficiency testing indicates that average VOC destruction efficiencies are greater than 98% and average methane destruction efficiencies are greater than 99% in compliance with the regulatory requirements and objectives set forth by the SCAQMD.

6.3 SUBSURFACE GAS

Subsurface gas monitoring at the PVLF is regulated primarily by the SCAQMD Rule 1150.1 Compliance Plan. The SCAQMD Rule 1150.1 Compliance Plan requires subsurface gas monitoring, which includes boundary probe monitoring and the monitoring of the landfill gas collection header lines. This section of the second Five-Year Review describes the subsurface gas monitoring at the site.

6.3.1 BOUNDARY PROBE MONITORING

Subsurface boundary probe monitoring is conducted in compliance with the SCAQMD Rule 1150.1 Compliance Plan and the California Department of Resources Recycling and Recovery (CalRecycle) Resolution 81-71 (June 4, 1981). Subsurface boundary probes are located around the perimeter of the PVLF as shown in Figure 7. Boundary probes are sampled on a monthly basis and analyzed for TOC (as methane) and oxygen to monitor potential landfill gas migration. Methane is proportionate to other landfill gas constituents (carbon dioxide and VOCs) and can be used as a surrogate for detecting any landfill gas migration (Huitric and Kong, 2006). The SCAQMD Rule 1150.1 Compliance Plan requires that corrective actions be taken to clear a probe within specified timelines if TOC (as methane) is detected in probes at concentrations equal to or greater than the action level of 5% by volume.

Boundary probe monitoring at Ernie Howlett Park is not required for compliance with the SCAQMD Rule 1150.1 Compliance Plan because the Sanitation Districts do not own or operate the park. Nonetheless, Sanitation Districts' staff monitor the Ernie Howlett Park

boundary probes for TOC (as methane) and so a comparison of these results to the SCAQMD Rule 1150.1 Compliance Plan action level is included in this review. Additionally, data from the 23 probes located along the Hawthorne Boulevard boundary of the Main Site (MH probes) and Ernie Howlett Park (PH probes) are not considered in assessing landfill gas migration because these probes are not located along the external perimeter of the site. CalRecycle cancelled mandatory monitoring of these probes in 1982 since gas migration in either direction would only affect the adjacent fill areas.

Since implementing SCAQMD Rule 1150.1 Compliance Plan boundary probe monitoring in April 2000, a sample has also been collected quarterly from the Main Site or South Coast Botanic Garden boundary probe with the highest TOC (as methane) reading, or from a random probe if no TOC (as methane) has been detected during monthly monitoring, and analyzed for VOCs.

The results of boundary probe monitoring are reported to the SCAQMD and DTSC quarterly and to the Los Angeles County Department of Health Services (LADHS) monthly. Both reports include a description of any corrective actions that were implemented and the resulting monitoring readings.

6.3.1.1 SAMPLING

During the second Five-Year period, approximately 25,500 samples were collected from the PVLF boundary probes: 17,449 samples from the Main Site boundary probes, 5,834 samples from the South Coast Botanic Garden boundary probes, and 2,201 from the Ernie Howlett Park boundary probes. Of the monthly samples collected, 22 quarterly samples from the Main Site boundary probes and 7 quarterly samples from the South Coast Botanic Garden boundary probes were analyzed for VOCs as well as TOC (as methane). By comparison, during the first Five-Year Review period nearly 46,000 samples were collected from the boundary probes between July 1994 and December 2006: 31,321 from the Main Site boundary probes, 10,564 from the South Coast Botanic Garden boundary probes, and 4,066 from the Ernie Howlett Park boundary probes. During the first Five-Year Review period, a total of 28 quarterly samples, collected from the Main Site and the South Coast Botanic Garden boundary probes, were analyzed for VOCs as well as TOC (as methane). An additional 191 samples were also collected from the Main Site, South Coast Botanic Garden, and Ernie Howlett Park boundary probes at the request of DTSC and analyzed for TOC (as methane) and VOCs.

Boundary probe TOC (as methane) and VOC data collected during the first and second Five-Year periods are summarized in Table 15. The first and second Five-Year Review TOC (as methane) results are also compared with the SCAQMD Rule 1150.1 action level of 5% by volume. The percentage of TOC samples at or above the action level, which were not cleared within the SCAQMD required time frame (criterion %) are also provided in Table 15.

6.3.1.2 SUMMARY TABLE ANALYSIS

The top of Table 15 contains a summary of the TOC (as methane) results obtained in the field during monthly boundary probe monitoring. During the second Five-Year Review period, the average Main Site boundary probe TOC (as methane) level was 0.002 percent, the average South Coast Botanic Garden TOC (as methane) level was 0.002 percent and there were no TOC (as methane) detections in the Ernie Howlett Park boundary probes. By comparison, during the first Five-Year Review period the average Main Site boundary probe TOC (as methane) level was 0.02 percent, the average South Coast Botanic Garden TOC (as methane) level was 0.0004 percent, and the average Ernie Howlett Park TOC (as methane) level was 0.05 percent. This comparison shows a decline in TOC (as methane) levels detected at the Main Site and Ernie Howlett Park boundary probes with an increase in average TOC (as methane) levels detected in the South Coast Botanic Garden boundary probes. Despite the increase in average methane levels detected in the South Coast Botanic Garden boundary probes, it is important to note that the average TOC (as methane) level detected in the PVLF boundary probes is well below the Rule 1150.1 Compliance Plan action level.

During the second Five-Year Review period, TOC (as methane) was detected, at or above the SCAQMD Rule 1150.1 Compliance Plan action level of 5% by volume, a total of five times in one Main Site boundary probe, one time in the South Coast Botanic Garden boundary probes, and was not detected in any of the Ernie Howlett Park boundary probes. At the Main Site, one boundary probe, located along the Northeast boundary, had one TOC (as methane) detection at or above the action level in 2008 and four TOC (as methane) detections at or above the action level during one sampling event in 2010. The detections triggered the implementation of corrective actions to clear the probe below the SCAQMD Rule 1150.1 Compliance Plan action level within 10 days. There have been no additional TOC (as methane) detections in the Main Site boundary probe since 2010 indicating that the corrective actions implemented have been successful in controlling subsurface gas migration. At the South Coast Botanic Garden, TOC (as methane) was detected, at or above the action level, in one boundary probe in 2013. The elevated detection triggered the implementation of corrective actions to clear the probe within the SCAQMD Rule 1150.1 Compliance Plan specified timelines. Gas collection system adjustments were implemented and have been effective in satisfying in gas control needs in the South Coast Botanic Garden.

During the first and second Five-Year Review periods, all boundary probe TOC (as methane) detections above the 5% action level were remediated within the SCAQMD Rule 1150.1 required timeline. Consequently, there have been no violations of the SCAQMD Rule 1150.1 Compliance Plan criteria regarding boundary probe monitoring as indicated in the "Criterion %" column in Table 15. In addition, the number of boundary probes with TOC (as methane) detections at or above the 5% action level has been decreasing over time, indicative of the ongoing effectiveness of the landfill gas collection system in controlling landfill gas migration.

Table 15 Summary of Boundary Probe Monitoring

Constituent	First Five-Year Review[a]																		Second Five Year Review[a]															
	Main Site						Ernie Howlett Park						South Coast Botanic Garden						Main Site						Ernie Howlett Park						South Coast Botanic Garden					
	No. Analyzed	Min	Max	Avg	No. ≥5%	Criterion %[d]	No. Analyzed	Min	Max	Avg	No. ≥5%	Criterion %[d]	No. Analyzed	Min	Max	Avg	No. ≥5%	Criterion %[d]	No. Analyzed	Min	Max	Avg	No. ≥5%	Criterion %[d]	No. Analyzed	Min	Max	Avg	No. ≥5%	Criterion %[d]	No. Analyzed	Min	Max	Avg	No. ≥5%	Criterion %[d]
TOC (as methane), %	31,321	0	30	0.02	45	0	4,066	0	12	0.05	16	0	10,564	0	2	0.0004	0	0	17,446	0	13.25	0.002	5	0	2,201	0	0	0	0	0	5,834	0	5	0.002	1	0

Constituent	First Five-Year Review [b]															Second Five Year Review[c]														
	Main Site					Ernie Howlett Park					South Coast Botanic Garden					Main Site					Ernie Howlett Park					South Coast Botanic Garden				
	No. Analyzed[g]	Min	Max	Avg[e]	No. ND	No. Analyzed[g]	Min	Max	Avg[e]	No. ND	No. Analyzed[g]	Min	Max	Avg[e]	No. ND	No. Analyzed[g]	Min	Max	Avg[e]	No. ND	No. Analyzed	Min	Max	Avg[e]	No. ND	No. Analyzed	Min	Max	Avg[e]	No. ND
Methylene Chloride, ppbv	180	<0.1	9.2	0.5	176	24	<0.5	0.73	0.3	23	51	<0.5	0.83	0.4	50	22	< 0.1	0.17	0.11	20						7	< 0.1	< 0.2	< 0.11	7
Chloroform, ppbv	180	<0.04	140	2.3	58	24	<0.06	2.2	0.6	4	51	<0.06	24	1.2	8	22	< 0.05	2.2	0.28	8						7	< 0.05	100	15.34	1
1,1,1-Trichloroethane, ppbv	180	<0.05	2.7	0.2	124	24	<0.05	0.65	0.1	13	51	<0.05	0.62	0.1	34	22	< 0.05	0.1	0.03	21						7	< 0.05	< 0.1	< 0.06	7
Carbon Tetrachloride, ppbv	180	<0.03	0.19	0.1	62	24	<0.03	0.11	0.1	12	51	<0.03	0.1	0.1	21	22	< 0.05	0.11	0.07	5						7	< 0.05	0.15	0.05	5
1,1-Dichloroethene, ppbv	180	<0.02	7.9	0.2	172	24	<0.05	0.36	0.04	23	51	<0.05	<2.1	< 0.1	51	22	< 0.05	< 0.06	< 0.05	22						7	< 0.05	< 0.1	< 0.06	7
Trichloroethylene, ppbv	180	<0.02	190	1.7	72	24	<0.05	3	0.7	4	51	<0.05	6.5	0.7	19	22	< 0.05	0.29	0.07	7						7	< 0.05	3.6	0.70	3
Tetrachloroethylene, ppbv	180	<0.05	430	6.4	18	24	0.14	61	6.5	0	51	<0.11	90	4.5	4	22	< 0.05	2.5	0.39	6						7	0.05	9.7	3.25	0
Chlorobenzene, ppbv	178	<0.04	7.2	0.3	167	24	<0.05	0.12	0.1	23	51	<0.05	6.8	0.3	50	22	< 0.05	0.1	0.06	21						7	< 0.05	0.29	0.12	5
Vinyl Chloride, ppbv	180	<0.04	210	2.1	163	24	<0.05	34	1.5	23	51	<0.05	<8	< 0.4	51	22	< 0.05	< 0.06	< 0.05	22						7	< 0.05	< 0.12	< 0.07	7
1,1-Dichloroethane, ppbv	180	<0.04	260	2.4	165	24	<0.05	0.13	0.04	23	51	<0.05	<2	< 0.2	51	22	< 0.05	0.21	0.03	21						7	< 0.05	< 0.1	< 0.06	7
1,2-Dichloroethane, ppbv	178	<0.02	0.1	0.6	176	24	<0.05	<1.1	< 1.0	24	51	<0.05	<4.2	< 1.1	51	22	< 0.25	< 0.28	< 0.25	22						7	< 0.25	< 0.5	< 0.29	7
Benzene, ppbv	180	<0.11	39	1.1	168	24	<0.26	1.6	0.5	20	50	<0.26	3.4	0.5	48	22	< 0.25	< 0.59	< 0.33	22						7	< 0.25	< 0.5	< 0.29	7
Toluene, ppbv	179	<0.47	30	1.3	152	24	<1.2	3.5	1.1	19	51	<1.1	9.8	0.9	50	22	< 1	2.4	0.69	20						7	< 1	1.8	0.78	6
Ethylbenzene, ppbv	163	<0.11	1.6	0.1	146	24	<0.15	0.84	0.2	13	49	<0.15	43	1	37	22	< 0.19	0.75	0.15	21						7	< 0.25	1.6	0.48	5
Acetonitrile, ppbv	180	<0.39	7.3	3.6	178	24	<1.1	<2.7	< 2.1	24	51	<1.1	<100	< 4.9	51	22	< 0.42	< 2.5	< 1.57	22						7	< 1.6	< 3.3	< 2.00	7
1,2-Dibromoethane, ppbv	180	<0.02	<21	< 0.5	180	24	<0.05	<0.11	< 0.1	24	51	<0.05	<8.3	< 0.3	51	22	< 0.05	< 0.52	< 0.16	22						7	< 0.05	< 0.26	< 0.09	7
Benzyl Chloride, ppbv	180	<0.11	<53	< 3.1	180	24	<2.7	<5.4	< 2.8	24	51	<1.1	<8.5	< 3.1	51	22	< 0.25	< 1	< 0.56	22						7	< 0.31	< 0.98	< 0.54	7
Xylene[f], ppbv	180	<0.27	125	1.8	168	24	<0.86	3.4	1.2	13	51	<0.27	47	1.6	40	22	< 1.23	< 1.63	< 1.48	22						7	< 1.52	2.2	1.09	6
Dichlorobenzene[f], ppbv	180	<0.32	26	1.4	169	24	<0.79	<3.77	< 2.6	24	51	<1.33	<25.4	< 2.6	51	22	< 0.27	0.34	0.63	21						7	< 0.44	2	0.96	6
TOC (as methane), ppmv	151	<1	118000	1,065	26	22	2	4.6	2.3	0	45	<2	7.9	2.1	3	22	< 2	33	3.40	11						7	< 2	2700	388	3

NA

(a) First Five-Year Review methane data monthly July 1994 - December 2007; Second-Year Review methane data monthly January 2007 - December 2013
(b) First Five-Year Review TAC data from select probes collected monthly July 1994 - August 1997 and quarterly June 2000 - December 2006 and additional sampling in 2003 per DTSC requests
(c) Second Five-Year Review TAC data from select probes collected quarterly 1stQ 2007 - 4thQ 2013
(d) Criterion percent is number of action level detections not corrected pursuant SCAQMD Compliance Plan time frame requirements
(e) Used 1/2 detection limits to calculate average unless all results were non-detected
(f) Xylene is total of m+p- and o-xylenes; Dichlorobenzene is total of m-, o-, and p-dichlorobenzenes
(g) First Five-Year Review TAC data from 28 sampling events for SCAQMD Rule 1150.1 purposes and 191 sampling events per DTSC requests. Not all constituents analyzed during each sampling event.
ppmv - parts per million by volume; ppbv - part per billion by volume; NA - constituent not analyzed; Min - minimum; Max - maximum; Avg - average; ND - not detected; "<" - less than detection limit

Table 15 contains a summary of the boundary probe TOC (as methane) and VOC monitoring results for the first and second Five-Year Review periods. The number of samples analyzed, concentration ranges and averages, and the number of non-detects for Main Site, South Coast Botanic Garden, and Ernie Howlett Park boundary probes are shown. During the second Five-Year Review period, average VOC concentrations detected in Main Site boundary probes were all lower than the VOC concentrations detected during the first Five-Year Review period. Similarly for boundary probes at South Coast Botanic Garden, 16 of the 17 VOCs analyzed had lower concentrations during the second Five-Year Review than during the first Five-Year Review. At Ernie Howlett Park, no samples were analyzed for VOCs during the second Five-Year Review period because boundary probe monitoring is not required for compliance with the SCAQMD Rule 1150.1 Compliance Plan.

The average concentration of one compound, chloroform, detected during the second Five-Year Review was greater than during the first Five-Year Review. However, chloroform was determined to be related to potable water (SCS, 2007) and is therefore not an indicator of potential landfill gas migration at the site. For each of the three landfill areas (Main Site, South Coast Botanic Garden, Ernie Howlett Park), the majority of the VOC average concentrations were either lower during the second Five-Year Review period, detected at concentrations below the first Five-Year Review period detection limits, or were not detected during either the first or second Five-Year Review periods. Analysis of the second Five-Year Review boundary probe monitoring TOC (as methane) and VOC data, as described above, indicates that the PVLF landfill gas collection system is effective in controlling subsurface gas migration.

6.3.2 LANDFILL GAS HEADER LINE MONITORING

In accordance with the SCAQMD Rule 1150.1 Compliance Plan, samples of extracted (recovered) landfill gas are taken from the landfill gas collection system header lines on a quarterly basis and analyzed for methane, carbon dioxide, oxygen, nitrogen, argon, and VOCs to assess the composition of landfill gas entering the gas control facilities. Generally, gas collection Header No.1 draws landfill gas from the site's perimeter gas migration control wells while Header No. 2 draws landfill gas from gas extraction wells placed in interior refuse. Header line monitoring results are included in quarterly reports submitted to the SCAQMD and DTSC.

6.3.2.1 SAMPLING

During the first Five-Year Review period, header line sampling was conducted in May and June 1998 and quarterly from April 2000 through December 2006. During the second Five-Year Review period, gas collection header line sampling was conducted quarterly from January 2007 through December 2013. Header line sampling locations are shown in Figure 8. During the first Five-Year Review period, 29 header line landfill gas samples were collected and 28 landfill gas samples were collected during the second Five-Year Review period. Header line monitoring results for Header No.1 and Header No. 2 are summarized in Table 16. The number of samples analyzed, concentration ranges and averages, and the number of non-detects for the first and second Five-Year Review periods are shown.

Table 16 Summary of Recovered Landfill Gas Monitoring at Header Lines

Constituent	First Five Year Review [a]										Second Five Year Review [b]									
	Header 1[c]					Header 2[c]					Header 1[c]					Header 2[c]				
	No. Analyzed	Min	Max	Avg[d]	No. ND	No. Analyzed	Min	Max	Avg[d]	No. ND	No. Analyzed	Min	Max	Avg[d]	No. ND	No. Analyzed	Min	Max	Avg[d]	No. ND
Oxygen, percent	29	14.2	18.2	16.89	0	29	4.91	10.3	7.5	0	28	16.6	18.6	17.9	0	28	7.4	14.1	9.69	0
Argon, percent	29	0.82	0.91	0.87	0	29	0.35	0.64	0.52	0	28	0.84	1.03	0.89	0	28	0.54	0.71	0.61	0
Nitrogen, percent	29	68.4	74.4	72.65	0	29	29.6	52.2	43.5	0	28	74	76.5	75.0	0	28	46.9	61.2	52.6	0
Methane, percent	29	1.87	6.12	3.17	0	29	19.8	34.5	25	0	28	1.07	2.15	1.72	0	28	11.6	22.1	18.6	0
Carbon Dioxide, percent	29	2.74	7.1	4.37	0	29	16.7	26.5	21.4	0	28	2.02	3.51	2.82	0	28	9.73	19.7	16.5	0
Hydrogen Sulfide, ppmv	29	0.8	6.8	2.3	0	29	23	50	33	0	28	< 0.5	1.6	0.62	9	28	6.2	30	19.5	0
Methylene Chloride, ppbv	29	< 10	< 420	ND	29	29	< 40	< 420	ND	29	28	< 10	< 50	< 15.9	28	28	< 40	< 200	< 59	28
Chloroform, ppbv	29	< 5.3	13	9.8	20	29	< 5.5	< 94	ND	29	28	< 4.9	21	4.46	19	28	< 20	< 37	< 22	28
1,1,1-Trichloroethane, ppbv	29	< 4.2	< 42	ND	29	29	< 5.3	< 42	ND	29	28	< 5	< 21	< 6.20	28	28	< 20	< 38	< 23	28
Carbon Tetrachloride, ppbv	29	< 1.1	< 22	ND	29	29	< 5.3	< 22	ND	29	28	< 5.2	< 21	< 5.84	28	28	< 21	< 22	< 21	28
1,1-Dichloroethene, ppbv	29	< 5.2	5	5.4	28	29	< 21	61	34	2	28	< 4.8	< 21	< 5.69	28	28	< 19	34	21	9
Trichloroethylene, ppbv	29	< 5.2	16	10.5	14	29	< 110	280	90	1	28	< 5.2	< 21	< 5.86	28	28	< 22	91	42	1
Tetrachloroethylene, ppbv	29	< 5.2	27	12.6	15	29	< 22	270	70	6	28	< 5	6.3	3.21	25	28	< 20	47	22	14
Chlorobenzene, ppbv	29	38	430	149	0	29	940	4,500	2,129	0	28	< 26	150	83.3	2	28	< 100	3,300	2,391	1
Vinyl Chloride, ppbv	29	150	290	208	0	29	570	1,600	926	0	28	61	440	132	0	28	380	870	724	0
1,1-Dichloroethane, ppbv	29	< 5.2	6.7	5.6	28	29	< 21	37	23	11	28	< 4.8	< 21	< 5.69	28	28	< 19	39	15	21
1,2-Dichloroethane, ppbv	29	< 25	15	84	28	29	< 100	< 420	ND	29	28	< 25	< 100	< 27.9	28	28	< 100	< 110	< 101	28
Benzene, ppbv	29	< 230	1,800	363	8	29	6,000	16,000	10,066	0	28	46	270	132	0	28	4,100	8,600	6,714	0
Toluene, ppbv	29	< 120	950	337	7	29	5,100	26,000	10,059	0	28	< 100	150	73.4	23	28	2,400	7,900	4,921	0
Ethylbenzene, ppbv	29	240	2,700	817	0	29	7,400	30,000	15,183	0	28	120	750	277	0	28	8,900	25,000	17,854	0
Acetonitrile, ppbv	29	< 52	270	159	28	29	< 52	250	338	28	28	< 42	< 660	< 183	28	28	< 170	< 1,000	< 658	28
1,2-Dibromoethane, ppbv	29	< 4.3	< 43	ND	29	29	< 11	< 43	ND	29	28	< 4.7	< 1,000	< 50.61	28	28	< 19	< 1,000	< 95	28
Benzyl Chloride, ppbv	29	< 11	< 2,100	ND	29	29	< 42	< 2,100	ND	29	28	< 26	< 1,000	< 87.21	28	28	< 100	< 1,000	< 244	28
Xylene[e], ppbv	29	< 490	3,600	980	3	29	9,000	45,000	19,807	0	28	< 152	970	256	8	28	6,700	31,800	21,189	0
Dichlorobenzene[e], ppbv	29	< 147	210	161	10	29	< 294	1300	349	7	28	< 206	183	109	13	28	360	1,512	946	0

(a) First Five-Year Review data collected May and June 1998, and quarterly April 2000 - December 2006.
(b) Second Five-Year Review data collected quarterly March 2007 - December 2013.
(c) Header 1 is gas migration control headerline and Header 2 is interior gas collection headerline.
(d) Used 1/2 detection limits to calculate average unless all results were non-detected.
(e) Xylene is total of m+p- and o-xylenes; Dichlorobenzene is total of m-, o-, and p-dichlorobenzenes.
ppmv - parts per million by volume; ppbv - part per billion by volume; NA - constituent not analyzed; Min - minimum; Max - maximum; Avg - average; ND - not detected; "<" - less than detection limit

6.3.2.2 SUMMARY TABLE ANALYSIS

As is expected, average concentrations of air compounds (oxygen, argon, and nitrogen) in Header No.1 and Header No.2 are generally higher during the second Five-Year Review period than in the first Five-Year Review period. This is due to the ongoing decline in landfill gas production (methane and carbon dioxide) as the waste mass at PVLF continues to age.

During the second Five-Year Review period, average VOC concentrations detected in Header No.1 landfill gas samples were lower than the average VOC concentrations detected during the first Five-Year Review period. Similarly, during the second Five-Year Review period, average VOC concentrations detected in Header No.2 landfill gas samples were lower than the average VOC concentrations detected during the first Five-Year Review period with the exception of four VOCs. Chlorobenzene, ethylbenzene, xylene, and dichlorobenzene were detected at slightly higher average concentrations during the second Five-Year Review period. The higher average concentration for these four VOCs is not indicative of increasing landfill gas production as the total VOC concentration in the second Five-Year Review period is 20% lower than the total VOC concentration in the first Five-Year Review period. This decrease in overall VOC concentration is consistent with declining refuse decomposition and reduced landfill gas production.

6.3.2.3 LANDFILL GAS PRODUCTION ANALYSIS

Landfill gas is primarily composed of nearly equal amounts of carbon dioxide and methane with trace levels of VOCs. Of these VOCs, vinyl chloride is not commonly detected in background ambient air (i.e., no background sources). It is formed in landfills under anaerobic conditions through microbial reductive dehalogenation of chlorinated hydrocarbons such as TCE and PCE (Sanitation Districts, June 1995a). It is expected that landfill generated gases, such as methane and vinyl chloride, will decline over time in a closed landfill. As Header No. 2 draws landfill gas from wells placed in interior refuse, it contains more representative levels of landfill gas constituents. A review of the ratio of vinyl chloride to methane levels in Header No.2 shows the decrease in landfill gas production at the site since the RI, as presented in Table 17.

Table 17 Average Vinyl Chloride to Methane Ratios

Year	Header 2
1982	0.000023
1990-1991, 1994	0.000010
1998, 2000-2006	0.000004
2007-2013	0.000004

Landfill generated gases conveyed in the header lines are typically lower in the second Five-Year Review data set compared with levels during the first Five-Year Review period. The reductions are due to mass removal of VOCs through operation of the landfill gas recovery

system and due to reduced organic matter available for natural degradation by microorganisms within the landfill.

6.3.3 SUBSURFACE GAS CONCLUSIONS

Routine sampling data from subsurface gas monitoring programs were summarized and include monitoring of boundary probes and gas collection system header lines conducted pursuant to SCAQMD Rule 1150.1 Compliance Plan requirements. Second Five-Year Review boundary probe data was compared with first Five-Year Review boundary probe data and SCAQMD action levels to document the ongoing effectiveness of landfill gas control systems. Methane detections in the boundary probes have been decreasing, indicative of the on-going effectiveness of the landfill gas collection system. Boundary probe monitoring has continually been in compliance with all of the regulatory requirements and objectives set forth by SCAQMD and CalRecycle.

Landfill gas is routinely sampled within the gas collection system header lines prior to treatment at the flare station. Thus, header line monitoring results are indicative of the composition of gas generated from within the landfill. Header line monitoring results show that methane concentrations are decreasing, indicating that landfill gas production is on the decline. In fact, as of 2013, methane levels were nearly 60 percent lower than they were during the RI. VOC concentrations in landfill gas collected from within the interior of the landfill have also declined when compared with levels detected during the RI.

Analytical results from routine subsurface gas monitoring indicate that landfill gas is not migrating from the PVLF into adjacent properties. This is due in part to the effectiveness of the landfill gas collection and control system as well as the fact that the potential for landfill gas migration will continue to be minimized as landfill gas production declines.

6.4 STORM WATER

At the request of DTSC, the second Five-Year Review of the PVLF includes an assessment of storm water to evaluate the performance of Best Management Practices (BMPs) as required by the National Pollutant Discharge Elimination System (NPDES) Permit for Discharges of Storm Water Associated With Industrial Activities (Water Quality Order No. 97-03-DWQ) or the General Permit.

As extensively described in the first Five-Year Review, the surface water management facilities at the PVLF are divided into three sections by Hawthorne and Crenshaw boulevards. There are a total of 10 storm water discharge locations from the combined site (See Figure 9): eight from the Main Site, one from the South Coast Botanic Garden, and one from Ernie Howlett Park. The Sanitation Districts conduct visual observations and storm water sampling at the representative storm water discharge points (NPD2, NPD3, NPD4, NPD5, NPD12, and NPD13) as part of the monitoring program (see Section 6.4.1). As required by the General Permit, the Sanitation Districts conduct routine inspections of the drainage areas, structural BMPs, and discharge locations. In addition to the required inspections, the Sanitation Districts perform preventative maintenance of the systems that could contribute pollutants to storm water.

The Sanitation Districts also perform an Annual Comprehensive Site Compliance Evaluation each year as required by Section A.9 of the General Permit. The comprehensive evaluation includes a review and evaluation of records, sampling results, BMPs, and equipment necessary to implement the Storm Water Pollution Prevention Plan (SWPPP) to determine if the BMPs are adequate, properly implemented and maintained, or whether additional BMPs are needed. The annual comprehensive site compliance evaluation is documented and submitted to the California Regional Water Quality Control Board, Los Angeles Region (RWQCB) as part of the annual storm water report for the site.

6.4.1 MONITORING PROGRAM

6.4.1.1 VISUAL OBSERVATIONS

As specified in the General Permit, visual observations of both non-storm water discharge (NSWD) and storm water discharge are made. The NSWD visual observations are conducted on a quarterly basis, during daylight hours, on days with no storm water discharges, and during scheduled facility operating hours. All drainage areas are observed for the presence of authorized and unauthorized non-storm water discharges. The Sanitation Districts typically conduct these observations in March, June, September, and December. In addition to the NSWD visual observations, the Sanitation Districts conduct storm water discharge observations during the wet season (October 1 to May 31, as defined in the General Permit). Storm water discharges are visually observed during one storm event per month during the wet season. The storm water visual observations are conducted during the first hour of discharge at discharge locations NPD2, NPD3, NPD4, NPD5, NPD12, and NPD13. In accordance with the General Permit, observations are conducted during daylight operating hours and on days that are preceded by at least three working days without storm water discharges. The observations document the presence of any floating and suspended materials, turbidity, odor, and the source of any pollutants in the discharge of storm water. The observation date, location, observation comments, and response taken to reduce or prevent pollutants in storm water, are documented. Results from the visual observations are evaluated to determine whether the SWPPP needs to be revised to ensure effective implementation of the BMPs. Observation records are submitted to the RWQCB.

6.4.1.2 STORM WATER SAMPLING

Pursuant to the General Permit during the wet season (October 1st – May 31st), the Sanitation Districts attempt to collect two storm water discharge samples at each of the representative storm water discharge points (NPD2, NPD3, NPD4, NPD5, NPD12, and NPD13). If possible, one set of samples is collected from the first storm event of the wet season. The General Permit requires that samples be collected during the first hour of discharge.

Section B.5.c. of the General Permit requires that all samples be analyzed for total suspended solids, pH, conductivity, and total organic carbon (TOC). In addition to the required parameters, Section B.5.c.ii requires that facility operators analyze for "Toxic chemicals and other pollutants that are likely to be present in storm water discharges in significant quantities". If any of these pollutants are not detected in significant quantities after two consecutive sampling events, the General Permit allows those pollutants to be eliminated from

future sample analysis. Consequently, the monitoring parameters have changed over time. Table 18 identifies the parameters that have been monitored at one or more locations at any time during second Five-Year Review period.

6.4.2 SUMMARY TABLE ANALYSIS

A storm water sampling result, summary table has been prepared to assess the quality of storm water discharges for the second Five-Year Review Period. The compounds have been divided for discussion purposes into chemical categories as follows: 1) general mineral and physical parameters, 2) metals, 3) VOCs, and 4) SVOCs. Table 19 lists the total number of samples analyzed, the range of values, and the number of non-detect results.

