SCS ENGINEERS

Report

Hidden Valley Landfill
Annual Report for 2016

Presented to:

Pierce County Recycling, Composting & Disposal, LLC dba LRI
17925 Meridian Street East
Puyallup, Washington 98375

Presented by:

SCS ENGINEERS
2405 140th Ave NE, Ste. 107
Bellevue, Washington 98005
(425) 746-4600

March 28, 2017
File No. 04217003.03

Offices Nationwide
www.scsengineers.com

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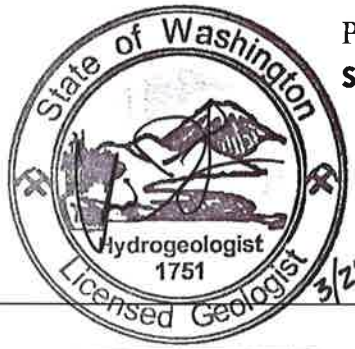

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Appendices

1.0 INTRODUCTION

This document represents the 2016 Annual Monitoring Report for the Hidden Valley Landfill (HVL) prepared on behalf of Pierce County Recycling, Composting and Disposal LLC, dba LRI (LRI). The facility is a closed municipal solid waste landfill that stopped accepting waste on December 31, 1998. The Hidden Valley Landfill is located at 17925 Meridian Street East, Puyallup, Washington (Figure 1). Post-closure activities are performed consistent with Consent Decree No. 032146876 between the Washington Department of Ecology (Ecology), Pierce County (County) and LRI. Ecology is the lead agency for post-closure activities. In addition, the Tacoma-Pierce County Health Department (TPCHD) is kept informed of post-closure activities and provided with the opportunity to review and comment upon proposed remedial action plans.

1.1 FACILITY CONTACT INFORMATION

Hidden Valley Landfill
17925 Meridian Street East
Puyallup, Washington 98375
Facility Contact: Greg Burrington (253) 377-2957

1.2 FACILITY DESCRIPTION

The landfill property is approximately 92 acres in size and is located in the north half of the northwest quarter of Section 34, Township 19N, Range 4E. The landfill includes approximately 56 acres of unlined closed fill and a closed 30-acre lined cell. Also present at the site are a leachate pre-treatment facility, a transfer station, and a recycling center.

Hidden Valley Landfill began operations in the mid-1960s and accepted waste until December 31, 1998. Waste disposed of at the landfill included municipal solid waste, demolition wastes, commercial waste, industrial wastes, and small quantities of bulk liquids and sludge.

1.3 PROJECT HISTORY

The U.S. Environmental Protection Agency (EPA) conducted an environmental assessment of the Hidden Valley Landfill between 1981 and 1985 and prepared a Preliminary Assessment (PA) and a Hazard Ranking System (HRS) score of the site. As a result of the HRS, Hidden Valley Landfill was placed on the National Priority List (NPL) in April 1989.

A Remedial Investigation (RI) was conducted under Ecology Consent Order DE 86 S173. The final RI report was submitted to Ecology in March 1992. The RI found groundwater impacts downgradient of the landfill. Groundwater contaminants have included dissolved iron and manganese, chloride, ammonia, nitrate, sulfate, specific conductance, total dissolved solids, and low levels of volatile organic compounds (VOCs) including benzene, chlorobenzene, tetrachloroethene, 1,1-dichloroethane, and 1,4-dichlorobenzene.

In January 2004, Consent Decree No. 032146876 was finalized and signed. The Consent Decree and associated Cleanup Action Plan address long-term maintenance and monitoring activities at

the landfill and establish groundwater cleanup levels. In April 2014, the Consent Decree was amended (First Amendment) to revise the groundwater monitoring plan (see Section 1.4).

1.4 2016 MONITORING ACTIVITIES

Groundwater monitoring was performed in January, April, July and October during 2016. Leachate monitoring was conducted in January. Landfill gas monitoring was performed monthly.

The Hidden Valley Landfill Groundwater Monitoring Plan (GWMP) was revised on August 8, 2014 to include WAC 173-351 Appendix I total and dissolved metals testing from 23 monitoring wells for a period of eight monitoring events. This testing began with the Third Quarter (July) monitoring event of 2014 and was completed with the Second Quarter (April) monitoring event of 2016. Consistent with the GWMP, Appendix I total-metals testing was continued and dissolved-metals testing was dropped from the monitoring program beginning with the Third Quarter 2016 monitoring event.

Monitoring results for the first three quarters of 2016 were previously submitted to the TPCHD and Ecology in quarterly reports. This report includes groundwater summary tables for all four quarters. The Fourth Quarter 2016 groundwater laboratory reports and the updated groundwater database were provided to the TPCHD in separate submittals. Groundwater data from 2016 were uploaded into Ecology's Environmental Information Management (EIM) system database.

SOURCE: KLEINFELDER

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PROJECT NO. 04216002.03	DES BY LEL	SITE LOCATION MAP	DATE MARCH 2016
SCALE NOT TO SCALE	CHK BY S.P.	HIDDEN VALLEY LANDFILL PIERCE COUNTY, WASHINGTON	FIGURE 1
CAD FILE FIGURE 1	APP BY KGL		

2.0 LANDFILL GAS MONITORING

Landfill gas probes were monitored monthly during 2016. Gas probe locations are shown on Figure 2. Parameters measured at the gas probes included carbon dioxide, oxygen, and combustible gas (measured as methane). Soil gas probe readings were less than 5 percent methane by volume in all probes each month in 2016, except for GP-13A during the May monitoring event which reported a concentration of 9.7 %. Monthly gas probe monitoring results are included in Appendix A.

Gas monitoring of building interiors was performed on February 19, May 24, August 23, and November 17, 2016. The main office, maintenance building, scale house/pay booth, leachate treatment buildings No. 1 and No. 2, recycling building, and transfer station were monitored. No detectable concentrations of combustible gas were found in any of these structures. Copies of the building survey reports are included in Appendix A.

A portion of the gas extraction system on the south slope of the landfill (affected gas wells include N42, N43, N60, N61, N62, and N54) was shut off in September 2009 in response to a suspected area of subsurface oxidation. Although the suspected subsurface oxidation event has ceased and the affected landfill cover was repaired in 2014, this section of the gas extraction system will remain off-line until in-situ methane levels as measured by probes LFG-1, -2, and -3, increase and stabilize (see trend charts in Appendix A).

E 52,500 E 53,000 E 53,500 E 54,000 E 54,500

N 26,000

N 25,500

N 25,000

SR-161 (MEDIDIAN STREET)

GP-22 LOCATED IN RIFLE RANGE

MAINTENANCE BUILDING

OFFICE BUILDING

FLARE STATION

FLARE NO.1

FLARE NO.2

GP-1 GP-2 GP-3 GP-4 GP-5 GP-6 GP-7 GP-8 GP-9 GP-10 GP-11 GP-12 GP-13 GP-14 GP-15 GP-16 GP-17 GP-18 GP-19

CS-1 CS-2 CS-3 CS-4 CS-5 CS-6 CS-7 CS-8 CS-9 CS-10

N1 N2 N3 N4 N5 N6 N7 N8 N9 N10 N11 N12 N13 N14 N15 N16 N17 N18 N19 N19A N20 N21 N23 N24 N25 N26 N27 N28 N29 N30 N31 N32 N33 N34 N35 N36 N36A N37 N37A N38 N39 N41 N42 N43 N44 N45 N46 N47 N48 N49 N50 N51 N52 N53 N54 N55 N55A N56 N57 N58 N59 N60 N60A N61 N62 N63 N64 N64A N64B,C N65 N66 N67 N68 N69 N70 N71 N72 N73 N75

E-32 E-36 E-37 E-40 E2 E2A E3A E5 E6B E7 E8A E9 E10 E11 E12 E13 E14 E15 E16 E17 E18 E19 E20 E21 E22 E23 E24 E25 E25A E26 E27 E28 E29 E31 E33 E34 E34A E38 E39 E41 E42 E43

H1 H2

12"ø SCH 40 PVC

12"x10" REDUCER

12"ø TEE

10"x8" REDUCER

8"x6" REDUCER

10"x6" REDUCER

10"ø SCH 40 PVC

3"ø SCH 40 PVC LATERAL (TYP.)

LEACHATE COLLECTION PIPE CLEANOUT

CONDENSATE DISPOSAL TRENCH

VERTICAL EXTRACTION WELLS AND HORIZONTAL COLLECTORS UNDER EAST LINED AREA SIDESLOPE LINER

LIMIT OF REFUSE

RECYCLING CENTER

LEACHATE PRETREATMENT FACILITY

GAS TO ENERGY FACILITY

TRANSFER STATION

PROPERTY LINE

UNDERGROUND AIR SUPPLY & CONDENSATE DISCHARGE PIPE

LFG-1 LFG-2 LFG-3

LEGEND:

- GP-1 Gas Probe
- Vertical Extraction Well Buried Under Liner
- Vertical Extraction Well
- CO Leachate Cleanout Riser
- Condensate Sump
- Control Valve
- Reducer
- Condensate Recirculation Lines
- Header Pipes
- 12"ø Header Pipe
- 10"ø PVC
- 8"ø PVC
- 6"ø PVC
- 4"ø PVC
- Underground Header Pipe

N

0 200

Scale in Feet

NOTE: GAS PIPING SHOWN IN RED IS ROUTED TO THE GAS ENERGY FACILITY

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PROJECT NO. 04216002.03	DES BY KGL	GAS SYSTEM HIDDEN VALLEY LANDFILL PIERCE COUNTY, WASHINGTON	DATE MARCH 2016
SCALE AS SHOWN	CHK BY S.P.		FIGURE 2
CAD FILE FIGURE 2	APP BY KGL		

3.0 LEAK DETECTION MONITORING

3.1 LEAK DETECTION SYSTEM

The East Lined Area at the Hidden Valley Landfill includes a leak detection system between the primary geosynthetic liner and the secondary composite liner in the portion of the cell that was constructed over refuse (side slope liner area). Pursuant to Section II C of the Stipulation and Agreed Order of Dismissal (Order), LRI was required to implement the March 1994 Leak Detection Response Action Plan (RAP) once refuse was placed onto the side slope liner. The RAP provides a mechanism for evaluating the performance of the side slope liner. Major components of the plan include routine monitoring of leachate quantities and fluid in the leak detection system, data analysis, record keeping, delineation of acceptable liner performance levels, response actions, and an outline of how groundwater impacts would be evaluated in the event that excessive leakage is observed in the leak detection system.

3.2 LINER PERFORMANCE STANDARD

The RAP defines an acceptable performance standard of 300 gallons per acre per day for the primary side-slope liner in the Cell 2 East Lined Area. The side slope liner covers approximately 13.5 acres of refuse, and therefore, the corresponding liner performance standard is 4,050 gallons per day.

3.3 SUMMARY OF PERFORMANCE DATA

Leachate volumes pumped from the main sump and side-slope liner sump, as well as volumes pumped from the side-slope leak detection system and rainfall totals from an on-site rain gauge are recorded on a daily basis by on-site personnel. A summary of monthly leachate treatment system data is provided in Table 1, and copies of the monthly reports are included in Appendix B. In 2016, the volume of fluid pumped from the side-slope liner leak detection system was approximately 4,834 gallons for the entire year, and therefore, well below the performance standard of 4,050 gallons per day defined in the RAP.

3.4 SUMMARY OF LEAK DETECTION MONITORING DATA

A sample of fluids in the side-slope liner leak detection system was collected on January 15, 2016 (see data summary table in Appendix D).

Table 1. 2016 Leachate Volumes and Side Slope Liner Performance Data

2016 Leachate Volumes & Side Slope Liner Performance Data Hidden Valley Landfill, Pierce County, Washington				
Month	Cell 1 Monthly Leachate Volume (gallons)	Cell 2 Monthly Leachate Volume (gallons)	Cell 2 Monthly Leakage Flow (gallons)	Monthly Rainfall (inches)
January	13,599	8,388	951	7.68
February	18,607	4,432	0	3.92
March	8,553	1,928	0	5.03
April	15,951	2,434	201	2.01
May	28,338	3,249	452	0.88
June	29,538	2,955	0	1.98
July	4,993	5,032	0	0.90
August	4,364	3,481	1,210	0.20
September	5,216	0	0	1.38
October	11,015	0	2,020	9.93
November	15,746	4,830	0	6.43
December	119	6,574	0	3.37
Totals	**156,039**	**43,303**	**4,834**	**43.7**

3.5 HYDRAULIC GRADIENT CONTROL SYSTEM MONITORING

In addition to the leak detection system, a hydraulic gradient control system is present beneath the main leachate collection sump for the East Lined Area. This system is routinely checked for the presence of liquid. Each quarter in which liquid is removed, the volume pumped is recorded and a representative sample is collected and tested for leachate constituents (see TPCHD correspondence letter dated April 21, 2003). The hydraulic gradient control system beneath the main leachate collection sump did not accumulate a significant volume of fluids or require pumping during 2016. However, a small volume of fluid was present during the January sampling event and a sample was collected on January 12, 2016 (see data summary table in Appendix D).

4.0 GROUNDWATER LEVELS AND FLOW DIRECTIONS

4.1 LOCAL HYDROGEOLOGY

Hidden Valley Landfill is located within a Vashon age glacial melt-water channel that trends in an east-west direction and is approximately 50 to 100 feet deep and several hundred feet wide. The northern boundary of the channel lies just north of the landfill. The landfill is underlain by glacial outwash deposits consisting of coarse sand and gravel to a depth of about 55 feet below grade. North of the landfill (and the outwash channel), the outwash deposits are overlain by Vashon till (upper till unit). The outwash deposits are underlain by successive layers of Vashon till (lower till unit), Vashon advance outwash, Salmon Springs till and interglacial deposits, and Salmon Springs advance outwash.

Three aquifers underlie the Hidden Valley Landfill. The aquifers are referred to as the shallow perched aquifer, the upper regional aquifer, and the lower regional aquifer. An intermittent aquitard, referred to as the Vashon till aquitard, is present between the shallow perched aquifer and the upper regional aquifer. A thick section of low permeability deposits referred to as the Salmon Springs aquitard separates the upper regional aquifer and the lower regional aquifer.

The shallow perched aquifer is an unconfined (water table) aquifer that occurs within the Vashon recessional outwash deposit. The shallow perched aquifer is the uppermost-saturated unit at the site. Depth to groundwater at the landfill ranges from about 11 to 15 feet below ground surface (bgs) in winter and spring months to about 25 feet bgs in late fall. Groundwater flow in the shallow perched aquifer at the site is towards the northwest with local components to the north and west. The down gradient extent of the shallow perched aquifer appears to be limited. Northwest of the landfill, the recessional outwash is either not saturated, or saturated to only a few feet. In areas where the recessional outwash is unsaturated, the uppermost zone of groundwater saturation occurs within the lower Vashon till unit.

The upper regional aquifer is present within Vashon advance outwash deposits. This aquifer is confined beneath the Vashon till aquitard and appears to be of regional extent. Groundwater flow, water level gradients, and seasonal water level fluctuations in the upper regional aquifer are similar to the shallow perched aquifer.

The lower regional aquifer is present within the Salmon Springs advance outwash deposits. The aquifer is confined and is interpreted to be of regional extent. Monitoring wells BC-4D, MW-14R, and MW-20R are completed at similar depth elevations and display similar water levels. Monitoring well MW-26R is completed approximately 80 feet higher in elevation and may be installed within a water-bearing zone in the Salmon Springs aquitard.

Detailed descriptions of the hydrogeologic units, as well as geologic cross-sections and boring logs/monitoring well details are included in the Hidden Valley Landfill Remedial Investigation Report (EMCON, 1991) and Hidden Valley Landfill Hydrogeologic Report Addendum (EMCON, 1998).

4.2 WATER LEVEL MEASUREMENTS

Static water levels were measured on January 14, April 21, July 7, and October 13, 2016. The water level database and water level contour maps are presented in Appendix C.

Groundwater flow within both the shallow perched aquifer and the upper regional aquifer was generally toward the northwest during all the 2016 monitoring events. Horizontal hydraulic gradients for both the shallow perched aquifer and the upper regional aquifer were less than 0.005 ft/ft in the central part of the site and approximately 0.025 ft/ft northwest of the landfill. This flow pattern remains consistent with previous data reported for the site. Water level gradients were similar to previous measurements, indicating that the previously reported flow rates of 3.2 ft/day to 6.5 ft/day for the shallow perched aquifer and 0.5 to 1.3 ft/day for the upper regional aquifer have not changed significantly. Water level data for wells MW-14R, MW-20R, and BC-4D indicate that the groundwater flow direction in the lower regional aquifer is towards the northeast.

Background monitoring well MW-10S has a blockage approximately 5 feet down in the well. The blockage appears to be due to a compression fitting that was used to repair the pump tubing. The fitting prevents advancement of the water level probe beyond that point. An attempt to remove the pump and tubing was made during the Second Quarter 2013 sampling event; however, this attempt was unsuccessful and the pump appears to be wedged at depth. Rather than risk pulling the tubing loose from the pump, or possibly damaging the well screen, the pump will remain in place until it needs to be repaired or replaced. Until that time, there is adequate water level elevation data to determine groundwater flow directions and gradients without a measurement from MW-10S.

5.0 GROUNDWATER QUALITY

During 2016, groundwater samples were collected on a quarterly basis from 23 monitoring wells, except during the fourth quarter (October) monitoring event when well MW-28S was not sampled due to insufficient water. Groundwater sampling locations are shown on Figure 3.

Copies of groundwater quality summary data tables for each quarter are provided in Appendix D. The summary tables include field parameters, laboratory parameters, and quality control samples. Time series plots for selected water quality parameters are included in Appendix E. Trilinear diagrams for each aquifer and leachate data are included in Appendix F. Statistical calculations performed on groundwater data are presented in Appendix G. The groundwater database was provided to the TPCHD as a Microsoft Access file in electronic format (on compact disk). In addition, groundwater data generated from the Hidden Valley Landfill during 2016 were validated and input into Ecology's EIM database system.

As noted in Section 1.4, the Hidden Valley Landfill GWMP was revised in August of 2016 to include WAC 173-351 Appendix I total and dissolved metals testing and the complete list of Appendix II parameters for eight sampling events. This program began with the Third Quarter 2014 monitoring event and concluded with the second quarter (April) monitoring event in 2016. For each of the eight monitoring events, groundwater samples were collected from a network of 23 monitoring wells, unless insufficient water was present. The results of the eight rounds of total and dissolved metals testing were submitted to Ecology in a summary report on December 2, 2016. A copy of the report is included here as Appendix H.

5.1 WATER SUPPLY WELL DATA

Water quality samples were collected from two water supply wells, designated as Corliss and Paul Bunyan (see Figure 4) in January, April, July and October 2016. Water quality results for the two water supply wells in 2016 were generally typical of previous results. VOCs were not detected in samples collected from the water supply wells during 2016. Low concentrations of total metals and inorganic parameters, including chloride, sulfate, ammonia and nitrate indicate the water quality at the Corliss and Paul Bunyan water supply wells is not affected by the Hidden Valley Landfill. A summary of the laboratory test results for the water supply wells is provided in Table 2.

5.2 BACKGROUND WATER QUALITY

Background water quality at the Hidden Valley Landfill is monitored using wells MW-l0S (shallow perched aquifer) and MW-10D (upper regional aquifer). These wells have been monitored on a quarterly basis since 1985.

In 2016, concentrations of inorganic parameters in samples from the background wells remained low and consistent with previous results. No detections of dissolved iron or manganese were reported above the laboratory method reporting limit in 2016. Barium was the only Appendix I metal detected in the background wells (see summary report in Appendix H).

5.3 DOWNGRADIENT WATER QUALITY

Phased closure of the unlined portion of the landfill, which began in 1989 and was completed in 1993, included capping the waste with a low permeability composite cover and installing a landfill gas collection and control system (GCCS). Closure actions were designed to minimize the infiltration of precipitation through the refuse and remove landfill gas. These actions have improved the groundwater quality in the shallow perched aquifer and the upper regional aquifer.

Time series plots for specific conductance, ammonia, nitrate, dissolved iron, and dissolved manganese, were prepared for wells in the shallow perched and upper regional aquifers that are located close to and downgradient of the landfill (MW-11S, MW-11D(2), MW-13S, MW-13D, MW-14S, MW-14D, and MW-17S, see Appendix E). These plots graphically display consistent trends of decreasing concentrations of these parameters in monitoring wells located downgradient of the landfill.

A cation-anion balance was prepared based in milliequivalents per liter (meq/L) for each water sample to determine whether it was electro-neutral (balanced cation and anion charges). A threshold of ten percent difference was used if the total sum of cations and anions were less than or equal to 5.0 meq/L, and a threshold of five percent difference was used if the total cation-anion sums was greater than 5.0 meq/L. The cation-anion balance was greater than the appropriate threshold for several downgradient wells (see Appendix D).

Trilinear (Piper) diagrams were prepared for groundwater sample results from each of the three water bearing zones at the landfill; shallow perched aquifer, upper regional aquifer, and lower regional aquifer (see Appendix F). As shown on the attached trilinear diagrams, the groundwater sample results from all three aquifers plot within a consistent area of the graph, while the leachate results (sampled annually in January) plot in a second, chemically distinct area.

The Hidden Valley Landfill Consent Decree established site groundwater cleanup levels and the groundwater point of compliance. Table 3 provides a summary of the site-specific groundwater cleanup levels and identifies those wells where 2016 water quality results were greater than the site-specific cleanup levels.

Shallow perched aquifer water quality results exceeded the cleanup level for nitrate during the first quarter monitoring event at MW-11S, MW-17S, MW-18S, and FM-2 and the cleanup level for dissolved manganese on one or more occasions at MW-12S, MW-13S, MW-14S, MW-15S, MW-17S, MW-23S, and FMMW-2. Upper regional aquifer water quality results exceeded the cleanup level for dissolved iron during the third and fourth quarter monitoring events at MW-14D, and the cleanup level for dissolved manganese on more than one occasion at MW-14D and MW-15D. Lower regional aquifer water quality results exceeded the cleanup level for dissolved iron during each monitoring quarter at MW-26R, and the cleanup level for dissolved manganese during each quarter at MW-14R and MW-26R.

Results for the lower regional aquifer are interpreted to be background water quality. As discussed in previous reports, the presence of dissolved iron and manganese in the lower regional aquifer does not appear to be related to the Hidden Valley Landfill. This interpretation is based on an overall assessment of the groundwater quality data, which include low concentrations of inorganic parameters and an absence of VOCs.

The results of the eight rounds of Appendix I total and dissolved metals testing completed with the second quarter 2016 monitoring event were submitted to Ecology in a summary report on December 2, 2016 (see Appendix H).

The following VOC's were reported present in groundwater samples collected at the Hidden Valley Landfill in 2016:

- Tetrachloroethene (PCE) in samples from MW-11D(2) during each quarterly monitoring event at a concentration range of 0.82 to 0.96 µg/L. These results are consistent with recent monitoring results and are slightly greater than the WAC 173-200 groundwater quality criteria of 0.80 µg/L but lower than the primary drinking water standard of 5.0 µg/L.
- Chloroform in samples from MW-25S during the first and second quarter monitoring events at a concentration range of 0.69 to of 0.91 µg/L, which is below the WAC 173-200 groundwater quality criteria of 7.0 µg/L.
- 1,4-dichlorobenzene in the sample from MW-12S during the second quarter monitoring event at a concentration of 0.73 µg/L, which is below the site cleanup level of 1.82 µg/L.
- Methylene chloride in samples from MW-14D and MW-23S during the third quarter monitoring event and MW-15D during the fourth quarter monitoring event at a concentration range of 2.0 to 3.5 µg/L, which is below the WAC 173-200 groundwater quality criteria of 5.0 µg/L. Methylene chloride is a common laboratory contaminant and the reported detections may not be representative of groundwater quality.

5.4 STATISTICAL ANALYSES

Groundwater quality data for the five-year period of January 2012 through October 2016 were statistically evaluated for all monitoring wells in the groundwater-monitoring network. A compound specific evaluation was used to determine the data distribution type for each compound as normal, lognormal, or non-parametric. The Consent Decree established a cleanup level for 1,4-dichlorobenzene at 1.82 micrograms per liter (µg/L). No other VOCs have Consent Decree defined cleanup levels for the Hidden Valley Landfill. However, the distributions of data are also determined for chlorobenzene and tetrachloroethene for tracking purposes. If the distribution was either normal or lognormal, the upper 95 percent confidence limits of the mean (UCL 95) were calculated for each data set using MTCAStat, version 3.0 obtained from Ecology. The MTCAStat program was used to evaluate data distributions (i.e., normal, lognormal, or neither) for constituents that were detected in at least 50 percent of the sampling events.

One-half the MRL was used when a parameter was not detected at a concentration above the MRL. If the distribution was neither normal nor lognormal, the UCL 95 was determined using the method of Van der Parren (1970) as described in the Statistical Guidance for Ecology Site Managers (Ecology 1992). For the data evaluated, this procedure defaults to the highest reported value. In addition, the highest reported value was used if either lognormal or normal distributions had the UCL 95 value outside of the data sample range. The UCL 95 was not calculated (NC) when any of the evaluated parameters were either not detected for 50 percent of the sampling events, or had less than five data entries.