The data are divided into first Five-Year Review period (1994 through 2006) and the second Five-Year Review time period (2007 through 2013). Storm water samples collected during both Five-Year Review periods were from locations that are downgradient of industrial activities at the site. Similar to the first Five-Year Review, the compounds presented include those that have been analyzed in the second Five-Year Review period and detected during either the first or second Five-Year Review periods.

6.4.2.1 GENERAL PARAMETERS

Based on the criteria described in Section 6.4.2, seven general parameters are presented in Table 9. These parameters are pH, conductivity, total suspended solids, total dissolved solids, oil and grease, nitrate, and total organic carbon. Total dissolved solids, oil and grease, and nitrate were not required to be tested in the second Five-Year Review; therefore, comparisons of these data are not possible. For the remaining parameters, comparisons of the maximum values between the two review periods indicate that all the maximum values in the second Five-Year Review are consistently lower than those in the first Five-Year Review period data set, showing a pattern of improved storm water discharge quality since the first Five-Year Review.

6.4.2.2 METALS

Metals were consistently detected in the storm water samples during the two review periods. Comparisons of the maximum values between the two Five-Year Review periods indicate that the maximum values in the second Five-Year Review are generally lower than those in the first Five-Year Review period data set, showing a pattern of improved storm water discharge quality since the first Five-Year Review.

Table 18 Storm Water Monitoring Parameters

Constituent			
General Parameters			
pH	Conductivity	Total Suspended Solids	Total Organic Carbon
Metals			
Total Antimony	Soluble Antimony	Total Iron	Soluble Iron
Arsenic	Soluble Arsenic	Total Lead	Soluble Lead
Total Barium	Soluble Barium	Total Nickel	Soluble Nickel
Total Chromium	Soluble Chromium	Total Selenium	Soluble Selenium
Total Cobalt	Soluble Cobalt	Total Vanadium	Soluble Vanadium
Total Copper	Soluble Copper	Total Zinc	Soluble Zinc
Volatile Organic Compounds			
1,1,1-Trichloroethane	Acrolein	Chloroethane	o-Dichlorobenzene
1,1,2,2-Tetrachloroethane	Acrylonitrile	Chloroform	p-Dichlorobenzene
1,1,2-Trichloroethane	Benzene	Chloromethane	Tetrachloroethylene
1,1-Dichloroethane	Bromodichloromethane	cis-1,3-Dichloropropene	Toluene
1,1-Dichloroethylene	Bromoform	Dibromochloromethane	trans-1,2-Dichloroethylene
1,2-Dichloroethane	Bromomethane	Ethyl Benzene	trans-1,3-Dichloropropene
1,2-Dichloropropane	Carbon Tetrachloride	m-Dichlorobenzene	Trichloroethylene
2-Chloroethylvinylether	Chlorobenzene	Methylene Chloride	Vinyl Chloride
Acetone			
Semi-Volatile Organic Compounds			
1,2,4-Trichlorobenzene	3,3'-Dichlorobenzidine	bis(2-chloroethyl)Ether	Hexachlorobutadiene
1,2-Dichlorobenzene	4-Bromophenyl Phenylether	bis(2-cl-ethoxy)Methane	Hexachlorocyclopentadiene
1,2-Diphenylhydrazine	4-Chloro-3-Methylphenol	bis(2-cl-isopropyl)Ether	Hexachloroethane
1,3-Dichlorobenzene	4-Chlorophenylphenylether	Butylbenzyl Phthalate	Indeno(1,2,3-c,d)Pyrene
1,4-Dichlorobenzene	4-Nitrophenol	Chrysene	Isophorone
2,4,6-Trichlorophenol	Acenaphthene	Dibenzo(a,h)Anthracene	Naphthalene
2,4-Dichlorophenol	Acenaphthylene	Diethyl Phthalate	Nitrobenzene
2,4-Dimethylphenol	Anthracene	Diethylhexyl Phthalate	n-Nitrosodimethylamine
2,4-Dinitrophenol	Benzidine	Dimethyl Phthalate	n-Nitrosodi-n-Propylamine
2,4-Dinitrotoluene	Benzo(a)Anthracene	di-n-Butyl Phthalate	n-Nitrosodiphenylamine
2,6-Dinitrotoluene	Benzo(a)Pyrene	di-n-Octyl Phthalate	Pentachlorophenol
2-Chloronaphthalene	Benzo(b)Fluoranthene	Fluoranthene	Phenanthrene
2-Chlorophenol	Benzo(g,h,i)Perylene	Fluorene	Phenol
2-Methyl-4,6-Dinitrophenol	Benzo(k)Fluoranthene	Hexachlorobenzene	Pyrene
2-Nitrophenol			
Pesticides			
Aldrin	Aroclor 1254	Endosulfan II	Lindane (Gamma-BHC)
Alpha-BHC	Aroclor 1260	Endosulfan Sulfate	pp'-DDD
Aroclor 1016	Beta-BHC	Endrin	pp'-DDE
Aroclor 1221	Delta-BHC	Endrin Aldehyde	pp'-DDT
Aroclor 1232	Dieldrin	Heptachlor	Technical Chlordane
Aroclor 1242	Endosulfan I	Heptachlor Epoxide	Toxaphene
Aroclor 1248			

Metals are naturally present in soils and are generally detected at levels that correlated with those of suspended solids. A comparison between the two sets of data (suspended solids and metals) indicates that the concentrations of metals are closely associated with the amount of natural suspended solids carried by the runoff. Because metals are naturally occurring in the environment and not necessarily related to any impacts from the landfill, application of BMPs for erosion and sediment control have shown to be effective for reducing metals in storm water runoff from the site.

6.4.2.3 VOLATILE ORGANIC COMPOUNDS

Two VOCs were detected in the storm water samples during the second Five-Year Review period: acetone and methylene chloride. Acetone was not monitored during the RI period. Methylene chloride was detected in the background samples for the RI.

Acetone is commonly present in the atmosphere and often detected in equipment and trip blank samples with higher or more elevated concentrations than those detected in storm water samples. Methylene chloride is also a common laboratory contaminant and was detected only once during the second Five-Year Review period. Consequently, acetone and methylene chloride detections in the storm water samples are not likely to be related to the landfill.

Based on the results of the storm water samples collected during the second Five-Year Review period (Table 19), storm water discharged from the site contained no landfill-related VOCs.

6.4.2.4 SEMI-VOLATILE ORGANIC COMPOUNDS

Two SVOCs were detected in the storm water samples during the first and second Five-Year Review periods: bis(2-ethylhexyl) phthalate (diethylhexyl phthalate) and pentachlorophenol.

Diethylhexyl phthalate is a commonly used plasticizer, a common laboratory contaminant, and it has been detected in storm water equipment quality control sample. Therefore, the detections of diethylhexyl phthalate are not likely to be related to the landfill.

Low levels of pentachlorophenol were detected in storm water samples collected during the first and second Five-Year Review periods. The Sanitation Districts investigated the potential sources of pentachlorophenol related to industrial activities at the site and determined that wood products used for construction of foot and light duty vehicle bridges, decks, and other soil and landscape retaining structures prior 1987[4] could have been treated with pentachlorophenol. Wood preservatives such as pentachlorophenol were often used for soil-contact applications where lumber requires protection against outdoor elements such as rot and fungal decay. In an effort to minimize potential pollutant from wood products, the Sanitation Districts have implemented a best management practice of sealing lumber products located onsite. A wood sealant was initially applied in December 2008 and again in 2011 in response to the detections of pentachlorophenol in storm water samples.

[4] Though once widely used as wood preservative (fungicide), pentachlorophenol was banned in 1987 for any over-the-counter sales.

Table 19 Storm Water Sampling Results

Constituents[a]	Units	First Five-Year Review Period (7/1/1994-12/31/2006)[b]				Second Five-Year Review Period (1/1/2007-12/31/2013)[b]			
		No. Analyzed	Min	Max	No. ND	No. Analyzed	Min	Max	No. ND
General Parameters									
pH	pH units	95	6.04	8.99	95	61	4.64	8	61
Conductivity	umhos/cm @25C	84	35	3000	84	49	63	1000	49
Total Suspended Solids	mg/L	84	36	4444	0	49	28	1580	0
Residue, Filterable (TDS)	mg/L	15	64	768	0	NT	NA	NA	0
Oil and Grease	mg/L	15	<3	17.4	10	NT	NA	NA	0
Nitrate as Nitrogen	mg/L	9	0.8	2.5	0	NT	NA	NA	0
Total Organic Carbon	mg/L	95	3.3	252	0	61	6	190	0
Metals[c]									
Antimony	mg/L	84	<0.0005	0.011	25	20	<0.01	0.003	12
Arsenic	mg/L	84	<0.003	0.24	8	48	<0.01	0.078	26
Barium	mg/L	84	<0.02	2.46	1	49	<0.01	1.36	1
Chromium	mg/L	84	<0.02	0.27	11	49	<0.005	0.162	3
Cobalt	mg/L	77	<0.01	0.1	21	20	<0.01	0.026	12
Copper	mg/L	84	<0.02	0.27	4	49	<0.01	0.32	1
Iron	mg/L	69	0.17	171	0	49	<0.04	52	1
Lead	mg/L	84	<0.04	0.51	14	49	<0.05	0.121	4
Nickel	mg/L	84	<0.04	0.48	10	49	<0.01	0.21	5
Selenium	mg/L	84	<0.0004	0.011	39	20	<0.01	0.0067	12
Vanadium	mg/L	84	<0.01	0.7	13	49	<0.01	0.23	2
Zinc	mg/L	84	<0.1	1.5	2	49	<0.02	2.1	1
Antimony, Soluble	mg/L	84	<0.0005	0.0075	35	20	<0.0005	0.0024	13
Arsenic, Soluble	mg/L	84	<0.001	0.054	21	20	<0.01	0.017	12
Barium, Soluble	mg/L	84	<0.01	0.07	10	20	0.013	0.081	0
Chromium, Soluble	mg/L	84	<0.001	0.03	42	20	<0.005	0.0066	12

Table 19 Storm Water Sampling Results (continued)

Constituents[a]	Units	First Five-Year Review Period (7/1/1994-12/31/2006)[b]				Second Five-Year Review Period (1/1/2007-12/31/2013)[b]			
		No. Analyzed	Min	Max	No. ND	No. Analyzed	Min	Max	No. ND
Cobalt, Soluble	mg/L	77	<0.0001	0.027	35	20	<0.01	0.0037	12
Copper, Soluble	mg/L	84	<0.01	0.08	14	20	<0.01	0.073	8
Iron, Soluble	mg/L	69	<0.02	1.06	9	20	0.042	0.47	0
Lead, Soluble	mg/L	84	<0.0002	0.02	33	20	<0.005	0.0026	12
Nickel, Soluble	mg/L	84	<0.005	0.41	28	20	<0.01	0.065	8
Selenium, Soluble	mg/L	84	<0.0004	0.049	54	20	<0.01	0.0039	12
Vanadium, Soluble	mg/L	84	<0.003	0.03	44	20	<0.01	0.017	11
Zinc, Soluble	mg/L	84	<0.02	0.65	7	20	<0.02	0.54	4
Volatile Organic Compounds (VOCs)									
Acetone	µg/l	76	<5	120	25	56	<5	59	13
Methylene Chloride	µg/l	18	<1	<50	18	23	<1	4	22
Semi-Volatile Organic Compounds (SVOCs)									
bis(2-Ethylhexyl)phthalate	µg/l	70	<1	26	50	23	<4.9	47	22
Pentachlorophenol	µg/l	70	<0.1	29.9	60	23	<1.9	5.7	20

(a) Constituent list includes those tested during the first Five-Year Review period (1994 - 2006) and the second Five-Year Review period (2007 - 2013)
(b) Sampling results are shown for the total runoff (unfiltered) samples for all constituents except soluble metals. For the soluble metals, the filtered surface water runoff results are shown.
(c) Total metal (sediment and liquid fraction) results are presented as well as soluble metal (liquid fraction) results
ND - not detected; "--" - not applicable; "<" - less than detection limit
µg/L - micrograms per liter; mg/L - milligrams per liter
Min is the minimum detection limit. If the minimum detection limit is not available during the review period, Min is the minimum detected concentration.
Max is the maximum detected concentration. If the maximum detected concentration is not available, Max is the maximum detection limit during the review period.

Storm water sampling results from both Five-Year Review periods have shown that BMPs have been effective in minimizing potential storm water pollution from SVOCs.

6.4.3 STORM WATER CONCLUSIONS

During this second Five-Year Review, storm water sampling data from January 1, 2007 through December 2013 were evaluated. The site is currently in compliance with all NPDES permit conditions and limitations. Comparisons of the maximum values with the first Five-Year Review have shown a pattern of improved quality of storm water discharges. Best management practices implemented at the site are effective in controlling and/or preventing storm water pollution. In addition, storm water discharges are infrequent and lacking any repeated detections of man-made constituents.

6.5 INDUSTRIAL WASTEWATER

At the request of DTSC, the second Five-Year Review of the PVLF includes an assessment of the industrial wastewater treatment system employed at the PVLF. As extensively described in the first Five-Year Review, the industrial wastewater is generated from three areas of the PVLF: the Main Site, the South Coast Botanic Garden, and Ernie Howlett Park. Figures 10 and 11 show the collection and conveyance systems for condensate and groundwater, respectively. A schematic diagram of the liquid conveyance system of industrial wastewater is presented in Figure 12. All industrial wastewater discharged from the site is comingled with business and residential wastewater while conveyed through closed underground sewer lines, to a centralized wastewater treatment facility in Carson, California.

Industrial wastewater generated at the site is discharged to the sanitary sewer pursuant to industrial wastewater discharge permits issued by the Industrial Wastewater Section of the Sanitation Districts. These permits contain monitoring and reporting requirements and discharge limitations in compliance with the Sanitation Districts' Wastewater Ordinance and other applicable laws and regulations to protect the downstream sanitary sewer system and to ensure compliance at the downstream regional wastewater treatment facility.

The site currently operates under three Industrial Wastewater Discharge Permits: Permit Nos. 11561, 10995, and 11695. The permitted discharge locations for Permit Nos. 11561, 10995, and 11695 are designated on Figures 5 and 6 as, SB3, SB4, and SB5, respectively. These permits are revised and renewed every five years. The currently applicable versions of Permit Nos. 11561, 10995, and 11695 became effective on February 12, 2010, February 3, 2010, and February 12, 2010, respectively.

As extensively described in the first Five-Year Review, the majority of the industrial wastewater from the Main Site is discharged to the sanitary sewer at Discharge Station SB3 (Permit No. 11561). These flows include landfill gas condensate (condensate), extracted groundwater, and underdrain water from the Main Site. The flows from these sources are treated (air stripper and a clarifier) prior to being combined with the dry-

weather surface runoff diversion system flows from the western portion of the Main Site. The underdrain water and extracted groundwater from Ernie Howlett Park discharges to the sanitary sewer at SB4 under Permit No. 10995. Extracted groundwater and condensate from the South Coast Botanic Garden and dry-weather surface runoff from the eastern portion of the Main Site are discharged to the sanitary sewer at SB5 under Permit No. 11695. Treatment of the flows at SB4 and SB5 is not necessary because these flows meet the discharge limitations of their respective industrial wastewater discharge permits without treatment.

6.5.1 OPERATION AND MAINTENANCE

Table 20 outlines inspection and data collection frequencies for components of the industrial wastewater collection, treatment, and discharge system. If any conditions are observed that require maintenance, the field technician will either perform the work or submit a request for the work to be performed by qualified personnel.

6.5.2 MONITORING PROGRAM

As required by the current Self-Monitoring Requirements (SMRs) associated with Permit Nos. 10995, 11561, and 11695, wastewater samples are collected on a semi-annual basis from each of the discharge locations. The industrial wastewater sampling parameters and the currently applicable discharge limitations are presented in Table 21.

6.5.3 SUMMARY TABLE ANALYSIS

A summary of the industrial wastewater SMR data has been prepared for the second Five-Year Review Period (2007 through 2013) to assess compliance with the industrial wastewater discharge permits. The compounds have been divided for discussion purposes into categories as follows: 1) general mineral and physical parameters, 2) metals, 3) VOCs 4) SVOCs; and 5) pesticides. Table 22 includes the total number of samples analyzed, the range of values, and the number of non-detects for the review period. In addition, the data are compared to the applicable permit limitations (Limit). The percentage of instances where permit limitation criteria (% Criterion) were exceeded in the second Five-Year Review period is provided. The analytical results are discussed in the following paragraphs.

6.5.3.1 GENERAL PARAMETERS

The site has been largely in compliance with permit limitations for the general mineral and physical parameters (Table 22). Soluble sulfide was generally not detected in second Five-Year Review period. Of the 101 soluble sulfide samples collected during the recent period, only one sample (0.99 percent) exceeded the 0.1 mg/L limitation. There are no discharge limitations for suspended solids and total chemical oxygen demand (COD). There have been no exceedances of the pH and total cyanide limitation.

Table 20 Inspection Schedule for Systems Generating Industrial Wastewater

Component	Inspection Frequency	Data Collection Frequency
Condensate Collection Sumps And Tanks		
Sump 7	Daily	Daily
Getty Sump	Daily	Daily
NE Torpedo Sump	Daily	Daily
Parcel 4 Sump	Daily	Weekly
Hawthorne Sump	Daily	Daily
50 Series Sump	Daily	Weekly
Low Point Tank	Daily	Weekly
Crenshaw Sump	Daily	Daily
FS3 Sump	Daily	Daily
BC Sump	Daily	Weekly
BR Sump	Daily	Weekly
Extraction Wells		
E01	Weekly	Bi-Weekly
E02	Weekly	Bi-Weekly
E03	Weekly	Bi-Weekly
E04	Weekly	Bi-Weekly
E05	Weekly	Bi-Weekly
E06	Weekly	Bi-Weekly
E07	Weekly	Weekly
E08	Weekly	Weekly
E09	Weekly	Bi-Weekly
E10	Weekly	Weekly
E11	Weekly	Weekly
E12	Weekly	Bi-Weekly
E13	Weekly	Weekly
E14	Weekly	Daily
E15	Weekly	Weekly
E16	Weekly	Weekly
E17	Weekly	Weekly
E18	Weekly	Weekly
E01-E11 Totalizer	Daily	Daily
Sewer Discharge Points		
SB3	Twice Daily	Daily
SB4	Bi-Weekly	Weekly
SB5	Twice Daily	Daily
Gas Well Pumps		
First Bench Wells	Daily	Weekly
Other Wells (QED Well Pumps)	Weekly	Weekly (Monthly)
Discharge Tanks		
Tanks at SB3	Daily	Daily
Tank at SB5	Daily	Daily

Table 21 Industrial Wastewater Monitoring Program for the Palos Verdes Landfill

Constituent	Units	Permit 11561 (SB3)		Permit 10995 (SB4)		Permit 11695 (SB5)	
		Monitoring Parameter	Limitation	Monitoring Parameter	Limitation	Monitoring Parameter	Limitation
General Parameters							
pH	pH units	Yes	≥6.0	Yes	≥6.0	Yes	≥6.0
Soluble Sulfide	mg/L	Yes	0.1	Yes	0.1	Yes	0.1
Suspended Solids	mg/L	Yes	--	Yes	--	Yes	--
Total COD	mg/L	Yes	--	Yes	--	Yes	--
Total Cyanide	mg/L	Yes	1.2	No	--	Yes	1.2
Metals							
Arsenic	mg/L	Yes	3	No	--	Yes	3
Cadmium	mg/L	Yes	0.69	No	--	Yes	0.69
Total Chromium	mg/L	Yes	2.77	No	--	Yes	2.77
Copper	mg/L	Yes	3.38	No	--	Yes	3.38
Lead	mg/L	Yes	0.69	No	--	Yes	0.69
Mercury	mg/L	Yes	2	No	--	Yes	2
Nickel	mg/L	Yes	3.98	No	--	Yes	3.98
Silver	mg/L	Yes	0.43	No	--	Yes	0.43
Zinc	mg/L	Yes	2.61	No	--	Yes	2.61
Volatile Organic Compounds							
Volatile TTO	µg/L	Calculated Value	1,000	Calculated Value	1,000	Calculated Value	1000
1,1,1-Trichloroethane	µg/L	Yes	--	Yes	--	Yes	--
1,1-Dichloroethane	µg/L	Yes	--	Yes	--	Yes	--
1,2-Dichloroethane	µg/L	Yes	--	Yes	--	Yes	--
Benzene	µg/L	Yes	--	Yes	--	Yes	--
Bromodichloromethane	µg/L	Yes	--	Yes	--	Yes	--
Bromoform	µg/L	Yes	--	Yes	--	Yes	--
Chlorobenzene	µg/L	Yes	--	Yes	--	Yes	--
Chloroform	µg/L	Yes	--	Yes	--	Yes	--
Dibromochloromethane	µg/L	Yes	--	Yes	--	Yes	--
Ethyl Benzene	µg/L	Yes	--	Yes	--	Yes	--
Methylene Chloride	µg/L	Yes	--	Yes	--	Yes	--
o-Dichlorobenzene	µg/L	Yes	--	Yes	--	Yes	--
p-Dichlorobenzene	µg/L	Yes	--	Yes	--	Yes	--

Table 21 Industrial Wastewater Monitoring Program for the Palos Verdes Landfill (continued)

Constituent	Units	Permit 11561 (SB3)		Permit 10995 (SB4)		Permit 11695 (SB5)	
		Monitoring Parameter	Limitation	Monitoring Parameter	Limitation	Monitoring Parameter	Limitation
Tetrachloroethylene	µg/L	Yes	--	Yes	--	Yes	--
Toluene	µg/L	Yes	--	Yes	--	Yes	--
Trans-1,2-dichloroethylene	µg/L	Yes	--	Yes	--	Yes	--
Trichloroethylene	µg/L	Yes	--	Yes	--	Yes	--
Vinyl Chloride	µg/L	Yes	--	Yes	--	Yes	--
Semi-Volatile Organic Compounds							
Semi-Volatile TTO	µg/L	Calculated Value	1000	Calculated Value	1000	Calculated Value	1000
Acenaphthene	µg/L	Yes	--	Yes	--	Yes	--
Anthracene	µg/L	Yes	--	Yes	--	Yes	--
Diethyl Phthalate	µg/L	Yes	--	Yes	--	Yes	--
Diethylhexyl Phthalate	µg/L	Yes	--	Yes	--	Yes	--
Di-N-Butyl Phthalate	µg/L	Yes	--	Yes	--	Yes	--
Fluoranthene	µg/L	Yes	--	Yes	--	Yes	--
Fluorene	µg/L	Yes	--	Yes	--	Yes	--
Isophorone	µg/L	Yes	--	Yes	--	Yes	--
Naphthalene	µg/L	Yes	--	Yes	--	Yes	--
Phenanthrene	µg/L	Yes	--	Yes	--	Yes	--
Pyrene	µg/L	Yes	--	Yes	--	Yes	--
Pesticides							
Aldrin	µg/L	Yes	0	No	--	Yes	0
Alpha-BHC	µg/L	Yes	0	No	--	Yes	0
Aroclor 1016	µg/L	Yes	0	No	--	Yes	0
Aroclor 1221	µg/L	Yes	0	No	--	Yes	0
Aroclor 1232	µg/L	Yes	0	No	--	Yes	0
Aroclor 1242	µg/L	Yes	0	No	--	Yes	0
Aroclor 1248	µg/L	Yes	0	No	--	Yes	0
Aroclor 1254	µg/L	Yes	0	No	--	Yes	0
Aroclor 1260	µg/L	Yes	0	No	--	Yes	0
Beta-BHC	µg/L	Yes	0	No	--	Yes	0
Delta-BHC	µg/L	Yes	0	No	--	Yes	0
Dieldrin	µg/L	Yes	0	No	--	Yes	0

Table 21 Industrial Wastewater Monitoring Program for the Palos Verdes Landfill (continued)

Constituent	Units	Permit 11561 (SB3)		Permit 10995 (SB4)		Permit 11695 (SB5)	
		Monitoring Parameter	Limitation	Monitoring Parameter	Limitation	Monitoring Parameter	Limitation
Endosulfan I	µg/L	Yes	0	No	0	Yes	0
Endosulfan II	µg/L	Yes	0	No	0	Yes	0
Endosulfan Sulfate	µg/L	Yes	0	No	0	Yes	0
Endrin	µg/L	Yes	0	No	0	Yes	0
Endrin Aldehyde	µg/L	Yes	0	No	0	Yes	0
Heptachlor	µg/L	Yes	0	No	0	Yes	0
Heptachlor Epoxide	µg/L	Yes	0	No	0	Yes	0
Lindane (Gamma-BHC)	µg/L	Yes	0	No	0	Yes	0
pp'-DDD	µg/L	Yes	0	No	0	Yes	0
pp'-DDE	µg/L	Yes	0	No	0	Yes	0
pp'-DDT	µg/L	Yes	0	No	0	Yes	0
Technical Chlordane	µg/L	Yes	0	No	0	Yes	0
Toxaphene	µg/L	Yes	0	No	0	Yes	0

mg/L - milligrams per liter
µg/L - micrograms per liter
COD - chemical oxygen demand
TTO - total toxic organics
"≥" - greater than or equal to; "--" - no permit limit

Table 22 Industrial Wastewater Summary of Sampling Results

Constituents[a]	Units	First Five-Year Review Period (7/1/1994-12/31/2006)				Second Five-Year Review Period (1/1/2007-12/31/2013)				Limit	% Criterion[b]
		No. Analyzed	Min	Max	No. ND	No. Analyzed	Min	Max	No. ND		
General Parameters											
pH	pH units	171	5.94	8.42	0	102	6.6	8.74	0	≥6	0
Sulfide, Soluble	mg/L	170	<0.1	9	168	101	<0.1	0.2	96	0.1	0.99%
Total Suspended Solids	mg/L	390	<10	3440	4	191	<25	687	1		--
COD	mg/L	389	31	2630	0	192	<10	1570	1		--
Cyanide, Total	mg/L	148	<0.002	0.11	110	67	<0.005	0.0182	53	1.2	0
Metals											
Arsenic	mg/L	115	0.0011	2.33	0	66	<0.1	0.14	16	3	0
Cadmium	mg/L	115	<0.002	0.26	28	66	<0.0005	0.0486	21	0.69	0
Chromium	mg/L	115	<0.01	0.51	61	66	<0.02	0.0333	22	2.77	0
Copper	mg/L	115	<0.008	0.15	31	66	<0.04	0.086	23	3.38	0
Lead	mg/L	115	<0.0004	0.03	97	66	<0.00025	0.01	52	0.69	0
Mercury	mg/L	114	<0.0001	0.0004	95	64	<0.00004	0.00011	60	2	0
Nickel	mg/L	115	<0.02	1.51	1	66	0.099	1.84	0	3.98	0
Silver	mg/L	115	<0.0004	0.0059	111	66	<0.0002	0.00216	65	0.43	0
Zinc	mg/L	116	<0.01	3.28	3	65	0.1	1.41	0	2.61	0
Volatile Organic Compounds (VOCs)											
1,1,1-Trichloroethane	µg/l	171	<0.5	<50	171	104	<0.5	<100	104	--	--
1,1-Dichloroethane	µg/l	171	<0.3	16	125	104	<0.5	2	102	--	--
1,2-Dichloroethane	µg/l	171	<0.3	13	91	104	<0.5	31	100	--	--
Benzene	µg/l	171	<0.3	270	84	104	<0.5	51.2	91	--	--
Bromodichloromethane	µg/l	171	<0.5	8.9	163	104	<0.5	3	103	--	--
Bromoform	µg/l	171	<0.5	2	169	104	<0.5	<100	104	--	--
Chlorobenzene	µg/l	171	<0.5	252	64	104	<0.5	146	58	--	--
Chloroform	µg/l	171	<0.5	40	153	104	<0.5	<100	104	--	--
Dibromochloromethane	µg/l	171	<0.5	6.7	164	104	<0.5	<100	104	--	--

Table 22 Industrial Wastewater Summary of Sampling Results (continued)

Constituents[a]	Units	First Five-Year Review Period (7/1/1994-12/31/2006)				Second Five-Year Review Period (1/1/2007-12/31/2013)				Limit	% Criterion[b]
		No. Analyzed	Min	Max	No. ND	No. Analyzed	Min	Max	No. ND		
Ethylbenzene	µg/l	171	<0.3	130	121	104	<0.5	32.6	99	--	--
Methylene Chloride	µg/l	171	<0.5	83	154	104	<0.5	33.6	94	--	--
1,2-Dichlorobenzene	µg/l	171	<0.5	10	147	105	<0.5	<100	105	--	--
1,4-Dichlorobenzene	µg/l	171	<0.5	64	105	105	<0.5	28.8	91	--	--
Tetrachloroethene	µg/l	171	<0.3	42	165	104	<0.5	61.4	103	--	--
Toluene	µg/l	171	<0.3	130	131	104	<0.5	3	102	--	--
trans-1,2-Dichloroethene	µg/l	171	<0.3	2.8	150	104	<0.5	1.5	102	--	--
Trichloroethene	µg/l	171	<0.3	70	130	104	<0.5	58.4	102	--	--
Vinyl Chloride	µg/l	171	<0.3	46	122	104	<0.5	7.2	102	--	--
IW Limit Exceedances for VOCs (Volatile TTO)	µg/l	171	0	802	--	104	0	300	--		
Semivolatile Organic Compounds (SVOCs)											
Acenaphthene	µg/l	168	<1	85	134	99	<5	<500	99	--	--
Anthracene	µg/l	168	<1	4	159	99	<5	<500	99	--	--
Diethyl phthalate	µg/l	168	<1	3	155	99	<5	<500	99	--	--
bis(2-Ethylhexyl)phthalate	µg/l	168	<1	290	76	99	<20	179	82	--	--
Di-n-butyl phthalate	µg/l	168	<1	1	167	99	<5	<500	99	--	--
Fluoranthene	µg/l	168	<1	5	160	99	<5	<500	99	--	--
Fluorene	µg/l	168	<1	32	142	99	<5	<500	99	--	--
Isophorone	µg/l	168	<1	9	150	99	<5	<500	99	--	--
Naphthalene	µg/l	167	<1	620	141	98	<5	33.3	97	--	--
Phenanthrene	µg/l	168	<1	23	146	99	<5	<500	99	--	--
Pyrene	µg/l	168	<1	17	159	99	<5	<500	99	--	--
IW Limit Exceedances for SVOCs (Semi -volatile TTO)	µg/l	168	0	915	--	99	0	190	--	--	--

Table 22 Industrial Wastewater Summary of Sampling Results (continued)

Constituents[a]	Units	First Five-Year Review Period (7/1/1994-12/31/2006)				Second Five-Year Review Period (1/1/2007-12/31/2013)				Limit	% Criterion[b]
		No. Analyzed	Min	Max	No. ND	No. Analyzed	Min	Max	No. ND		
Pesticides											
Aroclor 1242	µg/l	69	<0.1	73	63	50	<2	<200	50	0	0
Aroclor 1254	µg/l	69	<0.05	24	68	50	<2	<200	50	0	0
Aroclor 1260	µg/l	69	<0.1	8.1	68	50	<2	<200	50	0	0
gamma-BHC (Lindane)	µg/l	69	<0.01	<500	69	51	<20	<250	51	0	0
4,4'-DDD	µg/l	68	<0.01	<500	68	29	<20	<250	29	0	0
4,4'-DDE	µg/l	70	<0.01	11	64	29	<20	<250	29	0	0
p,p'-DDT	µg/l	69	<0.01	<500	69	51	<20	<250	51	0	0
Technical Chlordane	µg/l	67	<0.05	<500	67	45	<20	<250	45	0	0

(a) Constituent list includes those tested during the first Five-Year Review period (7/1/1994 - 12/31/2006) and the second Five-Year Review period (1/1/2007 - 12/31/2013).
(b) % criterion is the percentage of instances when permit limits were exceeded
ND - not detected; "--" - not applicable; "<" - less than detection limit
µg/L - micrograms per liter; mg/L - milligrams per liter
Min is the minimum detection limit. If the minimum detection limit is not available during the review period, Min is the minimum detected concentration.
Max is the maximum detected concentration. If the maximum detected concentration is not available, Max is the maximum detection limit during the review period.

6.5.3.2 METALS

Low concentrations of metals were frequently detected in the industrial wastewater samples (Table 22). There have been no exceedances of discharge limitations for metals during the second Five-Year Review period.

6.5.3.3 VOLATILE ORGANIC COMPOUNDS

The self-monitoring requirements of Permit Nos. 10995, 11561, and 11695, prescribe a limitation of 1,000 micrograms per liter (µg/L) for Volatile Total Toxic Organics (Volatile TTO). The Volatile TTO for a sample is the summation of the detected concentrations of methylene chloride, chloroform, 1,1,1-trichloroethane, trichloroethylene, tetrachloroethylene, bromo-dichloromethane, dibromochloromethane, bromoform, chlorobenzene, vinyl chloride, 1,2-dichlorobenzene, 1,4-dichlorobenzene, 1,l-dichloroethane, 1,2-dichloroethane, benzene, toluene, ethylbenzene, and trans-1,2-dichloroethylene. For the purpose of this calculation, non-detect values and constituents that are not required to be tested are treated as zero. The Volatile TTO limitation was not exceeded during the second Five-Year Review period.

6.5.3.4 SEMI-VOLATILE ORGANIC COMPOUNDS

The self-monitoring requirements of Permit Nos. 10995, 11561, and 11695, prescribe a limitation of 1,000 micrograms per liter (µg/L) for Semi-volatile Total Toxic Organics (Semi-volatile TTO). The Semi-volatile TTO for a sample is the summation of the detected concentrations of acenaphthene, anthracene, diethyl phthalate, dimethyl phthalate, di-n-butyl phthalate, fluoranthene, fluorene, isophorone, naphthalene, phenanthrene, and pyrene. For the purpose of this calculation, non-detect values and constituents that are not required to be tested are treated as zero. There were no exceedances of the Semi-volatile TTO limitation during the second Five-Year Review period.

6.5.3.5 PESTICIDES

The self-monitoring requirements of Permit Nos. 11561 and 11695 prescribe that pesticides shall not be detected in the industrial wastewater. No pesticide compounds have been detected in second Five-Year Review period.

6.5.4 INDUSTRIAL WASTEWATER CONCLUSIONS

The site is currently in compliance with all Industrial Waste permit conditions and limitations. In addition, industrial wastewater flows are discharged via subsurface sanitary sewer connections. Accordingly, potential emissions from industrial waste discharges were deemed not to pose a long-term hazard to users of the site.

7. RECOMMENDATIONS AND FOLLOW-UP ACTIONS

7.1 GROUNDWATER

Assessment of groundwater monitoring data indicates that the groundwater containment system is functioning as intended in controlling the size and magnitude of the groundwater plumes. The groundwater directly downgradient of the site is not in a designated groundwater basin and its future use as a drinking water supply is unlikely due to limited aquifer thickness and naturally poor water quality. Nevertheless, the Sanitation Districts will continue to optimize operation and maintenance of the groundwater containment systems at the site to ensure ongoing control and containment of the groundwater plumes.

7.2 SURFACE AIR AND SUBSURFACE GAS

Continued operation, maintenance, and monitoring of the landfill gas systems are recommended.

7.3 STORM WATER

The site is in compliance of all NPDES permit conditions and limitations. Best management practices implemented at the site control and/or prevent storm water pollution. No follow-up actions are necessary.

7.4 INDUSTRIAL WASTE WATER

The site is in compliance of all industrial wastewater permit conditions and limitations. No follow-up actions are necessary.

8. PROTECTIVE STATEMENTS

In answering the questions posed for the technical assessment during the second Five-Year Review and as stated in the Five-Year Review Summary Form (Appendix C):

- The remedial systems are functioning as intended by the decision documents with respect to all media,
- The remedial action objectives used at the time of remedy selection are still valid, and
- No other information has come to light that call into question the protectiveness of the remedy.

9. NEXT REVIEW

The third Five-Year Review for the site will be conducted by November 2019, five years from the date of this review.

10. REFERENCES

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FIGURES

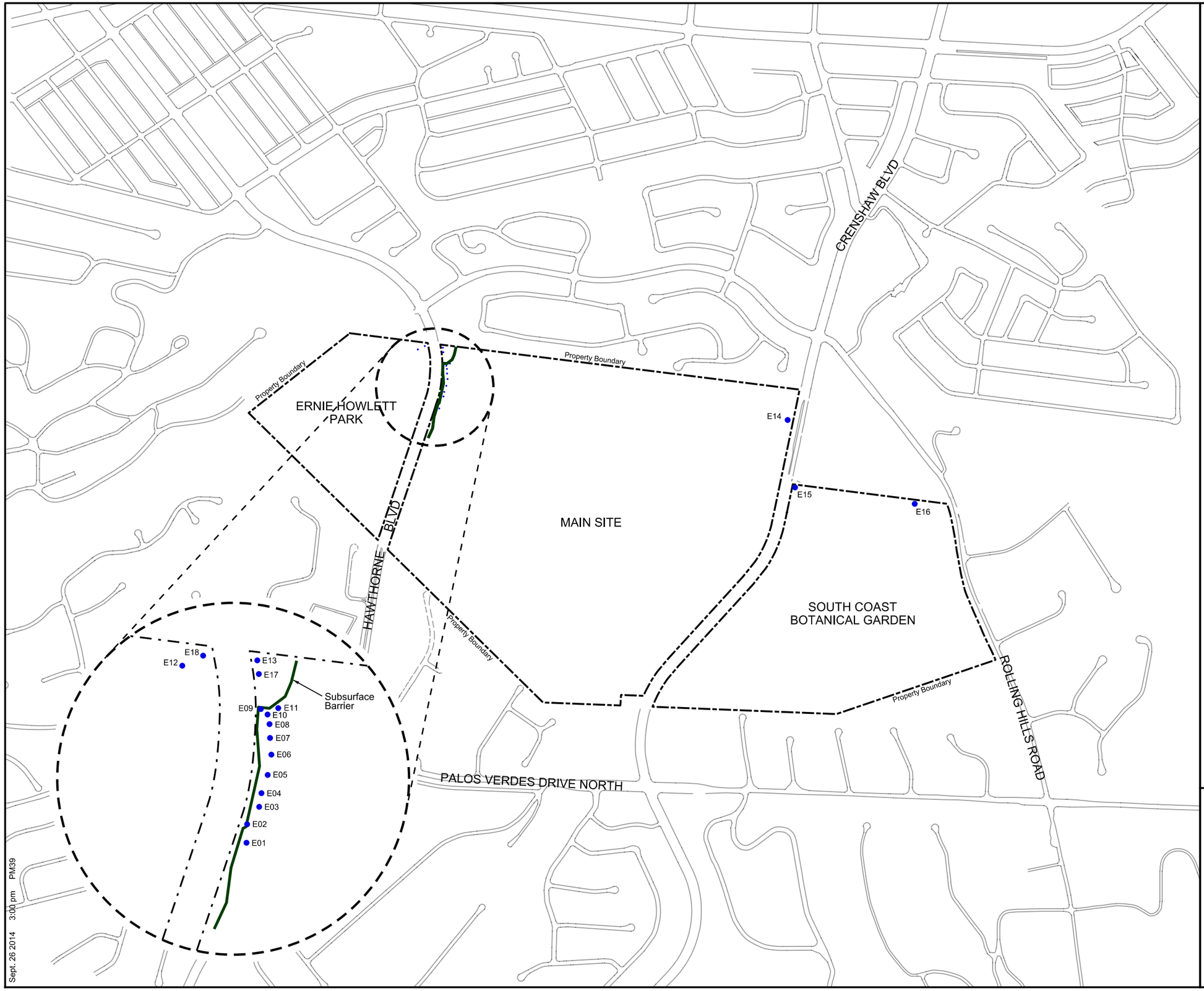
GENERAL LOCATION

Palos Verdes Landfill
Los Angeles County, California

WASTEWATER RECLAMATION
SOLID WASTE MANAGEMENT

Figure 1

n: \ lfm12 \ pv \ Groundwater \ pv Figure 01.dgn



Explanation

- Subsurface Barrier
- Property Boundary
- Extraction Well

0' 250' 500' 1000'

GRAPHIC SCALE

SITE LAYOUT AND LOCATION OF GROUNDWATER EXTRACTION WELLS

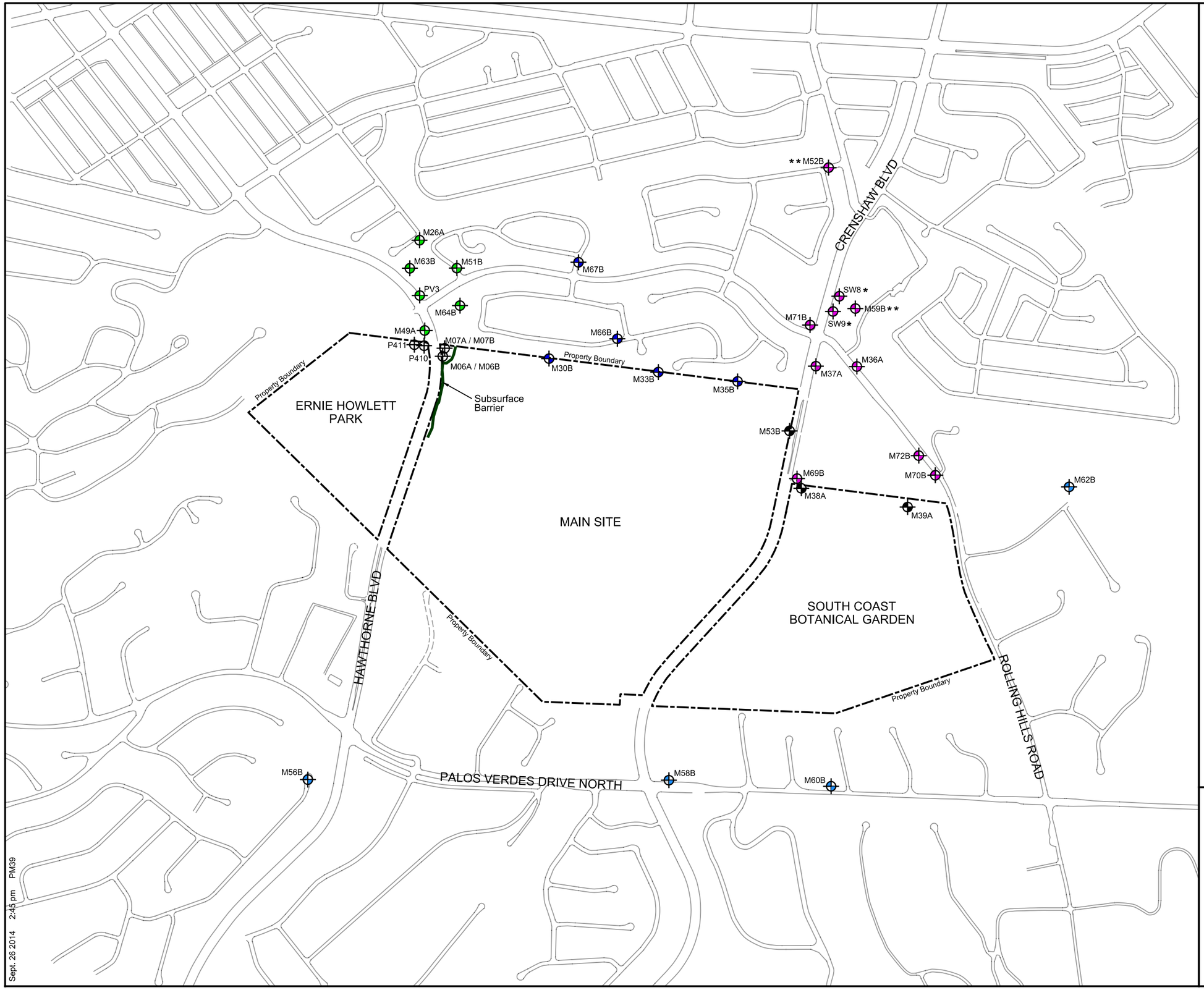
Palos Verdes Landfill
Los Angeles County, California

WASTEWATER RECLAMATION
SOLID WASTE MANAGEMENT

Figure 2

Sept. 26 2014 3:00 pm PM39

n: \ lfm12 \ pv \ Groundwater \ pv Figure 02.dgn



Explanation

- Subsurface Barrier
- Property Boundary
- Downgradient Well Along Crenshaw Blvd
- Downgradient Well Along Hawthorne Blvd
- Northeast Boundary Well
- Onsite Well Along Crenshaw Blvd
- Onsite Well Along Hawthorne Blvd
- Upgradient Well
- * Decommissioned on April 16, 2010
- ** Sampling Began Third Quarter, 2010

N

0' 250' 500' 1000'

GRAPHIC SCALE

LOCATION OF GROUNDWATER MONITORING WELLS

Palos Verdes Landfill
Los Angeles County, California

WASTEWATER RECLAMATION
SOLID WASTE MANAGEMENT

Figure 3

Sept. 26 2014 2:45 pm PM39

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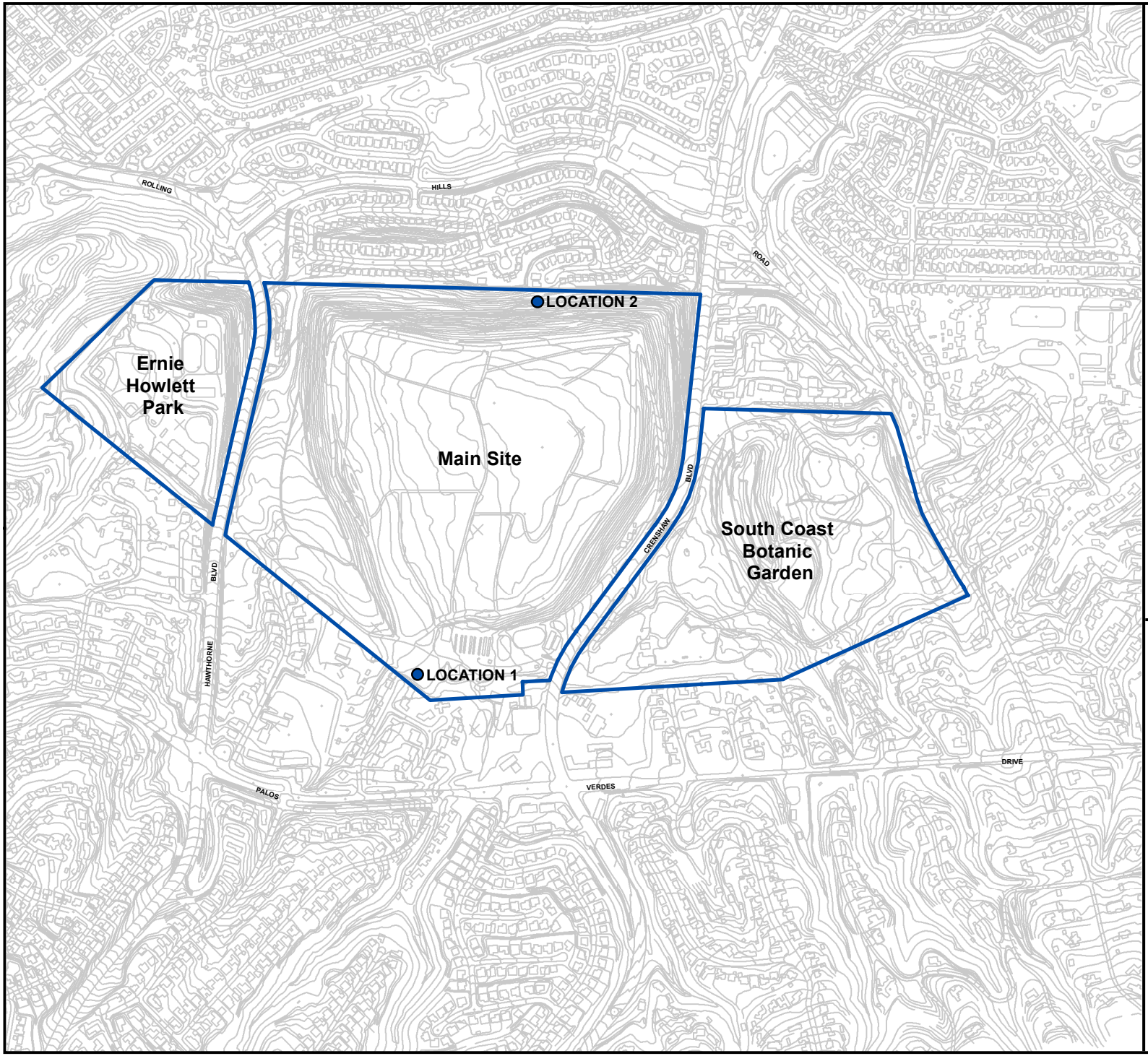


Legend

- Ambient Air Monitoring Location
- Property Boundary

0 250 500 1,000

Feet

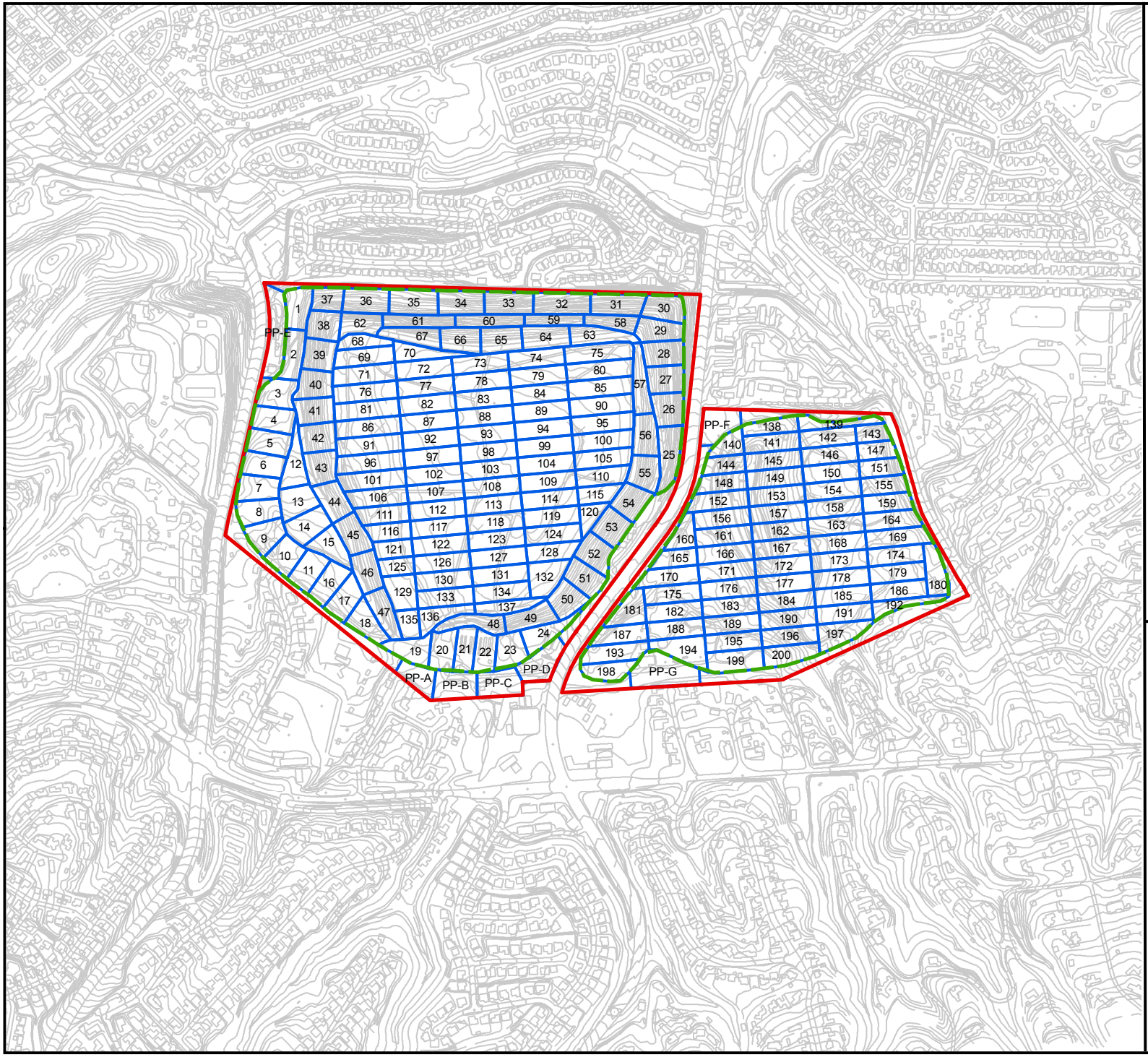
Ambient Air Monitoring Locations

Figure 4

Palos Verdes Landfill
Los Angeles County, California

WASTEWATER RECLAMATION

SOLID WASTE MANAGEMENT



Legend

- Property Boundary
- Monitoring Grid
- Landfill Footprint

0 250 500 1,000

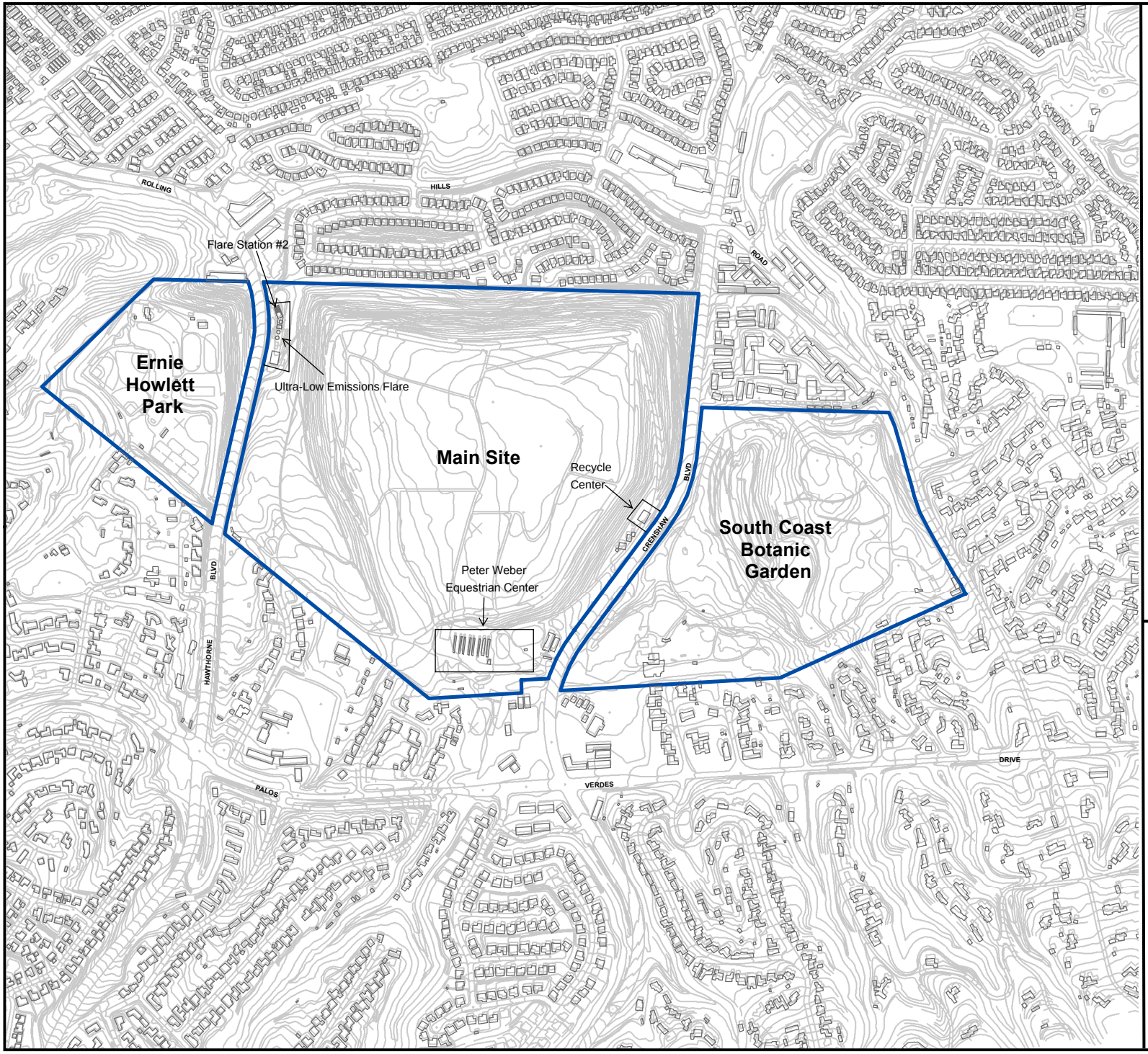
Feet

Integrated Surface Gas Monitoring Grids

Figure 5

Palos Verdes Landfill
Los Angeles County, California

WASTEWATER RECLAMATION
SOLID WASTE MANAGEMENT



Legend

Property Boundary

0 250 500 1,000

Feet

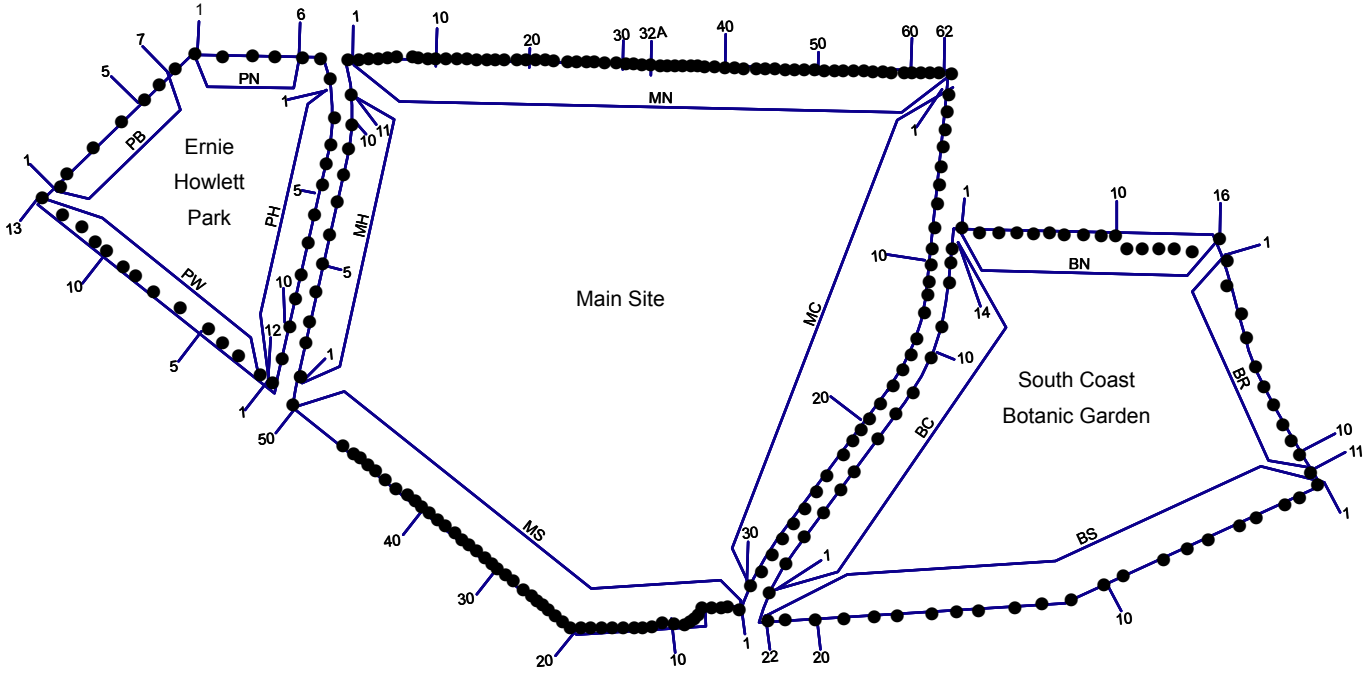
Ambient Air Monitoring Locations

Figure 6

Palos Verdes Landfill
Los Angeles County, California

WASTEWATER RECLAMATION

SOLID WASTE MANAGEMENT



Legend

- Boundary Probe
  (showing numbering and name)