Table 4 provides a summary of UCL 95 values. Shallow perched aquifer UCL 95 values that exceed cleanup levels include nitrate (MW-11S, MW-12S, MW-17S, MW-18Sand FMMW-2), dissolved iron (MW-23S) and dissolved manganese (MW-12S, MW-13S, MW-14S, MW-15S, MW-17S, MW-23S,

and FMMW-2). Upper regional aquifer UCL 95 values that exceed cleanup levels include dissolved iron (MW-14D) and dissolved manganese (MW-14D and MW-15D). Lower regional aquifer UCL 95 values that exceed cleanup levels include dissolved iron (MW-26R) and dissolved manganese (MW-14R and MW-26R). Statistical calculations are provided in Appendix G.

Table 2. 2016 Water Supply Well Data Summary

Parameters	MRL	Corliss				Paul Bunyan			
		January-15	April-23	July-31	October-19	January-15	April-23	July-31	October-19
Volatile Organics (µg/L)									
No Detections	0.50	*	*	*	*	*	*	*	*
Total Metals (mg/L)									
Arsenic	0.005	*	*	*	*	*	*	*	*
Iron	0.030	0.046	0.110	0.097	*	0.440	*	01601	0.051
Manganese	0.001	0.008	0.014	0.002	0.003	0.020	*	0.002	*
Zinc	0.010	0.060	0.020	0.030	0.030	0.040	0.030	*	0.02
Inorganic Parameters (mg/L)									
Chloride	0.20	5.6	5.9	5.8	5.7	5.1	5.6	5.7	5.9
Ammonia as Nitrogen	0.10	*	*	*	*	*	*	*	*
Nitrate as Nitrogen	0.20	1.3	1.2	1.6	1.5	1.7	2.0	2.4	2.5
Nitrite as Nitrogen	0.50	*	*	*	*	*	*	*	*
Sulfate	0.25	9.2	10	10	10	9.4	10	10	10
Chemical Oxygen Demand	5.0	*	*	*	9.5	*	*	7.9	8.9
Total Organic Carbon	1.0	*	*	*	*	*	*	*	*
Color	5.0	5	*	*	*	5	*	5	*
Field Parameters									
pH		6.97	6.64	6.67	6.44	7.04	6.85	6.19	6.08
Conductance (µS)		243	237	224	224	269	279	275	283
Temperature (°C)		9.9	20.0	18.5	13.7	10.8	18.3	15.9	11.7

Notes:

Analyses performed by TestAmerica, Arvada, Colorado

VOCs; concentrations in all samples were less than the method reporting limit

µg/L = micrograms per liter

mg/L = milligrams per liter

* = not reported at or above the MRL

Table 3. 2016 Groundwater Quality Data versus Site-Specific Cleanup Levels

Shallow Perched Aquifer

Parameter	Cleanup Level	MW-10S (BG)	MW-11S	MW-12S	MW-13S	MW-14S	MW-15S	MW-17S	MW-18S	MW-23S	MW-25S	MW-28S	FMMW-1	FMMW-2
Inorganics (mg/L)														
Chloride	250	—	—	—	—	—	—	—	—	—	—	—	—	—
Sulfate	250	—	—	—	—	—	—	—	—	—	—	—	—	—
Nitrate	10	—	Q1	—	—	—	—	Q1	Q1	—	—	—	—	Q1
Specific Conductance	700	—	—	—	—	—	—	—	—	—	—	—	—	—
TDS	500	—	—	—	—	—	—	—	—	—	—	—	—	—
Metals (mg/L)														
Iron	0.30	—	—	—	—	—	—	—	—	—	—	—	—	—
Manganese	0.05	—	—	Q2,3,4	Q3,4	Q1,2,4	Q1,2,3,4	Q1,2,3,4	—	Q2	—	—	—	Q2,4
VOCs (µg/L)														
1,4-Dichlorobenzene	1.8	—	—	—	—	—	—	—	—	—	—	—	—	—

Upper Regional Aquifer **Lower Regional Aquifer**

Parameter	Cleanup Level	MW-10D (BG)	MW-11D (2)	MW-12D	MW-13D	MW-14D	MW-15D	MW-18D	MW-14R	MW-20R	MW-26R
Inorganics (mg/L)											
Chloride	250	—	—	—	—	—	—	—	—	—	—
Sulfate	250	—	—	—	—	—	—	—	—	—	—
Nitrate	10	—	—	—	—	—	—	—	—	—	—
Specific Conductance	700	—	—	—	—	—	—	—	—	—	—
TDS	500	—	—	—	—	—	—	—	—	—	—
Metals (mg/L)											
Iron	0.30	—	—	—	—	Q3,4	—	—	—	—	Q1,2,3,4
Manganese	0.05	—	—	—	—	Q1,2,3,4	Q1,3	—	Q1,2,3,4	—	Q1,2,3,4
VOCs (g/L)											
1,4-Dichlorobenzene	1.8	—	—	—	—	—	—	—	—	—	—

Notes:
— indicates results were less than cleanup level
Q indicates results were greater than cleanup level
1, 2, 3, 4 indicate quarter in which results were greater than cleanup level

Table 4. Summary of 5-Year Groundwater Statistics

Shallow Perched Aquifer

Parameter	Cleanup Level	MW-10S (BG)	MW-11S	MW-12S	MW-13S	MW-14S	MW-15S	MW-17S	MW-18S	MW-23S	MW-25S	MW-28S	FMMW-1	FMMW-2
Inorganics (mg/L)														
Chloride	250	8.4	16.6	20.0	16.3	11.6	16.6	20.0	18.4	12.0*	11.0*	15.4*	17.3	18.1
Sulfate	250	10.7	16.3	6.4	17.6	9.1	11.0	6.6	6.9	16.7*	7.3	17.2*	17.0*	12.0
Nitrate	10	1.0	**11.0***	**43.0***	4.4	1.1	NC	**23.0***	**11.0***	1.1	2.7*	3.4*	2.0	**14.6**
Specific Conductance	700	190	256	384	326	192	266	441	351	233	263*	233*	294	381
TDS	500	117	**1100***	350*	211	120	160	350	226	150	200*	135	240	253
Metals (mg/L)														
Iron	0.30	NC	NC	NC	NC	NC	NC	NC	NC	**0.36**	NC	NC	NC	NC
Manganese	0.05	NC	0.011	**0.610**	**0.168**	**0.667**	**0.862**	**1.180***	NC	**0.057***	NC	NC	NC	**0.087**
VOCs (µg/L)														
1,4-Dichlorobenzene	1.8	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Tetrachloroethene	—	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Chlorobenzene	—	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Upper Regional Aquifer **Lower Regional Aquifer**

Parameter	Cleanup Level	MW-10D (BG)	MW-11D (2)	MW-12D	MW-13D	MW-14D	MW-15D	MW-18D	MW-14R	MW-20R	MW-26R
Inorganics (mg/L)											
Chloride	250	7.1	6.2	13.0*	14.1	12.1	10.9	9.0	2.2*	2.0*	4.7*
Sulfate	250	10.2	7.4	6.3	16.3	11.2	10.0*	6.3	3.9*	3.1	10.0*
Nitrate	10	1.5	1.9*	1.6*	6.0*	NC	0.7	1.7*	NC	NC	NC
Specific Conductance	700	198	329*	308	379*	209	318*	275	128*	102*	197*
TDS	500	132	260*	230*	217	133	186	180	97	200*	140*
Metals (mg/L)											
Iron	0.30	NC	NC	NC	NC	**2.36**	NC	NC	NC	NC	**0.70**
Manganese	0.05	NC	NC	NC	NC	**1.30***	**0.300***	NC	**0.200***	NC	**1.00***
VOCs (g/L)											
1,4-Dichlorobenzene	1.8	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Tetrachloroethene	—	NC	1.10*	NC	NC	NC	NC	NC	NC	NC	NC
Chlorobenzene	—	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Notes:
Values shown are the upper confidence limit on the mean (UCL 95). Evaluated data are from January 2012 through October 2016.
(—) = not applicable. Bold indicates greater than Cleanup Level. (NC) = not calculated; less than 50 percent detection frequency.
(*) = maximum detected concentration listed because the UCL 95 calculated value was greater than the data range or the distribution was neither normal nor lognormal.

LEGEND:

MW-11(S) Monitoring Well Location

MW-25(S)
MW-25(D)

BC-4(R)
BC-4(S)

MW-27(S)
MW-27(D)

FMMW-2

FMMW-1

MW-18(S)
MW-18(D)

MW-11(D2)

MW-11(S)
MW-11(D)

176TH STREET

MAINTENANCE BUILDING

OFFICE BUILDING

MW-17(S)

MW-15(S)
MW-15(D)

MW-14(S)
MW-14(D)
MW-14(R)

STORMWATER BASIN AREA

MW-26(R)

MW-12(S)
MW-12(D)

MERIDIAN AVENUE

MW-28(S)

LIMIT OF REFUSE

MW-13(S)
MW-13(D)

LANDFILL

MW-10(S)
MW-10(D)

MW-23(S)
MW-23(D)

0 300 600

SCALE: 1" = 300'

CONTOUR INTERVAL = 5 FEET

RECYCLE CENTER

MW-19(S)
MW-19(D)

PROPERTY BOUNDARY

MW-20(R)

SCS ENGINEERS
Environmental Consultants and Contractors
2405 140th Avenue NE, Suite 107
Bellevue, Washington 98005
(425) 746-4600 FAX: (425) 746-6747

PROJECT NO. 04216002.03	DES BY KGL	GROUNDWATER MONITORING WELL LOCATIONS HIDDEN VALLEY LANDFILL PIERCE COUNTY, WASHINGTON	DATE MARCH 2016
SCALE AS SHOWN	CHK BY S.P.		FIGURE 3
CAD FILE FIGURE 3	APP BY KGL		

0 400 800

APPROX SCALE IN FEET

LEGEND

WATER SUPPLY WELL LOCATION

SOURCE: KLEINFELDER

SCS ENGINEERS
Environmental Consultants and Contractors
2405 140th Avenue NE, Suite 107
Bellevue, Washington 98005
(425) 746-4600 FAX: (425) 746-6747

PROJECT NO.	DES BY
04216002.03	LEL
SCALE	CHK BY
NOT TO SCALE	S.P.
CAD FILE	APP BY
FIGURE 4	KGL

WATER SUPPLY WELL LOCATION

HIDDEN VALLEY LANDFILL
PIERCE COUNTY, WASHINGTON

DATE
MARCH 2016

FIGURE
4

6.0 LEACHATE QUALITY

Leachate quality is monitored on an annual basis. A sample of untreated leachate was obtained from the East Lined Area leachate collection system (main sump) on January 12, 2016. The sample was analyzed for the parameters specified in WAC 173-351, Appendix IV. Leachate quality for 2016 was typical of previous results. A summary of the analytical results for the leachate sample is provided in Table 5, and included with the groundwater results in Appendix D.

Table 5. 2016 Leachate Data Summary

Parameter	Method Reporting Limit (MRL)	Leachate Main Sump
Volatile Organics (µg/L)		
1,4-Dichlorobenzene	0.50	1.8
2-Butanone (MEK)	6.0	7.8
Acetone	10.0	46
Benzene	0.50	1.2
Carbon Disulfide	0.50	0.56
Ethylbenzene	1.0	1.6
m-Xylene & p-Xylene	0.50	2.8
o-Xylene	0.50	1.3
Toluene	0.50	1.9
Total Metals (mg/L)		
Antimony	0.002	0.007
Arsenic	0.005	0.051
Barium	0.005	0.480
Calcium	0.20	87
Chromium	0.005	0.130
Cobalt	0.010	0.012
Copper	0.010	0.260
Iron	0.058	10
Lead	0.002	0.013
Magnesium	0.10	54
Manganese	0.005	1.90
Nickel	0.02	0.360
Potassium	2.0	260
Selenium	0.005	*
Sodium	1.0	2,900
Vanadium	0.010	0.10
Zinc	0.010	0.230
Inorganic Parameters (mg/L)		
Bicarbonate Alkalinity as CaCO3	5.0	4,500
Ammonia	2.2	360
Chloride	40	2,000
Nitrate as N	0.50	1.5
Sulfate	1.0	49
Total Dissolved Solids	47	8,200
Total Organic Carbon	3.1	590
Field Parameters		
pH		7.61
Specific Conductance (µS/cm)		13,530
Temperature (°C)		15.62

Notes:
Analyses performed by TestAmerica, Arvada, CO
VOCs were not listed when not present at concentrations exceeding the MRL
µg/L = micrograms per liter, mg/L = milligrams per liter, ND=Not detected above MRL

7.0 POST-CLOSURE MAINTENANCE

7.1 COVER SYSTEM MAINTENANCE

The landfill cover system was inspected on a quarterly basis in 2016. Cover inspections were also performed on an ongoing basis by LRI staff, as well as during monthly and quarterly monitoring events. The inspections found minor areas requiring maintenance of the cover system during 2016. Copies of the inspection reports are included in Appendix I.

7.2 LANDFILL GAS COLLECTION & CONTROL SYSTEM (GCCS) MAINTENANCE

The landfill gas extraction wells, piping and blower/flare station were inspected, monitored and maintained on a monthly basis during 2016. In addition, the landfill gas condensate recirculation system was inspected on a quarterly basis in 2016 and the condensate sumps were working as designed. During the fourth quarter inspection, the ground was frozen and covered with snow, which prevented a visual inspection of the sumps. Sumps 5 and 10 did not collect condensate for a number of years, and therefore, the pumps were previously removed. Monthly records of GCCS maintenance activities and quarterly records of condensate sump inspections are included in Appendix J.

A record of the monthly volume of landfill gas combusted and the average monthly methane concentration at the flare station is provided in Table 6.

Table 6. 2016 Flare Station Data

2016 Flare Station Data Hidden Valley Landfill, Pierce County, Washington		
Month	LFG Volume Combusted (scf)	Methane (% by volume)
January	65,030,813	36.8
February	58,737,927	38.4
March	65,839,017	38.3
April	69,823,252	29.5
May	60,906,686	32.6
June	56,859,479	37.1
July	62,112,623	40.8
August	66,024,874	41.9
September	52,300,625	39.2
October	55,541,970	41.2
November	51,264,676	41.8
December	64,907,843	16.6
Totals	**729,349,785**	**37.7 (average)**
Note: (scf) indicates standard cubic feet		

7.3 GROUNDWATER WELL MAINTENANCE

No significant well maintenance activities were necessary in 2016.

Appendix A

LANDFILL GAS MONITORING DATA

Landfill Gas Probe Monitoring

SCS Engineers

Hidden Valley Landfill

04216002.02

PCRCD dba LRI

January 12, 2016

Location Reference Designation	Date	Time	Pressure (in. H_2O)	CH_4 (% vol.)	CO_2 (% vol.)	O_2 (% vol.)	Comments: Spike CH4 *Note 1* (% vol.)	Comments: Spike CO2 *Note 1* (% vol.)	Comments: Other
Gas Probes									
GP-1A	12-Jan-16	7:22	0.09	0.0	6.5	0.6	-	-	
GP-1B	12-Jan-16	7:25	0.09	0.0	11.9	7.5	-	-	
GP-1C	12-Jan-16	7:28	0.04	0.0	2.6	18.6	-	-	
GP-2A	12-Jan-16	7:35	0.10	0.0	16.5	0.5	-	-	
GP-2B	12-Jan-16	7:39	0.03	0.0	0.2	21.6	-	-	
GP-3S	12-Jan-16	7:43	0.19	0.0	3.6	16.4	-	-	
GP-3M	12-Jan-16	7:46	0.06	0.0	3.2	9.7	-	-	
GP-3D	12-Jan-16	7:49	0.07	0.0	8.7	4.2	-	-	
GP-4A	12-Jan-16	7:56	-0.01	0.0	2.1	20.1	-	-	
GP-4B	12-Jan-16	7:59	0.00	0.0	0.2	21.9	-	-	
GP-5A	12-Jan-16	8:03	0.00	0.0	0.2	21.9	-	-	
GP-5B	12-Jan-16	8:06	0.00	0.0	0.7	20.4	-	-	
GP-6	12-Jan-16	8:14	0.00	0.0	0.2	21.9	-	-	
GP-7S	12-Jan-16	8:20	0.00	0.0	0.2	22.0	-	-	
GP-7D	12-Jan-16	8:23	-0.01	0.0	0.4	21.8	-	-	
GP-8A	12-Jan-16	8:33	0.01	0.0	0.4	21.8	-	-	
GP-8B	12-Jan-16	8:35	0.00	0.0	0.2	21.8	-	-	
GP-9	12-Jan-16	8:41	0.00	0.0	2.4	16.8	-	-	
GP-10	12-Jan-16	8:46	0.00	0.0	0.1	22.0	-	-	
GP-11	12-Jan-16	8:51	0.00	0.0	2.0	20.2	-	-	
GP-12	12-Jan-16	8:57	0.00	0.0	3.3	14.5	-	-	
GP-13A	12-Jan-16	9:05	0.01	4.8	8.8	3.9	4.9	-	
GP-13B	12-Jan-16	9:08	0.01	0.0	0.2	22.1	-	-	
GP-14S	12-Jan-16	9:14	0.00	0.0	9.9	14.3	-	-	
GP-14D	12-Jan-16	9:18	0.14	0.0	14.3	1.4	-	-	
GP-15A	12-Jan-16	9:37	0.00	0.0	5.1	7.9	-	-	
GP-15B	12-Jan-16	9:40	0.06	0.9	12.0	0.0	1.0	-	
GP-16A	12-Jan-16	9:46	0.00	0.0	0.7	21.3	-	-	
GP-16B	12-Jan-16	9:49	0.00	0.0	0.2	21.8	-	-	
GP-17	12-Jan-16	9:53	0.00	0.0	0.2	21.8	-	-	
GP-18	12-Jan-16	9:59	0.00	0.0	2.0	20.8	-	-	
GP-19	12-Jan-16	10:04	0.01	0.0	4.2	18.5	-	-	
LFG-1	12-Jan-16	9:21	0.13	0.1	13.3	3.7	-	-	
LFG-2	12-Jan-16	9:24	0.00	0.0	10.0	7.2	-	-	
LFG-3	12-Jan-16	9:27	0.07	7.9	16.6	3.6	-	-	

General Data

		Weather Conditions	
Monitored by:	S. Adlington	Sky Cover:	Cloudy
Instruments:	GEM 2000	Wind / Rain / Snow:	Rain
Calibration Date:	12-Jan-16	Temperature (°F):	45

Notes

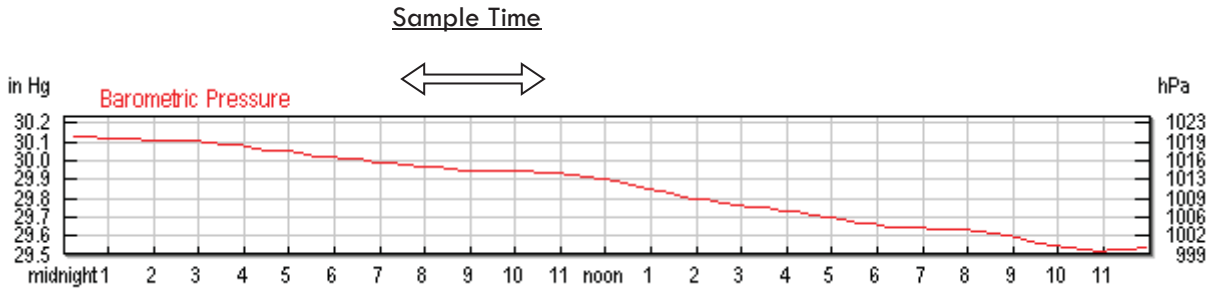
1. Measurement for spike concentrations of CH_4 and CO_2 are recorded if observed during sampling

GP = Gas Probe	CH_4 = Methane	S = shallow	A= shallow
NM = Not measured	CO_2 = Carbon Dioxide	M = medium	B = medium
equipment malfunction	O_2 = Oxygen	D = deep	C = deep

Barometric Pressure Trend – January 2016
Hidden Valley Landfill, Pierce County, Washington

Barometric Pressure Trend for January 2016

Barometric Pressure Trend for January 12, 2016



Source : KPLU
http://www.wunderground.com/history/airport/KPLU/2015/12/10/DailyHistory.html?req_city=Puyallup&req_state=WA&reqdb.zip=98371&reqdb.magic=1&reqdb.wmo=99999

Landfill Gas Probe Monitoring

SCS Engineers

Hidden Valley Landfill
PCRCD dba LRI

04216002.02
February 18, 2016

Location Reference Designation	Date	Time	Pressure (in. H_2O)	CH_4 (% vol.)	CO_2 (% vol.)	O_2 (% vol.)	Comments: Spike CH4 *Note 1* (% vol.)	Comments: Spike CO2 *Note 1* (% vol.)	Comments: Other
Gas Probes									
GP-1A	18-Feb-16	7:43	0.00	0.0	6.4	0.0	-	-	
GP-1B	18-Feb-16	7:46	0.26	0.0	11.0	8.3	-	-	
GP-1C	18-Feb-16	7:50	-0.02	0.0	2.8	16.9	-	-	
GP-2A	18-Feb-16	7:56	-0.03	0.2	16.2	0.0	-	-	
GP-2B	18-Feb-16	8:00	0.02	0.0	0.3	19.6	-	-	
GP-3S	18-Feb-16	8:12	-0.04	0.3	11.4	0.1	-	-	
GP-3M	18-Feb-16	8:08	-0.03	0.0	3.2	8.3	-	-	
GP-3D	18-Feb-16	8:05	-0.01	0.0	3.5	13.8	-	-	
GP-4A	18-Feb-16	8:18	-0.03	0.0	0.4	19.4	-	-	
GP-4B	18-Feb-16	8:21	0.06	0.0	0.5	19.0	-	-	
GP-5A	18-Feb-16	8:26	-0.04	0.0	0.1	19.4	-	-	
GP-5B	18-Feb-16	8:30	-0.03	0.0	0.1	19.5	-	-	
GP-6	18-Feb-16	8:35	-0.03	0.0	0.2	19.0	-	-	
GP-7S	18-Feb-16	8:44	0.03	0.0	0.3	19.1	-	-	
GP-7D	18-Feb-16	8:41	-0.01	0.0	0.4	19.0	-	-	
GP-8A	18-Feb-16	8:56	0.00	0.0	0.9	18.4	-	-	
GP-8B	18-Feb-16	9:00	0.01	0.0	0.7	18.6	-	-	
GP-9	18-Feb-16	9:06	0.00	0.0	2.2	15.6	-	-	
GP-10	18-Feb-16	9:12	0.00	0.0	0.2	19.2	-	-	
GP-11	18-Feb-16	9:19	0.00	0.0	1.1	16.6	-	-	
GP-12	18-Feb-16	9:25	0.00	0.0	4.8	5.0	-	-	
GP-13A	18-Feb-16	9:30	0.02	0.0	1.3	18.0	4.9	-	
GP-13B	18-Feb-16	9:33	0.02	0.0	0.2	19.2	-	-	
GP-14S	18-Feb-16	9:43	0.00	0.0	14.3	0.2	-	-	
GP-14D	18-Feb-16	9:38	-0.05	0.0	8.2	11.4	-	-	
GP-15A	18-Feb-16	10:04	0.01	0.0	8.0	1.2	-	-	
GP-15B	18-Feb-16	10:07	-0.02	0.4	11.8	0.0	-	-	
GP-16A	18-Feb-16	10:14	0.03	0.0	1.4	17.2	-	-	
GP-16B	18-Feb-16	10:16	0.08	0.0	1.1	17.6	-	-	
GP-17	18-Feb-16	10:23	0.01	0.0	0.1	19.4	-	-	
GP-18	18-Feb-16	10:28	-0.18	0.0	0.7	19.0	-	-	
GP-19	18-Feb-16	10:33	-0.08	0.0	0.1	19.5	-	-	
LFG-1	18-Feb-16	9:49	0.02	0.5	12.5	1.8	-	-	
LFG-2	18-Feb-16	9:53	-0.39	0.0	13.1	0.7	-	-	
LFG-3	18-Feb-16	9:58	0.18	16.7	21.6	0.0	-	-	

General Data

		Weather Conditions	
Monitored by:	S. Adlington	Sky Cover:	Overcast
Instruments:	GEM 2000	Wind / Rain / Snow:	None
Calibration Date:	18-Feb-16	Temperature (°F):	46