0 250 500 1,000

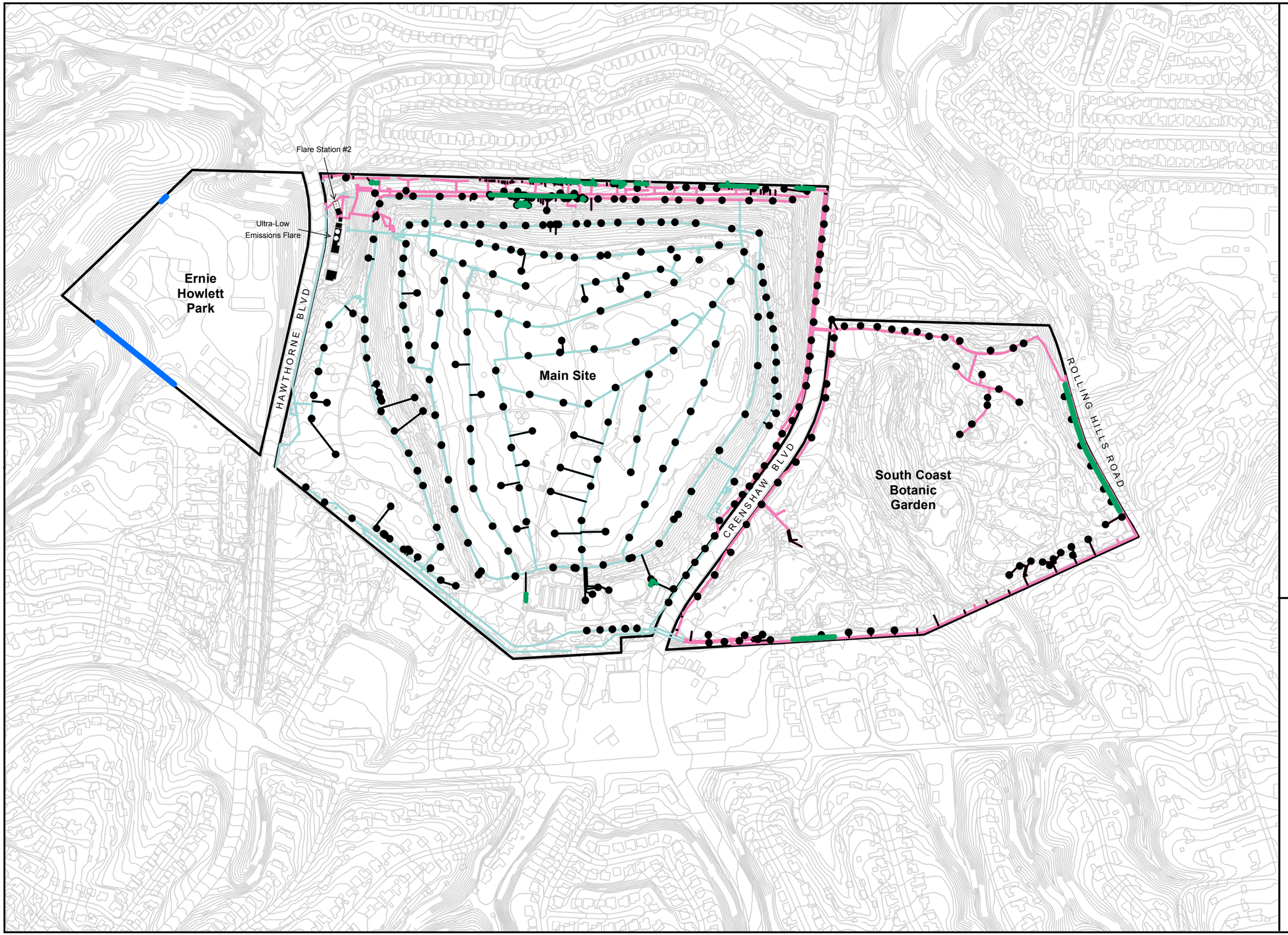
Feet

Boundary Probe Locations

Figure 7

Palos Verdes Landfill
Los Angeles County, California

WASTEWATER RECLAMATION
SOLID WASTE MANAGEMENT



LEGEND

- Gas Well
- Trench (Passive)
- Trench (Active)
- Gas Headerline (Header 1)
- Gas Headerline (Header 2)
- Gas Collector Lateral

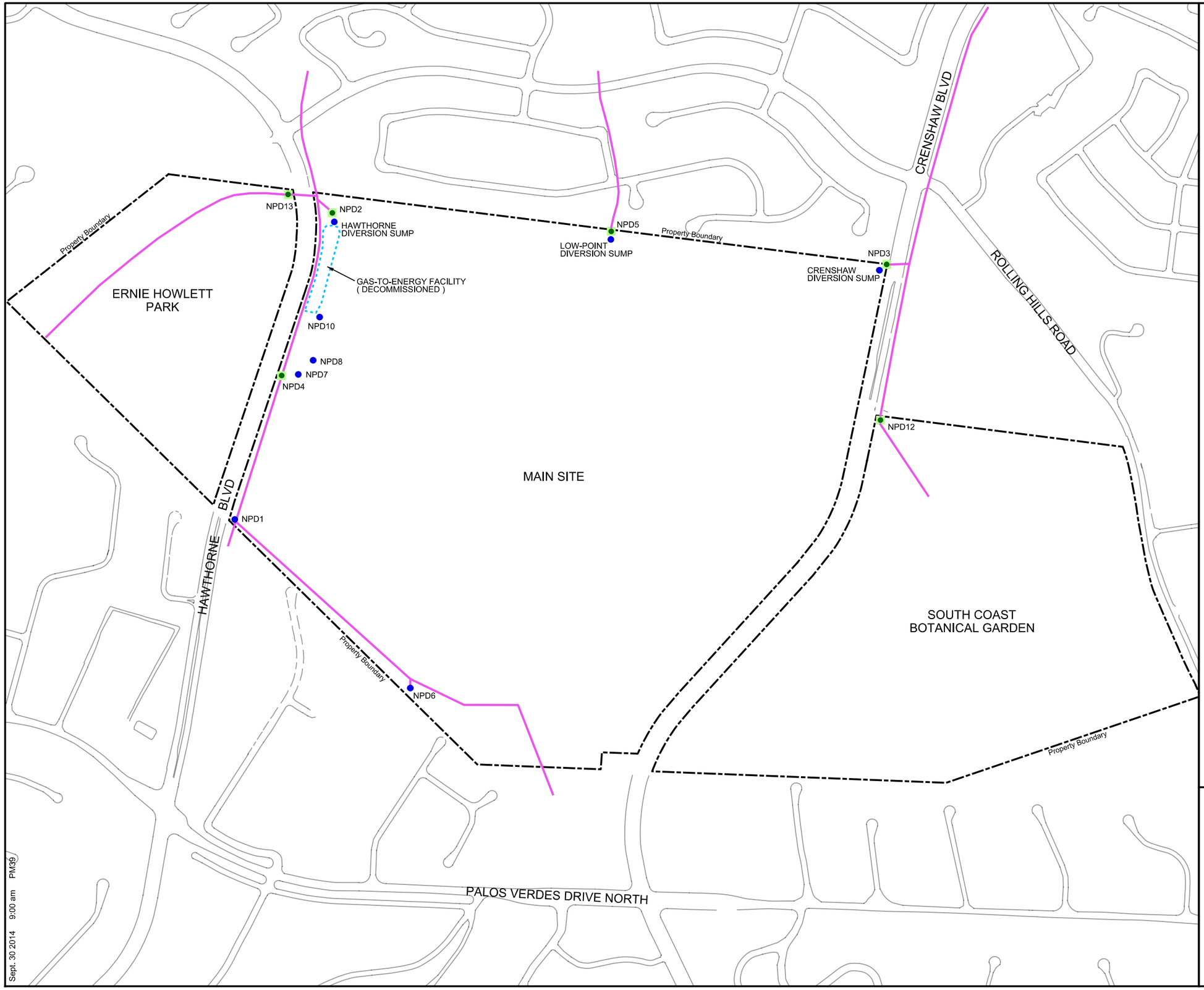
0 250 500 1,000 Feet

Landfill Gas Extraction System

Figure 8

Palos Verdes Landfill
Los Angeles County, California

WASTEWATER RECLAMATION
SOLID WASTE MANAGEMENT



Explanation

- NPDES Sampling Location
- Diversion Sump
- Discharge Piping
- Property Boundary

N

0′ 200′ 400′ 800′

GRAPHIC SCALE

STORM WATER CONVEYANCE SYSTEM AND SAMPLING LOCATIONS

Palos Verdes Landfill
Los Angeles County, California

WASTEWATER RECLAMATION
SOLID WASTE MANAGEMENT

Figure 9

n: \ lfm12 \ pv \ Groundwater \ pv Figure 09.dgn

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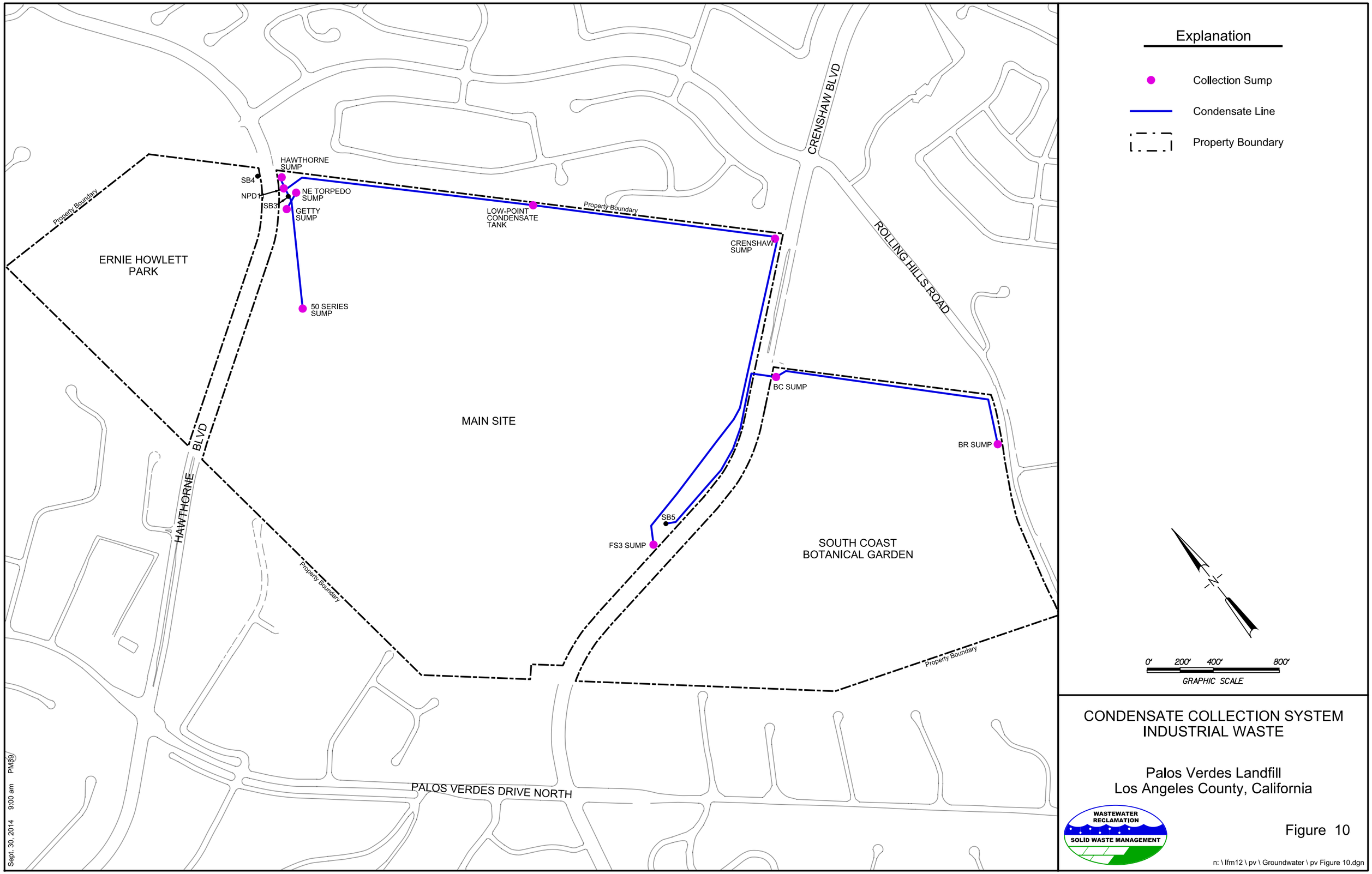


CONDENSATE COLLECTION SYSTEM INDUSTRIAL WASTE

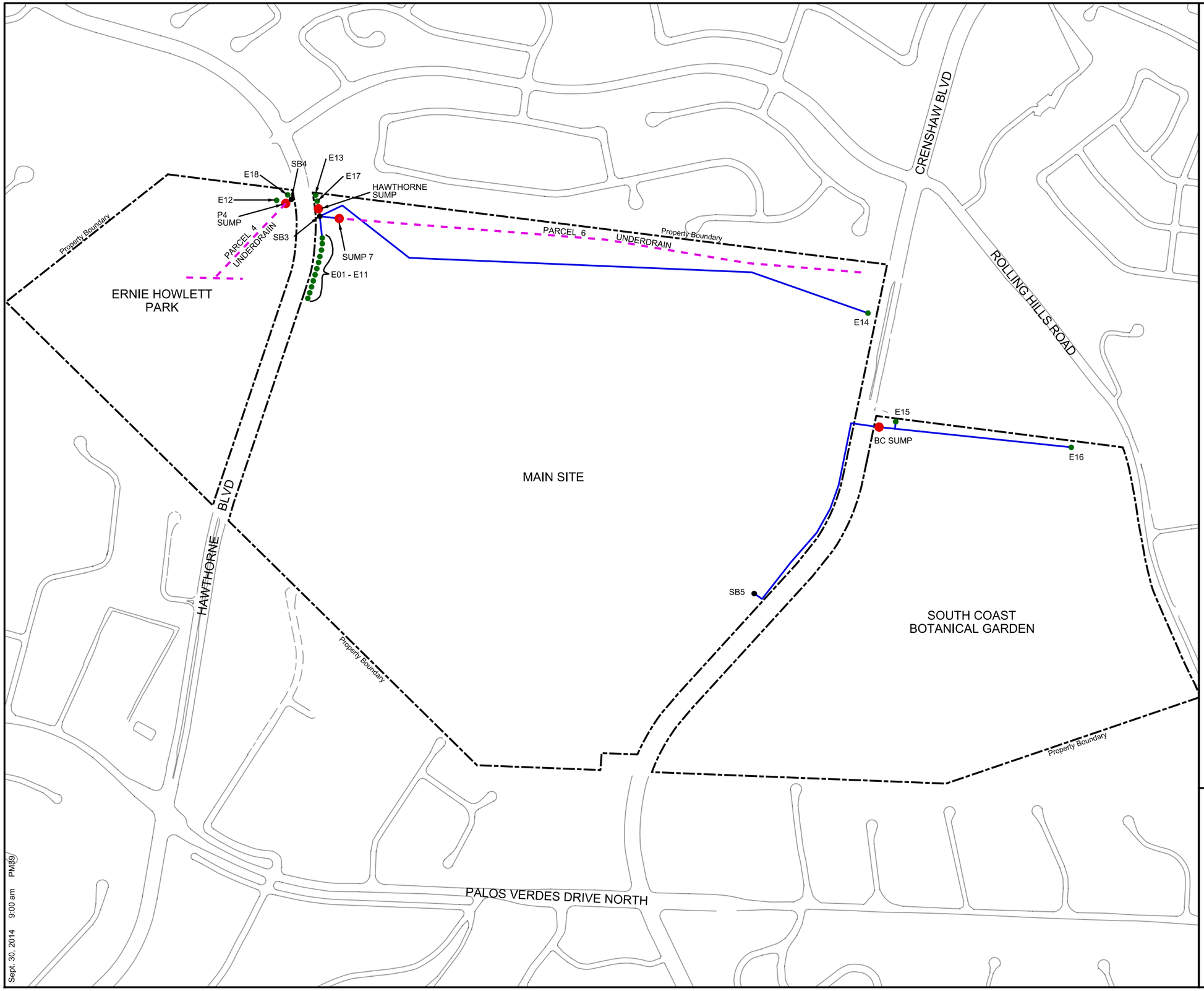
Palos Verdes Landfill
Los Angeles County, California

WASTEWATER RECLAMATION
SOLID WASTE MANAGEMENT

Figure 10

Sept. 30, 2014 9:00 am PM39

n: \ lfm12 \ pv \ Groundwater \ pv Figure 10.dgn



Explanation

- Sump
- Extraction Well
- Discharge Piping
- Underdrain
- Property Boundary

N

0′ 200′ 400′ 800′

GRAPHIC SCALE

GROUNDWATER COLLECTION SYSTEM INDUSTRIAL WASTE

Palos Verdes Landfill
Los Angeles County, California

WASTEWATER RECLAMATION
SOLID WASTE MANAGEMENT

Figure 11

n: \ lfm12 \ pv \ Groundwater \ pv Figure 11.dgn

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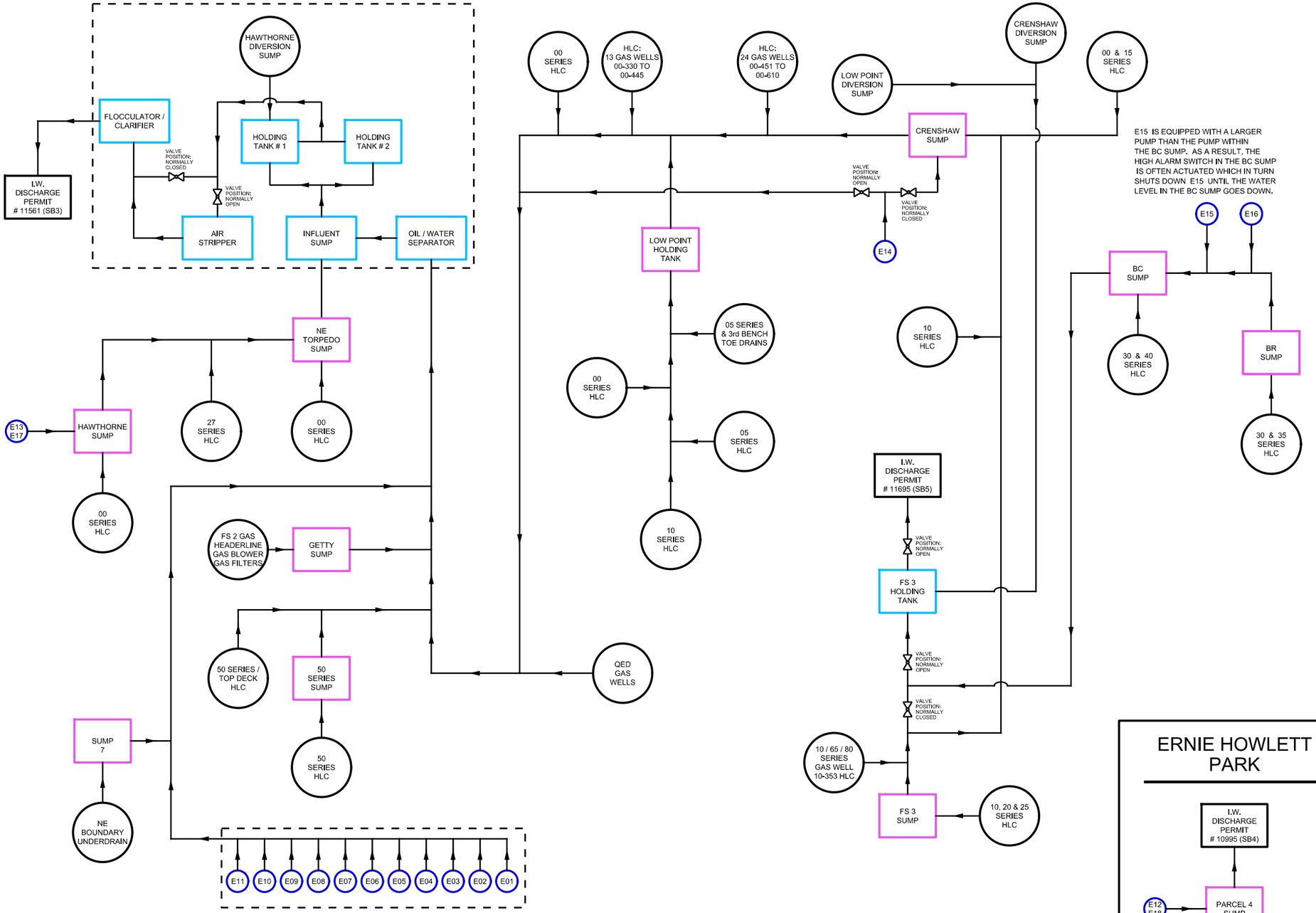
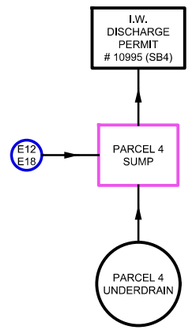


Explanation

- STORAGE / HOLDING FACILITY
- INDUSTRIAL DISCHARGE POINT
- TREATMENT FACILITY
- EXTRACTION WELL
- SOURCE OF INDUSTRIAL WATER: HLC (Headerline Condensate) AND/OR LIQUIDS FROM BLOWDOWN, TOE DRAINS AND UNDERDRAINS

ERNIE HOWLETT PARK



LIQUIDS CONVEYANCE SYSTEM SCHEMATIC DIAGRAM

Palos Verdes Landfill
Main Site, South Coast Botanical Gardens
& Ernie Howlett Park
Los Angeles County, California

WASTEWATER RECLAMATION
SOLID WASTE MANAGEMENT

Figure 12

n: \ lfm12 \ pv \ gas n83 \ pv Figure 12.dgn

Sept. 30, 2014 9:00 am PM39

APPENDIX A
FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

Palos Verdes Landfill Site Inspection Roster – September 22, 2014

Name	Agency or Firm	Address	Phone Number
Kristen Ruffell	Sanitation Districts	1955 Workman Mill Road Whittier, CA 90601	562/699-7411
Karen Luo	Sanitation Districts	1955 Workman Mill Road Whittier, CA 90601	562/699-7411
KC Irwin	Sanitation Districts	25706 Hawthorne Blvd. Rolling Hills Estates, CA 90274	310/377-3514
Ethan Laden	Sanitation Districts	25706 Hawthorne Blvd. Rolling Hills Estates, CA 90274	310/373-9043
Dan Zogaib	DTSC	5796 Corporate Ave. Cypress, CA 90630	714/484-5483

Five-Year Review Site Inspection Checklist

(Working document for site inspection. Information may be completed by hand and attached to the Five-Year Review report as supporting documentation of site status. "N/A" refers to "not applicable.")

I. SITE INFORMATION	
Site name: Palos Verdes Landfill	**Date of inspection:** 9/22/2014
Location and Region: 25706 Hawthorne Blvd. Rolling Hills Estates, CA Los Angeles County	**EPA ID:** N/A
Agency, office, or company leading the five-year review: Department of Toxic Substances Control	**Weather/temperature:** Clear/77°F

Remedy Includes: (Check all that apply)

- ☑Landfill cover/containment
- ☑Access controls
- ☑Institutional controls
- ☑Groundwater pump and treatment
- ☐Surface water collection and treatment
- ☑Other Gas control
- ☐Monitored natural attenuation
- ☑ Groundwater containment
- ☑Vertical barrier walls

Attachments: ☑Inspection team roster attached ☐Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** Ethan Laden (Name) Senior Engineer (Title) 9/22/2014 (Date)
   Interviewed ☑at site ☐at office ☐by phone Phone no. 310/373-9043
   Problems, suggestions; ☐Report attached No concerns noted. Site is in good condition and is well maintained.

2. **O&M staff** KC Irwin (Name) Supervising Engineering Technician (Title) 9/22/2014 (Date)
   Interviewed ☑at site ☐at office ☐by phone Phone no. 310/377-3514
   Problems, suggestions; ☐Report attached No concerns noted. Site is in good condition and is well maintained.

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency South Coast Air Quality Control Board (AQMD)
Contact Edwin Pupka Senior Enforcement Manager 909/396-3332
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached Per email from AQMD: (1) The AQMD is unaware of any compliance / engineering issues or incidents related to the site that have not been resolved promptly and appropriately and (2) The AQMD has no additional comments, suggestions, or recommendations regarding the site's management and operation.

Agency Los Angeles County Fire Department –Battalion 14
Contact Martin Ross Captain 310/377-9523
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached Not aware of any compliance issues or incidents related to the site and has no additional comments, suggestions, or recommendations regarding the site's management and operation.

4. **Other interviews** (optional) ☐Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - ☑ O&M manual — ☑ Readily available — ☑ Up to date — ☐ N/A
   - ☑ As-built drawings — ☑ Readily available — ☑ Up to date — ☐ N/A
   - ☑ Maintenance logs — ☑ Readily available — ☑ Up to date — ☐ N/A

   Remarks Work request logs document repairs and maintenance. Work also documented in internal monthly reports.

2. **Site-Specific Health and Safety Plan** — ☑ Readily available — ☑ Up to date — ☐ N/A
   - ☑ Contingency plan/emergency response plan — ☑ Readily available — ☑ Up to date — ☐ N/A

   Remarks Environmental H&S Plan, Districts' Emergency Procedures, PVLF Emergency Action and Fire Prevention Plan

3. **O&M and OSHA Training Records** — ☑ Readily available — ☑ Up to date — ☐ N/A

   Remarks O&M records and schedule for OSHA training at PVLF site, personnel training records maintained at Joint Administration Office in Whittier

4. **Permits and Service Agreements**
   - ☑ Air discharge permit — ☑ Readily available — ☑ Up to date — ☐ N/A
   - ☑ Effluent discharge — ☑ Readily available — ☑ Up to date — ☐ N/A
   - ☑ Waste disposal, POTW — ☑ Readily available — ☑ Up to date — ☐ N/A
   - ☑ Other permits NPDES — ☑ Readily available — ☑ Up to date — ☐ N/A

   Remarks DTSC and Sanitation Districts' O&M Agreement

5. **Gas Generation Records** — ☑ Readily available — ☑ Up to date — ☐ N/A

   Remarks Paper and electronic

6. **Settlement Monument Records** — ☑ Readily available — ☑ Up to date — ☐ N/A

   Remarks Maintained at Joint Administration Office in Whittier

7. **Groundwater Monitoring Records** — ☑ Readily available — ☑ Up to date — ☐ N/A

   Remarks Maintained at Joint Administration Office in Whittier

8. **Leachate Extraction Records** — ☐ Readily available — ☐ Up to date — ☑ N/A

   Remarks _____

9. **Discharge Compliance Records**
   - ☑ Air — ☑ Readily available — ☑ Up to date — ☐ N/A
   - ☑ Water (effluent and surface water) — ☑ Readily available — ☑ Up to date — ☐ N/A

   Remarks Regulatory reports provided

10. **Daily Access/Security Logs** — ☑ Readily available — ☑ Up to date — ☐ N/A

    Remarks _____

IV. O&M COSTS

1. **O&M Organization**

☐ State in-house ☐ Contractor for State
☑ PRP in-house ☐ Contractor for PRP
☐ Federal Facility in-house ☐ Contractor for Federal Facility
☐ Other_____

2. **O&M Cost Records**

☑ Readily available ☑ Up to date
☐ Funding mechanism/agreement in place
Original O&M cost estimate N/A ☐ Breakdown attached

Total annual cost by year for review period if available

From	1/1/2007 Date	To	12/31/20007 Date	$3,522,000 Total cost	☑ Breakdown in report
From	1/1/2008 Date	To	12/31/2008 Date	$4,050,000 Total cost	☑ Breakdown in report
From	1/1/2009 Date	To	12/31/2009 Date	$3,580,000 Total cost	☑ Breakdown in report
From	1/1/2010 Date	To	12/31/2010 Date	$3,160,000 Total cost	☑ Breakdown in report
From	1/1/2011 Date	To	12/31/2011 Date	$3,125,000 Total cost	☑ Breakdown in report
From	1/1/2012 Date	To	12/31/2012 Date	$3,459,000 Total cost	☑ Breakdown in report
From	1/1/2013 Date	To	12/31/2013 Date	$3,423,000 Total cost	☑ Breakdown in report

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: No unusually high O&M costs during review period. Highest yearly costs were incurred in 2008 when the Sanitation Districts were conducting the first Five-Year Review.

V. ACCESS AND INSTITUTIONAL CONTROLS ☑ Applicable ☐N/A

A. Fencing

1. **Fencing damaged** None noted ☐ Location shown on site map ☑ Gates secured ☐ N/A
Remarks Fencing in good condition.

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A
Remarks Public access to Ernie Howlett Park and South Coast Botanic Garden, limited public access to Main Site, staffed recycling center open to public (Wednesday, Thursday, Friday and Saturday), numerous signs posted that note public and restricted access areas, signs posted on hazardous materials (paints, gasoline, diesel, etc.) in storage areas. Landfill staff onsite during regular business hours five days per week. Cameras operated at the main gate off Hawthorne Boulevard and at the treatment area.

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☑ No ☐ N/A
Site conditions imply ICs not being fully enforced ☐ Yes ☑ No ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) self-reporting
Frequency varies by media
Responsible party/agency LACSD is responsible party for all media. Lead agency responsibility for groundwater is DTSC, for gas and air is SCAQMD, for wastewater is LACSD, for storm water is RWQCB.
Contact Dan Zogaib (Name) Hazardous Substances Engineer (Title) 9/23/14 (Date) 714-484-5483 (Phone no.)

Reporting is up-to-date ☑ Yes ☐ No ☐ N/A
Reports are verified by the lead agency ☑ Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ☑ Yes ☐No ☐ N/A
Violations have been reported ☑ Yes ☐ No ☐ N/A
Other problems or suggestions: ☐ Report attached
_____

2. **Adequacy** ☑ ICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks_____
_____

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☑ No vandalism evident
Remarks_____

2. **Land use changes on site** ☐N/A
Remarks The Palos Verdes Gas-to Energy Facility was decommissioned in October 2011.

3. **Land use changes off site** ☑ N/A
Remarks_____

VI. GENERAL SITE CONDITIONS

A. Roads ☑ Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map ☑ Roads adequate ☐ N/A
Remarks_____
_____

B. Other Site Conditions

Remarks _____
_____
_____
_____
_____
_____

VII. LANDFILL COVERS ☑ Applicable ☐ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ☑ Settlement not evident
Areal extent_____ Depth_____
Remarks Soil stockpile available to fill any low spots when necessary.
_____

2. **Cracks** ☐ Location shown on site map ☑ Cracking not evident
Lengths_____ Widths_____ Depths_____
Remarks_____

3. **Erosion** ☐ Location shown on site map ☑ Significant Erosion not evident
Areal extent_____ Depth_____
Remarks Minor erosion noted during inspection

4. **Holes** ☐ Location shown on site map ☑ Large holes not evident
Areal extent_____ Depth_____
Remarks Gopher holes noted but no settlement holes

5. **Vegetative Cover** ☐Grass ☑ Cover properly established ☑ No signs of stress ☑ Trees/Shrubs
Remarks Stopped watering of grass cover due to severe drought condition. Scattered shrubs and trees are more densely planted on slopes and perimeter areas for visual barrier.

6. **Alternative Cover (armored rock, concrete, etc.)** ☑ N/A
Remarks_____
_____

7. **Bulges** ☐ Location shown on site map ☑ Bulges not evident
Areal extent_____ Height_____
Remarks No bulges observed at time of site inspection
_____

8. **Wet Areas/Water Damage** ☑ Wet areas/water damage not evident
☐ Wet areas ☐ Location shown on site map Areal extent_____
☐ Ponding ☐ Location shown on site map Areal extent_____
☐Seeps ☐ Location shown on site map Areal extent_____
☐ Soft subgrade ☐ Location shown on site map Areal extent_____
Remarks No wet areas or water damage observed at time of site inspection

9. **Slope Instability** ☐ Slides ☐ Location shown on site map ☑ No evidence of slope instability
Areal extent_____
Remarks No slope instability observed during site inspection.

B. Benches ☑ Applicable ☐ N/A
Remarks Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.

1. **Flows Bypass Bench** ☐ Location shown on site map ☑N/A or okay
Remarks_____

2. **Bench Breached** ☐ Location shown on site map ☑ N/A or okay
Remarks_____

3. **Bench Overtopped** ☐ Location shown on site map ☑ N/A or okay
Remarks_____

C. Letdown Channels ☑ Applicable ☐ N/A
Remarks Channel lined with erosion control mats, riprap, sand bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.

1. **Settlement** ☐ Location shown on site map ☑ No evidence of settlement
Areal extent_____ Depth_____
Remarks_____

2. **Material Degradation** ☐ Location shown on site map ☑ No evidence of degradation
Material type_____ Areal extent_____
Remarks_____

3. **Erosion** ☐ Location shown on site map ☑ No evidence of significant erosion
Areal extent_____ Depth_____
Remarks_____

4. **Undercutting** ☐ Location shown on site map ☑ No evidence of undercutting
Areal extent_____ Depth_____
Remarks_____

5. **Obstructions** Type_____ ☑ No obstructions
☐ Location shown on site map Areal extent_____
Size_____
Remarks_____

6. **Excessive Vegetative Growth** Type_____
☑ No evidence of excessive growth
☐ Vegetation in channels does not obstruct flow
☐ Location shown on site map Areal extent_____
Remarks_____

D. Cover Penetrations ☑ Applicable ☐ N/A

1. **Gas Vents** ☑ Active ☑ Passive
☑ Properly secured/locked ☑ Functioning ☑ Routinely sampled ☑ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks Passive trench on Ernie Howlett Park, all other gas extraction wells are active.

2. **Gas Monitoring Probes**
☑ Properly secured/locked ☑ Functioning ☑ Routinely sampled ☑ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks_____
_____

3. **Monitoring Wells** (within surface area of landfill)
☑ Properly secured/locked ☑ Functioning ☑ Routinely sampled ☑ Good condition
☐ Evidence of leakage at penetration ☐Needs Maintenance ☐ N/A
Remarks_____
_____

4. **Leachate Extraction Wells**
☐ Properly secured/locked ☐Functioning ☐Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐Needs Maintenance ☑ N/A
Remarks_____
_____

5. **Settlement Monuments** ☑ Located ☑ Routinely surveyed ☐ N/A
Remarks_____

E. Gas Collection and Treatment ☑ Applicable ☐ N/A

1. **Gas Treatment Facilities**
   ☑ Flaring ☐ Thermal destruction ☐ Collection for reuse
   ☑ Good condition ☐ Needs Maintenance
   Remarks Due to declining methane concentration at the Palos Verdes Landfill, a new flare was installed and the Gas-to Energy Facility was decommissioned in October 2011.

2. **Gas Collection Wells, Manifolds and Piping**
   ☑ Good condition ☐ Needs Maintenance
   Remarks_____
   _____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
   ☑ Good condition ☐ Needs Maintenance ☐ N/A
   Remarks Perimeter gas probes more densely spaced based on proximity to homes.

F. Cover Drainage Layer ☐ Applicable ☑ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☑ N/A
   Remarks_____
   _____

2. **Outlet Rock Inspected** ☐ Functioning ☑ N/A
   Remarks_____
   _____

G. Detention/Sedimentation Ponds ☐ Applicable ☑ N/A

1. **Siltation** Areal extent_____ Depth_____ ☑ N/A
   ☐ Siltation not evident
   Remarks_____
   _____

2. **Erosion** Areal extent_____ Depth_____ ☑ Erosion not evident
   Remarks_____
   _____

3. **Outlet Works** ☐ Functioning ☑ N/A
   Remarks_____
   _____

4. **Dam** ☐ Functioning ☑ N/A
   Remarks_____
   _____

H. Retaining Walls ☑ Applicable ☐ N/A

1. **Deformations** ☐ Location shown on site map ☑ Deformation not evident
   Horizontal displacement_____ Vertical displacement_____
   Rotational displacement_____
   Remarks Small (~4 foot) retaining wall at Gas-to-Energy facility

2. **Degradation** ☐Location shown on site map ☑ Degradation not evident
   Remarks_____

I. Perimeter Ditches/Off-Site Discharge ☑ Applicable ☐ N/A

1. **Siltation** ☐Location shown on site map ☑ Siltation not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

2. **Vegetative Growth** ☐ Location shown on site map ☑ N/A
   ☐ Vegetation does not impede flow
   Areal extent_____ Type_____
   Remarks_____
   _____

3. **Erosion** ☐ Location shown on site map ☑ Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

4. **Discharge Structure** ☑ Functioning ☐ N/A
   Remarks_____
   _____

VIII. VERTICAL BARRIER WALLS ☑ Applicable ☐ N/A

1. **Settlement** ☐ Location shown on site map ☑Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

2. **Performance Monitoring** Type of monitoring Groundwater quality
   ☐ Performance not monitored
   Frequency_____☐ Evidence of breaching
   Head differential_____
   Remarks Groundwater monitoring wells downgradient of subsurface barrier

IX. GROUNDWATER/SURFACE WATER REMEDIES ☐ Applicable ☐N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable ☐ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
☑ Good condition ☑ All required wells properly operating ☐ Needs Maintenance ☐ N/A
Remarks_____
_____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☑ Good condition ☐ Needs Maintenance
Remarks_____
_____

3. **Spare Parts and Equipment**
☑ Readily available ☑ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks_____
_____

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☐ N/A

1. **Collection Structures, Pumps, and Electrical**
☑ Good condition ☐ Needs Maintenance
Remarks Dry-weather diversion systems are in place to collect non-storm water discharges and the first flush of a rain event.

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☑ Good condition ☐Needs Maintenance
Remarks_____

3. **Spare Parts and Equipment**
☑ Readily available ☑ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks_____
_____

C. Treatment System ☑ Applicable ☐ N/A

1. **Treatment Train** (Check components that apply)
   ☐Metals removal ☑ Oil/water separation ☐ Bioremediation
   ☑ Air stripping ☐ Carbon adsorbers
   ☐ Filters_____
   ☐ Additive (*e.g.*, chelation agent, flocculent)_____
   ☑Others clarifier
   ☑Good condition ☐ Needs Maintenance
   ☑ Sampling ports properly marked and functional
   ☑ Sampling/maintenance log displayed and up to date
   ☑Equipment properly identified
   ☑Quantity of groundwater treated annually 12,000 to 30,000 gpd, capacity 100 to 200 gpm
   ☐ Quantity of surface water treated annually N/A
   Remarks_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
   ☐ N/A ☑ Good condition ☐ Needs Maintenance
   Remarks_____

3. **Tanks, Vaults, Storage Vessels**
   ☐ N/A ☑ Good condition ☐Proper secondary containment ☐ Needs Maintenance
   Remarks_____

4. **Discharge Structure and Appurtenances**
   ☐ N/A ☑Good condition ☐Needs Maintenance
   Remarks_____

5. **Treatment Building(s)**
   ☐ N/A ☑Good condition (esp. roof and doorways) ☐ Needs repair
   ☑ Chemicals and equipment properly stored
   Remarks_____

6. **Monitoring Wells** (pump and treatment remedy)
   ☑ Properly secured/locked ☑Functioning ☑ Routinely sampled ☑Good condition
   ☑ All required wells located ☐ Needs Maintenance ☐ N/A
   Remarks_____

D. Monitoring Data

1. Monitoring Data
   ☑Is routinely submitted on time ☑ Is of acceptable quality

2. Monitoring data suggests:
   ☑ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

D. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☑N/A
Remarks_____

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

The groundwater remedial system is intended to control groundwater contamination from the site. Assessment of groundwater monitoring data indicate that concentrations of the site's constituents of concern have remained stable, undetected, or decreased during the second Five-Year Review period except for chlorobenzene at one downgradient well (M70B) along Crenshaw Boulevard, which was detected at levels significantly below the MCL of 70 µg/L between 2 µg/L and 8.1 µg/L. Aside from chlorobenzene, virtually all of the constituents of concerns (VOCs and 1,4-dioxane) evaluated remain undetected or have decreased significantly since the Remedial Investigation. Overall, the data indicate that the remedial systems are functioning as intended in mitigating downgradient groundwater impacts from the site. In addition, the groundwater directly downgradient of the site is not in a designated groundwater basin and its future use as a drinking water supply is unlikely due to limited aquifer thickness and naturally poor water quality. As such, the groundwater containment systems have been effective in containing these plumes and are protective of human health and the environment.

The landfill gas control system is intended to prevent the emission of gas into the air and the lateral migration of gas outside the perimeter of the site. Monitoring of surface air and subsurface gas demonstrate that the extensive landfill gas control system at the site provides effective containment. Analytical results of surface air and subsurface gas confirm that the landfill gas control system at the site is adequate and protective of human health and the environment.

In association with the storm water and the industrial wastewater regulatory compliance programs, assessments of the sampling data reported during the second Five-Year Review period indicate that the site is in full compliance with the National Pollutant Discharge Elimination System General Permit for storm water and the Industrial Wastewater Discharge Permits for industrial wastewater.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

O&M activities are adequate to ensure that the systems are operating as designed and functioning to

	control potential migration of landfill gas contaminants in groundwater, landfill-related contaminants in storm water runoff, and industrial wastewater.
C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. There have been no unexpected changes in the scope or cost of O&M or the frequency of unscheduled repairs that suggest the protectiveness of the remedy may be compromised in the future.
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. The Sanitation Districts will continue to optimize operation and maintenance of the groundwater containment systems at the site to ensure ongoing control and containment of the groundwater plumes.

APPENDIX B
GROUNDWATER SUMMARY TABLES VOCS AND 1,4-DIOXANE

TABLE B-1

Benzene

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	83	1	<125	23.22	34	30	<10	<50	16.58	19	0
M06B	83	3	<250	41.21	14	29	<0.5	<50	17.24	17	0
M07A	86	<0.3	990	76.42	27	29	<2.5	<25	7.11	29	0
M07B	55	0.7	27	3.17	35	28	<5	<25	5.22	28	0
M26A	104	<0.1	3	0.23	103	36	<0.5	<0.5	0.25	36	0
M30B	87	<0.1	<5	0.39	87	31	<0.5	<10	1.63	31	0
M33B	86	<0.1	1.7	0.23	84	32	<0.5	<5	0.47	32	0
M35B	85	<0.1	<2.5	0.25	84	32	<0.5	<5	0.7	32	0
M36A	91	<0.1	16	0.45	90	31	<0.5	<5	0.76	31	0
M37A	89	0.2	89	1.37	84	32	<0.5	<10	1.03	32	0
M38A	83	<0.5	<25	1.48	24	29	<2.5	<25	3.49	29	0
M39A	87	0.5	<10	1.59	17	29	<0.5	<12.5	3.55	29	0
M49A	81	<0.5	<25	2.15	36	29	<0.5	<10	2.03	22	0
M51B	76	<0.3	1	0.22	75	36	<0.5	<2.5	0.31	36	0
M52B*	34	<0.3	1	0.2	33	14	<0.5	<0.5	0.25	14	0
M53B	68	<0.5	52.2	12.03	6	30	<0.5	10	4.15	6	0
M56B	79	<0.3	<1	0.21	78	30	<0.5	<5	0.33	30	0
M58B	69	<0.3	<2.5	0.24	69	29	<0.5	<5	0.57	29	0
M59B*	31	<0.3	<0.5	0.17	31	18	<0.5	<0.5	0.25	18	0
M60B	67	<0.3	<5	0.29	67	35	<0.5	<5	0.7	35	0
M62B	65	<0.3	<2.5	0.25	63	32	<0.5	<0.5	0.25	32	0
M63B	54	<0.5	<12.5	1.13	53	31	<0.5	<25	4.54	31	0
M64B	60	<0.3	4	0.47	51	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.3	<1	0.22	53	28	<0.5	<2.5	0.36	28	0
M67B	55	<0.3	73	1.57	52	31	<0.5	<0.5	0.25	31	0
M69B	55	0.8	<25	2.21	23	29	<0.5	<10	1.51	22	0
M70B	55	<0.3	<5	0.62	50	30	<0.5	<5	1.11	30	0
M71B	44	<0.3	<5	0.41	43	29	<0.5	<10	0.8	29	0
M72B	43	<0.3	<5	0.37	42	31	<0.5	<25	1.04	31	0
P410	84	<0.5	<50	2.35	55	29	<0.5	<25	5.28	29	0
P411	54	<0.3	<50	3.81	44	31	<5	<50	10.89	31	0
PV03	90	<0.3	<50	1.98	80	31	<0.5	<50	8.23	31	0
SW08*	11	<0.5	<5	0.84	11	12	<0.5	<2.5	0.96	12	0
SW09*	14	<0.5	<2.5	0.7	14	16	<0.5	<2.5	0.88	16	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-2

Bromodichloromethane

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	83	<1	<125	9.65	83	30	<5	<50	10.54	30	0
M06B	83	<0.5	<250	10.89	83	29	<0.5	<50	11.82	29	0
M07A	86	<0.5	<100	4.59	86	29	<2.5	<25	7.11	29	0
M07B	55	<0.1	<25	2.78	55	28	<5	<25	5.22	28	0
M26A	104	<0.1	<1	0.27	104	36	<0.5	<0.5	0.25	36	0
M30B	87	<0.1	<5	0.46	87	31	<0.5	<10	1.63	31	0
M33B	86	<0.1	<1	0.29	86	32	<0.5	<5	0.47	32	0
M35B	85	<0.1	<2.5	0.31	84	32	<0.5	<5	0.7	32	0
M36A	91	<0.1	<5	0.35	91	31	<0.5	<5	0.76	31	0
M37A	90	<0.1	<5	0.46	89	32	<0.5	<10	1.03	32	0
M38A	83	<0.5	<25	0.99	83	29	<2.5	<25	3.49	29	0
M39A	87	<0.1	<10	0.81	86	29	<0.5	<12.5	3.55	29	0
M49A	81	<0.5	<25	1.2	81	29	<0.5	<10	1.88	29	0
M51B	76	<0.5	<1	0.29	76	36	<0.5	<2.5	0.32	36	0
M52B*	34	<0.5	<0.5	0.25	34	14	<0.5	<0.5	0.25	14	0
M53B	68	<0.5	<10	1.39	68	30	<0.5	<5	1.07	30	0
M56B	79	<0.5	<1	0.29	79	30	<0.5	<5	0.46	29	3.33
M58B	70	<0.5	<2.5	0.34	67	29	<0.5	<5	0.57	29	0
M59B*	31	<0.5	<0.5	0.25	31	18	<0.5	<0.5	0.25	18	0
M60B	68	<0.5	<5	0.37	68	35	<0.5	<5	0.7	35	0
M62B	65	<0.5	<2.5	0.32	65	32	<0.5	<0.5	0.25	32	0
M63B	54	<0.5	<12.5	1.4	54	31	<0.5	<25	4.55	31	0
M64B	60	<0.5	<1	0.32	60	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.5	<1	0.32	54	28	<0.5	<2.5	0.37	28	0
M67B	55	<0.5	<5	0.34	55	31	<0.5	<1	0.26	31	0
M69B	55	<0.5	<25	1.52	55	29	<0.5	<10	1.37	29	0
M70B	55	<0.5	<5	0.66	55	30	<0.5	<5	1.11	30	0
M71B	44	<0.5	<5	0.48	44	29	<0.5	<10	0.81	29	0
M72B	43	<0.5	<5	0.45	43	31	<0.5	<25	1.04	31	0
P410	84	<1	<50	2.32	84	29	<0.5	<25	5.28	29	0
P411	54	<0.5	<50	3.96	54	31	<5	<50	10.89	31	0
PV03	90	<0.1	<50	2.13	90	31	<1	<50	8.24	31	0
SW08*	11	<0.5	<5	0.86	11	12	<0.5	<2.5	0.98	12	0
SW09*	14	<0.5	<2.5	0.71	14	16	<0.5	<2.5	0.91	16	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-3

Bromoform

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	83	<1	<125	9.65	83	30	<5	<50	10.54	30	0
M06B	83	<0.5	<250	10.91	83	29	<0.5	<50	11.82	29	0
M07A	86	<0.5	<100	4.65	86	29	<2.5	<25	7.11	29	0
M07B	55	<0.1	<25	2.83	55	28	<5	<25	5.22	28	0
M26A	104	<0.1	<1	0.27	104	36	<0.5	<0.5	0.25	36	0
M30B	87	<0.1	<5	0.46	87	31	<0.5	<10	1.63	31	0
M33B	86	<0.1	<2	0.29	86	32	<0.5	<5	0.47	32	0
M35B	85	<0.1	<2.5	0.32	85	32	<0.5	<5	0.7	32	0
M36A	91	<0.1	<5	0.35	91	31	<0.5	<5	0.76	31	0
M37A	90	<0.1	<5	0.43	90	32	<0.5	<10	1.03	32	0
M38A	83	<0.5	<25	1.08	82	29	<2.5	<25	3.49	29	0
M39A	87	<0.1	<10	0.77	87	29	<0.5	<12.5	3.55	29	0
M49A	81	<0.5	<25	1.2	81	29	<0.5	<10	1.88	29	0
M51B	76	<0.5	<2	0.3	76	36	<0.5	<2.5	0.32	36	0
M52B*	34	<0.5	<0.5	0.25	34	14	<0.5	<0.5	0.25	14	0
M53B	68	<0.5	<10	1.41	68	30	<0.5	<5	1.07	30	0
M56B	79	<0.5	<2	0.3	79	30	<0.5	<5	0.39	29	0
M58B	70	<0.5	<2.5	0.34	70	29	<0.5	<5	0.57	29	0
M59B*	31	<0.5	<0.5	0.25	31	18	<0.5	<0.5	0.25	18	0
M60B	68	<0.5	<5	0.38	68	35	<0.5	<5	0.7	35	0
M62B	65	<0.5	<2.5	0.33	65	32	<0.5	<0.5	0.25	32	0
M63B	54	<0.5	<12.5	1.45	54	31	<0.5	<25	4.55	31	0
M64B	60	<0.5	<2	0.33	60	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.5	<2	0.33	54	28	<0.5	<2.5	0.37	28	0
M67B	55	<0.5	<5	0.34	55	31	<0.5	<1	0.26	31	0
M69B	55	<0.5	<25	1.56	55	29	<0.5	<10	1.37	29	0
M70B	55	<0.5	<5	0.67	55	30	<0.5	<5	1.11	30	0
M71B	44	<0.5	<5	0.49	44	29	<0.5	<10	0.81	29	0
M72B	43	<0.5	<5	0.47	43	31	<0.5	<25	1.04	31	0
P410	84	<1	<50	2.35	84	29	<0.5	<25	5.28	29	0
P411	54	<0.5	<50	4	54	31	<5	<50	10.89	31	0
PV03	90	<0.1	<50	2.15	90	31	<1	<50	8.24	31	0
SW08*	11	<0.5	<5	0.86	11	12	<0.5	<2.5	0.98	12	0
SW09*	14	<0.5	<2.5	0.71	14	16	<0.5	<2.5	0.91	16	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-4

Bromomethane

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	83	<2	<500	31.11	83	30	<5	<50	10.54	30	0
M06B	83	<2	<500	38.14	83	29	<0.5	<50	11.82	29	0
M07A	86	<1	<250	15.18	86	29	<2.5	<25	7.11	29	0
M07B	55	<1	<200	6.55	55	28	<5	<25	5.22	28	0
M26A	91	<0.5	<20	1.15	91	36	<0.5	<0.5	0.25	36	0
M30B	87	<0.5	<20	1.22	87	31	<0.5	<10	1.63	31	0
M33B	86	<0.5	<20	1.09	86	32	<0.5	<5	0.47	32	0
M35B	85	<0.5	<20	1.12	85	32	<0.5	<5	0.7	32	0
M36A	91	<0.5	<20	1.07	91	31	<0.5	<5	0.76	31	0
M37A	90	<0.5	<20	1.22	90	32	<0.5	<10	1.03	32	0
M38A	83	<0.5	<25	2.01	83	29	<2.5	<25	3.49	29	0
M39A	87	<0.5	<20	1.86	87	29	<0.5	<12.5	3.55	29	0
M49A	81	<0.5	<50	2.86	81	29	<0.5	<10	2.03	29	0
M51B	76	<0.5	<20	1.1	76	36	<0.5	<10	0.57	36	0
M52B*	34	<0.5	<2.5	1.02	34	14	<0.5	<0.5	0.25	14	0
M53B	68	<0.5	<100	5.06	68	30	<0.5	<5	1.07	30	0
M56B	79	<0.5	<20	0.99	79	30	<0.5	<10	0.48	30	0
M58B	70	<0.5	<20	0.96	70	29	<0.5	<5	0.57	29	0
M59B*	31	<1	<2.5	1.1	31	18	<0.5	<0.5	0.25	18	0
M60B	68	<0.5	<10	0.96	68	35	<0.5	<5	0.7	35	0
M62B	65	<0.5	<20	1.02	65	32	<0.5	<0.5	0.25	32	0
M63B	54	<0.5	<50	3.51	54	31	<0.5	<25	4.69	31	0
M64B	60	<0.5	<10	0.87	60	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.5	<10	0.94	54	28	<0.5	<10	0.53	28	0
M67B	55	<0.5	<25	1	55	31	<0.5	<10	0.4	31	0
M69B	55	<0.5	<25	3.38	55	29	<0.5	<10	1.37	29	0
M70B	55	<0.5	<20	1.4	55	30	<0.5	<5	1.11	30	0
M71B	44	<0.5	<20	1.31	44	29	<0.5	<10	0.97	29	0
M72B	43	<0.5	<10	0.97	43	31	<0.5	<25	1.04	31	0
P410	84	<1	<100	6.06	84	29	<0.5	<25	5.28	29	0
P411	54	<1	<200	8.53	54	31	<5	<50	10.89	31	0
PV03	90	<0.1	<100	4.24	90	31	<2.5	<50	8.39	31	0
SW08*	11	<0.5	<10	1.34	11	12	<0.5	<10	1.35	12	0
SW09*	14	<0.5	<10	1.09	14	16	<0.5	<10	1.47	16	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-5

Carbon Tetrachloride

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	83	<0.6	<125	8.52	83	30	<5	<50	10.54	30	0
M06B	83	<0.5	<250	9.1	83	29	<0.5	<50	11.82	29	0
M07A	86	<0.3	<62.5	3.57	86	29	<2.5	<25	7.11	29	0
M07B	55	<0.1	<25	2.51	55	28	<5	<25	5.22	28	0
M26A	104	<0.1	<1	0.2	103	36	<0.5	<0.5	0.25	36	0
M30B	87	<0.1	<5	0.39	87	31	<0.5	<10	1.63	31	0
M33B	86	<0.1	<1	0.21	86	32	<0.5	<5	0.47	32	0
M35B	85	<0.1	<2.5	0.24	84	32	<0.5	<5	0.7	32	0
M36A	91	<0.1	<5	0.27	91	31	<0.5	<5	0.76	31	0
M37A	90	<0.1	<5	0.35	90	32	<0.5	<10	1.03	32	0
M38A	83	<0.3	<25	0.9	83	29	<2.5	<25	3.49	29	0
M39A	87	<0.1	<10	0.65	86	29	<0.5	<12.5	3.55	29	0
M49A	81	<0.3	<25	1.07	81	29	<0.5	<10	1.87	29	0
M51B	76	<0.3	<1	0.21	76	36	<0.5	<2.5	0.31	36	0
M52B*	34	<0.3	<0.5	0.18	34	14	<0.5	<0.5	0.25	14	0
M53B	68	<0.3	<10	1.04	67	30	<0.5	<5	1.07	30	0
M56B	79	<0.3	<1	0.21	79	30	<0.5	<5	0.33	30	0
M58B	70	<0.3	<2.5	0.24	70	29	<0.5	<5	0.57	29	0
M59B*	31	<0.3	0.6	0.19	30	18	<0.5	<0.5	0.25	18	0
M60B	68	<0.3	<5	0.28	68	35	<0.5	<5	0.7	35	0
M62B	65	<0.3	<2.5	0.23	65	32	<0.5	<0.5	0.25	32	0
M63B	54	<0.5	<12.5	1.12	54	31	<0.5	<25	4.54	31	0
M64B	60	<0.3	<1	0.21	60	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.3	<1	0.2	54	28	<0.5	<2.5	0.36	28	0
M67B	55	<0.3	<2.5	0.22	55	31	<0.5	<0.5	0.25	31	0
M69B	55	<0.3	<25	1.26	55	29	<0.5	<10	1.37	29	0
M70B	55	<0.3	<5	0.56	55	30	<0.5	<5	1.11	30	0
M71B	44	<0.3	<5	0.39	44	29	<0.5	<10	0.8	29	0
M72B	43	<0.3	<5	0.36	43	31	<0.5	<25	1.04	31	0
P410	84	<0.5	<50	2	84	29	<0.5	<25	5.28	29	0
P411	54	<0.3	<50	3.67	53	31	<5	<50	10.89	31	0
PV03	90	<0.1	<50	1.94	88	31	<0.5	<50	8.23	31	0
SW08*	11	<0.5	<5	0.84	11	12	<0.5	<2.5	0.96	12	0
SW09*	14	<0.5	<2.5	0.7	14	16	<0.5	<2.5	0.88	16	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-6

Chlorobenzene

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	83	<10	1400	499.23	3	30	258	829	620.73	0	0
M06B	83	<10	1300	568.61	1	29	7	568	388.34	0	0
M07A	86	0.8	1300	136.44	12	29	<2.5	70.6	22.82	12	0
M07B	55	<1	33	3.67	37	28	<5	<25	5.22	28	0
M26A	104	<0.1	<1	0.27	104	36	<0.5	<0.5	0.25	36	0
M30B	87	<0.1	<5	0.46	87	31	<0.5	<10	1.63	31	0
M33B	86	<0.1	<1	0.29	86	32	<0.5	<5	0.47	32	0
M35B	85	0.3	<2.5	0.32	83	32	<0.5	<5	0.7	32	0
M36A	91	<0.1	<5	0.35	91	31	<0.5	<5	0.76	31	0
M37A	90	<0.1	<5	0.58	68	32	<0.5	<10	1.03	32	0
M38A	83	2	31	14.6	2	29	<5	37.2	24.67	1	13.79
M39A	87	<0.1	<10	0.84	81	29	0.5	<12.5	4.11	23	0
M49A	81	<0.5	<25	5.3	26	29	2.5	<10	4.87	9	0
M51B	76	<0.5	<1	0.29	76	36	<0.5	<2.5	0.32	36	0
M52B*	34	<0.5	<0.5	0.25	34	14	<0.5	<0.5	0.25	14	0
M53B	68	<0.5	<10	1.73	53	30	<0.5	<5	1.82	17	0
M56B	79	<0.5	<1	0.29	79	30	<0.5	<5	0.33	30	0
M58B	70	<0.5	<2.5	0.33	70	29	<0.5	<5	0.57	29	0
M59B*	31	<0.5	<0.5	0.25	31	18	<0.5	<0.5	0.25	18	0
M60B	68	<0.5	<5	0.37	68	35	<0.5	<5	0.7	35	0
M62B	65	<0.5	<2.5	0.32	65	32	<0.5	<0.5	0.25	32	0
M63B	54	<0.5	<12.5	1.7	40	31	0.6	<25	4.58	29	0
M64B	60	<0.5	<1	0.32	60	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.5	<1	0.32	54	28	<0.5	<2.5	0.37	28	0
M67B	55	<0.5	<5	0.35	54	31	<0.5	<1	0.26	31	0
M69B	55	7	28	18.12	2	29	2.4	32.3	23.47	0	7
M70B	55	<0.5	<5	0.92	41	30	2	8.1	3.92	4	23.33
M71B	44	<0.5	<5	0.48	44	29	<0.5	<10	0.81	29	0
M72B	43	<0.5	<5	0.45	43	31	<0.5	<25	1.04	31	0
P410	84	19	66.1	39.82	0	29	4.1	44	31.21	0	0
P411	54	<0.5	100	7	27	31	<5	<50	10.89	31	0
PV03	90	<0.5	<50	2.53	58	31	<1	<50	8.24	31	0
SW08*	11	<0.5	<5	0.86	11	12	<0.5	<2.5	0.98	12	0
SW09*	14	<0.5	<2.5	0.71	14	16	<0.5	<2.5	0.91	16	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-7

Chloroethane

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	83	<2	<500	31.51	83	30	<5	<50	10.54	30	0
M06B	83	0.7	<500	38.23	82	29	<0.5	<50	11.82	29	0
M07A	86	<1	<250	14.95	86	29	<2.5	<25	7.11	29	0
M07B	55	<0.5	<200	6.2	55	28	<5	<25	5.22	28	0
M26A	91	<0.5	<20	0.94	91	36	<0.5	<0.5	0.25	36	0
M30B	87	<0.5	<20	1.11	87	31	<0.5	<10	1.63	31	0
M33B	86	<0.5	<20	0.89	86	32	<0.5	<5	0.47	32	0
M35B	85	<0.5	<20	0.95	85	32	<0.5	<5	0.7	32	0
M36A	91	<0.5	<20	1	91	31	<0.5	<5	0.76	31	0
M37A	90	<0.5	<20	1.03	90	32	<0.5	<10	1.03	32	0
M38A	83	<0.5	<25	1.94	83	29	<2.5	<25	3.49	29	0
M39A	87	<0.5	<20	1.86	87	29	<0.5	<12.5	3.55	29	0
M49A	81	<0.5	<50	2.66	81	29	<0.5	<10	1.95	29	0
M51B	76	<0.5	<20	1.05	76	36	<0.5	<5	0.43	36	0
M52B*	34	<0.5	<2.5	1.02	34	14	<0.5	<0.5	0.25	14	0
M53B	68	<0.5	<100	5.19	68	30	<0.5	<5	1.07	30	0
M56B	79	<0.5	<20	0.88	79	30	<0.5	<5	0.4	30	0
M58B	70	<0.5	<20	0.93	70	29	<0.5	<5	0.57	29	0
M59B*	31	<1	<2.5	1.1	31	18	<0.5	<0.5	0.25	18	0
M60B	68	<0.5	<5	0.85	68	35	<0.5	<5	0.7	35	0
M62B	65	<0.5	<20	0.97	65	32	<0.5	<0.5	0.25	32	0
M63B	54	<0.5	<50	3.38	54	31	<0.5	<25	4.61	31	0
M64B	60	<0.5	<2.5	0.73	60	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.5	<2.5	0.71	54	28	<0.5	<5	0.44	28	0
M67B	55	<0.5	<25	0.98	55	31	<0.5	<5	0.32	31	0
M69B	55	<0.5	<25	3.46	55	29	<0.5	<10	1.37	29	0
M70B	55	<0.5	<20	1.35	55	30	<0.5	<5	1.11	30	0
M71B	44	<0.5	<20	1.26	44	29	<0.5	<10	0.88	29	0
M72B	43	<0.5	<5	0.83	43	31	<0.5	<25	1.04	31	0
P410	84	<1	<100	5.78	84	29	<0.5	<25	5.28	29	0
P411	54	<1	<200	8.32	54	31	<5	<50	10.89	31	0
PV03	90	<0.1	<100	4.18	90	31	<2.5	<50	8.31	31	0
SW08*	11	<0.5	<5	0.86	11	12	<0.5	<5	1.15	12	0
SW09*	14	<0.5	<2.5	0.71	14	16	<0.5	<5	1.16	16	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-8