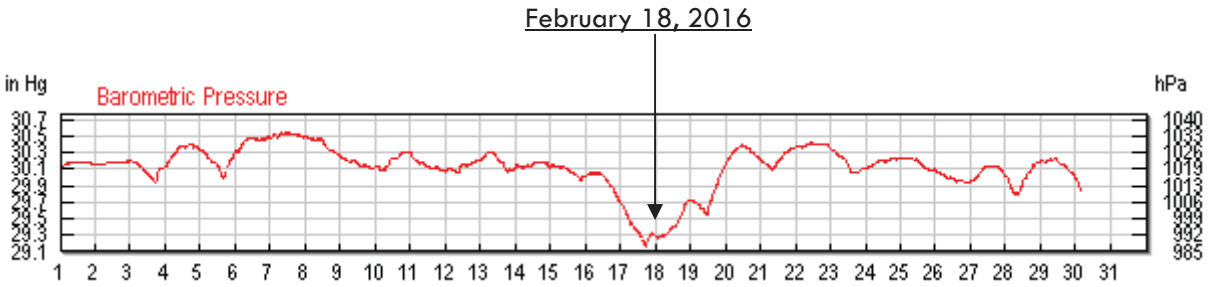
Notes

1. Measurement for spike concentrations of CH_4 and CO_2 are recorded if observed during sampling

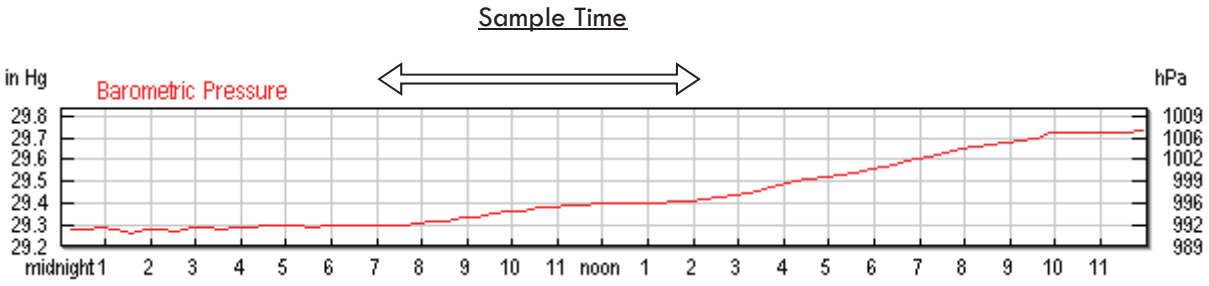
GP = Gas Probe	CH_4 = Methane	S = shallow	A= shallow
NM = Not measured	CO_2 = Carbon Dioxide	M = medium	B = medium
equipment malfunction	O_2 = Oxygen	D = deep	C = deep

Barometric Pressure Trend – February 2016
Hidden Valley Landfill, Pierce County, Washington

Barometric Pressure Trend for February 2016



Barometric Pressure Trend for February 18, 2016



Source : KPLU
http://www.wunderground.com/history/airport/KPLU/2015/12/10/DailyHistory.html?req_city=Puyallup&req_state=WA&reqdb.zip=98371&reqdb.magic=1&reqdb.wmo=99999

Landfill Gas Probe Monitoring

SCS Engineers

Hidden Valley Landfill

04216002.02

PCRCD dba LRI

March 8, 2016

Location Reference Designation	Date	Time	Pressure (in. H_2O)	CH_4 (% vol.)	CO_2 (% vol.)	O_2 (% vol.)	Comments: Spike CH4 *Note 1* (% vol.)	Comments: Spike CO2 *Note 1* (% vol.)	Comments: Other
Gas Probes									
GP-1A	8-Mar-16	8:16	0.15	0.0	5.9	0.2	-	-	
GP-1B	8-Mar-16	8:19	0.00	0.0	10.7	10.1	-	-	
GP-1C	8-Mar-16	8:22	0.00	0.0	1.7	19.4	-	-	
GP-2A	8-Mar-16	8:56	0.01	0.0	0.7	20.2	-	-	
GP-2B	8-Mar-16	8:59	-0.02	0.0	0.2	20.9	-	-	
GP-3S	8-Mar-16	9:10	0.00	0.0	8.4	6.6	-	-	
GP-3M	8-Mar-16	9:07	0.00	0.0	2.9	10.1	-	-	
GP-3D	8-Mar-16	9:04	0.00	0.0	3.6	15.8	-	-	
GP-4A	8-Mar-16	9:17	0.00	0.0	1.4	20.4	-	-	
GP-4B	8-Mar-16	9:20	0.00	0.0	0.3	20.9	-	-	
GP-5A	8-Mar-16	9:26	-10.65	0.0	0.1	21.2	-	-	
GP-5B	8-Mar-16	9:29	0.00	0.0	0.1	21.1	-	-	
GP-6	8-Mar-16	9:35	0.00	0.0	0.1	21.1	-	-	
GP-7S	8-Mar-16	9:43	0.00	0.0	0.3	21.0	-	-	
GP-7D	8-Mar-16	9:40	0.00	0.0	0.7	20.7	-	-	
GP-8A	8-Mar-16	9:51	-0.01	0.0	0.8	20.5	-	-	
GP-8B	8-Mar-16	9:56	0.00	0.0	0.2	21.0	-	-	
GP-9	8-Mar-16	10:01	-0.01	0.0	1.8	17.9	-	-	
GP-10	8-Mar-16	10:07	0.00	0.0	0.1	20.9	-	-	
GP-11	8-Mar-16	10:12	-0.01	0.0	1.3	19.7	-	-	
GP-12	8-Mar-16	10:24	0.00	0.0	1.0	18.2	-	-	
GP-13A	8-Mar-16	8:34	0.00	0.0	5.5	15.0	-	-	
GP-13B	8-Mar-16	8:38	0.01	0.0	0.3	20.9	-	-	
GP-14S	8-Mar-16	10:34	0.01	0.0	13.5	2.3	-	-	
GP-14D	8-Mar-16	10:31	0.01	0.0	8.3	13.2	-	-	
GP-15A	8-Mar-16	10:55	0.00	0.0	5.0	13.4	-	-	
GP-15B	8-Mar-16	10:57	0.00	0.0	11.3	1.0	-	-	
GP-16A	8-Mar-16	11:04	0.05	0.0	0.4	20.4	-	-	
GP-16B	8-Mar-16	11:07	0.01	0.0	0.3	20.7	-	-	
GP-17	8-Mar-16	11:16	0.00	0.0	0.1	20.9	-	-	
GP-18	8-Mar-16	11:21	0.01	0.0	0.0	21.0	-	-	
GP-19	8-Mar-16	11:26	0.04	0.0	3.0	18.1	-	-	
LFG-1	8-Mar-16	10:38	0.00	0.1	10.8	5.5	-	-	
LFG-2	8-Mar-16	10:43	0.00	0.0	10.0	6.7	-	-	
LFG-3	8-Mar-16	10:47	0.00	11.1	18.8	1.1	-	-	

General Data

		Weather Conditions	
Monitored by:	S. Palachuk	Sky Cover:	Overcast
Instruments:	GEM 2000	Wind / Rain / Snow:	None
Calibration Date:	8-Mar-16	Temperature (°F):	42

Notes

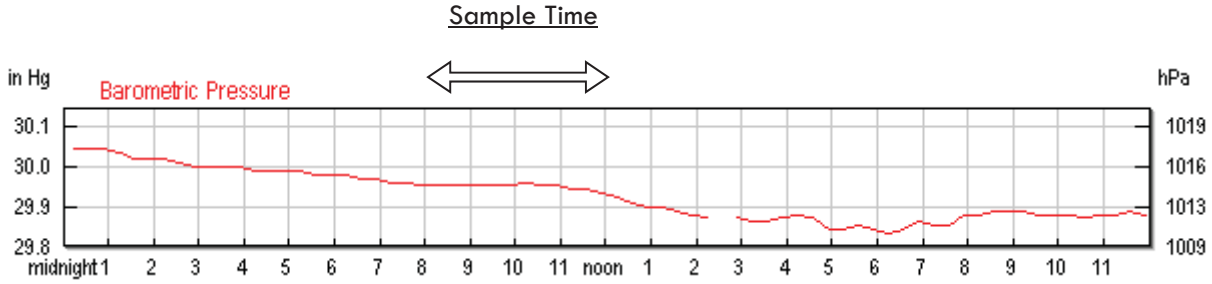
1. Measurement for spike concentrations of CH_4 and CO_2 are recorded if observed during sampling

GP = Gas Probe	CH_4 = Methane	S = shallow	A= shallow
NM = Not measured	CO_2 = Carbon Dioxide	M = medium	B = medium
equipment malfunction	O_2 = Oxygen	D = deep	C = deep

Barometric Pressure Trend – March 2016
Hidden Valley Landfill, Pierce County, Washington

Barometric Pressure Trend for March 2016

Barometric Pressure Trend for March 8, 2016



Source : KPLU
http://www.wunderground.com/history/airport/KPLU/2015/12/10/DailyHistory.html?req_city=Puyallup&req_state=WA&reqdb.zip=98371&reqdb.magic=1&reqdb.wmo=99999

Landfill Gas Probe Monitoring

SCS Engineers

Hidden Valley Landfill

04216002.02

PCRCD dba LRI

April 7, 2016

Location Reference Designation	Date	Time	Pressure (in. H_2O)	CH_4 (% vol.)	CO_2 (% vol.)	O_2 (% vol.)	Comments: Spike CH4 *Note 1* (% vol.)	Comments: Spike CO2 *Note 1* (% vol.)	Comments: Other
Gas Probes									
GP-1A	7-Apr-16	9:12	0.04	0.0	5.4	0.0	-	-	
GP-1B	7-Apr-16	9:16	0.02	0.0	9.8	11.1	-	-	
GP-1C	7-Apr-16	9:19	0.00	0.0	2.3	18.9	-	-	
GP-2A	7-Apr-16	9:44	-0.01	0.0	2.3	17.9	-	-	
GP-2B	7-Apr-16	9:47	0.00	0.0	0.2	21.0	-	-	
GP-3S	7-Apr-16	10:00	0.02	0.0	5.3	16.8	-	-	
GP-3M	7-Apr-16	9:55	0.03	0.0	2.7	9.9	-	-	
GP-3D	7-Apr-16	9:53	0.00	0.0	1.8	18.4	-	-	
GP-4A	7-Apr-16	10:09	-0.01	0.0	1.3	20.6	-	-	
GP-4B	7-Apr-16	10:12	0.00	0.0	0.2	21.1	-	-	
GP-5A	7-Apr-16	10:18	0.00	0.0	0.2	21.2	-	-	
GP-5B	7-Apr-16	10:21	0.00	0.0	0.0	21.3	-	-	
GP-6	7-Apr-16	10:48	0.00	0.0	0.2	21.2	-	-	
GP-7S	7-Apr-16	10:34	0.00	0.0	0.1	21.4	-	-	
GP-7D	7-Apr-16	10:31	0.01	0.0	0.4	20.9	-	-	
GP-8A	7-Apr-16	10:57	0.00	0.0	1.1	19.9	-	-	
GP-8B	7-Apr-16	11:00	0.01	0.0	0.4	19.9	-	-	
GP-9	7-Apr-16	11:06	0.00	0.0	1.4	18.3	-	-	
GP-10	7-Apr-16	11:11	0.00	0.0	0.1	20.9	-	-	
GP-11	7-Apr-16	11:15	0.01	0.0	0.8	20.1	-	-	
GP-12	7-Apr-16	11:20	0.02	0.0	0.2	19.6	-	-	
GP-13A	7-Apr-16	9:29	0.01	0.0	3.5	17.1	-	-	
GP-13B	7-Apr-16	9:32	0.04	0.0	0.1	21.2	-	-	
GP-14S	7-Apr-16	11:28	0.00	0.0	12.9	1.7	-	-	
GP-14D	7-Apr-16	11:25	0.00	0.0	5.7	15.2	-	-	
GP-15A	7-Apr-16	11:48	0.00	0.0	4.3	13.1	-	-	
GP-15B	7-Apr-16	11:51	0.00	0.0	9.2	3.6	-	-	
GP-16A	7-Apr-16	11:58	0.06	0.0	1.8	18.3	-	-	
GP-16B	7-Apr-16	12:01	0.01	0.0	1.3	19.3	-	-	
GP-17	7-Apr-16	12:08	0.01	0.0	0.2	21.4	-	-	
GP-18	7-Apr-16	12:12	0.01	0.0	0.0	21.6	-	-	
GP-19	7-Apr-16	12:16	0.02	0.0	2.5	19.5	-	-	
LFG-1	7-Apr-16	11:32	0.00	0.0	10.7	5.5	-	-	
LFG-2	7-Apr-16	11:38	0.00	0.0	11.2	4.7	-	-	
LFG-3	7-Apr-16	11:42	0.00	9.4	17.2	0.7	7.6	-	

General Data

		Weather Conditions	
Monitored by:	S. Palachuk	Sky Cover:	Overcast
Instruments:	GEM 2000	Wind / Rain / Snow:	None
Calibration Date:	7-Apr-16	Temperature (°F):	60

Notes

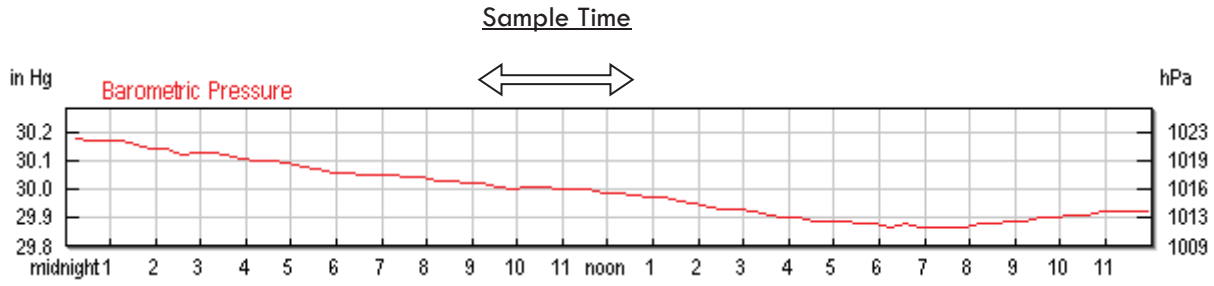
1. Measurement for spike concentrations of CH_4 and CO_2 are recorded if observed during sampling

GP = Gas Probe	CH_4 = Methane	S = shallow	A= shallow
NM = Not measured	CO_2 = Carbon Dioxide	M = medium	B = medium
equipment malfunction	O_2 = Oxygen	D = deep	C = deep

Barometric Pressure Trend – April 2016
Hidden Valley Landfill, Pierce County, Washington

Barometric Pressure Trend for April 2016

Barometric Pressure Trend for April 7, 2016



Source : KPLU
https://www.wunderground.com/history/airport/KPLU/2016/4/7/DailyHistory.html?req_city=Graham&req_state=WA&reqdb.zip=98338&reqdb.magic=1&reqdb.wmo=99999

Landfill Gas Probe Monitoring

SCS Engineers

Hidden Valley Landfill
PCRCD dba LRI

04216002.02
May 24, 2016

Location Reference Designation	Date	Time	Pressure (in. H_2O)	CH_4 (% vol.)	CO_2 (% vol.)	O_2 (% vol.)	Comments: Spike CH4 *Note 1* (% vol.)	Comments: Spike CO2 *Note 1* (% vol.)	Comments: Other
Gas Probes									
GP-1A	24-May-16	7:02	-0.02	0.0	5.4	0.0	-	-	
GP-1B	24-May-16	7:05	-0.03	0.0	8.9	12.4	-	-	
GP-1C	24-May-16	7:08	-0.02	0.0	2.9	17.9	-	-	
GP-2A	24-May-16	7:12	-0.02	0.0	1.5	18.7	-	-	
GP-2B	24-May-16	7:15	0.01	0.0	0.3	20.9	-	-	
GP-3S	24-May-16	7:19	-0.03	0.0	1.0	19.8	-	-	
GP-3M	24-May-16	7:22	-0.03	0.0	2.7	11.3	-	-	
GP-3D	24-May-16	7:25	-0.02	0.0	5.1	12.0	-	-	
GP-4A	24-May-16	7:31	0.00	0.0	0.3	20.8	-	-	
GP-4B	24-May-16	7:34	0.05	0.0	0.3	20.6	-	-	
GP-5A	24-May-16	7:38	0.00	0.0	0.5	20.4	-	-	
GP-5B	24-May-16	7:42	0.00	0.0	0.2	20.9	-	-	
GP-6	24-May-16	7:47	0.00	0.0	0.4	20.8	-	-	
GP-7S	24-May-16	7:52	0.00	0.0	0.7	20.5	-	-	
GP-7D	24-May-16	7:55	0.00	0.0	0.6	20.1	-	-	
GP-8A	24-May-16	8:04	0.00	0.0	2.5	18.7	-	-	
GP-8B	24-May-16	8:07	0.00	0.0	0.9	20.3	-	-	
GP-9	24-May-16	8:12	0.11	0.0	1.9	17.4	-	-	
GP-10	24-May-16	8:19	0.00	0.0	0.2	21.0	-	-	
GP-11	24-May-16	8:24	0.00	0.0	1.0	20.2	-	-	
GP-12	24-May-16	8:29	0.00	0.0	2.0	13.7	-	-	
GP-13A	24-May-16	8:38	0.00	9.7	11.6	0.4	10.0	-	
GP-13B	24-May-16	8:42	0.02	0.0	0.5	20.7	-	-	
GP-14S	24-May-16	8:47	0.08	0.0	6.9	15.2	-	-	
GP-14D	24-May-16	8:49	0.00	0.0	13.8	1.4	-	-	
GP-15A	24-May-16	9:05	0.00	0.0	4.5	13.5	-	-	
GP-15B	24-May-16	9:07	0.00	0.0	7.7	6.7	-	-	
GP-16A	24-May-16	9:13	0.00	0.0	0.6	20.7	-	-	
GP-16B	24-May-16	9:15	0.03	0.0	0.5	20.9	-	-	
GP-17	24-May-16	9:21	0.01	0.0	5.9	15.3	-	-	
GP-18	24-May-16	9:26	-0.01	0.0	6.9	12.9	-	-	
GP-19	24-May-16	9:31	0.00	0.0	0.1	21.3	-	-	
LFG-1	24-May-16	8:52	0.00	0.1	11.0	4.8	-	-	
LFG-2	24-May-16	8:56	0.00	0.4	11.9	4.2	-	-	
LFG-3	24-May-16	8:59	0.03	9.2	14.2	5.6	-	-	

General Data

		Weather Conditions	
Monitored by:	S. Adlington	Sky Cover:	Overcast
Instruments:	GEM 2000	Wind / Rain / Snow:	None
Calibration Date:	24-May-16	Temperature (°F):	56

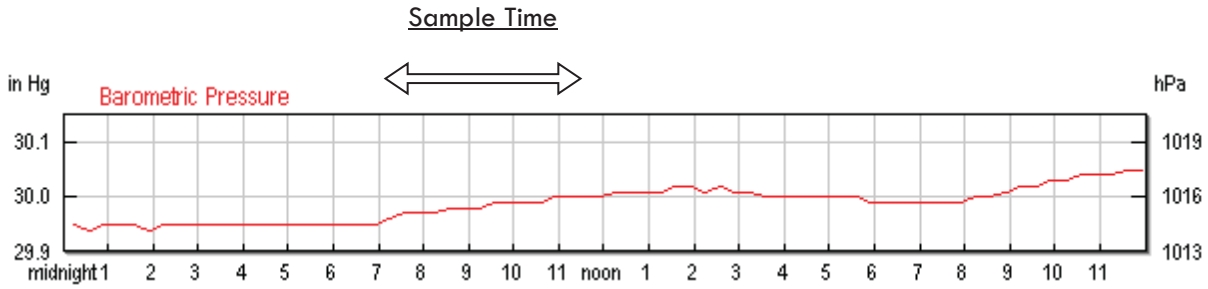
Notes
1. Measurement for spike concentrations of CH_4 and CO_2 are recorded if observed during sampling

GP = Gas Probe	CH_4 = Methane	S = shallow	A= shallow
NM = Not measured	CO_2 = Carbon Dioxide	M = medium	B = medium
equipment malfunction	O_2 = Oxygen	D = deep	C = deep

Barometric Pressure Trend – May 2016
Hidden Valley Landfill, Pierce County, Washington

Barometric Pressure Trend for May 2016

Barometric Pressure Trend for May 24, 2016



Source : KPLU
https://www.wunderground.com/history/airport/KPLU/2016/5/24/DailyHistory.html?req_city=Graham&req_state=WA&req_statename=&reqdb.zip=98338&reqdb.magic=1&reqdb.wmo=99999

Landfill Gas Probe Monitoring

SCS Engineers

Hidden Valley Landfill

04216002.02

PCRCD dba LRI

June 24, 2016

Location Reference Designation	Date	Time	Pressure (in. H_2O)	CH_4 (% vol.)	CO_2 (% vol.)	O_2 (% vol.)	Comments: Spike CH4 *Note 1* (% vol.)	Comments: Spike CO2 *Note 1* (% vol.)	Comments: Other
Gas Probes									
GP-1A	24-Jun-16	8:45	0.07	0.1	5.4	0.0	-	-	
GP-1B	24-Jun-16	8:49	-0.02	0.0	10.0	10.1	-	-	
GP-1C	24-Jun-16	8:51	0.00	0.0	2.3	18.9	-	-	
GP-2A	24-Jun-16	8:55	0.16	0.0	0.9	19.7	-	-	
GP-2B	24-Jun-16	8:58	0.03	0.0	0.3	21.1	-	-	
GP-3S	24-Jun-16	9:03	-0.02	0.0	1.1	19.9	-	-	
GP-3M	24-Jun-16	9:05	0.20	0.0	2.6	12.8	-	-	
GP-3D	24-Jun-16	9:08	-0.01	0.0	6.9	12.1	-	-	
GP-4A	24-Jun-16	9:13	0.00	0.0	0.1	21.3	-	-	
GP-4B	24-Jun-16	9:16	0.10	0.0	0.3	20.9	-	-	
GP-5A	24-Jun-16	9:21	0.00	0.0	0.4	21.0	-	-	
GP-5B	24-Jun-16	9:23	0.00	0.0	0.3	20.9	-	-	
GP-6	24-Jun-16	9:28	0.00	0.0	0.3	21.2	-	-	
GP-7S	24-Jun-16	9:33	0.07	0.0	0.7	20.5	-	-	
GP-7D	24-Jun-16	9:36	0.00	0.0	1.0	20.1	-	-	
GP-8A	24-Jun-16	9:44	0.02	0.0	2.9	13.3	-	-	
GP-8B	24-Jun-16	9:47	0.01	0.0	0.9	19.8	-	-	
GP-9	24-Jun-16	9:53	0.02	0.0	2.2	17.3	-	-	
GP-10	24-Jun-16	9:59	0.03	0.0	0.3	21.2	-	-	
GP-11	24-Jun-16	10:04	0.02	0.0	1.1	20.0	-	-	
GP-12	24-Jun-16	10:11	0.02	0.0	0.8	20.4	-	-	
GP-13A	24-Jun-16	10:18	0.40	2.4	14.2	0.0	2.5	-	
GP-13B	24-Jun-16	10:21	0.12	0.0	0.5	20.6	-	-	
GP-14S	24-Jun-16	10:26	0.11	0.0	7.2	15.0	-	-	
GP-14D	24-Jun-16	10:29	0.18	0.0	13.6	1.4	-	-	
GP-15A	24-Jun-16	10:44	0.00	0.0	2.7	18.5	-	-	
GP-15B	24-Jun-16	10:46	0.00	0.0	7.0	13.7	-	-	
GP-16A	24-Jun-16	10:52	0.17	0.0	0.6	20.8	-	-	
GP-16B	24-Jun-16	10:55	0.31	0.0	0.5	20.8	-	-	
GP-17	24-Jun-16	11:01	0.00	0.0	5.6	15.8	-	-	
GP-18	24-Jun-16	11:04	0.00	0.0	5.2	16.7	-	-	
GP-19	24-Jun-16	11:11	-0.02	0.0	0.2	21.3	-	-	
LFG-1	24-Jun-16	10:32	0.05	0.2	11.4	4.6	-	-	
LFG-2	24-Jun-16	10:35	-0.01	0.3	11.4	4.7	-	-	
LFG-3	24-Jun-16	10:39	0.02	12.6	18.9	0.1	-	-	

General Data

		Weather Conditions	
Monitored by:	S. Adlington	Sky Cover:	Overcast
Instruments:	GEM 2000	Wind / Rain / Snow:	None
Calibration Date:	24-Jun-16	Temperature (^{o}F):	59