Chloroform

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	83	<1	230	12.44	81	30	<5	<50	10.54	30	0
M06B	83	<0.5	<250	10.89	83	29	<0.5	<50	11.82	29	0
M07A	86	<0.5	<100	4.59	86	29	<2.5	<25	7.11	29	0
M07B	55	<0.1	<25	2.78	55	28	<5	<25	5.22	28	0
M26A	104	<0.1	<1	0.28	104	36	<0.5	<0.5	0.25	36	0
M30B	87	<0.1	<5	0.47	86	31	<0.5	<10	1.63	31	0
M33B	86	<0.1	2	0.31	84	32	<0.5	<5	0.47	32	0
M35B	85	<0.1	<2.5	0.33	84	32	<0.5	<5	0.7	32	0
M36A	91	<0.1	<5	0.36	89	31	<0.5	<5	0.76	31	0
M37A	90	0.2	5.3	0.49	87	32	<0.5	<10	1.03	32	0
M38A	83	<0.5	<25	1.01	78	29	<2.5	<25	3.49	29	0
M39A	87	0.2	<10	0.83	82	29	<0.5	<12.5	3.55	29	0
M49A	81	<0.5	<25	1.26	79	29	<0.5	<10	1.88	29	0
M51B	76	<0.5	<1	0.29	76	36	<0.5	<2.5	0.32	36	0
M52B*	34	<0.5	<0.5	0.25	34	14	<0.5	<0.5	0.25	14	0
M53B	68	<0.5	<10	1.39	68	30	<0.5	<5	1.07	30	0
M56B	79	<0.5	<1	0.3	79	30	<0.5	5	0.49	29	3.33
M58B	70	<0.5	<2.5	0.62	48	29	<0.5	<5	1.33	12	0
M59B*	31	<0.5	<0.5	0.25	31	18	<0.5	<0.5	0.25	18	0
M60B	68	<0.5	<5	0.37	68	35	<0.5	<5	0.7	35	0
M62B	65	<0.5	2.8	0.5	54	32	<0.5	3	0.49	21	3
M63B	54	<0.5	<12.5	1.4	54	31	<0.5	<25	4.55	31	0
M64B	60	<0.5	<1	0.32	60	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.5	<1	0.32	54	28	<0.5	<2.5	0.37	28	0
M67B	55	<0.5	<5	0.34	55	31	<0.5	<1	0.26	31	0
M69B	55	<0.5	<25	1.52	55	29	<0.5	<10	1.37	29	0
M70B	55	<0.5	<5	0.66	55	30	<0.5	<5	1.11	30	0
M71B	44	<0.5	<5	0.48	44	29	<0.5	<10	0.81	29	0
M72B	43	<0.5	<5	0.45	43	31	<0.5	<25	1.04	31	0
P410	84	<1	<50	2.41	83	29	<0.5	<25	5.28	29	0
P411	54	<0.5	<50	4.08	53	31	<5	<50	10.89	31	0
PV03	90	<0.1	<50	2.23	87	31	<1	<50	8.24	31	0
SW08*	11	<0.5	<5	0.86	11	12	<0.5	<2.5	0.98	12	0
SW09*	14	<0.5	<2.5	0.71	14	16	<0.5	<2.5	1.11	14	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-9

Chloromethane

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	83	<2	<500	31.92	83	30	<5	<50	10.54	30	0
M06B	83	<0.5	<500	38.69	83	29	<0.5	<50	11.82	29	0
M07A	86	<1	<250	15.11	86	29	<2.5	<25	7.11	29	0
M07B	55	<0.5	<200	6.37	55	28	<5	<25	5.22	28	0
M26A	91	<0.5	<20	1.15	90	36	<0.5	<0.5	0.25	36	0
M30B	87	<0.5	<20	1.25	87	31	<0.5	<10	1.63	31	0
M33B	86	<0.5	<20	1.09	86	32	<0.5	<5	0.47	32	0
M35B	85	<0.5	<20	1.13	85	32	<0.5	<5	0.7	32	0
M36A	91	<0.5	<20	1.11	91	31	<0.5	<5	0.76	31	0
M37A	90	<0.5	<20	1.24	90	32	<0.5	<10	1.03	32	0
M38A	83	<0.5	<25	2.07	83	29	<2.5	<25	3.49	29	0
M39A	87	<0.5	<20	1.98	87	29	<0.5	<12.5	3.55	29	0
M49A	81	<0.5	<50	2.94	81	29	<0.5	<10	2.03	29	0
M51B	76	<0.5	<20	1.11	76	36	<0.5	<10	0.57	36	0
M52B*	34	<0.5	<2.5	1.02	34	14	<0.5	<0.5	0.25	14	0
M53B	68	<0.5	<100	5.26	68	30	<0.5	<5	1.07	30	0
M56B	79	<0.5	<20	1	79	30	<0.5	<10	0.48	30	0
M58B	70	<0.5	<20	0.99	70	29	<0.5	<5	0.57	29	0
M59B*	31	<1	<2.5	1.1	31	18	<0.5	<0.5	0.25	18	0
M60B	68	<0.5	<10	0.98	68	35	<0.5	<5	0.7	35	0
M62B	65	<0.5	<20	1.04	65	32	<0.5	<0.5	0.25	32	0
M63B	54	<0.5	<50	3.55	54	31	<0.5	<25	4.69	31	0
M64B	60	<0.5	<10	0.88	60	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.5	<10	0.96	54	28	<0.5	<10	0.53	28	0
M67B	55	<0.5	<25	1.06	55	31	<0.5	<10	0.4	31	0
M69B	55	<0.5	<25	3.54	55	29	<0.5	<10	1.37	29	0
M70B	55	<0.5	<20	1.43	55	30	<0.5	<5	1.11	30	0
M71B	44	<0.5	<20	1.36	44	29	<0.5	<10	0.97	29	0
M72B	43	<0.5	<10	1.03	43	31	<0.5	<25	1.04	31	0
P410	84	<1	<100	6.12	84	29	<0.5	<25	5.28	29	0
P411	54	<1	<200	8.91	54	31	<5	<50	10.89	31	0
PV03	90	<0.1	<100	4.32	90	31	<2.5	<50	8.39	31	0
SW08*	11	<0.5	<10	1.27	11	12	<0.5	<10	1.35	12	0
SW09*	14	<0.5	<10	1.04	14	16	<0.5	<10	1.47	16	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-10

2-Chloroethylvinyl ether

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	83	<2	<250	20.87	83	30	<5	<50	10.54	30	0
M06B	83	<2.5	<500	23.49	83	29	<0.5	<50	11.82	29	0
M07A	86	<1	<250	10.35	86	29	<2.5	<25	7.11	29	0
M07B	55	<0.1	<25	3.93	55	28	<5	<25	5.22	28	0
M26A	91	<0.5	<10	0.62	91	36	<0.5	<0.5	0.25	36	0
M30B	87	<0.5	<10	0.73	87	31	<0.5	<10	1.63	31	0
M33B	86	<0.5	<10	0.6	86	32	<0.5	<5	0.47	32	0
M35B	85	<0.5	<10	0.61	85	32	<0.5	<5	0.7	32	0
M36A	91	<0.5	<10	0.61	91	31	<0.5	<5	0.76	31	0
M37A	90	<0.5	<10	0.77	90	32	<0.5	<10	1.03	32	0
M38A	83	<0.5	<25	1.35	83	29	<2.5	<25	3.49	29	0
M39A	87	<0.5	<10	1.16	87	29	<0.5	<12.5	3.55	29	0
M49A	81	<0.5	<25	1.86	81	29	<0.5	<10	2.03	29	0
M51B	76	<0.5	<10	0.54	76	36	<0.5	<10	0.57	36	0
M52B*	34	<0.5	<1	0.49	34	14	<0.5	<0.5	0.25	14	0
M53B	68	<0.5	<20	2.42	68	30	<0.5	<5	1.07	30	0
M56B	77	<0.5	<10	0.59	77	30	<0.5	<10	0.48	30	0
M58B	70	<0.5	<10	0.54	70	29	<0.5	<5	0.57	29	0
M59B*	31	<1	<1	0.5	31	18	<0.5	<0.5	0.25	18	0
M60B	68	<0.5	<10	0.68	68	35	<0.5	<5	0.7	35	0
M62B	65	<0.5	<10	0.58	65	32	<0.5	<0.5	0.25	32	0
M63B	54	<0.5	<12.5	2.01	54	31	<0.5	<25	4.69	31	0
M64B	60	<0.5	<10	0.63	60	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.5	<10	0.72	54	28	<0.5	<10	0.53	28	0
M67B	55	<0.5	<10	0.58	55	31	<0.5	<10	0.4	31	0
M69B	55	<0.5	<25	2.04	55	29	<0.5	<10	1.37	29	0
M70B	55	<0.5	<10	0.92	55	30	<0.5	<5	1.11	30	0
M71B	44	<0.5	<10	0.68	44	29	<0.5	<10	0.97	29	0
M72B	43	<0.5	<10	0.77	43	31	<0.5	<25	1.04	31	0
P410	84	<1	<100	3.9	84	29	<0.5	<25	5.28	29	0
P411	54	<1	<50	5.07	54	31	<5	<50	10.89	31	0
PV03	90	<0.1	<50	2.79	90	31	<2.5	<50	8.39	31	0
SW08*	11	<0.5	<10	1.48	11	12	<0.5	<10	1.35	12	0
SW09*	14	<0.5	<10	1.2	14	16	<0.5	<10	1.47	16	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-11

Dibromochloromethane

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	83	<1	<125	9.65	83	30	<5	<50	10.54	30	0
M06B	83	<0.5	<250	10.89	83	29	<0.5	<50	11.82	29	0
M07A	86	<0.5	<100	4.59	86	29	<2.5	<25	7.11	29	0
M07B	55	<0.1	<25	2.78	55	28	<5	<25	5.22	28	0
M26A	104	<0.1	<1	0.27	104	36	<0.5	<0.5	0.25	36	0
M30B	87	<0.1	<5	0.46	87	31	<0.5	<10	1.63	31	0
M33B	86	<0.1	<1	0.29	86	32	<0.5	<5	0.47	32	0
M35B	85	<0.1	<2.5	0.31	85	32	<0.5	<5	0.7	32	0
M36A	91	<0.1	<5	0.35	90	31	<0.5	<5	0.76	31	0
M37A	90	<0.1	<5	0.44	88	32	<0.5	<10	1.03	32	0
M38A	83	<0.5	<25	1.08	73	29	<2.5	<25	3.49	29	0
M39A	87	<0.1	<10	0.8	86	29	<0.5	<12.5	3.55	29	0
M49A	81	<0.5	<25	1.2	81	29	<0.5	<10	1.88	29	0
M51B	76	<0.5	<1	0.29	76	36	<0.5	<2.5	0.32	36	0
M52B*	34	<0.5	<0.5	0.25	34	14	<0.5	<0.5	0.25	14	0
M53B	68	<0.5	<10	1.39	68	30	<0.5	<5	1.07	30	0
M56B	79	<0.5	<1	0.29	79	30	<0.5	5	0.49	29	3.33
M58B	70	<0.5	<2.5	0.33	70	29	<0.5	<5	0.57	29	0
M59B*	31	<0.5	<0.5	0.25	31	18	<0.5	<0.5	0.25	18	0
M60B	68	<0.5	<5	0.37	68	35	<0.5	<5	0.7	35	0
M62B	65	<0.5	<2.5	0.32	65	32	<0.5	<0.5	0.25	32	0
M63B	54	<0.5	<12.5	1.4	54	31	<0.5	<25	4.55	31	0
M64B	60	<0.5	<1	0.32	60	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.5	<1	0.32	54	28	<0.5	<2.5	0.37	28	0
M67B	55	<0.5	<5	0.34	55	31	<0.5	<1	0.26	31	0
M69B	55	<0.5	<25	1.63	51	29	<0.5	<10	1.37	29	0
M70B	55	<0.5	<5	0.66	55	30	<0.5	<5	1.11	30	0
M71B	44	<0.5	<5	0.48	44	29	<0.5	<10	0.81	29	0
M72B	43	<0.5	<5	0.45	43	31	<0.5	<25	1.04	31	0
P410	84	<1	<50	2.32	84	29	<0.5	<25	5.28	29	0
P411	54	<0.5	<50	3.96	54	31	<5	<50	10.89	31	0
PV03	90	<0.1	<50	2.13	90	31	<1	<50	8.24	31	0
SW08*	11	<0.5	<5	0.86	11	12	<0.5	<2.5	0.98	12	0
SW09*	14	<0.5	<2.5	0.71	14	16	<0.5	<2.5	0.91	16	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-12

1,3-Dichlorobenzene

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	80	<1	<125	11.84	79	30	<5	<50	10.54	30	0
M06B	80	<0.5	<250	12.96	80	29	<0.5	<50	11.82	29	0
M07A	83	<0.5	<125	6.15	83	29	<2.5	<25	7.11	29	0
M07B	52	<0.5	<25	2.79	52	28	<5	<25	5.22	28	0
M26A	100	<0.5	<1	0.27	100	36	<0.5	<0.5	0.25	36	0
M30B	83	<0.5	<5	0.47	83	31	<0.5	<10	1.63	31	0
M33B	82	<0.5	<1	0.29	82	32	<0.5	<5	0.47	32	0
M35B	80	<0.5	<2.5	0.31	80	32	<0.5	<5	0.7	32	0
M36A	87	<0.5	<5	0.35	87	31	<0.5	<5	0.76	31	0
M37A	86	<0.5	<5	0.43	86	32	<0.5	<10	1.03	32	0
M38A	79	<0.5	<25	1.04	79	29	<2.5	<25	3.49	29	0
M39A	83	<0.5	<10	0.79	83	29	<0.5	<12.5	3.55	29	0
M49A	77	<0.5	<25	1.25	77	29	<0.5	<10	1.88	29	0
M51B	76	<0.5	<1	0.29	76	36	<0.5	<2.5	0.32	36	0
M52B*	34	<0.5	<0.5	0.25	34	14	<0.5	<0.5	0.25	14	0
M53B	68	<0.5	<10	1.39	68	30	<0.5	<5	1.07	30	0
M56B	79	<0.5	<1	0.29	79	30	<0.5	<5	0.33	30	0
M58B	70	<0.5	<2.5	0.33	70	29	<0.5	<5	0.57	29	0
M59B*	31	<0.5	<0.5	0.25	31	18	<0.5	<0.5	0.25	18	0
M60B	68	<0.5	<5	0.37	68	35	<0.5	<5	0.7	35	0
M62B	65	<0.5	<2.5	0.32	65	32	<0.5	<0.5	0.25	32	0
M63B	54	<0.5	<12.5	1.4	54	31	<0.5	<25	4.55	31	0
M64B	60	<0.5	<1	0.32	60	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.5	<1	0.32	54	28	<0.5	<2.5	0.37	28	0
M67B	55	<0.5	<5	0.34	55	31	<0.5	<1	0.26	31	0
M69B	55	<0.5	<25	1.52	55	29	<0.5	<10	1.37	29	0
M70B	55	<0.5	<5	0.66	55	30	<0.5	<5	1.11	30	0
M71B	44	<0.5	<5	0.48	44	29	<0.5	<10	0.81	29	0
M72B	43	<0.5	<5	0.45	43	31	<0.5	<25	1.04	31	0
P410	81	<1	<50	2.43	81	29	<0.5	<25	5.28	29	0
P411	51	<0.5	<50	4.24	51	31	<5	<50	10.89	31	0
PV03	87	<0.5	<50	2.21	87	31	<1	<50	8.24	31	0
SW08*	11	<0.5	<5	0.86	11	12	<0.5	<2.5	0.98	12	0
SW09*	14	<0.5	<2.5	0.71	14	16	<0.5	<2.5	0.91	16	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-13

1,2-Dichlorobenzene

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	83	1.1	<135	12.11	76	30	<10	<50	13.85	20	0
M06B	83	<1.2	<250	13.14	76	29	<0.5	<50	12.18	27	0
M07A	86	<0.5	<125	6.13	86	29	<2.5	<25	7.11	29	0
M07B	55	<0.5	<25	2.82	55	28	<5	<25	5.22	28	0
M26A	100	<0.5	<1	0.27	100	36	<0.5	<0.5	0.25	36	0
M30B	85	<0.5	<5	0.47	85	31	<0.5	<10	1.63	31	0
M33B	84	<0.5	<1	0.29	84	32	<0.5	<5	0.47	32	0
M35B	82	<0.5	<5	0.34	82	32	<0.5	<5	0.7	32	0
M36A	89	<0.5	<5	0.35	89	31	<0.5	<5	0.76	31	0
M37A	88	<0.5	<5	0.43	88	32	<0.5	<10	1.03	32	0
M38A	81	<0.5	<25	1.49	37	29	<2.5	<25	3.49	29	0
M39A	85	<0.5	<10	0.78	85	29	<0.5	<12.5	3.55	29	0
M49A	80	<0.5	<25	1.29	80	29	<0.5	<10	1.88	29	0
M51B	76	<0.5	<1	0.29	76	36	<0.5	<2.5	0.32	36	0
M52B*	34	<0.5	<0.5	0.25	34	14	<0.5	<0.5	0.25	14	0
M53B	68	<0.5	<10	1.4	67	30	<0.5	<5	1.07	30	0
M56B	79	<0.5	<1	0.29	79	30	<0.5	<5	0.33	30	0
M58B	70	<0.5	<2.5	0.33	70	29	<0.5	<5	0.57	29	0
M59B*	31	<0.5	<0.5	0.25	31	18	<0.5	<0.5	0.25	18	0
M60B	68	<0.5	<5	0.37	68	35	<0.5	<5	0.7	35	0
M62B	65	<0.5	<2.5	0.32	65	32	<0.5	<0.5	0.25	32	0
M63B	54	<0.5	<12.5	1.4	54	31	<0.5	<25	4.55	31	0
M64B	60	<0.5	<1	0.32	60	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.5	<1	0.32	54	28	<0.5	<2.5	0.37	28	0
M67B	55	<0.5	<5	0.34	55	31	<0.5	<1	0.26	31	0
M69B	55	0.6	<25	2.48	30	29	0.5	10.5	4.89	3	0
M70B	55	<0.5	<5	0.67	55	30	<0.5	<5	1.11	30	0
M71B	44	<0.5	<5	0.48	44	29	<0.5	<10	0.81	29	0
M72B	43	<0.5	<5	0.45	43	31	<0.5	<25	1.04	31	0
P410	84	<1	<50	2.43	84	29	<0.5	<25	5.28	29	0
P411	54	<0.5	<50	4.07	54	31	<5	<50	10.89	31	0
PV03	91	<0.5	<100	2.7	91	31	<1	<50	8.24	31	0
SW08*	11	<0.5	<5	0.86	11	12	<0.5	<2.5	0.98	12	0
SW09*	14	<0.5	<2.5	0.71	14	16	<0.5	<2.5	0.91	16	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-14

1,4-Dichlorobenzene

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	80	<2.5	<125	23.11	32	30	25.6	85	56.44	2	0
M06B	80	<2.5	<250	24.05	32	29	0.5	<50	26.23	10	0
M07A	83	<0.5	<125	6.87	69	29	<2.5	<25	7.11	29	0
M07B	52	<0.5	<25	2.79	52	28	<5	<25	5.22	28	0
M26A	100	<0.5	<1	0.27	100	36	<0.5	<0.5	0.25	36	0
M30B	83	<0.5	<5	0.47	83	31	<0.5	<10	1.63	31	0
M33B	82	<0.5	<1	0.3	81	32	<0.5	<5	0.47	32	0
M35B	80	<0.5	<2.5	0.31	80	32	<0.5	<5	0.7	32	0
M36A	87	<0.5	<5	0.35	87	31	<0.5	<5	0.76	31	0
M37A	86	<0.5	<5	0.44	85	32	<0.5	<10	1.17	22	0
M38A	79	2.7	34	11.01	1	29	11	27.4	14.46	0	0
M39A	83	<0.5	<10	0.85	76	29	<0.5	<12.5	3.6	28	0
M49A	78	<0.5	<25	1.25	78	29	<0.5	<10	1.88	29	0
M51B	76	<0.5	<1	0.29	76	36	<0.5	<2.5	0.32	36	0
M52B*	34	<0.5	<0.5	0.25	34	14	<0.5	<0.5	0.25	14	0
M53B	68	<0.5	<10	1.93	53	30	<0.5	<5	1.07	30	0
M56B	79	<0.5	<1	0.29	79	30	<0.5	<5	0.33	30	0
M58B	70	<0.5	<2.5	0.33	70	29	<0.5	<5	0.57	29	0
M59B*	31	<0.5	<0.5	0.25	31	18	<0.5	<0.5	0.25	18	0
M60B	68	<0.5	<5	0.37	68	35	<0.5	<5	0.7	35	0
M62B	65	<0.5	<2.5	0.32	65	32	<0.5	<0.5	0.25	32	0
M63B	54	<0.5	<12.5	1.41	53	31	<0.5	<25	4.56	30	0
M64B	60	<0.5	<1	0.32	60	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.5	<1	0.32	54	28	<0.5	<2.5	0.37	28	0
M67B	55	<0.5	<5	0.34	55	31	<0.5	<1	0.26	31	0
M69B	55	7	<25	13.61	2	29	2.1	36.8	18.69	0	7
M70B	55	<0.5	<5	0.66	55	30	<0.5	<5	1.11	30	0
M71B	44	<0.5	<5	0.48	44	29	<0.5	<10	0.81	29	0
M72B	43	<0.5	<5	0.45	43	31	<0.5	<25	1.04	31	0
P410	81	<1	<50	2.44	80	29	<0.5	<25	5.28	29	0
P411	51	<0.5	<50	4.24	51	31	<5	<50	10.89	31	0
PV03	88	<0.5	<50	2.31	87	31	<1	<50	8.24	31	0
SW08*	11	<0.5	<5	0.86	11	12	<0.5	<2.5	0.98	12	0
SW09*	14	<0.5	<2.5	0.71	14	16	<0.5	<2.5	0.91	16	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-15

1,1-Dichloroethane

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	83	<2.5	210	58.42	22	30	<10	<50	18.56	16	0
M06B	83	4	<250	76.26	7	29	<0.5	<50	19.38	16	0
M07A	86	<0.3	210	31.18	19	29	<2.5	<25	7.36	27	0
M07B	55	<2.5	33	8	16	28	<5	<25	5.22	28	0
M26A	104	<0.1	<1	0.22	104	36	<0.5	<0.5	0.25	36	0
M30B	87	0.2	<5	0.46	85	31	<0.5	<10	1.63	31	0
M33B	86	<0.1	<1	0.25	86	32	<0.5	<5	0.47	32	0
M35B	85	<0.1	<2.5	0.27	85	32	<0.5	<5	0.7	32	0
M36A	91	<0.1	<5	0.31	91	31	<0.5	<5	0.76	31	0
M37A	90	0.6	11	3.29	3	32	<0.5	<10	2.37	12	0
M38A	83	0.6	<25	5.17	9	29	3.6	<25	3.85	25	0
M39A	87	0.1	<10	0.68	85	29	<0.5	<12.5	3.55	29	0
M49A	81	<0.5	<25	4.65	22	29	<2.5	<10	3.73	15	0
M51B	76	<0.3	<1	0.24	76	36	<0.5	<2.5	0.32	36	0
M52B*	34	<0.3	<0.5	0.18	34	14	<0.5	<0.5	0.25	14	0
M53B	68	<0.5	27	8.68	13	30	<0.5	<5	1.21	22	0
M56B	79	<0.3	<1	0.25	79	30	<0.5	<5	0.33	30	0
M58B	70	<0.3	<2.5	0.29	70	29	<0.5	<5	0.57	29	0
M59B*	31	<0.3	<0.5	0.17	31	18	<0.5	<0.5	0.25	18	0
M60B	68	<0.3	<5	0.32	68	35	<0.5	<5	0.7	35	0
M62B	65	<0.3	<2.5	0.27	65	32	<0.5	<0.5	0.25	32	0
M63B	54	0.6	<12.5	2.62	17	31	<2.5	<25	5.05	23	0
M64B	60	<0.3	<1	0.28	60	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.3	<1	0.28	54	28	<0.5	<2.5	0.37	28	0
M67B	55	<0.3	<2.5	0.27	55	31	<0.5	<1	0.26	31	0
M69B	55	2.6	<25	8.38	3	29	<0.5	<10	4.98	3	0
M70B	55	<0.3	<5	0.65	54	30	<0.5	<5	1.11	30	0
M71B	44	<0.3	<5	0.44	44	29	<0.5	<10	0.81	29	0
M72B	43	<0.5	<5	1.34	9	31	0.8	<25	1.8	8	0
P410	84	12	52	25.7	3	29	2.6	25	17.09	6	0
P411	54	<1	58	6.39	30	31	<5	<50	10.89	31	0
PV03	90	<0.3	<50	3.06	37	31	1.3	<50	8.27	30	0
SW08*	11	<0.5	<5	0.86	11	12	<0.5	<2.5	0.98	12	0
SW09*	14	<0.5	<2.5	0.71	14	16	<0.5	<2.5	0.91	16	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-16

1,1-Dichloroethene

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	83	<1	<125	8.75	81	30	<5	<50	10.54	30	0
M06B	83	<0.5	<250	9.49	83	29	<0.5	<50	11.82	29	0
M07A	86	<0.3	<100	4.08	86	29	<2.5	<25	7.11	29	0
M07B	55	<0.1	<25	2.69	54	28	<5	<25	5.22	28	0
M26A	104	<0.1	<1	0.22	104	36	<0.5	<0.5	0.25	36	0
M30B	87	<0.1	<5	0.42	87	31	<0.5	<10	1.63	31	0
M33B	86	<0.1	<1	0.25	86	32	<0.5	<5	0.47	32	0
M35B	85	<0.1	<2.5	0.27	84	32	<0.5	<5	0.7	32	0
M36A	91	<0.1	<5	0.31	91	31	<0.5	<5	0.76	31	0
M37A	90	<0.3	<5	0.52	60	32	<0.5	<10	1.03	32	0
M38A	83	0.3	<25	1.7	42	29	<2.5	<25	3.49	29	0
M39A	87	<0.1	<10	0.68	87	29	<0.5	<12.5	3.55	29	0
M49A	81	<0.3	<25	1.12	81	29	<0.5	<10	1.88	29	0
M51B	76	<0.3	<1	0.24	76	36	<0.5	<2.5	0.32	36	0
M52B*	34	<0.3	<0.5	0.18	34	14	<0.5	<0.5	0.25	14	0
M53B	68	<0.3	<10	1.14	68	30	<0.5	<5	1.07	30	0
M56B	79	<0.3	<1	0.25	79	30	<0.5	<5	0.33	30	0
M58B	70	<0.3	<2.5	0.29	70	29	<0.5	<5	0.57	29	0
M59B*	31	<0.3	<0.5	0.17	31	18	<0.5	<0.5	0.25	18	0
M60B	68	<0.3	<5	0.32	68	35	<0.5	<5	0.7	35	0
M62B	65	<0.3	<2.5	0.27	65	32	<0.5	<0.5	0.25	32	0
M63B	54	<0.5	<12.5	1.28	53	31	<0.5	<25	4.55	31	0
M64B	60	<0.3	<1	0.28	60	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.3	<1	0.28	54	28	<0.5	<2.5	0.37	28	0
M67B	55	<0.3	<2.5	0.27	55	31	<0.5	<1	0.26	31	0
M69B	55	<0.3	<25	2.54	22	29	<0.5	<10	2.22	16	0
M70B	55	<0.3	<5	0.74	37	30	<1	<5	1.38	23	0
M71B	44	<0.3	<5	0.44	44	29	<0.5	<10	0.81	29	0
M72B	43	<0.3	<5	0.42	43	31	<0.5	<25	1.04	31	0
P410	84	<0.5	<50	2.34	65	29	<0.5	<25	5.28	29	0
P411	54	<0.3	<50	3.97	53	31	<5	<50	10.89	31	0
PV03	90	<0.1	<50	2.04	88	31	<1	<50	8.24	31	0
SW08*	11	<0.5	<5	0.86	11	12	<0.5	<2.5	0.98	12	0
SW09*	14	<0.5	<2.5	0.71	14	16	<0.5	<2.5	0.91	16	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-17

1,2-Dichloroethane

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	83	<5	430	126.41	8	30	<10	<50	26.47	5	0
M06B	83	9	590	181.12	2	29	<0.5	<50	26.94	8	0
M07A	86	<0.3	280	41.9	22	29	<2.5	<25	7.11	29	0
M07B	55	<0.3	47	5.33	35	28	<5	<25	5.22	28	0
M26A	91	<0.1	<1	0.21	91	36	<0.5	<0.5	0.25	36	0
M30B	87	<0.1	<5	0.39	87	31	<0.5	<10	1.63	31	0
M33B	86	<0.1	<1	0.21	86	32	<0.5	<5	0.47	32	0
M35B	85	0.2	<2.5	0.24	83	32	<0.5	<5	0.7	32	0
M36A	91	<0.1	<5	0.27	91	31	<0.5	<5	0.76	31	0
M37A	90	<0.1	<5	0.91	41	32	<0.5	<10	1.43	16	0
M38A	83	<0.5	50	14.04	6	29	<5	<25	6.66	12	0
M39A	87	<0.1	<10	0.84	63	29	<0.5	<12.5	3.55	29	0
M49A	81	<0.3	31	7.66	20	29	<2.5	<10	4.01	14	0
M51B	76	<0.3	<1	0.21	76	36	<0.5	<2.5	0.31	36	0
M52B*	34	<0.3	<0.5	0.18	34	14	<0.5	<0.5	0.25	14	0
M53B	68	<0.5	<10	1.99	38	30	<0.5	<5	1.1	29	0
M56B	79	<0.3	<1	0.21	79	30	<0.5	<5	0.33	30	0
M58B	70	<0.3	<2.5	0.24	70	29	<0.5	<5	0.57	29	0
M59B*	31	<0.3	<0.5	0.17	31	18	<0.5	<0.5	0.25	18	0
M60B	68	<0.3	<5	0.28	68	35	<0.5	<5	0.7	35	0
M62B	65	<0.3	<2.5	0.23	65	32	<0.5	<0.5	0.25	32	0
M63B	54	<1.5	<12.5	5.69	9	31	4	<25	6.88	16	0
M64B	60	<0.3	<1	0.21	60	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.3	<1	0.21	54	28	<0.5	<2.5	0.36	28	0
M67B	55	<0.3	<2.5	0.22	55	31	<0.5	<0.5	0.25	31	0
M69B	55	20	69	32.99	2	29	1.3	26	13.48	1	0
M70B	55	<0.3	<5	0.56	55	30	<0.5	<5	1.11	30	0
M71B	44	<0.3	<5	0.39	44	29	<0.5	<10	0.8	29	0
M72B	43	<0.3	<5	0.36	43	31	<0.5	<25	1.04	31	0
P410	84	42	160	95.5	0	29	11.8	116	84.02	1	0
P411	54	0.5	240	14.54	18	31	<5	<50	10.89	31	0
PV03	90	0.4	<50	4.96	19	31	2.2	<50	8.38	28	0
SW08*	11	<0.5	<5	0.84	11	12	<0.5	<2.5	0.96	12	0
SW09*	14	<0.5	<2.5	0.7	14	16	<0.5	<2.5	0.88	16	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-18

cis-1,2-Dichloroethene

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	62	<5	510	171.33	3	30	24.8	160	101.98	0	0
M06B	61	29	600	288.66	2	29	2.2	215	151.8	0	0
M07A	66	0.8	550	47.66	5	29	4	47.5	22.91	8	0
M07B	40	5	<25	9.71	8	28	<5	<25	10.77	8	0
M26A	72	<0.3	<1	0.24	72	36	<0.5	<0.5	0.25	36	0
M30B	69	<0.3	<5	0.47	69	31	<0.5	<10	1.63	31	0
M33B	68	<0.1	<1	0.26	68	32	<0.5	<5	0.47	32	0
M35B	68	<0.3	<2.5	0.28	68	32	<0.5	<5	0.7	32	0
M36A	73	<0.3	<5	0.94	36	31	<0.5	<5	1.46	12	0
M37A	74	1.9	25	8.27	1	32	1.3	14.6	9.57	1	0
M38A	68	6.6	100	44.82	0	29	20.5	61	36.53	0	0
M39A	68	<0.5	14	5.42	16	29	<0.5	<12.5	3.55	29	0
M49A	66	<0.8	<25	6.87	12	29	<5	18.2	11.12	4	0
M51B	67	<0.3	<1	0.25	67	36	<0.5	<2.5	0.32	36	0
M52B*	24	<0.3	<0.5	0.19	24	14	<0.5	<0.5	0.25	14	0
M53B	61	<0.5	267	60.77	2	30	0.5	46.7	20.26	1	0
M56B	69	<0.3	<1	0.26	69	30	<0.5	<5	0.33	30	0
M58B	63	<0.3	<2.5	0.3	63	29	<0.5	<5	0.57	29	0
M59B*	22	<0.3	<0.5	0.17	22	18	<0.5	<0.5	0.25	18	0
M60B	59	<0.3	<5	0.35	59	35	<0.5	<5	0.7	35	0
M62B	57	<0.3	3.2	0.34	55	32	<0.5	<0.5	0.25	32	0
M63B	54	<1.5	<12.5	6.05	6	31	8	<25	13.4	6	51.61
M64B	60	<0.3	<1	0.28	60	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.3	<1	0.28	54	28	<0.5	<2.5	0.37	28	0
M67B	55	<0.3	<2.5	0.27	55	31	<0.5	<1	0.26	31	0
M69B	55	17	192	84.36	0	29	9.3	160	98.62	0	0
M70B	55	1.1	23	12.76	0	30	11	20.6	16.23	0	0
M71B	44	<0.3	<5	0.44	44	29	<0.5	<10	0.81	29	0
M72B	43	<0.3	<5	0.53	28	31	<0.5	<25	1.28	20	0
P410	63	55	250	133.17	0	29	37.9	354	266.45	0	58.62
P411	39	1.4	400	20.35	13	31	6.5	<50	11.02	30	0
PV03	68	<0.5	<50	4.96	19	31	<2.5	<50	9.4	22	0
SW08*	11	<0.5	<5	0.86	11	12	<0.5	<2.5	0.98	12	0
SW09*	14	<0.5	<2.5	1.15	7	16	<1	<2.5	1.05	12	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-19

trans-1,2-Dichloroethene

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	83	<2	<125	15.35	47	30	<10	<50	14.95	19	0
M06B	83	1	<250	20.27	27	29	<0.5	<50	15.89	17	0
M07A	86	<0.3	<100	7.61	43	29	<2.5	<25	7.11	29	0
M07B	55	<0.5	<25	2.68	45	28	<5	<25	5.22	28	0
M26A	91	<0.1	<1	0.23	91	36	<0.5	<0.5	0.25	36	0
M30B	87	<0.1	<5	0.44	86	31	<0.5	<10	1.63	31	0
M33B	86	<0.1	<2.5	0.26	86	32	<0.5	<5	0.47	32	0
M35B	85	<0.1	<2.5	0.27	85	32	<0.5	<5	0.7	32	0
M36A	91	<0.1	<5	0.31	91	31	<0.5	<5	0.76	31	0
M37A	90	<0.3	<5	0.66	48	32	<0.5	<10	1.4	18	0
M38A	83	<0.3	37	4.2	14	29	4.1	<25	4.04	24	0
M39A	87	<0.1	<10	0.87	67	29	<0.5	<12.5	3.55	29	0
M49A	81	<0.3	<25	1.32	55	29	0.7	<10	2.05	22	0
M51B	76	<0.3	<1	0.24	76	36	<0.5	<2.5	0.32	36	0
M52B*	34	<0.3	<0.5	0.18	34	14	<0.5	<0.5	0.25	14	0
M53B	68	<0.5	29.1	5.95	18	30	<0.5	5	1.96	15	0
M56B	79	<0.3	<1	0.25	79	30	<0.5	<5	0.33	30	0
M58B	70	<0.3	<2.5	0.29	70	29	<0.5	<5	0.57	29	0
M59B*	31	<0.3	<0.5	0.17	31	18	<0.5	<0.5	0.25	18	0
M60B	68	<0.3	<5	0.32	68	35	<0.5	<5	0.7	35	0
M62B	65	<0.3	<2.5	0.27	65	32	<0.5	<0.5	0.25	32	0
M63B	54	<0.5	<12.5	1.29	51	31	1.1	<25	4.63	28	0
M64B	60	<0.3	<1	0.28	60	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.3	<1	0.28	54	28	<0.5	<2.5	0.37	28	0
M67B	55	<0.3	<2.5	0.27	55	31	<0.5	<1	0.26	31	0
M69B	55	<1.5	<25	6.73	5	29	0.7	10	6.99	2	0
M70B	55	<0.3	<5	1.73	17	30	1	<5	1.89	17	0
M71B	44	<0.3	<5	0.44	44	29	<0.5	<10	0.81	29	0
M72B	43	<0.3	<5	0.42	43	31	<0.5	<25	1.04	31	0
P410	84	1.6	<50	9.16	9	29	2.9	28.9	18.37	5	0
P411	54	<0.3	<50	4.37	45	31	<5	<50	10.89	31	0
PV03	90	<0.3	<50	2.02	86	31	<1	<50	8.24	31	0
SW08*	11	<0.5	<5	0.86	11	12	<0.5	<2.5	0.98	12	0
SW09*	14	<0.5	<2.5	0.71	14	16	<0.5	<2.5	0.91	16	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-20

1,2-Dichloropropane

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	83	<2	<125	13.34	64	30	<5	<50	10.54	30	0
M06B	83	<1.2	<250	15.58	51	29	<0.5	<50	11.82	29	0
M07A	86	<0.5	<100	5.56	72	29	<2.5	<25	7.11	29	0
M07B	55	<0.5	<25	2.65	51	28	<5	<25	5.22	28	0
M26A	91	<0.1	<1	0.27	91	36	<0.5	<0.5	0.25	36	0
M30B	87	<0.1	<5	0.46	87	31	<0.5	<10	1.63	31	0
M33B	86	<0.1	<1	0.28	86	32	<0.5	<5	0.47	32	0
M35B	85	<0.1	<2.5	0.31	85	32	<0.5	<5	0.7	32	0
M36A	91	<0.1	<5	0.35	91	31	<0.5	<5	0.76	31	0
M37A	90	<0.1	<5	0.43	90	32	<0.5	<10	1.03	32	0
M38A	83	<0.3	<25	1.17	64	29	<2.5	<25	3.49	29	0
M39A	87	<0.1	<10	0.76	87	29	<0.5	<12.5	3.55	29	0
M49A	81	<0.5	<25	1.25	71	29	<0.5	<10	1.88	29	0
M51B	76	<0.3	<1	0.29	76	36	<0.5	<2.5	0.32	36	0
M52B*	34	<0.3	<0.5	0.24	34	14	<0.5	<0.5	0.25	14	0
M53B	68	<0.5	<10	1.38	67	30	<0.5	<5	1.07	30	0
M56B	79	<0.3	<1	0.29	79	30	<0.5	<5	0.33	30	0
M58B	70	<0.3	<2.5	0.33	70	29	<0.5	<5	0.57	29	0
M59B*	31	<0.3	<0.5	0.24	31	18	<0.5	<0.5	0.25	18	0
M60B	68	<0.3	<5	0.36	68	35	<0.5	<5	0.7	35	0
M62B	65	<0.3	<2.5	0.32	65	32	<0.5	<0.5	0.25	32	0
M63B	54	<0.5	<12.5	1.4	54	31	<0.5	<25	4.55	31	0
M64B	60	<0.5	<1	0.32	60	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.5	<1	0.32	54	28	<0.5	<2.5	0.37	28	0
M67B	55	<0.5	<5	0.34	55	31	<0.5	<1	0.26	31	0
M69B	55	<0.5	<25	1.52	55	29	<0.5	<10	1.37	29	0
M70B	55	<0.5	<5	0.66	55	30	<0.5	<5	1.11	30	0
M71B	44	<0.5	<5	0.48	44	29	<0.5	<10	0.81	29	0
M72B	43	<0.5	<5	0.45	43	31	<0.5	<25	1.04	31	0
P410	84	<1	<50	2.72	62	29	<0.5	<25	5.28	29	0
P411	54	<0.5	<50	3.96	54	31	<5	<50	10.89	31	0
PV03	90	<0.1	<50	2.12	88	31	<1	<50	8.24	31	0
SW08*	11	<0.5	<5	0.86	11	12	<0.5	<2.5	0.98	12	0
SW09*	14	<0.5	<2.5	0.71	14	16	<0.5	<2.5	0.91	16	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-21

cis-1,3-Dichloropropene

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	83	<1	<125	9.46	83	30	<5	<50	10.54	30	0
M06B	83	<0.5	<250	10.6	83	29	<0.5	<50	11.82	29	0
M07A	86	<0.5	<62.5	4.19	86	29	<2.5	<25	7.11	29	0
M07B	55	<0.1	<25	2.52	55	28	<5	<25	5.22	28	0
M26A	91	<0.1	<1	0.25	91	36	<0.5	<0.5	0.25	36	0
M30B	87	<0.1	<5	0.44	87	31	<0.5	<10	1.63	31	0
M33B	86	<0.1	<1	0.25	86	32	<0.5	<5	0.47	32	0
M35B	85	<0.1	<2.5	0.28	85	32	<0.5	<5	0.7	32	0
M36A	91	<0.1	<5	0.33	91	31	<0.5	<5	0.76	31	0
M37A	90	<0.1	<5	0.4	90	32	<0.5	<10	1.03	32	0
M38A	83	<0.5	<25	0.97	83	29	<2.5	<25	3.49	29	0
M39A	87	<0.1	<10	0.74	87	29	<0.5	<12.5	3.55	29	0
M49A	81	<0.5	<25	1.16	81	29	<0.5	<10	1.87	29	0
M51B	76	<0.5	<1	0.26	76	36	<0.5	<2.5	0.31	36	0
M52B*	34	<0.5	<0.5	0.25	34	14	<0.5	<0.5	0.25	14	0
M53B	68	<0.5	<10	1.27	68	30	<0.5	<5	1.07	30	0
M56B	79	<0.5	<1	0.26	79	30	<0.5	<5	0.33	30	0
M58B	70	<0.5	<2.5	0.29	70	29	<0.5	<5	0.57	29	0
M59B*	31	<0.5	<0.5	0.25	31	18	<0.5	<0.5	0.25	18	0
M60B	68	<0.5	<5	0.33	68	35	<0.5	<5	0.7	35	0
M62B	65	<0.5	<2.5	0.29	65	32	<0.5	<0.5	0.25	32	0
M63B	54	<0.5	<12.5	1.26	54	31	<0.5	<25	4.54	31	0
M64B	60	<0.5	<1	0.26	60	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.5	<1	0.26	54	28	<0.5	<2.5	0.36	28	0
M67B	55	<0.5	<5	0.3	55	31	<0.5	<0.5	0.25	31	0
M69B	55	<0.5	<25	1.46	55	29	<0.5	<10	1.37	29	0
M70B	55	<0.5	<5	0.63	55	30	<0.5	<5	1.11	30	0
M71B	44	<0.5	<5	0.43	44	29	<0.5	<10	0.8	29	0
M72B	43	<0.5	<5	0.41	43	31	<0.5	<25	1.04	31	0
P410	84	<0.5	<50	2.18	84	29	<0.5	<25	5.28	29	0
P411	54	<0.5	<50	3.88	54	31	<5	<50	10.89	31	0
PV03	90	<0.1	<50	2.09	89	31	<0.5	<50	8.23	31	0
SW08*	11	<0.5	<5	0.84	11	12	<0.5	<2.5	0.96	12	0
SW09*	14	<0.5	<2.5	0.7	14	16	<0.5	<2.5	0.88	16	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-22

trans-1,3-Dichloropropene

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	83	<1	<125	9.46	83	30	<5	<50	10.54	30	0
M06B	83	<0.5	<250	10.6	83	29	<0.5	<50	11.82	29	0
M07A	86	<0.5	<62.5	4.19	86	29	<2.5	<25	7.11	29	0
M07B	55	<0.1	<25	2.52	55	28	<5	<25	5.22	28	0
M26A	91	<0.1	<1	0.25	91	36	<0.5	<0.5	0.25	36	0
M30B	87	<0.1	<5	0.44	87	31	<0.5	<10	1.63	31	0
M33B	86	<0.1	<1	0.25	86	32	<0.5	<5	0.47	32	0
M35B	85	<0.1	<2.5	0.28	85	32	<0.5	<5	0.7	32	0
M36A	91	<0.1	<5	0.33	91	31	<0.5	<5	0.76	31	0
M37A	90	<0.1	<5	0.4	90	32	<0.5	<10	1.03	32	0
M38A	83	<0.5	<25	0.97	83	29	<2.5	<25	3.49	29	0
M39A	87	<0.1	<10	0.74	87	29	<0.5	<12.5	3.55	29	0
M49A	81	<0.5	<25	1.16	81	29	<0.5	<10	1.87	29	0
M51B	76	<0.5	<1	0.26	76	36	<0.5	<2.5	0.31	36	0
M52B*	34	<0.5	<0.5	0.25	34	14	<0.5	<0.5	0.25	14	0
M53B	68	<0.5	<10	1.27	68	30	<0.5	<5	1.07	30	0
M56B	79	<0.5	<1	0.26	79	30	<0.5	<5	0.33	30	0
M58B	70	<0.5	<2.5	0.29	70	29	<0.5	<5	0.57	29	0
M59B*	31	<0.5	<0.5	0.25	31	18	<0.5	<0.5	0.25	18	0
M60B	68	<0.5	<5	0.33	68	35	<0.5	<5	0.7	35	0
M62B	65	<0.5	<2.5	0.29	65	32	<0.5	<0.5	0.25	32	0
M63B	54	<0.5	<12.5	1.26	54	31	<0.5	<25	4.54	31	0
M64B	60	<0.5	<1	0.26	60	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.5	<1	0.26	54	28	<0.5	<2.5	0.36	28	0
M67B	55	<0.5	<5	0.3	55	31	<0.5	<0.5	0.25	31	0
M69B	55	<0.5	<25	1.46	55	29	<0.5	<10	1.37	29	0
M70B	55	<0.5	<5	0.63	55	30	<0.5	<5	1.11	30	0
M71B	44	<0.5	<5	0.43	44	29	<0.5	<10	0.8	29	0
M72B	43	<0.5	<5	0.41	43	31	<0.5	<25	1.04	31	0
P410	84	<0.5	<50	2.18	84	29	<0.5	<25	5.28	29	0
P411	54	<0.5	<50	3.88	54	31	<5	<50	10.89	31	0
PV03	90	<0.1	<50	2.09	90	31	<0.5	<50	8.23	31	0
SW08*	11	<0.5	<5	0.84	11	12	<0.5	<2.5	0.96	12	0
SW09*	14	<0.5	<2.5	0.7	14	16	<0.5	<2.5	0.88	16	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-23

1,4-Dioxane

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	19	<200	<500	295.26	2	31	230	530	301.81	0	3
M06B	18	<2	750	435.61	2	29	290	490	365.76	0	0
M07A	23	<10	<200	57.61	12	29	14.3	175	81.63	4	0
M07B	19	78	<200	85.32	6	29	66	122	97.23	0	0
M26A	25	<0.5	<3	0.99	25	36	<2	<2	1	36	0
M30B	22	<0.5	<50	4.55	21	30	<2	<20	2.03	29	0
M33B	21	<0.5	<4	1.01	21	32	<2	<10	1.13	32	0
M35B	22	<0.5	<40	1.97	22	32	<2	<10	1.75	32	0
M36A	22	1.9	<20	2.55	15	31	<2	<20	4.93	7	0
M37A	28	<2	<20	3.84	15	32	<2	<20	5.77	9	0
M38A	20	15	<100	22.75	9	30	26	40	31.83	2	0
M39A	19	<20	140	87.58	1	29	97.9	247	149.87	0	48.28
M49A	21	31	290	185.86	1	29	<20	294	234.76	1	3
M51B	23	<0.5	<4	1.03	23	36	<2	<2	1	36	0
M52B*	1	<2	<2	1	1	14	<2	<2	1	14	0
M53B	21	14	150	41.76	0	30	23.2	82	40.29	0	0
M56B	22	<0.5	<10	1.11	22	30	<2	210	7.97	29	3
M58B	21	<0.5	<10	1.19	21	29	<2	<4	1.03	29	0
M59B*	No Data					18	<2	<2	1	18	0
M60B	22	<0.5	<10	1.65	22	36	<2	<10	1.28	36	0
M62B	19	<0.5	<10	1.59	19	32	<2	<2	1	32	0
M63B	18	16	170	95.11	1	31	74	108	84.79	5	0
M64B	23	<0.5	<10	1.14	23	31	<2	<2	1	31	0
M66B	22	<0.5	<3	0.99	22	28	<2	<10	1.43	28	0
M67B	21	<0.5	<4	1.06	21	31	<2	<2	1	31	0
M69B	20	3	<100	31.3	3	29	9.2	155	89.31	0	44.83
M70B	20	<2	<20	6.71	13	30	<2	<20	8.95	7	0
M71B	20	<0.5	<20	2.69	20	29	<2	<40	2.69	29	0
M72B	20	1.2	<20	2.79	17	31	<2	<20	2.43	17	0
P410	19	240	670	461.58	0	29	400	570	463.21	0	0
P411	19	120	<500	156.32	2	31	100	240	127.06	0	0
PV03	21	<20	<200	52.71	14	31	<2	<200	52.8	6	0
SW08*	11	<2	<10	3.27	11	11	<2	<10	2.82	11	0
SW09*	14	<2	<10	3.7	8	16	<2	<10	4.63	8	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-24

Ethylbenzene

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	83	<1	<125	8.86	83	30	<5	<50	10.54	30	0
M06B	83	<0.5	<250	9.53	83	29	<0.5	<50	11.82	29	0
M07A	86	<0.3	430	9.09	83	29	<2.5	<25	7.11	29	0
M07B	55	<0.1	<25	2.49	55	28	<5	<25	5.22	28	0
M26A	104	<0.1	<1	0.22	104	36	<0.5	<0.5	0.25	36	0
M30B	87	0.1	<5	0.42	86	31	<0.5	<10	1.63	31	0
M33B	86	<0.1	<1	0.25	85	32	<0.5	<5	0.47	32	0
M35B	85	<0.1	<2.5	0.27	85	32	<0.5	<5	0.7	32	0
M36A	91	<0.1	9.5	0.41	90	31	<0.5	<5	0.76	31	0
M37A	90	<0.1	300	3.72	89	32	<0.5	<10	1.03	32	0
M38A	83	<0.3	<25	0.93	83	29	<2.5	<25	3.49	29	0
M39A	87	<0.3	<10	0.71	82	29	<0.5	<12.5	3.55	29	0
M49A	81	<0.3	<25	1.12	81	29	<0.5	<10	1.88	29	0
M51B	76	<0.3	<1	0.24	76	36	<0.5	<2.5	0.32	36	0
M52B*	34	<0.3	<0.5	0.18	34	14	<0.5	<0.5	0.25	14	0
M53B	68	<0.5	37.5	11.31	6	30	<0.5	9.4	3.71	7	0
M56B	79	<0.3	<1	0.25	79	30	<0.5	<5	0.33	30	0
M58B	69	<0.3	<2.5	0.29	69	29	<0.5	<5	0.57	29	0
M59B*	31	<0.3	<0.5	0.17	31	18	<0.5	<0.5	0.25	18	0
M60B	67	<0.3	<5	0.33	66	35	<0.5	<5	0.7	35	0
M62B	65	<0.3	<2.5	0.28	64	32	<0.5	<0.5	0.25	32	0
M63B	54	<0.5	<12.5	1.27	54	31	<0.5	<25	4.55	31	0
M64B	60	<0.3	1	0.33	54	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.3	<1	0.28	54	28	<0.5	<2.5	0.37	28	0
M67B	55	<0.3	<2.5	0.28	54	31	<0.5	<1	0.26	31	0
M69B	55	<0.3	<25	1.35	55	29	<0.5	<10	1.37	29	0
M70B	55	<0.3	<5	0.62	54	30	<0.5	<5	1.11	30	0
M71B	44	<0.3	<5	0.44	44	29	<0.5	<10	0.81	29	0
M72B	43	<0.3	<5	0.42	43	31	<0.5	<25	1.04	31	0
P410	84	<0.5	<50	2.17	84	29	<0.5	<25	5.28	29	0
P411	54	<0.3	<50	3.77	54	31	<5	<50	10.89	31	0
PV03	90	<0.1	<50	2.01	89	31	<1	<50	8.24	31	0
SW08*	11	<0.5	<5	0.86	11	12	<0.5	<2.5	0.98	12	0
SW09*	14	<0.5	<2.5	0.71	14	16	<0.5	<2.5	0.91	16	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-25

Methylene Chloride

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	83	<1	<1250	64.3	73	30	<5	54	11.51	29	0
M06B	83	<2	<1500	63.39	76	29	<0.5	56	12.89	28	0
M07A	86	<1	<1250	23.33	75	29	<2.5	<25	7.67	26	0
M07B	55	<0.5	<125	5.37	52	28	<5	<25	6.23	25	0
M26A	104	<0.5	<10	0.8	101	36	<0.5	<0.5	0.25	36	0
M30B	87	<0.5	<10	1.01	81	31	<0.5	11	2.08	28	3.23
M33B	86	<0.5	<10	0.76	86	32	<0.5	<5	0.52	31	0
M35B	85	<0.5	<10	0.71	84	32	<0.5	<5	0.78	30	0
M36A	91	<0.5	16	0.91	85	31	<0.5	<5	0.81	30	0
M37A	90	<0.5	<12.5	1.07	82	32	<0.5	<10	1.11	31	0
M38A	83	<0.5	<25	1.94	73	29	<2.5	<25	3.49	29	0
M39A	87	2	37	18.52	9	29	<0.5	14	4.2	25	0
M49A	81	<0.5	<60	3.71	70	29	<0.5	<10	2.03	29	0
M51B	76	<0.5	12	0.82	73	36	<0.5	<10	0.57	36	0
M52B*	34	<0.5	<5	0.78	34	14	<0.5	<0.5	0.25	14	0
M53B	68	<0.5	190	41.75	12	30	<0.5	5	1.26	28	0
M56B	78	<0.5	<10	0.73	78	30	<0.5	<10	0.49	29	0
M58B	69	<0.5	<10	0.7	68	29	<0.5	<5	0.59	28	0
M59B*	30	<0.5	<5	0.72	30	18	<0.5	<0.5	0.25	18	0
M60B	67	<0.5	<10	0.81	67	35	<0.5	<5	0.7	35	0
M62B	65	<0.5	<10	0.76	64	32	<0.5	<0.5	0.25	32	0
M63B	54	<0.5	<12.5	2.09	53	31	<0.5	28	5.39	29	3.23
M64B	60	<0.5	<10	0.65	60	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.5	<10	0.75	54	28	<0.5	<10	0.59	27	0
M67B	55	<0.5	<10	0.58	55	31	<0.5	<10	0.4	31	0
M69B	55	<0.5	<25	2.54	47	29	<0.5	<10	1.37	29	0
M70B	55	<0.5	20	1.3	54	30	<0.5	<5	1.18	28	0
M71B	44	<0.5	<10	0.66	44	29	<0.5	<10	1.33	24	0
M72B	43	<0.5	<10	0.81	42	31	<0.5	<25	1.15	29	0
P410	84	<1	<500	8.28	82	29	<0.5	28	5.81	28	0
P411	54	<1	<50	6.19	48	31	<5	<50	10.89	31	0
PV03	90	<0.5	<50	4.18	77	31	<2.5	190	14.7	28	6.45
SW08*	11	<0.5	<10	1.7	11	12	<0.5	<10	1.35	12	0
SW09*	14	<0.5	<10	1.5	13	16	<0.5	<10	1.47	16	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-26

Tetrachloroethene

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	83	1.2	<125	8.78	80	30	<5	<50	10.54	30	0
M06B	83	<0.5	<250	9.85	75	29	<0.5	<50	11.82	29	0
M07A	86	<0.3	<100	6.42	64	29	<2.5	<25	7.11	29	0
M07B	55	0.4	<25	2.72	51	28	<5	<25	5.22	28	0
M26A	104	<0.1	<1	0.22	104	36	<0.5	<0.5	0.25	36	0
M30B	87	<0.1	<5	0.42	87	31	<0.5	<10	1.63	31	0
M33B	86	<0.1	<1	0.25	85	32	<0.5	<5	0.47	32	0
M35B	85	<0.1	<2.5	0.27	85	32	<0.5	<5	0.7	32	0
M36A	91	<0.1	<5	0.45	61	31	<0.5	<5	0.94	20	0
M37A	90	0.8	16	5.39	3	32	<0.5	<10	1.79	15	0
M38A	83	0.9	34	10.66	12	29	<2.5	<25	3.49	29	0
M39A	87	<0.5	<10	2.2	26	29	<0.5	<12.5	3.55	29	0
M49A	81	<0.3	<25	1.12	81	29	<0.5	<10	1.88	29	0
M51B	76	<0.3	<1	0.24	76	36	<0.5	<2.5	0.32	36	0
M52B*	34	<0.3	<0.5	0.18	34	14	<0.5	<0.5	0.25	14	0
M53B	68	<0.5	92	25.42	3	30	<0.5	12	3.49	7	0
M56B	79	<0.3	1	0.34	67	30	<0.5	<5	0.33	30	0
M58B	70	<0.3	3	0.44	61	29	<0.5	<5	0.59	27	0
M59B*	31	0.3	<0.5	0.18	30	18	<0.5	<0.5	0.25	18	0
M60B	68	<0.3	<5	0.32	68	35	<0.5	<5	0.7	35	0
M62B	65	<0.3	<2.5	0.32	63	32	<0.5	<0.5	0.25	32	0
M63B	54	<0.5	<12.5	1.27	54	31	<0.5	<25	4.55	31	0
M64B	60	<0.3	<1	0.28	60	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.3	<1	0.28	54	28	<0.5	<2.5	0.37	28	0
M67B	55	<0.3	<2.5	0.31	54	31	<0.5	<1	0.26	31	0
M69B	55	<1.5	<25	6.65	8	29	0.5	<10	2.72	8	0
M70B	55	2	10	5.61	6	30	2	5.3	3.85	2	0
M71B	44	<0.3	<5	0.44	44	29	<0.5	<10	0.81	29	0
M72B	43	<0.3	<5	0.56	26	31	<0.5	<25	1.12	24	0
P410	84	0.5	<50	2.86	46	29	<0.5	<25	5.28	29	0
P411	54	<0.3	<50	3.91	53	31	<5	<50	10.89	31	0
PV03	90	0.1	<50	2.02	86	31	<1	<50	8.24	31	0
SW08*	11	<0.5	<5	0.86	11	12	<0.5	<2.5	0.98	12	0
SW09*	14	<0.5	<2.5	0.75	12	16	<0.5	<2.5	0.91	16	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-27

1,1,2,2-Tetrachloroethane

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	83	<1	<125	9.45	83	30	<5	<50	10.54	30	0
M06B	83	<0.5	<250	10.56	83	29	<0.5	<50	11.82	29	0
M07A	86	<0.5	<62.5	4.19	86	29	<2.5	<25	7.11	29	0
M07B	55	<0.1	<25	2.5	55	28	<5	<25	5.22	28	0
M26A	91	<0.1	<1	0.26	91	36	<0.5	<0.5	0.25	36	0
M30B	87	<0.1	<5	0.44	87	31	<0.5	<10	1.63	31	0
M33B	86	<0.1	<1	0.26	86	32	<0.5	<5	0.47	32	0
M35B	85	<0.1	<2.5	0.28	85	32	<0.5	<5	0.7	32	0
M36A	91	<0.1	<5	0.32	91	31	<0.5	<5	0.76	31	0
M37A	90	<0.1	<5	0.4	90	32	<0.5	<10	1.03	32	0
M38A	83	<0.5	<25	1	79	29	<2.5	<25	3.49	29	0
M39A	87	<0.1	<10	0.74	87	29	<0.5	<12.5	3.55	29	0
M49A	81	<0.5	<25	1.17	81	29	<0.5	<10	1.88	29	0
M51B	76	<0.5	<1	0.26	76	36	<0.5	<2.5	0.32	36	0
M52B*	34	<0.5	<0.5	0.25	34	14	<0.5	<0.5	0.25	14	0
M53B	68	<0.5	<10	1.26	68	30	<0.5	<5	1.07	30	0
M56B	79	<0.5	<1	0.26	79	30	<0.5	<5	0.33	30	0
M58B	70	<0.5	<2.5	0.29	70	29	<0.5	<5	0.57	29	0
M59B*	31	<0.5	<0.5	0.25	31	18	<0.5	<0.5	0.25	18	0
M60B	68	<0.5	<5	0.34	68	35	<0.5	<5	0.7	35	0
M62B	65	<0.5	<2.5	0.29	65	32	<0.5	<0.5	0.25	32	0
M63B	54	<0.5	<12.5	1.27	54	31	<0.5	<25	4.55	31	0
M64B	60	<0.5	<1	0.27	60	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.5	<1	0.27	54	28	<0.5	<2.5	0.37	28	0
M67B	55	<0.5	<5	0.3	55	31	<0.5	<1	0.26	31	0
M69B	55	<0.5	<25	1.44	54	29	<0.5	<10	1.37	29	0
M70B	55	<0.5	<5	0.62	55	30	<0.5	<5	1.11	30	0
M71B	44	<0.5	<5	0.43	44	29	<0.5	<10	0.81	29	0
M72B	43	<0.5	<5	0.41	43	31	<0.5	<25	1.04	31	0
P410	84	<1	<50	2.17	84	29	<0.5	<25	5.28	29	0
P411	54	<0.5	<50	3.87	54	31	<5	<50	10.89	31	0
PV03	90	<0.1	<50	2.06	90	31	<1	<50	8.24	31	0
SW08*	11	<0.5	<5	0.86	11	12	<0.5	<2.5	0.98	12	0
SW09*	14	<0.5	<2.5	0.71	14	16	<0.5	<2.5	0.91	16	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-28