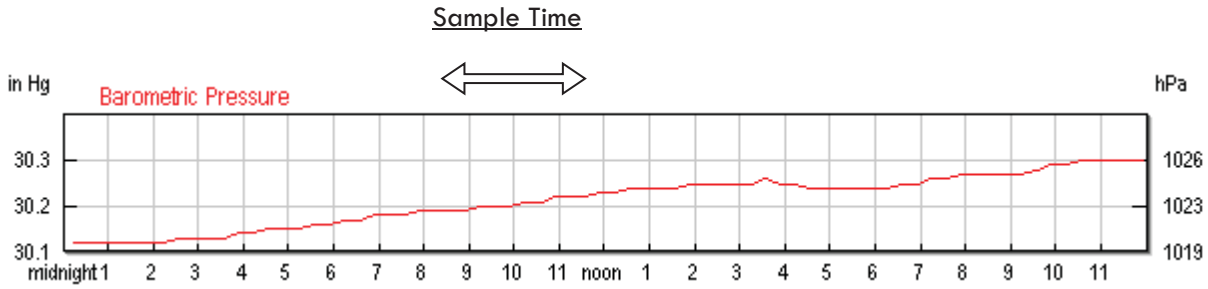
Notes 1. Measurement for spike concentrations of CH_4 and CO_2 are recorded if observed during sampling

GP = Gas Probe	CH_4 = Methane	S = shallow	A= shallow
NM = Not measured	CO_2 = Carbon Dioxide	M = medium	B = medium
equipment malfunction	O_2 = Oxygen	D = deep	C = deep

Barometric Pressure Trend – June 2016
Hidden Valley Landfill, Pierce County, Washington

Barometric Pressure Trend for June 2016

Barometric Pressure Trend for June 24, 2016



Source : KPLU
https://www.wunderground.com/history/airport/KPLU/2016/6/24/DailyHistory.html?req_city=Puyallup&req_state=WA&reqdb.zip=98371&reqdb.magic=1&reqdb.wmo=99999

Landfill Gas Probe Monitoring

SCS Engineers

Hidden Valley Landfill

04216002.02

PCRCD dba LRI

July 21, 2016

Location Reference Designation	Date	Time	Pressure (in. H_2O)	CH_4 (% vol.)	CO_2 (% vol.)	O_2 (% vol.)	Comments: Spike CH4 *Note 1* (% vol.)	Comments: Spike CO2 *Note 1* (% vol.)	Comments: Other
Gas Probes									
GP-1A	21-Jul-16	7:21	0.00	0.3	5.6	0.0	0.4	-	
GP-1B	21-Jul-16	7:24	-0.02	0.0	11.1	7.8	-	-	
GP-1C	21-Jul-16	7:27	0.00	0.0	1.6	18.9	-	-	
GP-2A	21-Jul-16	7:31	0.01	0.0	0.5	19.9	-	-	
GP-2B	21-Jul-16	7:34	0.03	0.0	0.2	20.6	-	-	
GP-3S	21-Jul-16	7:39	0.00	0.0	1.0	19.1	-	-	
GP-3M	21-Jul-16	7:41	0.00	0.0	2.3	15.2	-	-	
GP-3D	21-Jul-16	7:44	0.00	0.0	5.9	14.3	-	-	
GP-4A	21-Jul-16	7:50	0.02	0.0	1.5	19.4	-	-	
GP-4B	21-Jul-16	7:53	0.02	0.0	0.2	20.7	-	-	
GP-5A	21-Jul-16	7:58	0.02	0.0	0.6	19.3	-	-	
GP-5B	21-Jul-16	8:01	0.02	0.0	0.7	19.3	-	-	
GP-6	21-Jul-16	8:06	0.02	0.0	0.7	20.1	-	-	
GP-7S	21-Jul-16	8:12	0.01	0.0	1.0	19.4	-	-	
GP-7D	21-Jul-16	8:15	0.00	0.0	0.9	19.4	-	-	
GP-8A									*Note 2*
GP-8B									*Note 2*
GP-9	21-Jul-16	8:29	0.01	0.0	2.3	17.8	-	-	
GP-10	21-Jul-16	8:34	0.01	0.0	0.3	20.5	-	-	
GP-11	21-Jul-16	8:38	0.02	0.0	1.0	19.7	-	-	
GP-12	21-Jul-16	8:46	0.02	0.0	7.1	5.3	-	-	
GP-13A	21-Jul-16	8:52	0.08	1.8	12.8	1.6	1.9	-	
GP-13B	21-Jul-16	8:55	0.06	0.0	0.3	20.6	-	-	
GP-14S	21-Jul-16	9:00	0.02	0.0	6.2	15.7	-	-	
GP-14D	21-Jul-16	9:03	0.01	0.0	14.0	0.6	-	-	
GP-15A	21-Jul-16	9:18	0.03	0.0	2.9	17.5	-	-	
GP-15B	21-Jul-16	9:20	0.03	0.0	5.8	16.4	-	-	
GP-16A	21-Jul-16	9:26	0.00	0.0	0.5	20.5	-	-	
GP-16B	21-Jul-16	9:29	0.00	0.0	0.3	20.8	-	-	
GP-17	21-Jul-16	9:37	0.01	0.0	6.8	12.1	-	-	
GP-18	21-Jul-16	9:40	0.00	0.0	9.4	9.6	-	-	
GP-19	21-Jul-16	9:47	0.00	0.0	2.1	18.6	-	-	
LFG-1	21-Jul-16	9:06	0.02	0.0	10.2	5.1	-	-	
LFG-2	21-Jul-16	9:10	0.01	0.0	10.0	5.6	-	-	
LFG-3	21-Jul-16	9:13	0.05	4.1	14.3	2.2	-	-	

General Data

		Weather Conditions	
Monitored by:	S. Adlington	Sky Cover:	Clear
Instruments:	GEM 2000	Wind / Rain / Snow:	None
Calibration Date:	21-Jul-16	Temperature (^oF):	67

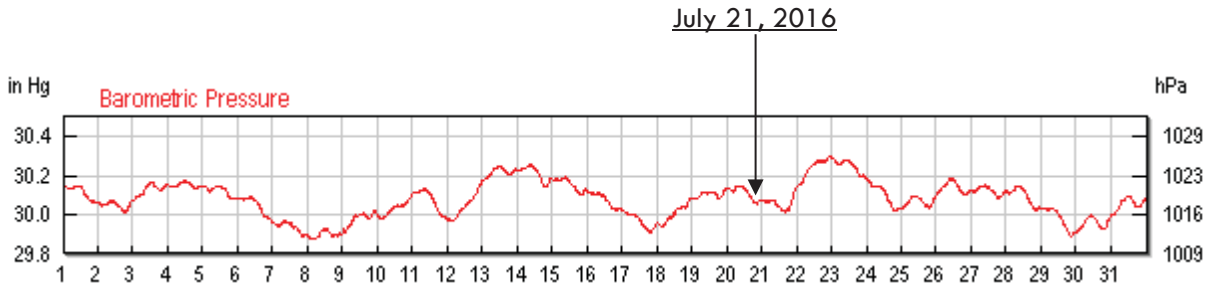
Notes

1. Measurement for spike concentrations of CH_4 and CO_2 are recorded if observed during sampling
2. Wasp nest in monument. Location not monitored.

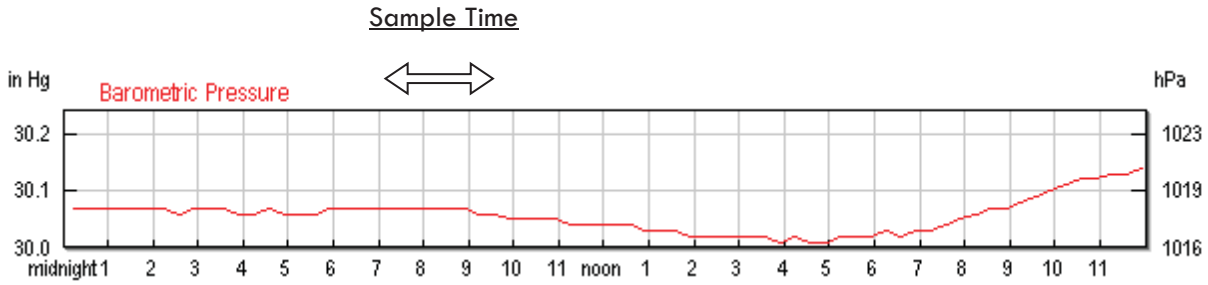
GP = Gas Probe	CH_4 = Methane	S = shallow	A= shallow
NM = Not measured	CO_2 = Carbon Dioxide	M = medium	B = medium
equipment malfunction	O_2 = Oxygen	D = deep	C = deep

Barometric Pressure Trend – July 2016
Hidden Valley Landfill, Pierce County, Washington

Barometric Pressure Trend for July 2016



Barometric Pressure Trend for July 21, 2016



Source : KPLU
https://www.wunderground.com/history/airport/KPLU/2016/7/21/DailyHistory.html?req_city=Puyallup&req_state=WA&req_statename=&reqdb.zip=98371&reqdb.magic=1&reqdb.wmo=99999

Landfill Gas Probe Monitoring

SCS Engineers

Hidden Valley Landfill

04216002.02

PCRCD dba LRI

August 25, 2016

Location Reference Designation	Date	Time	Pressure (in. H_2O)	CH_4 (% vol.)	CO_2 (% vol.)	O_2 (% vol.)	Comments: Spike CH4 *Note 1* (% vol.)	Comments: Spike CO2 *Note 1* (% vol.)	Comments: Other
Gas Probes									
GP-1A	25-Aug-16	7:09	0.02	0.9	5.7	0.0	-	-	
GP-1B	25-Aug-16	7:13	-0.03	0.0	12.2	6.3	-	-	
GP-1C	25-Aug-16	7:16	-0.01	0.0	1.4	19.4	-	-	
GP-2A	25-Aug-16	7:21	0.00	0.0	0.4	20.4	-	-	
GP-2B	25-Aug-16	7:24	0.03	0.0	0.2	21.0	-	-	
GP-3S	25-Aug-16	7:28	0.00	0.0	0.6	20.4	-	-	
GP-3M	25-Aug-16	7:31	0.00	0.0	2.0	18.2	-	-	
GP-3D	25-Aug-16	7:34	0.00	0.0	4.5	16.0	-	-	
GP-4A	25-Aug-16	7:40	0.01	0.0	1.6	19.8	-	-	
GP-4B	25-Aug-16	7:42	0.01	0.0	0.1	21.2	-	-	
GP-5A	25-Aug-16	7:48	0.01	0.0	1.0	20.3	-	-	
GP-5B	25-Aug-16	7:51	0.00	0.0	0.8	20.0	-	-	
GP-6	25-Aug-16	7:55	0.01	0.0	0.5	20.8	-	-	
GP-7S	25-Aug-16	8:00	0.01	0.0	1.1	20.2	-	-	
GP-7D	25-Aug-16	8:03	0.00	0.0	0.9	20.2	-	-	
GP-8A	25-Aug-16	8:12	0.01	0.0	5.7	3.1	-	-	
GP-8B	25-Aug-16	8:15	0.01	0.0	2.4	19.2	-	-	
GP-9	25-Aug-16	8:20	0.02	0.0	2.3	17.8	-	-	
GP-10	25-Aug-16	8:25	0.02	0.0	0.4	20.9	-	-	
GP-11	25-Aug-16	8:30	-0.02	0.0	0.7	20.4	-	-	
GP-12	25-Aug-16	8:35	0.02	0.0	7.3	11.8	-	-	
GP-13A	25-Aug-16	8:40	0.04	0.0	0.1	21.3	-	-	
GP-13B	25-Aug-16	8:43	0.04	0.0	0.1	21.4	-	-	
GP-14S	25-Aug-16	8:49	0.04	0.0	3.9	17.8	-	-	
GP-14D	25-Aug-16	8:51	0.03	0.0	14.0	0.8	-	-	
GP-15A	25-Aug-16	9:08	0.00	0.0	1.2	19.4	-	-	
GP-15B	25-Aug-16	9:11	0.01	0.0	4.5	16.7	-	-	
GP-16A	25-Aug-16	9:18	0.01	0.0	0.3	20.8	-	-	
GP-16B	25-Aug-16	9:21	0.03	0.0	0.2	21.1	-	-	
GP-17	25-Aug-16	9:29	0.03	0.0	9.1	7.5	-	-	
GP-18	25-Aug-16	9:32	0.02	0.0	10.7	10.3	-	-	
GP-19									*Note 2*
LFG-1	25-Aug-16	8:57	0.11	0.0	12.4	1.7	-	-	
LFG-2	25-Aug-16	9:00	0.00	0.0	7.8	9.0	-	-	
LFG-3	25-Aug-16	9:03	0.03	4.4	14.4	1.7	-	-	

General Data

		Weather Conditions	
Monitored by:	S. Adlington	Sky Cover:	Clear
Instruments:	GEM 2000	Wind / Rain / Snow:	None
Calibration Date:	25-Aug-16	Temperature (^oF):	71

Notes

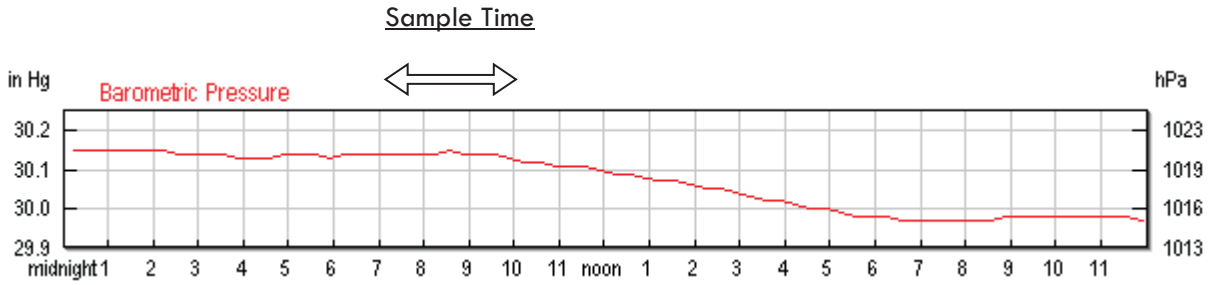
1. Measurement for spike concentrations of CH_4 and CO_2 are recorded if observed during sampling
2. Not measured, trail to monitoring probe overgrown. Unable to access.

GP = Gas Probe	CH_4 = Methane	S = shallow	A= shallow
NM = Not measured	CO_2 = Carbon Dioxide	M = medium	B = medium
equipment malfunction	O_2 = Oxygen	D = deep	C = deep

Barometric Pressure Trend – August 2016
Hidden Valley Landfill, Pierce County, Washington

Barometric Pressure Trend for August 2016

Barometric Pressure Trend for August 25, 2016



Source : KPLU
https://www.wunderground.com/history/airport/KPLU/2016/8/25/DailyHistory.html?req_city=Puyallup&req_state=WA&reqdb.zip=98371&reqdb.magic=1&reqdb.wmo=99999

Landfill Gas Probe Monitoring

SCS Engineers

Hidden Valley Landfill

04216002.02

PCRCD dba LRI

September 29, 2016

Location Reference Designation	Date	Time	Pressure (in. H_2O)	CH_4 (% vol.)	CO_2 (% vol.)	O_2 (% vol.)	Comments: Spike CH4 *Note 1* (% vol.)	Comments: Spike CO2 *Note 1* (% vol.)	Comments: Other
Gas Probes									
GP-1A	29-Sep-16	7:23	0.01	1.7	5.9	0.0	1.3	-	
GP-1B	29-Sep-16	7:28	-0.03	0.0	12.2	5.5	-	-	
GP-1C	29-Sep-16	7:31	-0.01	0.0	3.2	17.4	-	-	
GP-2A	29-Sep-16	7:36	-0.01	0.8	2.8	16.5	0.2	-	
GP-2B	29-Sep-16	7:39	0.03	0.0	0.2	21.5	-	-	
GP-3S	29-Sep-16	7:44	-0.01	0.0	1.1	20.4	-	-	
GP-3M	29-Sep-16	7:48	0.00	0.0	1.9	18.8	-	-	
GP-3D	29-Sep-16	7:51	0.00	0.0	4.9	14.3	-	-	
GP-4A	29-Sep-16	7:57	0.00	0.0	2.0	18.1	-	-	
GP-4B	29-Sep-16	8:00	0.01	0.0	0.2	21.8	-	-	
GP-5A	29-Sep-16	8:05	0.00	0.0	1.2	20.5	-	-	
GP-5B	29-Sep-16	8:08	0.00	0.0	0.8	20.7	-	-	
GP-6	29-Sep-16	8:14	0.00	0.0	0.5	21.2	-	-	
GP-7S	29-Sep-16	8:19	0.00	0.0	0.7	21.0	-	-	
GP-7D	29-Sep-16	8:21	0.00	0.0	0.9	20.7	-	-	
GP-8A	29-Sep-16	8:31	0.00	0.0	3.9	16.8	-	-	
GP-8B	29-Sep-16	8:34	0.00	0.0	1.3	20.1	-	-	
GP-9	29-Sep-16	8:39	0.00	0.0	2.1	15.0	-	-	
GP-10	29-Sep-16	8:45	0.00	0.0	0.3	21.4	-	-	
GP-11	29-Sep-16	8:50	0.00	0.0	0.9	20.5	-	-	
GP-12	29-Sep-16	8:54	0.01	0.0	2.0	19.7	-	-	
GP-13A	29-Sep-16	8:59	0.02	0.0	0.5	21.0	-	-	
GP-13B	29-Sep-16	9:03	0.02	0.0	0.1	21.5	-	-	
GP-14S	29-Sep-16	9:08	0.01	0.0	5.6	15.4	-	-	
GP-14D	29-Sep-16	9:11	0.01	0.0	14.1	0.0	-	-	
GP-15A	29-Sep-16	9:27	0.02	0.0	3.5	17.1	-	-	
GP-15B	29-Sep-16	9:29	0.02	0.0	6.1	13.3	-	-	
GP-16A	29-Sep-16	9:34	0.02	0.0	1.0	19.8	-	-	
GP-16B	29-Sep-16	9:37	0.05	0.0	0.7	20.2	-	-	
GP-17	29-Sep-16	9:43	0.03	0.0	8.4	10.0	-	-	
GP-18	29-Sep-16	9:48	0.03	0.0	5.6	17.1	-	-	
GP-19									*Note 2*
LFG-1	29-Sep-16	9:15	0.03	0.1	9.4	6.5	-	-	
LFG-2	29-Sep-16	9:18	0.02	0.0	8.2	8.5	-	-	
LFG-3	29-Sep-16	9:22	0.05	5.9	13.4	2.9	-	-	

General Data

		Weather Conditions	
Monitored by:	S. Adlington	Sky Cover:	Lt. Clouds
Instruments:	GEM 2000	Wind / Rain / Snow:	None
Calibration Date:	29-Sep-16	Temperature (^oF):	54

Notes

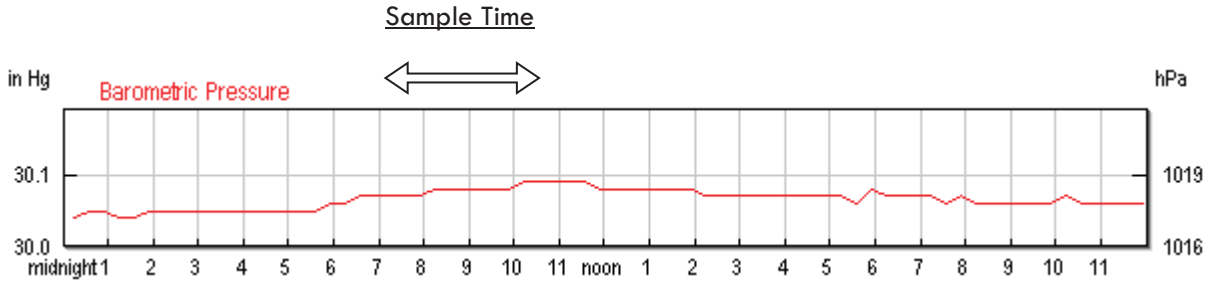
1. Measurement for spike concentrations of CH_4 and CO_2 are recorded if observed during sampling
2. Not measured, trail to monitoring probe overgrown. Unable to access.

GP = Gas Probe	CH_4 = Methane	S = shallow	A= shallow
NM = Not measured	CO_2 = Carbon Dioxide	M = medium	B = medium
equipment malfunction	O_2 = Oxygen	D = deep	C = deep

Barometric Pressure Trend – September 2016
Hidden Valley Landfill, Pierce County, Washington

Barometric Pressure Trend for September 2016

Barometric Pressure Trend for September 29, 2016



Source : KPLU
https://www.wunderground.com/history/airport/KPLU/2016/9/29/DailyHistory.html?req_city=Puyallup&req_state=WA&req_statename=&reqdb.zip=98371&reqdb.magic=1&reqdb.wmo=99999

Landfill Gas Probe Monitoring

SCS Engineers

Hidden Valley Landfill

04216002.02

PCRCD dba LRI

October 19, 2016

Location Reference Designation	Date	Time	Pressure (in. H_2O)	CH_4 (% vol.)	CO_2 (% vol.)	O_2 (% vol.)	Comments: Spike CH4 *Note 1* (% vol.)	Comments: Spike CO2 *Note 1* (% vol.)	Comments: Other
Gas Probes									
GP-1A	19-Oct-16	10:15	0.05	1.8	6.1	0.0	1.1	-	
GP-1B	19-Oct-16	10:18	0.00	0.0	12.9	5.1	-	-	
GP-1C	19-Oct-16	10:22	0.02	0.0	6.6	13.2	-	-	
GP-2A	19-Oct-16	10:27	0.14	0.0	0.3	21.2	-	-	
GP-2B	19-Oct-16	10:30	0.06	0.0	0.2	21.2	-	-	
GP-3S	19-Oct-16	10:39	0.14	0.0	6.4	13.0	-	-	
GP-3M	19-Oct-16	10:37	0.21	0.0	2.2	15.1	-	-	
GP-3D	19-Oct-16	10:34	0.09	0.0	1.6	19.6	-	-	
GP-4A	19-Oct-16	10:45	0.01	0.0	0.2	21.3	-	-	
GP-4B	19-Oct-16	10:47	0.03	0.0	0.2	21.3	-	-	
GP-5A	19-Oct-16	10:52	0.00	0.0	0.6	21.2	-	-	
GP-5B	19-Oct-16	10:55	0.00	0.0	0.6	20.4	-	-	
GP-6	19-Oct-16	10:59	0.01	0.0	0.2	21.3	-	-	
GP-7S	19-Oct-16	11:07	0.11	0.0	0.9	20.4	-	-	
GP-7D	19-Oct-16	11:04	0.02	0.0	0.6	21.0	-	-	
GP-8A	19-Oct-16	11:15	0.14	0.0	4.3	14.4	-	-	
GP-8B	19-Oct-16	11:17	0.14	0.0	0.5	20.9	-	-	
GP-9	19-Oct-16	11:22	0.15	0.0	2.1	14.7	-	-	
GP-10	19-Oct-16	11:27	0.08	0.0	0.3	21.1	-	-	
GP-11	19-Oct-16	11:32	0.05	0.0	1.5	19.5	-	-	
GP-12	19-Oct-16	11:37	0.05	0.0	2.1	17.7	-	-	
GP-13A	19-Oct-16	11:42	0.05	0.0	0.3	21.3	-	-	
GP-13B	19-Oct-16	11:44	0.07	0.0	0.1	21.6	-	-	
GP-14S	19-Oct-16	11:52	0.11	0.0	13.0	1.9	-	-	
GP-14D	19-Oct-16	11:49	0.06	0.0	8.9	11.2	-	-	
GP-15A	19-Oct-16	12:03	0.16	0.0	2.9	18.0	-	-	
GP-15B	19-Oct-16	12:06	0.01	0.0	7.8	8.0	-	-	
GP-16A	19-Oct-16	12:12	0.02	0.0	1.8	19.0	-	-	
GP-16B	19-Oct-16	12:14	0.00	0.0	1.8	19.0	-	-	
GP-17	19-Oct-16	12:20	0.00	0.0	6.9	13.4	-	-	
GP-18	19-Oct-16	12:24	0.00	0.0	2.4	20.8	-	-	
GP-19	19-Oct-16	12:30	0.01	0.0	2.2	17.8	-	-	
LFG-1	19-Oct-16	11:54	0.11	0.4	10.3	5.0	-	-	
LFG-2	19-Oct-16	11:56	0.00	0.0	9.8	7.9	-	-	
LFG-3	19-Oct-16	11:58	0.00	10.1	15.9	2.6	-	-	

General Data

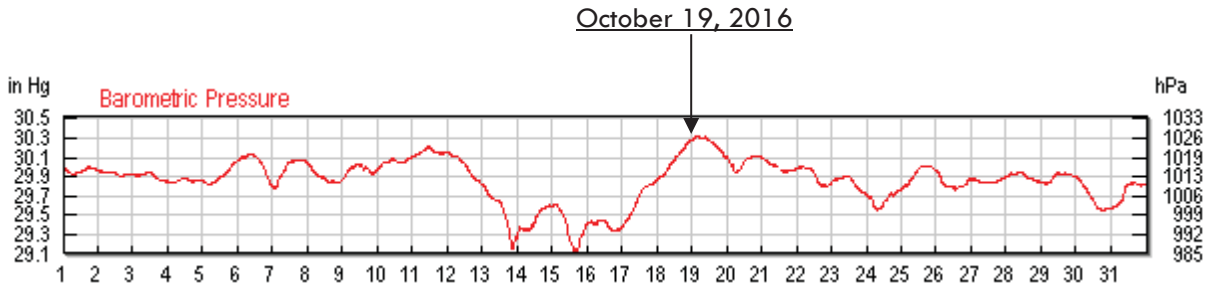
		Weather Conditions	
Monitored by:	S. Adlington	Sky Cover:	Lt. Clouds
Instruments:	GEM 2000	Wind / Rain / Snow:	None
Calibration Date:	19-Oct-16	Temperature (^{o}F):	50

Notes 1. Measurement for spike concentrations of CH_4 and CO_2 are recorded if observed during sampling

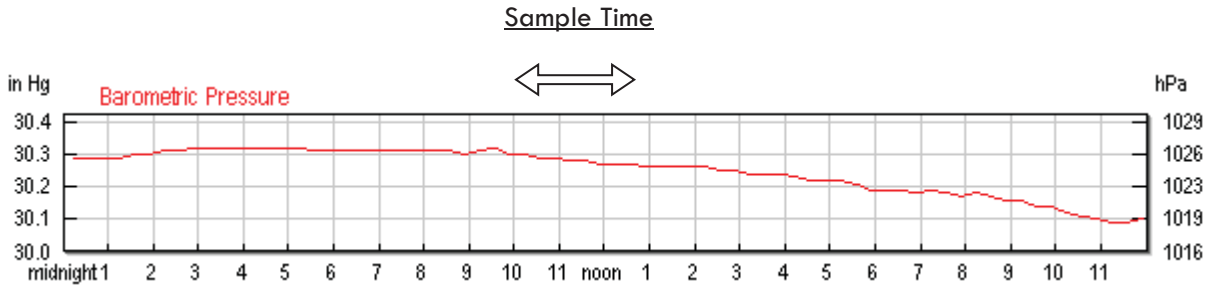
GP = Gas Probe	CH_4 = Methane	S = shallow	A= shallow
NM = Not measured	CO_2 = Carbon Dioxide	M = medium	B = medium
equipment malfunction	O_2 = Oxygen	D = deep	C = deep

Barometric Pressure Trend – October 2016
Hidden Valley Landfill, Pierce County, Washington

Barometric Pressure Trend for October 2016



Barometric Pressure Trend for October 19, 2016



Source : KPLU
https://www.wunderground.com/history/airport/KPLU/2016/10/19/MonthlyHistory.html?req_city=Puyallup&req_state=WA&reqdb.zip=98371&reqdb.magic=1&reqdb.wmo=99999

Landfill Gas Probe Monitoring

SCS Engineers

Hidden Valley Landfill

04216002.02

PCRCD dba LRI

November 17, 2016

Location Reference Designation	Date	Time	Pressure (in. H_2O)	CH_4 (% vol.)	CO_2 (% vol.)	O_2 (% vol.)	Comments: Spike CH4 *Note 1* (% vol.)	Comments: Spike CO2 *Note 1* (% vol.)	Comments: Other
Gas Probes									
GP-1A	17-Nov-16	7:29	0.00	1.1	6.5	0.0	-	-	
GP-1B	17-Nov-16	7:32	-0.05	0.0	14.8	5.7	-	-	
GP-1C	17-Nov-16	7:37	-0.03	0.0	10.0	10.1	-	-	
GP-2A	17-Nov-16	7:46	-0.03	3.6	19.4	0.6	-	-	
GP-2B	17-Nov-16	7:49	0.00	0.0	0.2	21.5	-	-	
GP-3S	17-Nov-16	7:54	-0.01	0.0	2.4	18.9	-	-	
GP-3M	17-Nov-16	7:57	-0.01	0.0	2.4	15.9	-	-	
GP-3D	17-Nov-16	8:00	-0.02	0.0	8.6	7.5	-	-	
GP-4A	17-Nov-16	8:05	-0.02	0.0	0.2	21.7	-	-	
GP-4B	17-Nov-16	8:08	-0.01	0.0	0.1	21.9	-	-	
GP-5A	17-Nov-16	8:14	-0.03	0.0	0.5	21.5	-	-	
GP-5B	17-Nov-16	8:17	0.00	0.0	1.0	18.8	-	-	
GP-6	17-Nov-16	8:21	-0.01	0.0	0.3	21.9	-	-	
GP-7S	17-Nov-16	8:27	-0.01	0.0	1.0	21.3	-	-	
GP-7D	17-Nov-16	8:29	-0.02	0.0	0.9	20.6	-	-	
GP-8A	17-Nov-16	8:40	0.16	0.0	2.9	18.4	-	-	
GP-8B	17-Nov-16	8:43	-0.02	0.0	0.4	21.6	-	-	
GP-9	17-Nov-16	8:49	0.00	0.0	2.2	15.2	-	-	
GP-10	17-Nov-16	8:54	0.00	0.0	0.3	21.6	-	-	
GP-11	17-Nov-16	9:00	0.00	0.0	2.6	17.4	-	-	
GP-12	17-Nov-16	9:06	0.00	0.0	1.0	20.6	-	-	
GP-13A	17-Nov-16	9:11	0.00	0.0	2.6	19.2	-	-	
GP-13B	17-Nov-16	9:15	0.02	0.0	0.1	21.4	-	-	
GP-14S	17-Nov-16	9:19	0.07	0.0	9.2	12.1	-	-	
GP-14D	17-Nov-16	9:22	0.01	0.0	14.9	2.0	-	-	
GP-15A	17-Nov-16	9:36	0.02	0.0	3.4	16.8	-	-	
GP-15B	17-Nov-16	9:38	0.02	0.0	10.2	6.1	-	-	
GP-16A	17-Nov-16	9:48	0.03	0.0	1.0	19.6	-	-	
GP-16B	17-Nov-16	9:52	0.04	0.0	0.5	20.6	-	-	
GP-17	17-Nov-16	9:58	0.14	0.0	6.9	14.0	-	-	
GP-18	17-Nov-16	10:04	-0.01	0.0	1.8	20.2	-	-	
GP-19	17-Nov-16	10:11	-0.01	0.0	0.1	21.5	-	-	
LFG-1	17-Nov-16	9:25	0.02	0.3	10.0	7.5	-	-	
LFG-2	17-Nov-16	9:28	0.01	0.0	11.1	6.8	-	-	
LFG-3	17-Nov-16	9:31	0.04	10.3	18.8	0.4	-	-	

General Data

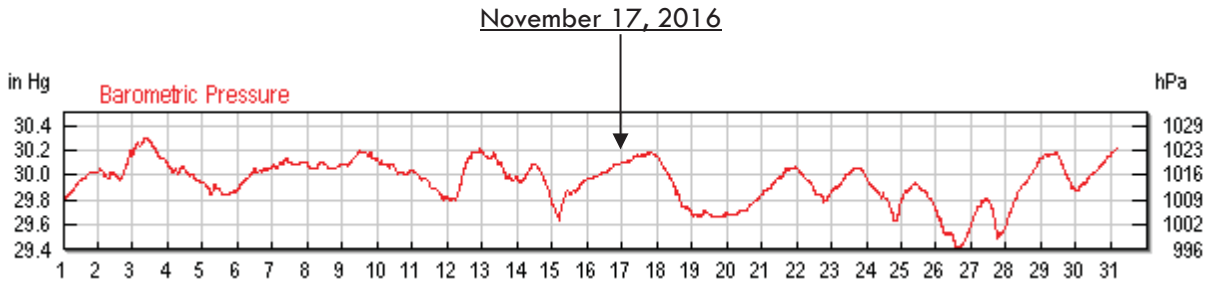
		Weather Conditions	
Monitored by:	S. Adlington	Sky Cover:	Lt. Clouds
Instruments:	GEM 2000	Wind / Rain / Snow:	None
Calibration Date:	17-Nov-16	Temperature (^{o}F):	42

Notes 1. Measurement for spike concentrations of CH_4 and CO_2 are recorded if observed during sampling

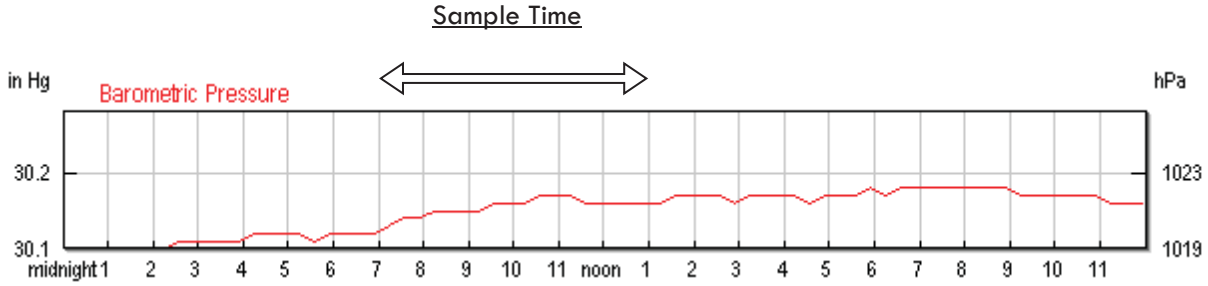
GP = Gas Probe	CH_4 = Methane	S = shallow	A= shallow
NM = Not measured	CO_2 = Carbon Dioxide	M = medium	B = medium
equipment malfunction	O_2 = Oxygen	D = deep	C = deep

Barometric Pressure Trend – November 2016
Hidden Valley Landfill, Pierce County, Washington

Barometric Pressure Trend for November 2016



Barometric Pressure Trend for November 17, 2016



Source : KPLU
https://www.wunderground.com/history/airport/KPLU/2016/11/17/DailyHistory.html?req_city=Graham&req_state=WA&req_statename=&reqdb.zip=98338&reqdb.magic=1&reqdb.wmo=99999

Landfill Gas Probe Monitoring

SCS Engineers

Hidden Valley Landfill

04216002.02

PCRCD dba LRI

December 15, 2016

Location Reference Designation	Date	Time	Pressure (in. H_2O)	CH_4 (% vol.)	CO_2 (% vol.)	O_2 (% vol.)	Comments: Spike CH4 *Note 1* (% vol.)	Comments: Spike CO2 *Note 1* (% vol.)	Comments: Other
Gas Probes									
GP-1A	15-Dec-16	8:50	0.13	0.2	6.0	0.0	0.3	-	
GP-1B	15-Dec-16	8:55	-0.06	0.0	13.0	4.6	-	-	
GP-1C	15-Dec-16	8:58	-0.06	0.0	12.0	5.1	-	-	
GP-2A	15-Dec-16	9:03	-0.05	3.3	16.5	0.0	2.7	-	
GP-2B	15-Dec-16	9:06	0.18	0.0	0.2	21.3	-	-	
GP-3S	15-Dec-16	9:11	0.00	0.0	3.6	14.0	-	-	
GP-3M	15-Dec-16	9:14	0.14	0.0	2.6	11.9	-	-	
GP-3D	15-Dec-16	9:16	0.09	3.5	11.5	1.7	3.8	-	
GP-4A	15-Dec-16	9:22	0.00	0.0	0.7	20.2	-	-	
GP-4B	15-Dec-16	9:25	0.01	0.0	0.1	21.6	-	-	
GP-5A							-	-	*Note 2*
GP-5B							-	-	*Note 2*
GP-6	15-Dec-16	9:30	0.00	0.0	0.2	21.5	-	-	
GP-7S	15-Dec-16	9:35	0.07	0.0	0.3	21.3	-	-	
GP-7D	15-Dec-16	9:38	-0.01	0.0	0.8	20.2	-	-	
GP-8A	15-Dec-16	9:46	0.08	0.0	1.5	20.3	-	-	
GP-8B	15-Dec-16	9:49	0.12	0.0	0.2	21.3	-	-	
GP-9	15-Dec-16	9:54	0.10	0.0	2.2	13.6	-	-	
GP-10	15-Dec-16	9:59	0.02	0.0	0.1	21.5	-	-	
GP-11	15-Dec-16	10:03	0.07	0.0	3.7	13.4	-	-	
GP-12	15-Dec-16	10:08	0.00	0.0	1.4	20.1	-	-	
GP-13A	15-Dec-16	10:13	0.00	0.0	0.1	21.4	-	-	
GP-13B	15-Dec-16	10:15	0.00	0.0	0.0	21.5	-	-	
GP-14S	15-Dec-16	10:20	0.02	0.0	10.5	11.5	-	-	
GP-14D	15-Dec-16	10:22	0.00	0.0	13.4	0.6	-	-	
GP-15A	15-Dec-16	10:26	-0.01	0.0	5.2	3.4	-	-	
GP-15B	15-Dec-16	10:28	0.00	0.0	11.7	0.1	-	-	
GP-16A	15-Dec-16	10:33	0.00	0.0	0.9	20.5	-	-	
GP-16B	15-Dec-16	10:36	0.00	0.0	0.5	21.0	-	-	
GP-17							-	-	*Note 3*
GP-18	15-Dec-16	10:45	0.00	0.0	0.8	20.9	-	-	
GP-19	15-Dec-16	10:50	-0.02	0.0	2.5	18.7	-	-	
LFG-1							-	-	*Note 3*
LFG-2							-	-	*Note 3*
LFG-3							-	-	*Note 3*

General Data

		Weather Conditions	
Monitored by:	S. Adlington	Sky Cover:	Overcast
Instruments:	GEM 2000	Wind / Rain / Snow:	Snow
Calibration Date:	15-Dec-16	Temperature (^{o}F):	33

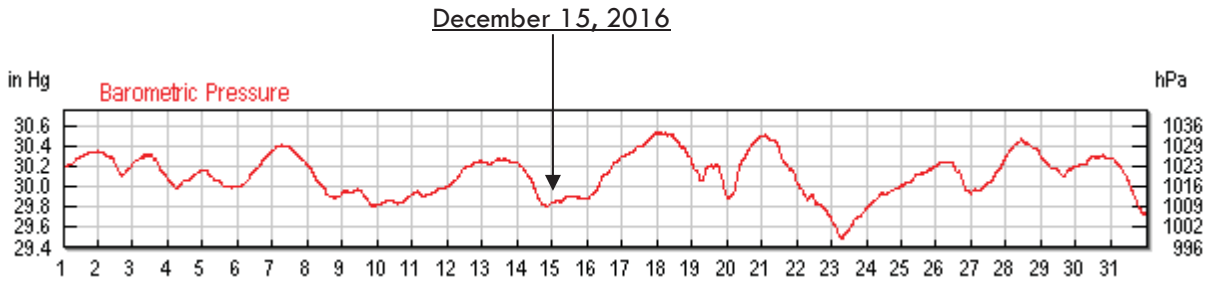
Notes

1. Measurement for spike concentrations of CH_4 and CO_2 are recorded if observed during sampling
2. Monument lock frozen, unable to open.
3. Monitoring port frozen, unable to monitor.

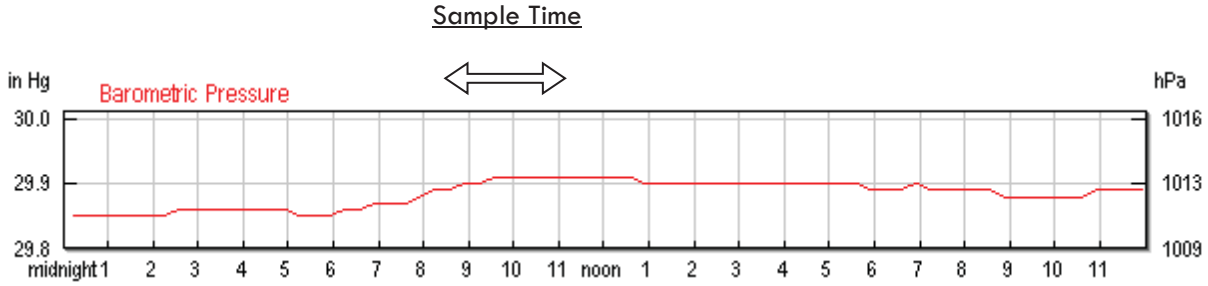
GP = Gas Probe	CH_4 = Methane	S = shallow	A= shallow
NM = Not measured	CO_2 = Carbon Dioxide	M = medium	B = medium
equipment malfunction	O_2 = Oxygen	D = deep	C = deep

Barometric Pressure Trend – December 2016
Hidden Valley Landfill, Pierce County, Washington

Barometric Pressure Trend for December 2016



Barometric Pressure Trend for December 15, 2016



Source : KPLU
https://www.wunderground.com/history/airport/KPLU/2016/12/15/DailyHistory.html?req_city=Graham&req_state=WA&reqdb.zip=98338&reqdb.magic=1&reqdb.wmo=99999

Hidden Valley Landfill
Landfill Gas Monitoring of On-site Buildings

Project Number: 04216002.02

Date: 2/19/2016
Weather Conditions: Lt. clouds
Instrument: MICRO FID
Measured By: SAM ADDINGTON

The atmosphere inside buildings at the landfill were monitored for possible intrusion of methane gas. Per WAC 173-351, concentrations of methane in on-site structures must not exceed 25% of the lower explosive limit (LEL). If off-site gas migration is suspected, concentrations of methane in off-site structures must not exceed 100 ppm methane.

The areas monitored included:

The general overall work area
Floor drains
Underground conduit protrusions
Closed areas where landfill gas could collect, such as under cupboards and inside closets

The gas detection instrument must be calibrated using calibration gas containing methane equal to 50 % LEL. Calibration must be performed before and after the survey is completed.

Checked boxes indicate that the survey revealed **no detectable methane**.

- [x] Main Office - individual office spaces, storage areas and within open crawl-space area.
- [x] Repair Shop – survey atmosphere conditions throughout (lower height levels).
- [ ] Guard Post – main room and restroom area. – BUILDING REMOVED
- [x] Pay/Scale Booth – interior of building.
- [x] Recycle Building – throughout facility and water drainage areas.
- [x] Leachate Treatment Building – all lower level office spaces, restrooms, water drainage system and storage/equipment areas.
- [x] Gas to Energy Building – central monitoring/control room, engine room and storage cabinets.
- [x] Transfer Station Building – throughout entire building and lower levels.

Signature

Hidden Valley Landfill
Landfill Gas Monitoring of On-site Buildings

Date: 5/24/2016
Weather Conditions: CLOUDY
Instrument: PHOTOVAC MICROFID
Measured By: SAM ADLINGTON

The atmosphere inside buildings at the landfill were monitored for possible intrusion of methane gas. Per WAC 173-351, concentrations of methane in on-site structures must not exceed 25% of the lower explosive limit (LEL). If off-site gas migration is suspected, concentrations of methane in off-site structures must not exceed 100 ppm methane.

The areas monitored included:

The general overall work area
Floor drains
Underground conduit protrusions
Closed areas where landfill gas could collect, such as under cupboards and inside closets

The gas detection instrument must be calibrated using calibration gas containing methane equal to 50 % LEL. Calibration must be performed before and after the survey is completed.

Checked boxes indicate that the survey revealed **no detectable methane**.

- [x] Main Office - individual office spaces, storage areas and within open crawl-space area.
- [x] Repair Shop – survey atmosphere conditions throughout (lower height levels).
- [ ] Pay/Scale Booth – interior of building. – SEE NOTE 1.
- [x] Recycle Building – throughout facility and water drainage areas.
- [x] Leachate Treatment Building – all lower level office spaces, restrooms, water drainage system and storage/equipment areas.
- [x] Gas to Energy Building – central monitoring/control room, engine room and storage cabinets.
- [x] Transfer Station Building – throughout entire building and lower levels.

NOTE

1. HEAVY TRAFFIC, 3RD LANE OPEN. UNABLE TO ACCESS SAFELY.

Signature

04716002.02

Hidden Valley Landfill
Landfill Gas Monitoring of On-site Buildings

Date: 8/25/2016
Weather Conditions: CLEAR
Instrument: PHOTOVAC MICRO FID
Measured By: SAM ADLINGTON

The atmosphere inside buildings at the landfill were monitored for possible intrusion of methane gas. Per WAC 173-351, concentrations of methane in on-site structures must not exceed 25% of the lower explosive limit (LEL). If off-site gas migration is suspected, concentrations of methane in off-site structures must not exceed 100 ppm methane.

The areas monitored included:
- The general overall work area
- Floor drains
- Underground conduit protrusions
- Closed areas where landfill gas could collect, such as under cupboards and inside closets

The gas detection instrument must be calibrated using calibration gas containing methane equal to 50 % LEL. Calibration must be performed before and after the survey is completed.

Checked boxes indicate that the survey revealed **no detectable methane**.

- [x] Main Office - individual office spaces, storage areas and within open crawl-space area.
- [x] Repair Shop – survey atmosphere conditions throughout (lower height levels).
- [ ] (1) Pay/Scale Booth – interior of building.
- [x] Recycle Building – throughout facility and water drainage areas.
- [x] Leachate Treatment Building – all lower level office spaces, restrooms, water drainage system and storage/equipment areas.
- [x] Gas to Energy Building – central monitoring/control room, engine room and storage cabinets.
- [x] Transfer Station Building – throughout entire building and lower levels.

NOTE
1. UNABLE TO ACCESS DUE TO HIGH TRAFFIC AT TIME OF MONITORING.

Signature

Hidden Valley Landfill
Landfill Gas Monitoring of On-site Buildings

Date: 11/17/2016
Weather Conditions: OVERCAST
Instrument: MICRO FID
Measured By: SAM ADDINGTON

The atmosphere inside buildings at the landfill were monitored for possible intrusion of methane gas. Per WAC 173-351, concentrations of methane in on-site structures must not exceed 25% of the lower explosive limit (LEL). If off-site gas migration is suspected, concentrations of methane in off-site structures must not exceed 100 ppm methane.

The areas monitored included:
- The general overall work area
- Floor drains
- Underground conduit protrusions
- Closed areas where landfill gas could collect, such as under cupboards and inside closets

The gas detection instrument must be calibrated using calibration gas containing methane equal to 50 % LEL. Calibration must be performed before and after the survey is completed.

Checked boxes indicate that the survey revealed **no detectable methane**.

- [x] Main Office - individual office spaces, storage areas and within open crawl-space area.
- [x] Repair Shop – survey atmosphere conditions throughout (lower height levels).
- [x] Pay/Scale Booth – interior of building.
- [x] Recycle Building – throughout facility and water drainage areas.
- [x] Leachate Treatment Building – all lower level office spaces, restrooms, water drainage system and storage/equipment areas.
- [x] Gas to Energy Building – central monitoring/control room, engine room and storage cabinets.
- [x] Transfer Station Building – throughout entire building and lower levels.