Tetrahydrofuran

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	61	<2.5	<2500	248.86	45	30	<100	<500	140.6	25	0
M06B	61	<50	<5000	445.74	32	29	<5	<1000	160.16	23	0
M07A	65	<5	7700	228.3	50	29	<25	<500	82.91	28	0
M07B	40	<2.5	350	57.83	36	28	<50	<250	56.7	28	0
M26A	68	<0.5	<50	7.21	68	36	<5	<10	2.78	36	0
M30B	67	<0.5	<50	9.42	67	31	<5	<100	17.9	31	0
M33B	65	<0.5	56	7.29	64	32	<5	<50	5.47	32	0
M35B	64	<0.5	<40	6.81	64	32	<5	<50	7.89	32	0
M36A	70	<0.5	<50	7.86	70	31	<5	<50	8.79	31	0
M37A	69	<0.5	<50	9.13	63	32	<5	<100	13.93	22	0
M38A	63	<10	<250	25.97	42	29	<25	<500	43.53	29	0
M39A	63	7	<100	20.5	60	29	<5	<200	38.97	29	0
M49A	62	<1	470	162.23	16	29	<50	297	155.61	2	0
M51B	67	<0.5	<40	6.76	67	36	<5	<25	3.61	36	0
M52B*	24	<5	<20	7.81	24	14	<5	<5	2.5	14	0
M53B	61	<25	606	202.42	7	30	49.1	210	112.2	1	0
M56B	69	<0.5	<50	6.89	69	30	<5	<50	3.83	30	0
M58B	63	<0.5	<50	7.07	63	29	<5	<50	6.12	29	0
M59B*	22	<10	<50	9.32	22	18	<5	<5	2.5	18	0
M60B	59	<0.5	<50	7.72	59	35	<5	<50	8.36	35	0
M62B	57	<0.5	<40	6.99	57	32	<5	<10	2.81	32	0
M63B	54	<2	220	67.72	16	31	<25	<500	65.21	22	0
M64B	60	<0.5	<40	6.88	60	31	<5	<10	2.74	31	0
M66B	54	<0.5	<20	6.3	53	28	<5	<25	4.11	28	0
M67B	55	<0.5	21	7.26	53	31	<5	<20	2.9	31	0
M69B	55	<20	<250	36.7	40	29	<5	<100	32.21	12	0
M70B	55	<0.5	<50	10.96	54	30	<5	<50	12.75	30	0
M71B	44	<0.5	<50	7.79	43	29	<5	<100	9.31	29	0
M72B	43	<0.5	<50	7.91	43	31	<5	<500	15.08	31	0
P410	62	<100	1900	648.86	4	29	25.5	<500	198.87	4	0
P411	38	<5	3500	253.37	15	31	<25	<500	129.53	29	0
PV03	67	<10	<500	66.3	36	31	<25	<500	100.49	29	0
SW08*	11	<5	<50	9.09	11	12	<5	<50	12.29	12	0
SW09*	14	<5	<25	7.68	13	16	<5	<50	12.34	16	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-29

Toluene

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	83	<1.5	<125	12.15	63	30	<5	<50	10.54	30	0
M06B	83	1	<250	15.21	43	29	<0.5	<50	11.92	28	0
M07A	86	<0.3	<125	7.13	64	29	<2.5	<25	7.11	29	0
M07B	55	<0.5	<25	2.75	54	28	<5	<25	5.22	28	0
M26A	104	<0.3	1	0.23	103	36	<0.5	0.5	0.26	35	0
M30B	87	<0.3	<5	0.43	86	31	<0.5	<10	1.63	31	0
M33B	86	<0.3	<1	0.26	85	32	<0.5	<5	0.47	32	0
M35B	85	<0.3	<2.5	0.29	84	32	<0.5	<5	0.7	32	0
M36A	91	<0.3	59	0.95	90	31	<0.5	<5	0.76	31	0
M37A	90	<0.3	310	3.84	88	32	<0.5	<10	1.03	32	0
M38A	83	<0.3	<25	1.01	68	29	<2.5	<25	3.49	29	0
M39A	87	0.6	<10	2.04	13	29	<0.5	<12.5	3.55	29	0
M49A	81	<0.3	<25	1.16	76	29	<0.5	<10	1.88	29	0
M51B	76	<0.3	3	0.28	74	36	<0.5	<2.5	0.33	35	0
M52B*	34	<0.3	4	0.29	33	14	<0.5	<0.5	0.25	14	0
M53B	68	<0.5	142	43.18	2	30	<0.5	21	3.87	11	0
M56B	79	<0.3	<1	0.25	79	30	<0.5	<5	0.33	30	0
M58B	69	<0.3	<2.5	0.29	68	29	<0.5	<5	0.57	29	0
M59B*	31	<0.3	<0.5	0.18	30	18	<0.5	0.8	0.4	11	38.89
M60B	67	<0.3	<5	0.34	65	35	<0.5	8	1.03	32	2.86
M62B	65	<0.3	4	0.37	60	32	<0.5	0.7	0.26	31	0
M63B	54	<0.5	<12.5	1.28	53	31	<0.5	<25	4.55	31	0
M64B	60	<0.3	10	1.05	47	31	<0.5	2	0.39	26	0
M66B	54	<0.3	1	0.29	53	28	<0.5	<2.5	0.38	27	0
M67B	55	<0.3	4	0.47	43	31	<0.5	<1	0.26	31	0
M69B	55	<0.3	<25	1.45	45	29	<0.5	<10	1.37	29	0
M70B	55	<0.3	<5	0.65	53	30	<0.5	<5	1.11	30	0
M71B	44	<0.3	<5	0.44	44	29	<0.5	<10	0.81	29	0
M72B	43	<0.3	<5	0.42	42	31	<0.5	<25	1.04	31	0
P410	84	<0.5	<50	2.29	82	29	<0.5	<25	5.28	29	0
P411	54	<0.3	<50	3.89	53	31	<5	<50	10.89	31	0
PV03	90	<0.3	<50	2.14	85	31	<1	<50	8.24	31	0
SW08*	11	<0.5	<5	0.86	11	12	<0.5	<2.5	0.98	12	0
SW09*	14	<0.5	<2.5	0.71	14	16	<0.5	<2.5	0.91	16	0

Detections of BTEX compounds (benzene, toluene, ethyl benzene, and xylene) in well M59B appear to be from a local source unrelated to the landfill.
Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-30

Trichloroethene

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	83	<2	<125	15.17	49	30	<5	<50	10.54	30	0
M06B	83	1	<250	21.04	37	29	<0.5	<50	11.82	29	0
M07A	86	0.4	100	29.88	21	29	<2.5	<25	7.54	26	0
M07B	55	1.4	<25	3.97	26	28	<5	<25	5.22	28	0
M26A	104	<0.1	<1	0.22	104	36	<0.5	<0.5	0.25	36	0
M30B	87	<0.1	<5	0.42	87	31	<0.5	<10	1.63	31	0
M33B	86	<0.1	<1	0.25	86	32	<0.5	<5	0.47	32	0
M35B	85	<0.1	<2.5	0.27	84	32	<0.5	<5	0.7	32	0
M36A	91	<0.1	<5	0.8	54	31	<0.5	<5	1.48	14	0
M37A	90	1	25	9.5	6	32	<0.5	<10	3.17	9	0
M38A	83	<10	53.2	27.82	4	29	7.8	<25	12.2	6	0
M39A	87	0.4	12	4.6	13	29	<0.5	<12.5	3.55	29	0
M49A	81	<0.3	<25	1.41	55	29	<0.5	<10	1.88	29	0
M51B	76	<0.3	<1	0.24	76	36	<0.5	<2.5	0.32	36	0
M52B*	34	<0.3	<0.5	0.18	34	14	<0.5	<0.5	0.25	14	0
M53B	68	<0.5	16.2	5.03	19	30	<0.5	<5	1.09	29	0
M56B	79	<0.3	<1	0.25	79	30	<0.5	<5	0.33	30	0
M58B	70	<0.3	<2.5	0.29	70	29	<0.5	<5	0.57	29	0
M59B*	31	<0.3	<0.5	0.17	31	18	<0.5	<0.5	0.25	18	0
M60B	68	<0.3	<5	0.32	68	35	<0.5	<5	0.7	35	0
M62B	65	<0.3	<2.5	0.27	65	32	<0.5	<0.5	0.25	32	0
M63B	54	<0.5	<12.5	1.47	35	31	<0.5	<25	4.55	31	0
M64B	60	<0.3	<1	0.28	60	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.3	<1	0.28	54	28	<0.5	<2.5	0.37	28	0
M67B	55	<0.3	<2.5	0.29	54	31	<0.5	<1	0.26	31	0
M69B	55	7	35	20.27	2	29	1.5	21	14.52	1	0
M70B	55	2.9	16	8.89	1	30	<5	18.9	12.79	1	16.67
M71B	44	<0.3	<5	0.44	44	29	<0.5	<10	0.81	29	0
M72B	43	<0.3	<5	0.5	31	31	<0.5	<25	1.11	26	0
P410	84	9	<50	17.56	7	29	2.3	<25	13.18	8	0
P411	54	<1	<50	5.45	35	31	<5	<50	10.89	31	0
PV03	90	<0.3	<50	2.45	58	31	<1	<50	8.24	31	0
SW08*	11	<0.5	<5	0.86	11	12	<0.5	<2.5	0.98	12	0
SW09*	14	<0.5	<2.5	0.94	10	16	0.7	<2.5	0.93	15	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-31

1,1,1-Trichloroethane

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	83	<1	<125	9.8	82	30	<5	<50	10.54	30	0
M06B	83	<0.5	<250	11.07	82	29	<0.5	<50	11.82	29	0
M07A	86	<0.5	<100	4.94	82	29	<2.5	<25	7.11	29	0
M07B	55	<0.1	<25	2.78	55	28	<5	<25	5.22	28	0
M26A	104	<0.1	<1	0.27	104	36	<0.5	<0.5	0.25	36	0
M30B	87	<0.1	<5	0.46	87	31	<0.5	<10	1.63	31	0
M33B	86	<0.1	<1	0.29	85	32	<0.5	<5	0.47	32	0
M35B	85	<0.1	<2.5	0.31	84	32	<0.5	<5	0.7	32	0
M36A	91	<0.1	<5	0.35	90	31	<0.5	<5	0.76	31	0
M37A	90	<0.1	<5	0.43	90	32	<0.5	<10	1.03	32	0
M38A	83	<0.5	<25	0.99	83	29	<2.5	<25	3.49	29	0
M39A	87	<0.1	<10	0.77	87	29	<0.5	<12.5	3.55	29	0
M49A	81	<0.5	<25	1.2	81	29	<0.5	<10	1.88	29	0
M51B	76	<0.5	<1	0.29	76	36	<0.5	<2.5	0.32	36	0
M52B*	34	<0.5	<0.5	0.25	34	14	<0.5	<0.5	0.25	14	0
M53B	68	<0.5	<10	1.39	68	30	<0.5	<5	1.07	30	0
M56B	79	<0.5	<1	0.29	79	30	<0.5	<5	0.33	30	0
M58B	70	<0.5	<2.5	0.33	70	29	<0.5	<5	0.57	29	0
M59B*	31	<0.5	<0.5	0.25	31	18	<0.5	<0.5	0.25	18	0
M60B	68	<0.5	<5	0.37	68	35	<0.5	<5	0.7	35	0
M62B	65	<0.5	<2.5	0.32	65	32	<0.5	<0.5	0.25	32	0
M63B	54	<0.5	<12.5	1.4	54	31	<0.5	<25	4.55	31	0
M64B	60	<0.5	<1	0.32	60	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.5	<1	0.32	54	28	<0.5	<2.5	0.37	28	0
M67B	55	<0.5	<5	0.34	55	31	<0.5	<1	0.26	31	0
M69B	55	<0.5	<25	1.52	55	29	<0.5	<10	1.37	29	0
M70B	55	<0.5	<5	0.66	55	30	<0.5	<5	1.11	30	0
M71B	44	<0.5	<5	0.48	44	29	<0.5	<10	0.81	29	0
M72B	43	<0.5	<5	0.45	43	31	<0.5	<25	1.04	31	0
P410	84	<1	<50	2.32	84	29	<0.5	<25	5.28	29	0
P411	54	<0.5	<50	3.96	54	31	<5	<50	10.89	31	0
PV03	90	<0.1	<50	2.15	87	31	<1	<50	8.24	31	0
SW08*	11	<0.5	<5	0.86	11	12	<0.5	<2.5	0.98	12	0
SW09*	14	<0.5	<2.5	0.71	14	16	<0.5	<2.5	0.91	16	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-32

1,1,2-Trichloroethane

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	83	<1	<125	8.74	83	30	<5	<50	10.54	30	0
M06B	83	<0.5	<250	9.5	83	29	<0.5	<50	11.82	29	0
M07A	86	<0.3	<100	4.08	86	29	<2.5	<25	7.11	29	0
M07B	55	<0.1	<25	2.49	55	28	<5	<25	5.22	28	0
M26A	91	<0.1	<1	0.23	91	36	<0.5	<0.5	0.25	36	0
M30B	87	<0.1	<5	0.42	87	31	<0.5	<10	1.63	31	0
M33B	86	<0.1	<1	0.25	86	32	<0.5	<5	0.47	32	0
M35B	85	<0.1	<2.5	0.27	85	32	<0.5	<5	0.7	32	0
M36A	91	<0.1	<5	0.31	91	31	<0.5	<5	0.76	31	0
M37A	90	<0.1	<5	0.39	90	32	<0.5	<10	1.03	32	0
M38A	83	<0.3	<25	1.09	65	29	<2.5	<25	3.49	29	0
M39A	87	<0.1	<10	0.68	87	29	<0.5	<12.5	3.55	29	0
M49A	81	<0.3	<25	1.12	81	29	<0.5	<10	1.88	29	0
M51B	76	<0.3	<1	0.24	76	36	<0.5	<2.5	0.32	36	0
M52B*	34	<0.3	<0.5	0.18	34	14	<0.5	<0.5	0.25	14	0
M53B	68	<0.3	<10	1.14	68	30	<0.5	<5	1.07	30	0
M56B	79	<0.3	<1	0.25	79	30	<0.5	<5	0.33	30	0
M58B	70	<0.3	<2.5	0.29	70	29	<0.5	<5	0.57	29	0
M59B*	31	<0.3	<0.5	0.17	31	18	<0.5	<0.5	0.25	18	0
M60B	68	<0.3	<5	0.32	68	35	<0.5	<5	0.7	35	0
M62B	65	<0.3	<2.5	0.27	65	32	<0.5	<0.5	0.25	32	0
M63B	54	<0.5	<12.5	1.27	54	31	<0.5	<25	4.55	31	0
M64B	60	<0.3	<1	0.28	60	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.3	<1	0.28	54	28	<0.5	<2.5	0.37	28	0
M67B	55	<0.3	<2.5	0.27	55	31	<0.5	<1	0.26	31	0
M69B	55	<0.3	<25	3.6	26	29	<0.5	<10	1.37	29	0
M70B	55	<0.3	<5	0.61	55	30	<0.5	<5	1.11	30	0
M71B	44	<0.3	<5	0.44	44	29	<0.5	<10	0.81	29	0
M72B	43	<0.3	<5	0.42	43	31	<0.5	<25	1.04	31	0
P410	84	<0.5	<50	2.19	80	29	<0.5	<25	5.28	29	0
P411	54	<0.3	<50	3.77	54	31	<5	<50	10.89	31	0
PV03	90	<0.1	<50	2	90	31	<1	<50	8.24	31	0
SW08*	11	<0.5	<5	0.86	11	12	<0.5	<2.5	0.98	12	0
SW09*	14	<0.5	<2.5	0.71	14	16	<0.5	<2.5	0.91	16	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-33

Vinyl Chloride

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	83	<5	6600	781.97	9	30	172	568	371.33	0	0
M06B	83	34	6000	955.86	1	29	2.9	399	248.55	0	0
M07A	86	<0.5	2800	279.24	20	29	<2.5	56.1	14.21	19	0
M07B	55	<0.3	<200	6.44	46	28	<5	<25	5.22	28	0
M26A	104	<0.3	<20	0.37	104	36	<0.5	<0.5	0.25	36	0
M30B	87	<0.3	<20	0.58	87	31	<0.5	<10	1.63	31	0
M33B	86	<0.3	<20	0.4	86	32	<0.5	<5	0.47	32	0
M35B	85	<0.3	<20	0.44	85	32	<0.5	<5	0.7	32	0
M36A	91	<0.3	<5	0.35	91	31	<0.5	<5	0.76	31	0
M37A	90	<0.3	<20	1.37	33	32	<0.5	<10	1.04	31	0
M38A	83	<0.3	<25	4.67	24	29	<2.5	<25	3.49	29	0
M39A	87	<0.3	<20	0.91	87	29	<0.5	<12.5	3.55	29	0
M49A	81	<0.3	110	31.85	16	29	4.9	22.6	12.36	1	0
M51B	76	<0.3	<20	0.53	76	36	<0.5	<2.5	0.31	36	0
M52B*	34	<0.5	<1	0.32	34	14	<0.5	<0.5	0.25	14	0
M53B	68	<0.5	<100	2.99	50	30	<0.5	<5	1.07	30	0
M56B	79	<0.3	<20	0.39	79	30	<0.5	<5	0.33	30	0
M58B	70	<0.3	<20	0.45	70	29	<0.5	<5	0.57	29	0
M59B*	31	<0.5	<1	0.3	31	18	<0.5	<0.5	0.25	18	0
M60B	68	<0.3	<5	0.35	68	35	<0.5	<5	0.7	35	0
M62B	65	<0.3	<20	0.45	65	32	<0.5	<0.5	0.25	32	0
M63B	54	<1	16	5.67	12	31	1.7	<25	4.71	28	0
M64B	60	<0.3	<1	0.25	60	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.3	<1	0.24	54	28	<0.5	<2.5	0.36	28	0
M67B	55	<0.3	<5	0.29	55	31	<0.5	<0.5	0.25	31	0
M69B	55	1.2	31	11.26	12	29	<0.5	<10	1.53	23	0
M70B	55	<0.5	7	3.34	9	30	2	5.3	3.1	3	0
M71B	44	<0.3	<20	0.86	44	29	<0.5	<10	0.8	29	0
M72B	43	<0.3	<5	0.39	43	31	<0.5	<25	1.04	31	0
P410	84	39	330	93.77	1	29	15	122	86.13	0	0
P411	54	<0.5	<200	11.21	23	31	<5	<50	10.89	31	0
PV03	90	<0.3	<100	3.47	58	31	1.5	<50	8.27	30	0
SW08*	11	<0.5	<5	0.84	11	12	<0.5	<2.5	0.96	12	0
SW09*	14	<0.5	<2.5	0.7	14	16	<0.5	<2.5	0.88	16	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-34

m+p-Xylenes

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	60	<2	<125	12.47	60	30	<10	<100	21.08	30	0
M06B	60	1	<250	14.96	58	29	<1	<100	23.64	29	0
M07A	64	<0.5	<100	6.39	64	29	<5	<50	14.22	29	0
M07B	40	<0.5	<50	5.6	40	28	<10	<50	10.45	28	0
M26A	69	<0.5	<1	0.35	69	36	<1	<1	0.5	36	0
M30B	68	<0.5	<10	0.81	68	31	<1	<20	3.26	31	0
M33B	66	<0.5	<2	0.36	66	32	<1	<10	0.95	32	0
M35B	65	<0.5	<5	0.43	63	32	<1	<10	1.39	32	0
M36A	71	<0.5	<10	0.52	71	31	<1	<10	1.52	31	0
M37A	70	<0.5	<10	0.7	70	32	<1	<20	2.06	32	0
M38A	64	<0.5	<50	2.09	64	29	<5	<50	6.98	29	0
M39A	65	0.7	<20	1.53	59	29	<1	<25	7.1	29	0
M49A	61	<0.5	<50	2.31	59	29	<1	<20	3.74	29	0
M51B	68	<0.5	<2	0.37	67	36	<1	<5	0.61	36	0
M52B*	25	<0.5	<1	0.26	25	14	<1	<1	0.5	14	0
M53B	62	<1	50.2	15.84	10	30	<1	<10	3.22	19	0
M56B	70	<0.5	<1	0.36	70	30	<1	<10	0.65	30	0
M58B	64	<0.5	<5	0.44	64	29	<1	<10	1.14	29	0
M59B*	23	<0.5	<0.5	0.25	23	18	<1	<1	0.5	18	0
M60B	60	<0.5	<10	0.55	59	35	<1	<10	1.47	34	0
M62B	58	<0.5	<5	0.44	56	32	<1	<1	0.5	32	0
M63B	54	<0.5	<25	2.02	54	31	<1	<50	9.08	31	0
M64B	60	<0.5	5	0.7	51	31	<1	<1	0.5	31	0
M66B	54	<0.5	<1	0.39	54	28	<1	<5	0.71	28	0
M67B	55	<0.5	<5	0.44	54	31	<1	<1	0.5	31	0
M69B	55	<0.5	<50	2.4	55	29	<1	<20	2.74	29	0
M70B	55	<0.5	<10	1.09	55	30	<1	<10	2.22	30	0
M71B	44	<0.5	<10	0.74	44	29	<1	<20	1.6	29	0
M72B	43	<0.5	<10	0.69	43	31	<1	<50	2.08	31	0
P410	61	<1	<50	4.05	61	29	<1	<50	10.55	29	0
P411	38	<0.5	<100	9.51	38	31	<10	<100	21.77	31	0
PV03	65	<0.5	<100	4.92	64	31	<1	<100	16.47	31	0
SW08*	11	<0.5	<10	1.66	11	12	<1	<5	1.92	12	0
SW09*	14	<0.5	<5	1.38	14	16	<1	<5	1.75	16	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

TABLE B-35

o-Xylene

Palos Verdes Landfill
Los Angeles County, California

Well No.	First Five-Year Review Period (01/01/1987 to 12/31/2006)					Second Five-Year Review Period (01/01/2007 to 12/31/2013)					Criterion %
	No. Analyzed	Min	Max	Average	No. ND	No. Analyzed	Min	Max	Average	No. ND	
M06A	60	<2	<125	9.76	60	30	<5	<50	10.54	30	0
M06B	60	<0.5	<250	12.59	59	29	<0.5	<50	11.82	29	0
M07A	64	<0.5	<100	4.93	64	29	<2.5	<25	7.11	29	0
M07B	40	<0.5	<25	3.28	40	28	<5	<25	5.22	28	0
M26A	69	<0.5	<1	0.29	69	36	<0.5	<0.5	0.25	36	0
M30B	68	<0.5	<5	0.52	68	31	<0.5	<10	1.63	31	0
M33B	66	<0.5	<1	0.3	66	32	<0.5	<5	0.47	32	0
M35B	65	<0.5	<2.5	0.33	65	32	<0.5	<5	0.7	32	0
M36A	71	<0.5	<5	0.38	71	31	<0.5	<5	0.76	31	0
M37A	70	<0.5	<5	0.48	70	32	<0.5	<10	1.03	32	0
M38A	64	<0.5	<25	1.21	64	29	<2.5	<25	3.49	29	0
M39A	65	<0.5	<10	0.95	65	29	<0.5	<12.5	3.55	29	0
M49A	62	<0.5	<25	1.45	62	29	<0.5	<10	1.88	29	0
M51B	68	<0.5	<1	0.3	68	36	<0.5	<2.5	0.32	36	0
M52B*	25	<0.5	<0.5	0.25	25	14	<0.5	<0.5	0.25	14	0
M53B	62	<0.5	24.2	7.16	13	30	<0.5	8.2	3.24	11	0
M56B	70	<0.5	<1	0.31	70	30	<0.5	<5	0.33	30	0
M58B	64	<0.5	<2.5	0.34	64	29	<0.5	<5	0.57	29	0
M59B*	23	<0.5	<0.5	0.25	23	18	<0.5	<0.5	0.25	18	0
M60B	60	<0.5	<5	0.39	60	35	<0.5	<5	0.7	35	0
M62B	58	<0.5	<2.5	0.34	57	32	<0.5	<0.5	0.25	32	0
M63B	54	<0.5	<12.5	1.41	54	31	<0.5	<25	4.55	31	0
M64B	60	<0.5	2	0.42	53	31	<0.5	<0.5	0.25	31	0
M66B	54	<0.5	<1	0.32	54	28	<0.5	<2.5	0.37	28	0
M67B	55	<0.5	<5	0.35	55	31	<0.5	<1	0.26	31	0
M69B	55	<0.3	<25	1.53	55	29	<0.5	<10	1.37	29	0
M70B	55	<0.5	<5	0.66	55	30	<0.5	<5	1.11	30	0
M71B	44	<0.5	<5	0.48	44	29	<0.5	<10	0.81	29	0
M72B	43	<0.5	<5	0.46	43	31	<0.5	<25	1.04	31	0
P410	61	<1	<50	2.99	61	29	<0.5	<25	5.28	29	0
P411	38	<0.5	<50	5.33	38	31	<5	<50	10.89	31	0
PV03	66	<0.5	<50	2.76	65	31	<1	<50	8.24	31	0
SW08*	11	<0.5	<5	0.86	11	12	<0.5	<2.5	0.98	12	0
SW09*	14	<0.5	<2.5	0.71	14	16	<0.5	<2.5	0.91	16	0

Concentrations in micrograms per liter. Averages calculated using 1/2 detection limit for NDs.
Min - minimum; Max - maximum; ND - non-detect; " < " - less than; na - not applicable, insufficient data.
Criterion % - percentage of recent concentrations exceeding maximum historic concentration or maximum historic detection limit.
*Groundwater wells SW08 and SW09 were decomissioned in second quarter 2010 and wells M52B and M59B were added to the groundwater sampling program in third quarter 2010.

APPENDIX C
FIVE-YEAR REVIEW SUMMARY FORM

Five-Year Review Summary Form

SITE IDENTIFICATION

Site name *(from WasteLAN)*: **Palos Verdes Landfill**

EPA ID *(from WasteLAN)*: **N/A**

Region: N/A	**State: CA**	**City/County: Rolling Hills Estates, Los Angeles County**

SITE STATUS

NPL status: ☐ Final ☐ Deleted ☑ Other (specify)

Remediation status (choose all that apply): ☐ Under Construction ☑ Operating ☑ Complete

Multiple OUs?* ☐ YES ☑ NO	**Construction completion date:** December 1996

Has site been put into reuse? ☑ YES ☐ NO

REVIEW STATUS

Lead agency: ☐ EPA ☑ State ☐ Tribe ☐ Other Federal Agency California Environmental Protection Agency, Department of Toxic Substances Control (DTSC)

Author name: Kristen M. Ruffell

Author title: Division Engineer	**Author affiliation:** LA County Sanitation Districts

Review period:** 1 / 1 / 2007 to 12 / 31 / 2013

Date(s) of site inspection: 9 / 22 / 2014

Type of review:

☐ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only
☑ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead
☐ Regional Discretion

Review number: ☐ 1 (first) ☑ 2 (second) ☐ 3 (third) ☐ Other (specify) _____

Triggering action:

☐Actual RA Onsite Construction at OU #____ ☐ Actual RA Start at OU#____
☐ Construction Completion ☑ Previous Five-Year Review Report
☑ Other (specify) O&M Agreement between DTSC and the Los Angeles County Sanitation Districts

Triggering action date *(from WasteLAN)*: November 2009

Due date *(five years after triggering action date)*: November 2014

* ["OU" refers to operable unit.]
** [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

Five-Year Review Summary Form, cont'd.

Issues:

See Section 6 of the second Five-Year Review report for the detailed assessment of remedial/control systems for groundwater, surface air, subsurface gas, storm water, and industrial wastewater. During the second Five-Year Review, the environmental control systems at the Palos Verdes Landfill are found to be effective and protective of the surrounding community and the environment.

Recommendations and Follow-up Actions:

Groundwater

Assessment of groundwater monitoring data indicate that concentrations of the site's constituents of concern have remained stable, undetected, or decreased during the second Five-Year Review period except for chlorobenzene at one downgradient well (M70B) along Crenshaw Boulevard, which was detected at levels significantly below the MCL of 70 µg/L between 2 µg/L and 8.1 µg/L. Aside from chlorobenzene, virtually all of the constituents of concerns (VOCs and 1,4-dioxane) evaluated remain undetected or have decreased significantly since the Remedial Investigation. Overall, the data indicate that the remedial systems are functioning as intended in mitigating downgradient groundwater impacts from the site. In addition, the groundwater directly downgradient of the site is not in a designated groundwater basin and its future use as a drinking water supply is unlikely due to limited aquifer thickness and naturally poor water quality. Nevertheless, the Sanitation Districts will continue to optimize operation and maintenance of the groundwater containment systems at the site to ensure ongoing control and containment of the groundwater plumes.

Landfill Gas (Surface Air and Subsurface Gas)

Results of ambient air and integrated surface gas monitoring indicate that air quality measured above the surface of the landfill during the second Five-Year period is better than air quality quantified during the first Five-Year review period. Also, analytical results from routine monitoring indicate that subsurface landfill gas is not migrating from the Palos Verdes Landfill into adjacent properties. The potential for landfill gas emissions and migration continue to be minimized as landfill gas production declines. As a result, continued operation, maintenance, and monitoring of the landfill gas systems are recommended.

Storm Water and Industrial Wastewater

Assessments of the sampling data reported during the second Five-Year Review period indicate that the site is in full compliance with the National Pollutant Discharge Elimination System General Permit for storm water and the Industrial Wastewater Discharge Permits for industrial wastewater and therefore, no follow-up actions are recommended.

Protectiveness Statement(s):

Long-term protectiveness of the remedial action has been verified by the assessment of routine monitoring data for groundwater, surface air, and subsurface gas. The second Five-Year Review assessment found that:

- The remedy is functioning as intended.
- The remedial action objectives used at the time of remedy selection are still valid.
- No other information has come to light that calls into question the protectiveness of the remedy.

Other Comments:

None.