Signature

Figure 6. Monitoring Results LFG-1
Fourth Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

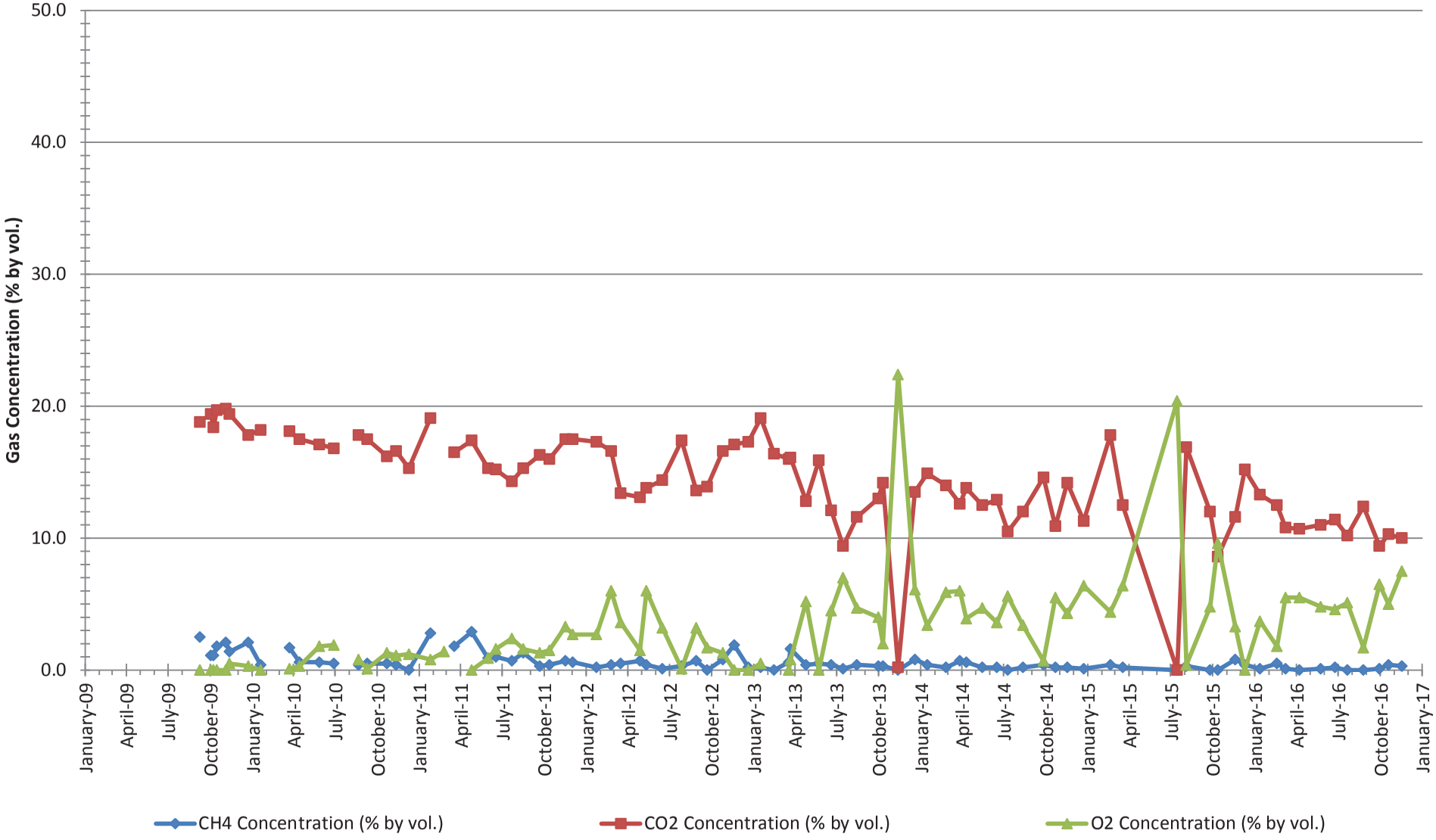


Figure 7. Monitoring Results LFG-2
Fourth Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

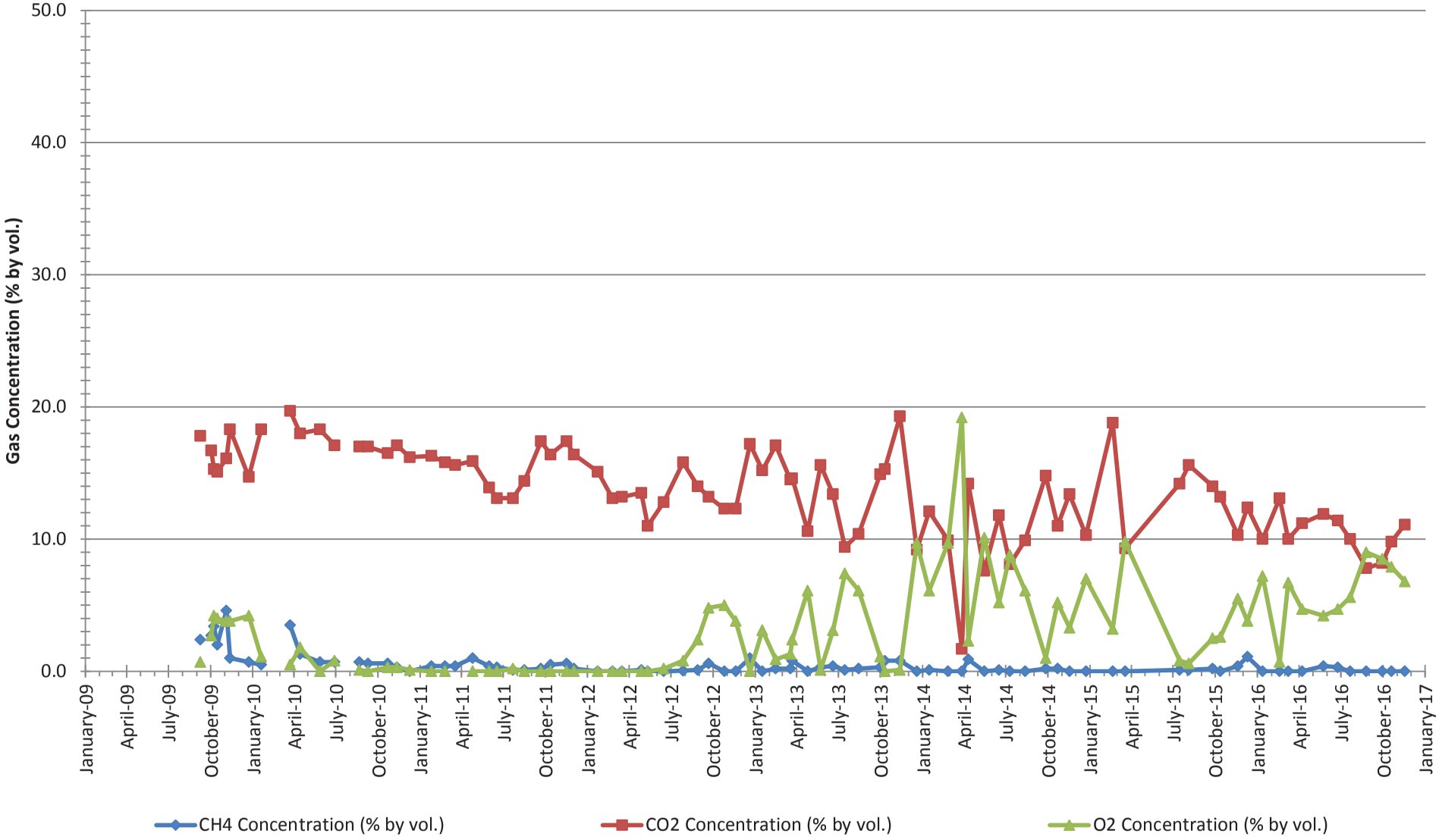
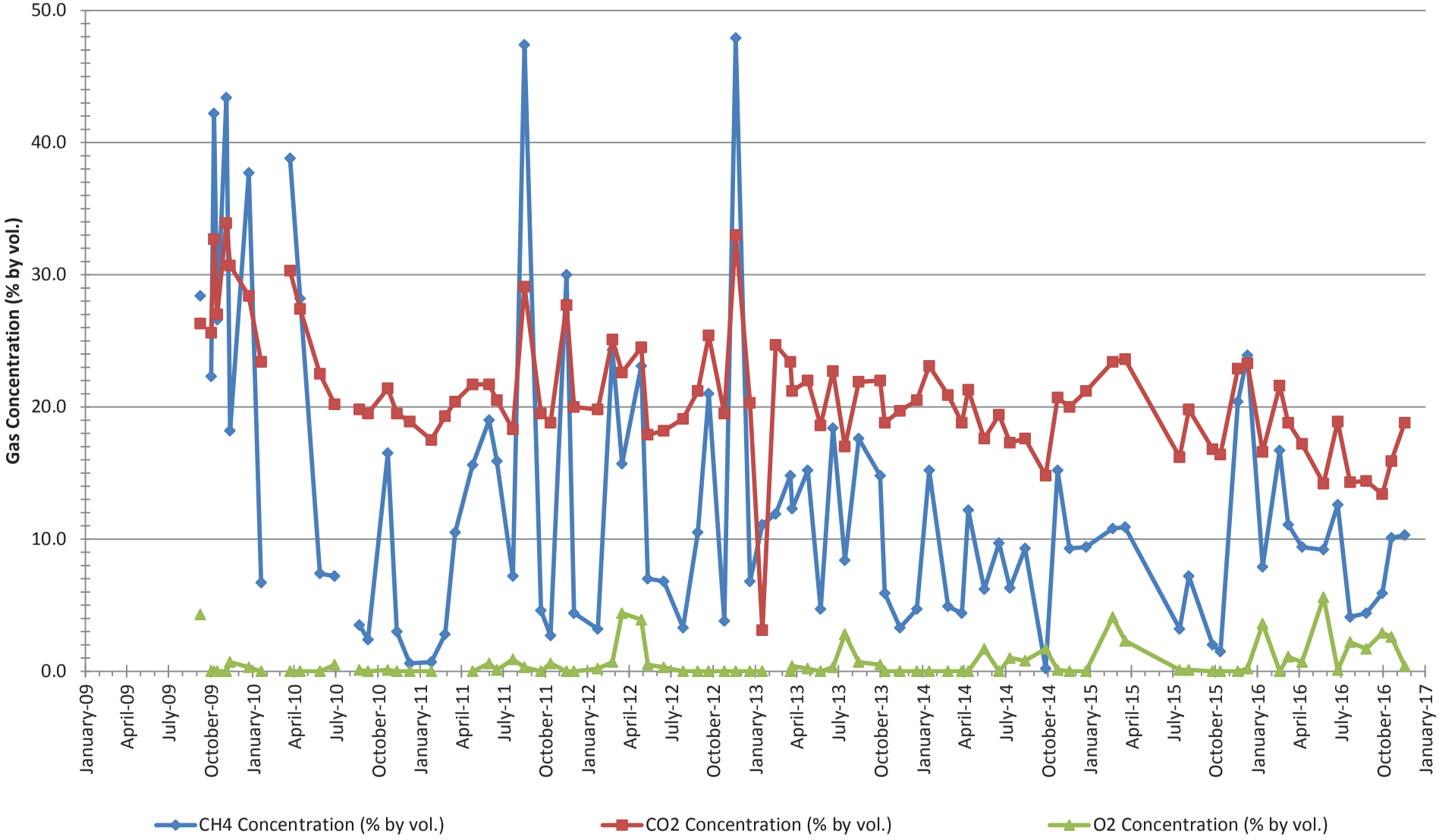


Figure 8. Monitoring Results LFG-3
Fourth Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington



Appendix B

LEACHATE TREATMENT &
SIDE-SLOPE LINER SYSTEM DATA

Table 1. 2016 Main Sump and Side-Slope Liner Area Performance Data
Fourth Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Month	Main Sump Monthly Leachate Volume - Cell 1 (gallons)	Side-Slope Sump Monthly Leachate Volume - Cell 2 (gallons)	Side-Slope Sump Monthly Leakage Flow[a] - Cell 2 (gallons/month)	Monthly Rainfall (inches)
January	13,599	9,339	951	7.68
February	18,607	4,432	0	3.92
March	8,553	1,928	0	5.03
April	15,951	2,635	201	1.91
May	28,338	3,701	452	0.88
June	29,538	2,955	0	1.98
July	4,993	5,032	0	0.90
August	4,364	4,691	1,210	0.20
September	5,216	0	0	1.38
October	11,015	2,020	2,020	9.93
November	15,746	4,830	0	6.43
December	119	6,574	0	3.37
Year to date:	156,039	48,137	4,834	43.6

Notes:

a = Leakage is fluid pumped from the leak detection sump as recorded by LRI staff.

LEACHATE DAILY LOG #2

Month: January
Year: 2016

Leak Det. 1/12 951 gal

Date	Time	INFLUENT FM 212	EFFLUENT FM 511	AC-HRS	D-AP	RAIN	L8 LVL	GP MIN	S-SL	CELL1	TS/GL	TRAN P	BLW 1/2	E-PH	DAILY EFFLUENT
1	12:00	2532173	2561602	27567	65.2	0	20.77	273	23086	118423	46247	622	A 15616	8.33	32587
2	12:00	2563386	2593442	27591	65	0	20.82	273	23086	118423	46247	623	15640	8.3	32587
3	12:00	2596019	2625890	27615	65.2	0	20.2	273	23086	121937	46247	624	15664	8.27	32586
4	12:00	2627507	2658596	27639	66	0.1	20.3	276	23086	121937	46247	625	15686	8.31	32586
5	12:00	2659534	2691181	27663	65	0.5	20.41	279	23086	121937	46247	626	15710	8.23	32587
6	12:00	2692198	2723768	27687	64.8	0.125	20.53	281	23086	121937	46247	628	15735	8.32	32587
7	12:00	2725112	2757053	17711	65.9	0.05	20.06	284	23086	125328	46247	628	15760	8.27	32586
8	12:00	2757016	2788798	27735	65.6	0.05	20.17	287	23086	125328	46247	629	15784	8.33	32587
9	12:00	2790126	2821528	27756	65.9	0	20.32	289	23086	125328	46247	630	15805	8.29	32587
10	12:00	2823369	2853631	27780	65.5	0	20.38	292	23086	125328	46247	631	15828	8.3	32588
11	12:00	2856112	2887611	27807	65.7	0	20.53	292	23086	125328	46247	633	15855	8.35	32587
12	12:00	2888133	2919240	27831	60.4	0.125	20.55	295	23086	125328	46247	635	15879	8.33	32587
13	12:00	2919803	2951877	27855	59	0.25	20.35	298	24480	126763	46247	636	15903	8.26	32588
14	12:00	2952845	2984465	27879	60	0.625	19.52	301	24480	132022	46247	637	15927	8.29	32587
15	12:00	2985212	3016936	27903	65.2	0	19.72	304	26601	132022	46247	638	15951	8.29	32587
16	12:00	3018012	3049524	27927	59.7	0.1	19.8	307	28507	132022	46247	639	15975	8.33	32586
17	12:00	3050331	3082100	27951	60.1	0.25	19.9	307	28507	132022	46247	640	15999	8.33	32586
18	12:00	3082743	3114009	27973	59.8	1.5	20.05	310	28507	132022	46247	641	16021	8.31	32585
19	12:00	3114134	3147395	27999	60	0	20.14	313	28507	132022	46947	642	16046	8.26	32586
20	12:00	3147305	3179981	28023	59.4	0.5	20.24	313	28507	132022	46947	644	16070	8.27	32587
21	12:00	3179318	3212568	28047	60.5	0.5	20.44	318	32425	132022	46973	645	16094	8.27	32586
22	12:00	3212386	3245154	28070	59.8	0.5	20.6	319	32425	132022	46973	646	16118	8.31	32587
23	12:00	3245215	3277716	28095	59.9	0.2	20.8	321	32425	132022	46973	647	16142	8.29	32586
24	12:00	3278111	3111148	28119	59.8	0.9	20.88	324	32425	132022	46973	648	16166	8.29	32586
25	12:00	3309799	3342913	28143	60	0	20.98	324	32425	132022	46973	650	16189	8.3	32587
26	12:00	3341872	3375437	28168	60	0	20.08	327	32425	132022	47312	651	16214	8.28	32586
27	12:00	3374432	3408086	28191	59.8	0	20.2	329	32425	132022	47312	652	16237	8.33	32588
28	12:00	3408112	3440535	28215	59	0.1	20.33	329	32425	132022	47312	653	16261	8.29	32587
29	12:00	3441232	3473828	28239	58.9	1.1	20.47	331	32425	132022	47750	654	16285	8.29	32587
30	12:00	3474010	3506110	28263	58.8	0.2	20.58	334	32425	132022	47755	655	16309	8.3	32587
31	12:00	3506810	3538305	28287	60.6	0	20.69	336	32425	132022	47755	657	16333	8.33	32586

7.68

9339 13599
- 951
8338

LEACHATE DAILY LOG #2

Month: FEB
Year: 2016

Date	Time	INFLUENT FM 212	EFFLUENT FM 511	AC-HRS	D-AP	RAIN	L8 LVL	GP MIN	S-SL	CELL1	TS/GL	TRAN P	BLW 1/2	E-PH	DAILY EFFLUENT
1	12:00	3538944	3571021	28310	60	0	20.78	336	32425	132022	47755	625	A 16357	8.31	32586
2	12:00	3571920	3603607	28335	62	0	21.88	338	32425	132022	47755	626	16380	8.26	32587
3	12:00	3604997	3536194	28359	61.6	0.125	21.97	340	32425	132022	47755	627	16406	8.25	32587
4	12:00	3638081	3669127	28383	62.2	0.2	21.2	342	32425	137023	47755	628	16431	8.27	32586
5	12:00	3670534	3701367	28406	61.6	0.15	21.33	345	32425	137023	47755	629	16456	8.29	32587
6	12:00	3702155	3734601	28430	62.1	0.25	21.44	348	32425	137023	48132	630	16482	8.31	32587
7	12:00	3735010	3766900	28455	62.2	0.05	21.55	351	32425	137023	48132	632	16507	8.26	32586
8	12:00	3766510	3798986	28479	61.8	0	21.65	351	32425	137023	48132	633	16532	8.28	32587
9	12:00	3799460	3831713	28503	55	0	21.77	355	32425	137023	48132	634	16558	8.29	32589
10	12:00	3832808	3864301	28527	54.7	0	21.86	358	32425	137023	48132	635	16582	8.26	25428
11	12:00	3858041	3889730	28551	54.7	0	21.51	364	32425	138942	48132	636	16608	8.39	32586
12	12:00	3890390	3922316	28574	58.4	0.45	21.66	367	32425	138942	48132	637	16633	8.3	32586
13	12:00	3924776	3954901	28589	55.9	0.5	21.75	370	32425	138942	48132	639	16658	8.3	32587
14	12:00	3958500	3987810	28662	56.5	0.6	21.88	373	32425	138942	48132	670	16684	8.33	32586
15	12:00	3990318	4020074	28646	58.5	0	21.98	373	32425	138942	48132	671	16709	8.32	32587
16	12:00	4023847	4052661	28670	58.5	0.25	22.04	376	32425	138942	48132	672	16735	8.32	32587
17	12:00	4054764	4085248	28694	56.4	0.25	22.16	379	32425	138942	48132	673	16759	8.3	32586
18	12:00	4086910	4117834	28713	56	0.39	21.66	385	35387	142073	48132	674	16785	8.33	32013
19	12:00	4119531	4150471	28742	56.2	0.15	21.81	388	35387	142073	48132	675	16811	8.35	32586
20	12:00	4151459	4182433	28766	56.4	0	21.95	391	35387	142073	48695	676	16833	8.31	32588
21	12:00	4185161	4215021	28789	57.8	0	20.08	394	35387	142073	48695	677	16859	8.33	32589
22	12:00	4217472	4247610	28813	58	0.05	20.12	394	35387	142073	48695	679	16884	8.3	32588
23	12:00	4249187	4280198	28837	57.2	0	22.28	395	35387	142073	48695	780	16906	8.27	32588
24	12:00	4280926	4312785	28861	57.2	0	22.35	401	35387	142073	48695	781	16933	8.33	32588
25	12:00	4313411	4345373	28885	58	0	21.59	404	35387	146632	48695	782	16959	8.3	32587
26	12:00	4344121	4377838	28910	57.5	0	21.08	407	35387	150629	48695	783	16985	8.29	32586
27	12:00	4377010	4410651	28934	58	0.25	21.18	407	35387	150629	48695	784	17010	8.3	32587
28	12:00	4408436	4443132	28957	54.7	0.25	21.28	409	36857	150629	48695	785	17036	8.29	32585
29	12:00	4440223	4475588	28971	54.9	0	21.38	412	36857	150629	48754	786	17061	8.29	32587
30															
31															
						3.92			4,432	18,607					

LEACHATE DAILY LOG #2

Month: March
Year: 2016

make bigger
make smaller

Date	Time	INFLUENT FM 212	EFFLUENT FM 511	AC-HRS	D-AP	RAIN	L8 LVL	GP MIN	S-SL	CELL1	TS/GL	TRAN P	BLW A/B	E-PH	DAILY EFFLUENT
1	12:00	4472757	4508304	29005	54.9	0.125	21.49	414	36857	150629	48754	787	17086	8.3	32587
2	12:00	4504850	4540891	29029	54.9	0.75	21.62	416	"	"	48954	788	17111	8.28	32586
3	12:00	4535482	4573477	29053	54.6	.25	21.03	418	"	154119	48985	789	17137	8.29	32586
4	12	4567175	4606063	29074	56.1	0	2114	421	"	"	"		17162	828	32588
5	12	4599715	4638651	29101	55.8	.05	2125	423	"	"	"		17187	82?	32587
6	12	4634778	4671238	29125	55.1	.15	2138	425	"	"	"		17213	831	28997 X
7	12	4663001	4700601	29142	55.2	.25	2153	"	"	"	49148		17238	832	32587
8	12	4696178	4732822	29166	55.4	1/4	21.60	428	"	"	[illegible]		17263	8.3	32588
9	12	4729637	4765409	2919?	55.?	1/2	21.71	43?	"	"	"		17288	8.24	3257?
10		4762080	4797996	29214	55.5	1/2	21.87	433	"	"	"		17314	8.29	32586
11	12	4794646	4830582	29238	56.3	.25	2199	436	"	159182	"		17339	832	32586
12	12	4826863	4863168	29261	55.6	.10	2115	438	"	"	"		17364	832	32587
13	12	4858673	4895754	29285	56.4	.2	2128	"	"	"	49155		17390	827	32587
14	12	4888092	4928341	29308	56.4	.15	2140	441	36257	"	"		17413	828	325??
15	12	4917896	4960926	29332	56.5	3/4	21.53	443	"	"	"		17439	8.29	32588
16	12	4948919	4993513	29356	55.5	1/8	21.63	448	"	"	"		17463	829	32587
17	12	4978515	5025100	29380	55.9	0	21.74	449	"	"	"		17490	829	32587
18	12	5008871	5058686	29404	56.?	0	2189	452	"	"	"		13913	827	32588
19	12	5039426	5091274	29428	55.9	0	2194	"	"	"	"		13935	828	32586
20	12	5069413	5123860	29452	56.1	0	2204	454	"	"	"		13961	827	32588
21	12	5102210	5156339	29477	56		2209	457	"	"	"		13985	82?	3258?
22	12	5189336	5134580	29501	56.?	[illegible]	22.20	457	"	"	"		14009	829	3258?
23	12	5166864	5221622	29525	55.2	1/8	22.29	459	"	"	"		14033	8.29	32587
24	12	5198015	5254200	29549	56.4	.20	2240	464	38844	"	"		14057	8.2?	32586
25	12	5231303	5286796	29573	56.1	.20	2245	"	"	"	"		14081	835	32587
26	12	5262466	5319383	29596	55.9	0	2253	466	"	"	"		14105	831	32585
27	12	5293772	5351968	29620	56.5	.1	2263	469	"	"	49627		14128	829	32588
28	12	5326765	5384555	29643	56	0	2272	"	"	"	"		14152	830	32588
29	12	5359022	5417143	29667	55.9	0	22.73	472	"	"	"		14176	8.28	32589
30	12	5389436	5449732	2969?	55.6	0	22.79	475	"	"	"		14200	8.??	32587
31	12	5420011	5482178	29716	55.6	0	2284	477	38844	159182	49627		14224	829	32586

5.03 1928 8553

LEACHATE DAILY LOG #2

Leak Detection 4/21 201 gal.

Month: APRIL
Year: 2016

Date	Time	INFLUENT FM 212	EFFLUENT FM 511	AC-HRS	D-AP	RAIN	L8 LVL	GP MIN	S-SL	CELL1	TS/GL	TRAN P	BLW 1/2	E-PH	DAILY EFFLUENT
1	12	5451176	5514865	29740	56.4	0	2295	479	38844	159182	49933		14248	833	32587
2	12	5482110	5547387	29764	56.8	0	2300	482	"	"	"		14272	829	32587
3	12	5511696	5579927	29788	58	0	2308	484	"	"	"		14296	831	32588
4	12	5542024	5612666	29811	56.6		2316	487	"	"	"		14319	828	32587
5	12	5572816	5645253	29835	56.6	5/8	23.20	490	"	"	"		14343	83	32587
6	12	5604133	5677840	29854	56.5	0	23.25	493	"	"	"		14367	8.28	32587
7	12	5634876	5710427	29878	54.9	0	23.32	496	"	"	"		14391	8.28	32585
8	12	5665433	5743012	29908	54.6	0	23.39	499	"	"	"		14415	830	32586
9	12	5696413	5775598	29931	55.1	0	23.46	502	"	"	"		14439	83	32587
10	12	5726959	5808186	29955	55.6	0	2354	"	"	"	"		14463	834	32586
11	12	5757553	5840772	29979	56.4	0	2359	505	"	"	"		14487	834	32585
12	12	5788258	5873357	30003	52.4	0	23.65	508	"	"	"		14510	8.31	32582
13	12	5819520	5905944	30027	53	1/2	23.71	511	"	"	"		14534	8.31	32587
14	12	5851232	5938531	30051	51.8	0	2298	"	"	163876	"		14558	834	32587
15	12	5881600	5971022	30076	53.8	.2	2302	514	"	163876	"		14582	827	32587
16	12	5911892	6003705	30100	54	0	2312	516	"	"	"		14606	826	32586
17	12	5942153	6036291	30124	51.3	0	2320	519	"	"	"		14630	8	32589
18	12	5972991	6068879	30148	52	0	2327	"	"	"	"		14654	821	32587
19	12	6003653	6101466	30172	52.4	0	2332	523	"	"	"		14678	8.2	
20	12	6034329	6134052	30197	52.8	0	2340	526	"	"				827	32587
21	12	6064543	6166640	30219	53.2	.13	2257	528	"	169127	"		14725	826	32587
22	12	6095675	6199226	30243	52.4	.1	2268	530	39045	"	50245		14748	829	32587
23	12	6127491	6231801	30267	54.3	0	2274	532	"	"			14773	826	32587
24	12	6158520	6264400	30291	52.8	.1	2284	"	"	"			14797	825	32587
25	12	6187707	6296788	30315	54.5	.35	2291	534	"	"	50247		14821	829	32587
26	12	6218468	6329574	30338	55.9	0	2296	537	"	"	50290		14845	832	32587
27	12	6249749	6362160	30362	54.8	0	2303	539	"	"	50293		14869	831	32587
28	12	6280261	6394780	30386	55.5	0	2210	541	41479	175133	"		14892	833	32587
29	12	6312054	6427333	30410	55.3	0	2224	543	"	"	"		14916	829	32587
30	12	6341659	6459920	30434	54.9	0	2234	545	"	"	"		14940	830	32586
31					56.1										

~~6373261~~ ~~6403453~~ ~~6492506~~ ~~6525092~~ ~~30459~~ 56 0 2229 547 0 2248 542 " " 15,951" 2,635 2.01 -201 = 2,434 ~~14464~~ ~~828~~ ~~32586~~ ~~14489~~ ~~827~~

30346 . LEAK DET. 952 GAL 5/22

LEACHATE DAILY LOG #2

Month: MAY
Year: 2016

Date	Time	INFLUENT FM 212	EFFLUENT FM 511	AC-HRS	D-AP	RAIN	LB LVL	GP MIN	S-SL	CELL1	TS/GL	TRAN P	DLW AVG	S.G PH	DAILY EFFLUENT
1	12	6373261	6492506	30459	56.1	0	2239	547	41479	175133	50293		14964	828	32586
2	12	6403453	6525092	30483	56	0	2248	"	"	"	"		14989	827	32587
3	12	6435321	6557679	30506	49	0	2250	550	"	"	"		15012	8[illegible]	[illegible]
4	12	6466684	6590266	30530	50	0	2254	551	"	"	"		15036	824	32587
5	12	6496866	6622852	30554	49.5	0	2207	553	"	178013	"		15060	8.3	32588
6	12	6529193	6655440	30578	50.1	0	2103	554	"	185271	"		15084	8.3	32588
7	12	6560895	6688027	30602	50.4	0	2113	556	"	190704	"		15107	8.23	32586
8	12	6591598	6720613	30626	50.3	0	2124	"	"	"	"		15131	820	32587
9	12	6622053	6753200	30650	51.7	0		558	"	"	"		15155	831	32588
10	12	6653217	6785787	30674	51.2	0	20.43	560	"	"	"		15179	8.29	32588
11	12	6685287	6818375	30698	51.6	0	19.87	562	"	194119	"		15203	8.25	32588
12	12	6717778	6853225	30722	51.5	0	19.46	564	[illegible]28	195839	50579		15227	8.23	32587
13	12	6747856	6883571	30746	52.2	0	1965	567	"	195839	"		15251	82[illegible]	32578
14	12	6778667	69[illegible]149	30770	50.6	0	1985	569	"	"	"		15233	829	32588
15	12	6809371	6948736	30794	51	0	1989	"	"	"	50643		15[illegible]9	838	[illegible]
16	12	6841429	6981324	30818	50.5	0	1995	571	"	"	50752		15322	833	32566
17	12	6873143	7013912	30842	51	1/8	20.01	573	"	"	50763		15346	8.31	32587
18	12	6904291	7046499	30866	51.[illegible]	"	2008	575	"	"	"		15370	8.31	32588
19	12	6935300	7079087	30890	51	0	19.[illegible]1	578	"	198166	50754		15394	8.31	[illegible]
20	12	6966577	7111674	30915	51.1	0	19.77	581	"	"	"		15419	8.3[illegible]	32588
21	12	6996280	7144261	30939	50.6	0	19.65	584	"	"	"		15442	8.32	[illegible]
22	12	7028705	7176848	30963	50.3	1/8	19.73	582	[illegible]	"	"		15466	8.24	32588
23	12	7059520	7209436	30987	[illegible]	1/8	20.00	587	45[illegible]20	"	"		15490	8.3	
24	12	7090794	7242023	31011	51.1	0	20.07	589	"	"	"		15514	8.[illegible]	32589
25	12	7122321	7274611	31035	51.7	0	20.13	589	"	"	"		15538	8.27	32589
26	12	7155375	7307200	31059	[illegible]	0	19.26	591	"	203471	"		15562	8.24	32589
27	12	7187[illegible]104	7339788	31083	51	0	19.[illegible]0	593	"	"	"		15586	8.27	32588
28	12	7214683	7372376	31107	51.7	[illegible]	19.3[illegible]	595	"	"	"		[illegible]	8.25	32582
29	12	7245542	7404964	31131	51.5	1/8	19.[illegible]15	"	"	"	"		15634	8.25	32587
30	12	7275635	7437612	31155	50	0	19.47	597	"	"	"		15658	8.26	32589
31	12	7306768	7470134	31178	[illegible]	0	19.5[illegible]	599	"	"	"		15681	8.25	32586

0.875

3,701 28,338
-452
= 3,249

LEACHATE DAILY LOG #2

Month: June
Year: 2016

Date	Time	INFLUENT FM 212	EFFLUENT FM 511	AC-HRS	D-AP	RAIN	LB LVL	GP MIN	S-SL	CELL 2	TS/GL	TRAN P	BLW A/B	E-PH	DAILY EFFLUENT
1	12	7339715	7502727	31202	49.7	0	19.65	599	48135	2094521	50954		15705	824	32589
2	12	7376429	755[illegible]	31226	49.6	0	17.44	[illegible]	11	46754	11		15724	827	32588
3	12	7400101	7567752	31250	50	.25	15.87	603	11	222458	50954		15753	828	32589
4	12	7431111	7600448	31274	51.5	0	1599	604	11	11	11		15777	822	32587
5	12	7463301	7633079	31298	50.8	0	1607	605	11	11	11		15800	823	32588
6	12	7494200	7665523	31322	51	0	16.14	607	11	11	11		15824	824	32587
7	12	7526273	7698253	31346	51	0	15.21	604	11	11	11		15849	824	32587
8	12	7559[illegible]	7732840	31370	51.2	[illegible]	16.34	[illegible]	11	11	11		15873	824	32588
9	12	7590069	7763426	31394	51	0	16.43	614	11	11	51407		[illegible]	828	32588
10	12	7621483	7796016	31418	52.5	0	16.53	615	11	11	11		15920	835	32587
11	12	7653260	7828602	31442	51.8	.2	1660	617	11	11	11		15944	832	32588
12	12	7685446	7861190	31466	48.6	0	1668	617	11	11	51423		15968	829	32589
13	12	7717596	7893779	31490	50.2	0	1678	618	11	11	11		15991	826	32588
14	12	7749531	7926367	31514	49.6	0	16.86	619	11	11	11		16015	827	32588
15	12	7781220	7958955	31538	48.5	.25	1693	620	11	11	11		16039	829	32587
16	12	7811943	7991542	31562	48.2	.125	1565	623	11	227952	11		16063	829	32588
17	12	7844545	8024129	31586	49.1	.125	1575	624	11	11	11		16087	825	32588
18	12	7876027	8056717	31610	48.8	0	1587	625	11	11	11		16111	825	32588
19	12	7908742	8089305	31634	485	.2	1594	11	11	11	11		16135	825	32586
20	12	7993536	8129891	31658	1.7	.5	1600	626	11	11	11		16159	823	32585
21	12	7971557	8154512	31682	48.6	410	16.08	627	11	11	11		16183	9.14	32589
22	12	8004546	8187066	31706	49.3	0	16.14	627	11	11	11		16207	820	32589
23	12	8036389	8219654	31730	2.1	0	1478	631	11	233009	11		16231	822	32587
24	12	8066252	8252241	31754	46.1	.1	1489	633	11	11	11		16254	822	32587
25	12	8100255	8284827	31778	46.1	0	1501	635	11	11	11		16278	820	32588
26	12	8130969	8317415	31801	46.5	0	1511	11	11	"	11		16302	820	32587
27	12	8161649	8350003	31825	46.5	0	1516	636	"	"			16326	82[illegible]	32588
28	12	8194017	8382590	31849	48.6	0	1523	637	11	11	11		16350	822	32588
29	12	8226498	8415178	31873	48.6	0	15.35	638	11	11	11		17528	821	32589
30	12	8257347	8447765	31897	46.4	0	1541	639	11	11	11		17553	825	32587
31															
						1.98		2,955		29,538					

LEACHATE DAILY LOG #2

Month: July
Year: 2016

Date	Time	INFLUENT FM 212	EFFLUENT FM 511	AC-HRS	D-AP	RAIN	LS LVL	GP M/N	S-SL	CELL1	TS/GL	TRAN P	BLW A/B	E-PH	DAILY EFFLUENT
1	12	8288050	8480354	31922	46.1	0	1554	641	48135	233009	51423		17579	827	32587
2	12	8321050	8512942	31945	1.9	0	1562	645	"	"	"		17604	822	32587
3	12	8352358	8545528	31969	46.3	0	1571	646	"	"	"		17629	825	32588
4	12	8385435	8578116	31994		0	1578	647	"	"	"		17654	822	32588
5	12	8415786	86[illegible]	[illegible]	[illegible]	0	1587	648	"	"	"		17679	8.23	32585
6	12	8442056	8643282	32034	46.2	0	[illegible]	650	"	"	"		17703	8.20	32584
7	12	8471882	8675882	32059	46.1	0	1600	651	"	"	"		17730	8.16	32587
8	12	8511636	8708468	32090	1.7	.15	1605	652	"	"	"		17756	824	32587
9	12	8542294	8741056	32114	46.1	.1	1612	653	"	"	"		17781	826	32588
10	12	8575154	8773644	32138	45.9	.40	1620	"	"	"	"		17806	826	32587
11	12	8607098	8806230	32162	46.2		1628	654	"	"	"		17831	826	[illegible]
12	12	8637192	8838818	[illegible]	[illegible]		1638	[illegible]	"	"	"		[illegible]	8.25	58
13	12	8665[illegible]	8871406	[illegible]	47		[illegible]	[illegible]	"	"	"				32589
14	12	8701690	8903994	32234	46.6	0	1650	660	50076	233009	51423		17907	822	32588
15	12	8733810	8936582	32257	46	0	1658	661	"	"	"		17933	821	32588
16	12	8765190	8969170	32281	46	0	1670	662	"	"	"		17958	822	32589
17	12	8796408	9001760	32305	46.2	0	1677	"	"	"	"		17983	823	[illegible]
18	12	8828864	9034346	32329	47.2	0	1682	[illegible]	"	"	"		18008	[illegible]	32587
19	12	8860976	9066934	32353	47.1	0	1689	664	"	"	"		18034	824	32586
20	12	8893249	9099522	32378	[illegible]	0	1694	665	"	"	"		18060	824	32588
21	12	8924302	9113110	32402	47.1	0	1702	669	"	"	"		18084	825	32589
22	12	8957230	9164698	32426	47	0	1711	672	"	"	"		18110	823	32588
23	12	8987704	9197286	32450	46.9	.25	1715	673	"	"	"		18135	827	32588
24	12	9018774	9229874	32473	47	0	1719	"	"	"	"		18160	825	32586
25	12	9050496	9262460	32497	47.2	0	1726	671	"	"	"		18186	821	[illegible]
26	12	9083200	9295047	32522	47.5	0	1727	674	"	"	"		18211	5.19	[illegible]
27	12	9115582	9327636	32545	47.2	0	1734	676	"	"	"		18236	8.22	[illegible]
28	12	+	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	32587
29	12	9179826	9392812	32593	47.8	0	1633	680	"	"	"		18287	818	32590
30	12	9211990	9425402	32617	47.8	0	1637	"	"	"	"		18312	817	32589
31	12	9243162	9457990	32641	48.2	0	1642	694	53167	238002	51423		18337	824	32588
						0.90			5,032						
									4,993						

LEAK DET. 1,210 GAL 8/24

LEACHATE DAILY LOG #2

Month: Aug
Year: 2016

Date	Time	INFLUENT FM 212	EFFLUENT FM 511	AC-HRS	D-AP	RAIN	LB LVL	GP MIN	S-SL	CELL1	TS/GL	TRAN P	BLW/AVG	E-PH	DAILY EFFLUENT
1	12	9274640	9490578	32666	49.1	0	1657	694	53167	238002	51423		18363	822	32589
2	12	9307[illegible]	9522[illegible]	32689	47.7	0	16.62	708	"	"	"		18388	8.19	32589
3	12	9339[illegible]	4555756	32713	47.6	0	16.70	709	"	"	"		18412	8.18	[illegible]
4	12	9371312	4588[illegible]	32738	47.6	0	16.76	710	"	"	"		18439	8.23	32587
5	12	9401774	9620932	32761	[illegible]	0	1685	711	"	"	"		18464	823	32589
6	12	9434972	9653520	32786	47.2	0	1690	712	"	"	"		18489	821	32588
7	12	9465898	9686788	32810	47.5	0	1694	"	"	"	"		18514	823	32588
8	12	9497716	9718696	32834	47.5	.2	1706	713	"	"	"		18540	825	32588
9	12	4530134	4751284	[illegible]	561	0	17.10	714	"	"	"		18564	8.18	32582
10	12	9562368	47[illegible]	[illegible]	63.7	0	[illegible]	716	"	"	"		18589	8.22	32587
11	12	9592822	9816460	32905	64	0	1724	717	"	"	"		18616	822	32589
12	12	9625904	9849048	32929	64.4	0	1731	718	56648	"	"		18641	818	32590
13	12	9658542	9881638	32953	64.2	0	1738	720	"	"	"		18666	817	32587
14	12	9689208	9914226	32977	63.7	0	1740	721	"	"	"		18692	819	32588
15	12	9721134	9946814	33001	64.3	0	1744	"	"	"	"		18717	819	[illegible]
16	12	9753[illegible]	99[illegible]	33025	64	0	1750	722	"	"	"		18741	[illegible]	32589
17	12	9783086	11990.6	33049	64.5	0	1755	724	"	"	"		18768	820	32588
18	12	9815174	44578.9	33073	64.4	0	1767	725	"	"	"		18793	816	32589
19	12	9848408	77167	33097	64.2	0	1774	"	"	"	"		18818	816	32587
20	12	9877658	109755	33121	64.3	0	1780	"	"	"	"		18843	816	32589
21	12	9910598	142343	33145	64.4	0	1785	"	"	"	"		18869	814	32590
22	12	9943622	174935	33169	20.89	0	1791	725	"	"	"		18894	817	32588
23	12	99[illegible]	207522	33192	[illegible]	0	19.44	"	"	"	"		18919	813	32582
24	12	4003	240107	33216	652	0	20	"	"	"	"		18944	[illegible]	32587
25	12	[illegible]	27[illegible]	332[illegible]	6.54	0	17.06	"	57058	242[illegible]	"		18970	8.15	32588
26	12	68329	305284	33265	1.2	0	1718	725	57858	242366	"		18995	813	32589
27	12	99089	337873	33289	63.7	0	1726	743	"	"	"		19021	812	32589
28	12	131275	370462	33313	65	0	1734	743	"	"	"		19046	815	32587
29	12	161782	403049	33337	1.7	0	1737	744	"	"	"		19071	815	32588
30	12	194170	435638	33361	64.8	0	1744	745	"	"	"		19096	812	32587
31	12	225709	468225	33385	64.7	0	1752	747	57858	242366	51423		19122	813	32589
						0.2			4,691 -1,210 = 3,481	4,364					

LEACHATE DAILY LOG #2

Month: September
Year: 2016

Date	Time	INFLUENT FM 212	EFFLUENT FM 511	AC-HRS	D-AP	RAIN	LB LVL	GP-MIN	S-SL	CELL1	TS/GL	TRAN P	BLW/A/B	E-PH	DAILY EFFLUENT
1	12	257962	500813	33409	1.7	0	1758	747	57858	242366	51424		19147	8.13	32588
2	12	289056	533402	33433	65	.125	1766	748	"	"	"		19172	8.15	32588
3	12	32[illegible]	565990	33457	65	0	1741	750	"	243417	"		19197	8.14	32588
4	12	351504	597578	33481	1.8	0	1755	[illegible]	"	"	"		19223	8.13	32588
5	12	381987	631165	33505	65.5	0	1760	752	"	"	"		19248	8.14	32587
6	12	414666	663752	33529	65	0	1767	753	"	"	"		19274	8.1[illegible]	32588
7	12	445422	696341	33553	1.8	.35	1773	754	"	"	"		19299	8.13	32588
8	12	475834	728928	33577	65	0	1728	755	"	[illegible]556	"		19324	8.13	32589
9	12	508882	761517	33601	1.8	0	1690	"	"	247582	"		19349	8.10	32588
10	12	539142	794105	33625	1.8	0	1701	"	"	"	"		19375	8.11	32588
11	12	570536	826693	33649	65.2	0	1710	756	"	"	"		19400	8.10	32588
12	12	602400	859282	33673	65.1	0	1717	"	"	"	"		19425	8.11	32589
13	12	632805	891870	33697	1.8	0	1723	"	"	"	"		19451	8.12	32580
14	12	663215	924457	33721		0	1730	758	"	"	"		19476	8.11	32587
15	12	694156	957043	33745	77.3	0	1737	759	"	"	"		19501	8.10	32588
16	12	724986	989631	33769	75.6	0	1744	760	"	"	"		19526	8.11	32590
17	12	758583	1022221	33793	68.4	0	1750	762	"	"	"		19552	8.10	32587
18	12	788956	1054809	33817	68.5	.55	1756	"	"	"	"		19577	8.13	32588
19	12	819182	1087397	33841	1.7	0	1762	764	"	"	"		19603	8.12	325[illegible]
20	12	84[illegible]	11[illegible]	[illegible]	68.4	.4	[illegible]	765	"	"	"		19628	8.09	32584
21	12	878016	1152573	33688	68.5	0	17.75	766	"	"	"		19652	8.07	325[illegible]
22	12	907824	1185162	33713	67.4	0	17.82	769	"	"	"		[illegible]	8.04	32587
23	12	937380	1217749	33737	68	0	1787	770	"	"	"		19704	8.16	32587
24	12	966836	1250336	33761	68.4	0	1791	"	"	"	52100		19729	8.17	32588
25	12	998998	1282924	33785	68.9	0	1796	"	"	"	54835		19754	8.16	32588
26	12	1030109	1315486	33809	68.6	0	1804	771	"	"	54841		19764	8.13	325[illegible]
27	12	1060410	1348100	33833	68.1	0	1808	772	"	"	55248		19804	8.[illegible]	32588
28	12	1071688	1380698	33858	67.6	.1	18.15	773	"	"	"		19829	8.20	32587
29	12	112[illegible]	14[illegible]	33883		0	18.21	[illegible]	"	"	"		19855	8.14	32590
30	12	1154845	1445864	34105	68.6	0	1824	774	"	"	55248		19881	8.81	32588
31															
						1.38			0	5,216					

LEACHATE DAILY LOG #2

2,020 on 10/28

* LEAK DET. REPAIR 10/28

Month: OCTOBER

Year: 2016

Date	Time	INFLUENT FM 212	EFFLUENT FM 511	AC-HRS	D-AP	RAIN	L8 LVL	GP MIN	S-SL	CELL1	TS/GL	TRANP	DLY AVG	E-PH	DAILY EFFLUENT
1	12	1186253	1478453	34129	68.1	0	1834	775	57858	247582	55640		19906	8.8	32587
2	12	1217101	1511041	34153	68	0	1840	777	"	"	"		19931	882	32588
3	12	1248168	1543629	34176	67.9	0	1845	779	"	"	55644		19956	875	32588
4	12	1279521	1576216	34201	70.1	1/8	1850	781	"	"	55651		19982	8.77	32588
5	12	1311531	1608804	34225	70.1	1/4	18.56	782	"	"	55661		20006	8.74	32587
6	12	1341769	1641391	34249	69.8	1/4	18.62	783	"	"	55669		20031	8.73	32587
7	12	1372931	1673979	34274	69.8	1/4	18.80	785	"	"	55702		20058	8.75	32588
8	12	1404655	1706566	34299	69.7	1/4	18.92	786	"	"	55714		20083	8.75	32587
9	12	1436991	1739153	[illegible]		3/8	19.01	788	"	"	"		20108	[illegible]	[illegible]
10	12	1467250	1771741	[illegible]	69.8	1/2	19.23	[illegible]	"	"	55792		20133	8.75	[illegible]
11	12	1498418	1804329	[illegible]	70	3/8	19.35	784	"	"	55804		20157	8.73	32587
12	12	1531779	1836917	34394	69.9	0	19.59	"	"	"	55819		16367	8.73	32586
13	12	1561960	[illegible]	34416	70.1	0	19.70	791	"	"	[illegible]		16393	8.74	32588
14	12	1594828	1902090	34440	71.9	1.65	1927	792	"	"	55862		16418	873	32588
15	12	1625280	1934677	34464	72.1	1.1	2004	794	"	"	55905		16439	872	32588
16	12	1657825	1967266	34488	2.2	.5	2017	"	"	"	"		16464	873	32588
17	12	1688325	1999853	34513	71.9	.2	2025	795	"	"	55931		16490	871	[illegible]
18	12	1720356	2032443	34537	72.2	3/8	2041	"	"	"	55952		16514	8.71	[illegible]
19	12	1750 [illegible]	2065 [illegible]	34561	71.8	1/4	20.65	797	"	"	56078		16539	[illegible]	[illegible]
20	12	[illegible]	[illegible]	34585	72	.1	20.90	798	"	"	56120		16564	[illegible]	32589
21	12	1812580	2130207	34609	73.4	.2	2103	799	"	"	56225		16590	872	32588
22	12	1844779	2162795	34633	73.2	1.3	2121	801	"	"	"		16615	871	32590
23	12	1875148	2195386	34656	73.1	.5	2135	802	"	"	56254		16640	871	32589
24	12	1906199	2228130	34678	73.5	0	2149	802	"	"	56310		16666	870	[illegible]
25	12	[illegible]	[illegible]	[illegible]	72	0.1	21.52	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]
26	[illegible]	[illegible]	[illegible]	34725	73	0	[illegible]	[illegible]	"	"	[illegible]		[illegible]	[illegible]	[illegible]
27	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1.1	[illegible]	[illegible]	"	[illegible]54	[illegible]		[illegible]	[illegible]	32588
28	12	2031[illegible]	2258255	[illegible]	69.3	0.25	[illegible]	812	[illegible]	[illegible]	[illegible]		16767	87[illegible]	[illegible]
29	[illegible]	[illegible]	[illegible]	[illegible]1	6[illegible]	0	[illegible]	[illegible]	=59878	258597	[illegible]		[illegible]	[illegible]	32588
30	[illegible]	2095255	2423441	34825	69.1	.05	[illegible]	816	"	"	"		16817	867	32587
31		2125327	2456028	34849	[illegible]9	.25	2006	[illegible]	"	"	56354		16843	[illegible]	32587
						9.93			2,020	11,015					
									-2,020						
									=0						

LEACHATE DAILY LOG #2

Month: November
Year: 2016

Date	Time	INFLUENT FM 212	EFFLUENT FM 511	AC-HRS	D-AP	RAIN	LB LVL	GP MIN	S-SL	CELL 1	TS/GL	TRAN P	BLW AIR	F-PH	DAILY EFFLUENT
1	12	2156581	2488610	34872	69.2	.1	20.21	818	59878	258697	56354		16868	868	32588
2	12	2189170	2521204	34895	70.1	.1	20.27	820	64666	"	"		16893	8.69	32588
3	12	2219750	2553817	34921	71.5	.3	20 35	822	"	"	"		16919	869	32590
4	12	2252243	2586383	34945	71	0	1980	824	"	263795	"		16944	869	32589
5	12	2283189	2618973	34969	74.2	0	1780	"	"	271133	"		16969	868	32589
6	12	2314767	2651560	34993	74.9	1.75	1875	826	"	"	"		16994	867	32586
7	12	2344041	2684147	35018	74.5	0	1888	"	"	"	"		17021	867	32588
8	12	2376239	2716735	35041	73.6	0	19:05	827	"	"	"		17045	8.77	32587
9	12	2406787	2749323	35065	70.3	0	18.71	829	"	274343	"		17069	8.68	32588
10	12	2437769	2781910	35089	71.5	.1	1877	830	"	"	"		17097	868	32589
11	12	2468910	2814497	35113	75.6	0	1889	832	"	"	"		17122	870	32588
12	12	2498942	2847085	35137	70.4	0	1886	"	"	"	"		17147	870	32587
13	12	2529073	2879672	35161	70	0	1898	833	"	"	"		17173	871	32589
14	12	2559240	2912260	35185	70	.4	1909	"	"	"	"		17198	872	32587
15	12	2589287	2944848	35209	69.4	.6	14.17	834	"	"	"		17223	8.73	32587
16	12	2619815	2977435	35233	69.7	.7	19 23	835	"	"	"		17249	8.73	32588
17	12	2651078	3010023	35257	72.4	0	19.34	838	"	"	"		17274	8.71	32587
18	12	2681571	3042610	35281	55.7	0	1943	840	"	"	"		17298	872	32589
19	12	2714018	3075198	35305	55.3	0	1959	"	64708	274343	"		17324	871	32587
20	12	2744501	3107651	35329	55.5	0	1953	842	"	"	56375		17349	868	32588
21	12	2776610	3140 399	35353	59	.25	1958	843	"	"	56789		17374	869	32588
22	12	2808254	3172963	35377	54.9	.125	1970	845	"	"	56806		17400	872	32588
23	12	2839403	3205550	35401	61.1	.1	1976	846	"	"	"		17425	871	32589
24	12	2871069	3238332	35425	63.6	.2	1988	848	"	"	"		17450	871	32589
25	12	2903188	3270728	35449	1.7	.8	1990	848	"	"	57125		17475	873	32589
26	12	2933661	3303316	35473	63.5	.05	1998	849	"	"	57157		17501	874	32587
27	12	2965944	3335903	35497	59	.125	2002	849	"	"	"		17526	874	32587
28	12	2997427	3368491	35521	2.1	.125	2014	850	"	"	57222		17551	873	32587
29	12	3028222	3401078	35545	57.9	0	20.22	852	"	"	57241		17577	8.74	32586
30	12	3060106	3433664	35569	59.6	0	20.34	853	"	"	57244		17602	8.75	32587
31															

6.43 4,830 15,746

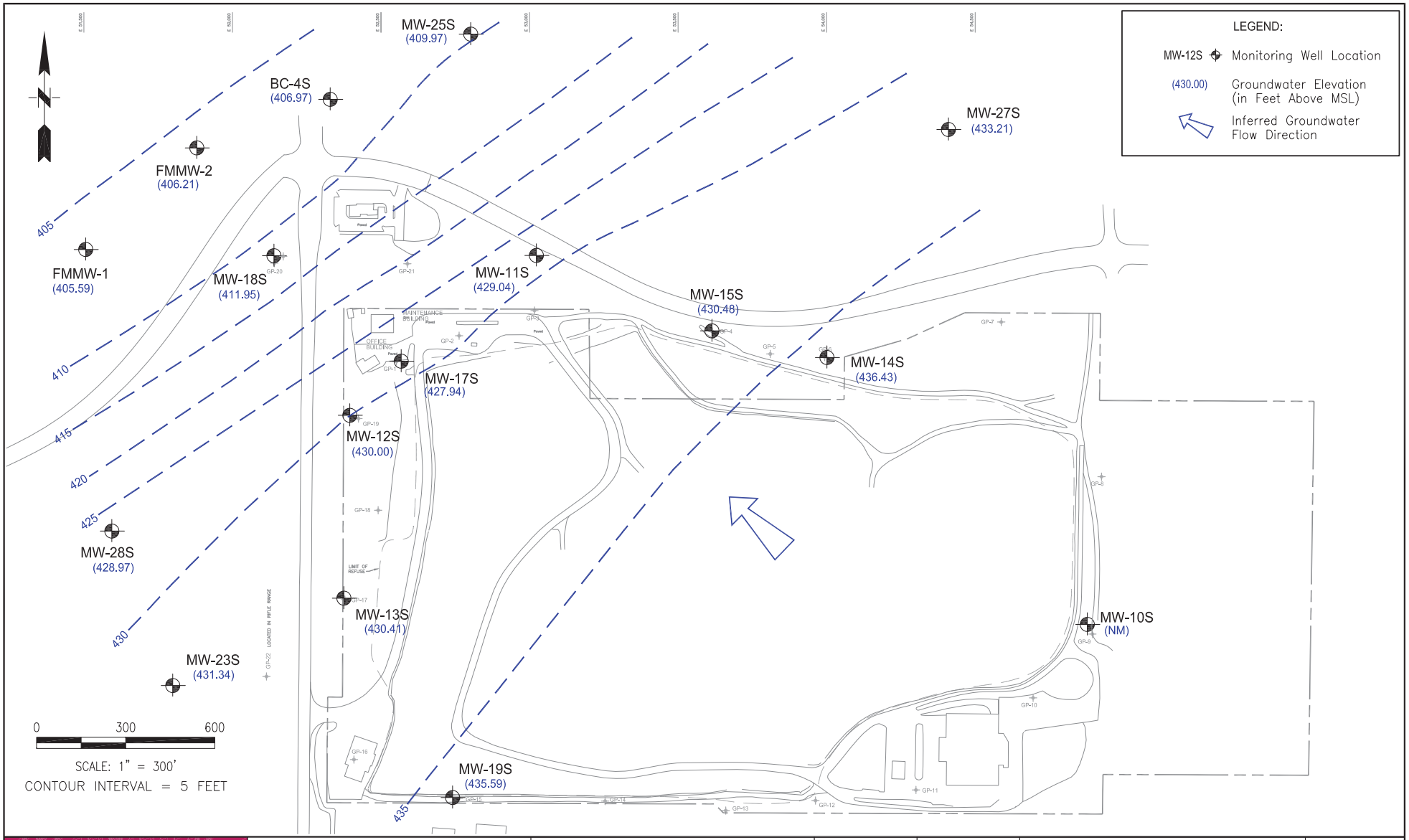
LEACHATE DAILY LOG #2

Month: December
Year: 2016

Date	Time	INFLUENT FM 212	EFFLUENT FM 511	AC-HRS	D-AP	RAIN	L8 LVL	GP MIN	S-SL	CELL1	TS/GL	TRAN P	DLW A/B	E-PH	DAILY EFFLUENT
1	12am	3092239	3466251	35593	1.7	.25	2044	855	64708	274343	57251		17627	873	32586
2	12	3123930	3498837	35617	59.9	.1	2061	856	"	"	57282		17652	872	32587
3	12	3156801	3531424	35641	59.7	.05	2071	858	"	"	57317		17677	872	32586
4	12	3189857	3564010	35665	2.1	.08	2085	858	"	"	"		17703	871	32585
5	12	3220858	3596596	35689	57	.1	2092	861	"	"	57360		17728	871	32587
6	12	3254747	3629182	35712	57.2	.1	21	863	"	"	57383		17753	8.74	32587
7	12	3286348	3661769	35736	off	0	2109	865	"	"	57409		17778	8.71	32587
8	12	3316851	3694355	35761	58	0	2116	868	"	274462	57449		17804	869	32586
9	12	3351986	3726942	35785	60.5	.1	2126	870	"	"	"		17829	870	32588
10	12	3383508	3759530	35809	2.0	.75	2137	873	"	"	"		17855	868	32585
11	12	3413899	3792115	35833	57.4	.1	2153	"	"	"	"		17880	868	32587
12	12	3447578	3824702	35857	2.2	.125	2155	875	"	"	"		17905	870	32586
13	12	3478084	3857289	35880	off	.125	21.68	876	"	"	57469		17931	8.72	32587
14	12	3508944	3889875	35824	off	0	21.59	877	"	"	57725		17956	8.71	32586
15	12	3540072	3922461	35849	59.1	0	21.76	878	"	"	57729		179	8.70	32587
16	12	3573092	3955048	35953	59	0	2186	879	"	"	57736		18006	876	32586
17	12	3603562	3987634	35977	60	0	2192	880	64708	274462	57759		18032	874	32586
18	12	3634683	4020162	36001	60	0	2193	881	"	"	"		18057	866	32586
19	12	3666064	4052806	36025		0	2000	882	"	"	"		18082	868	32587
20	12	3697514	4085393	36050	59.1	.5	22.07	883	"	"	57822		18108	8.75	32586
21	12	3730466	4117978	36073	58.1	0	22.15	888	"	"	"		18133	8.74	32587
22	12	3762102	4150565	36097	60.4	0	22.22	891	"	"	"		18157	875	32586
23	12	3793772	4183152	36121	59	.06	2233	893	"	"	"		18183	874	32587
24	12	3825342	4215740	36145	off	0	2234	"	71282	"	"		18209	877	32587
25	12	3857563	4248327	36169	off	.4	2245	895	"	"	"		18234	875	32586
26	12	3888035	4280912	36193	off		2251	"	"	"	"		18259	877	32587
27	12	3919967	4313494	36216	58.4	.4	22.57	897	"	"	57838		18284	8.76	32588
28	12	3951610	4346087	36240	58.2	.175	22.63	"	"	"	57855		18310	8.74	32588
29	12	3982803	4378675	36264	59	0	2273	899	"	"	57869		18335	873	32589
30	12	4014511	4411264	36288	58.8	0	not working	901	"	"	57919		18360	870	32588
31	12	4046444	4443852	36312	60.9	0	not working	904	71282	274462	57919		18386	866	32587
						3.37			6,574	119					

Appendix C

WATER LEVEL DATABASE



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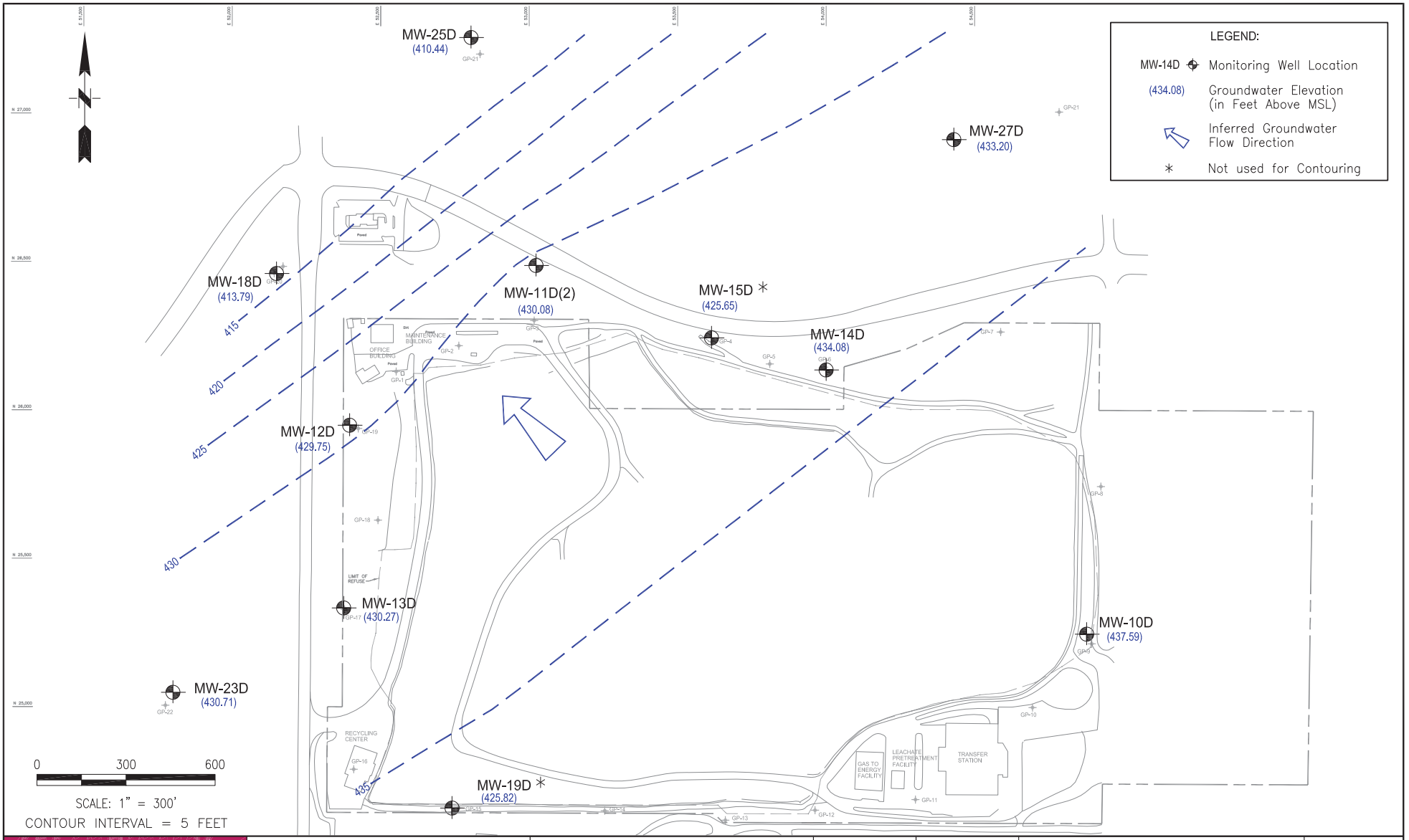
PROJECT NO. 04215002.03	DES BY SDP	SHALLOW PERCHED AQUIFER WATER LEVEL MAP JANUARY 14, 2016	DATE MAY 2016
SCALE AS SHOWN	CHK BY KGL		FIGURE 1
CAD FILE FIGURE 1	APP BY KGL	HIDDEN VALLEY LANDFILL PIERCE COUNTY, WASHINGTON	



SCS ENGINEERS
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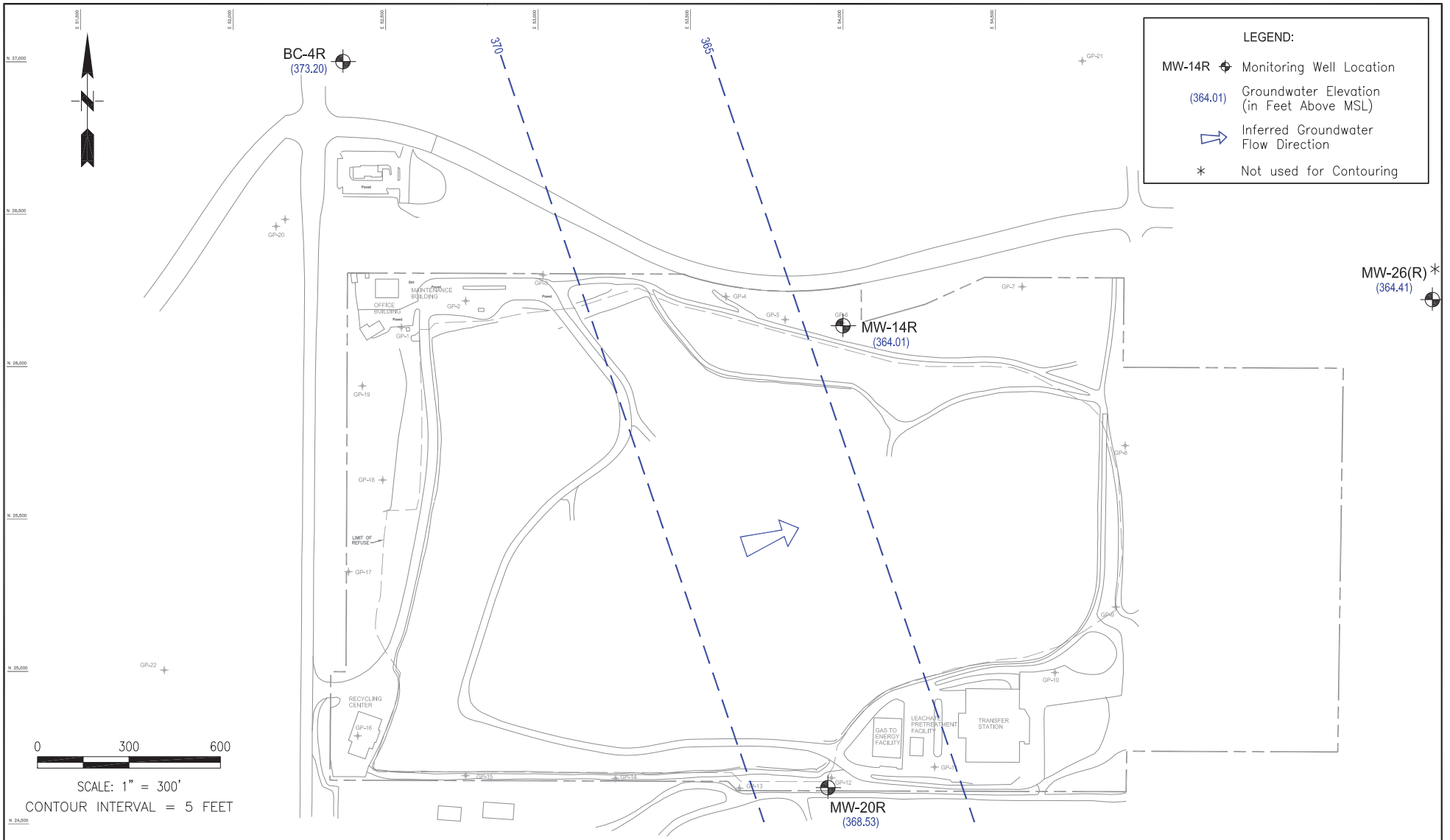
PROJECT NO.	04215002.03
DES BY	SDP
SCALE	AS SHOWN
CHK BY	KGL
CAD FILE	FIGURE 2
APP BY	KGL

UPPER REGIONAL AQUIFER
WATER LEVEL MAP
JANUARY 14, 2016

HIDDEN VALLEY LANDFILL
PIERCE COUNTY, WASHINGTON

DATE: MAY 2016

FIGURE: 2



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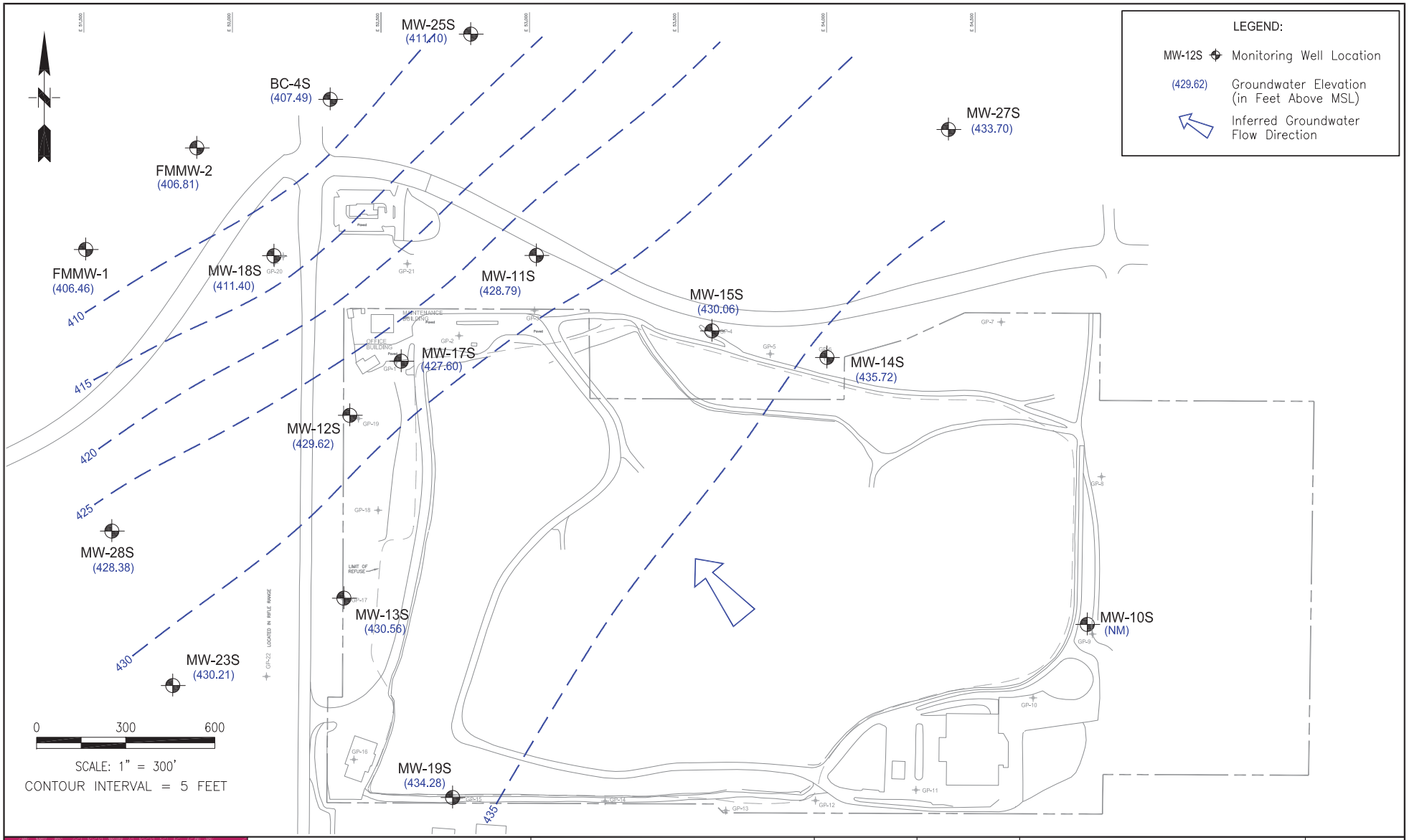
PROJECT NO. 04215002.03	DES BY SDP	LOWER REGIONAL AQUIFER WATER LEVEL MAP JANUARY 14, 2016	DATE MARCH 2016
SCALE AS SHOWN	CHK BY KGL		FIGURE 3
CAD FILE FIGURE 3	APP BY KGL	HIDDEN VALLEY LANDFILL PIERCE COUNTY, WASHINGTON	



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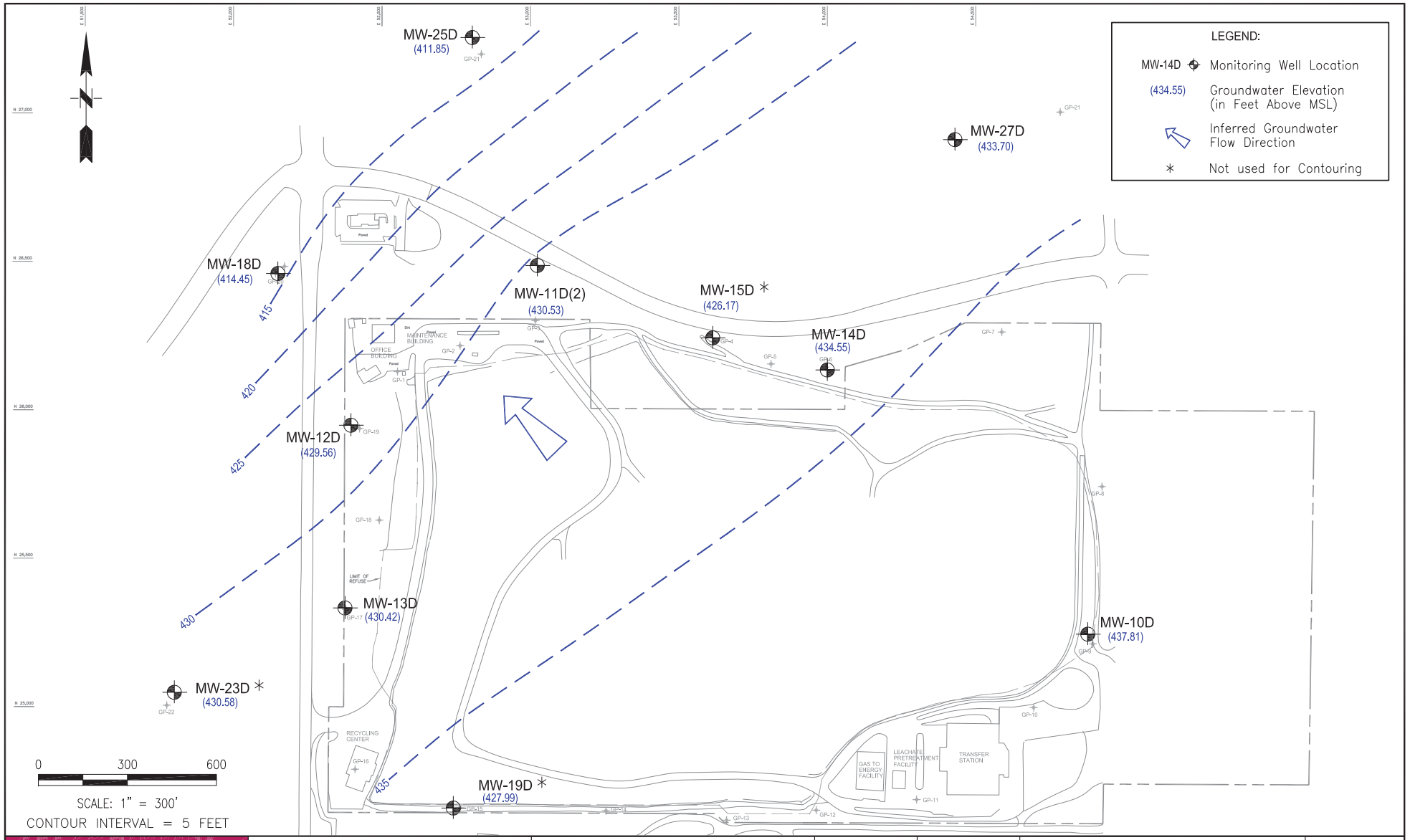
PROJECT NO. 04216002.03	DES BY SG	SHALLOW PERCHED AQUIFER WATER LEVEL MAP APRIL 21, 2016	DATE AUGUST 2016
SCALE AS SHOWN	CHK BY KGL		FIGURE 1
CAD FILE FIGURE 1	APP BY KGL	HIDDEN VALLEY LANDFILL PIERCE COUNTY, WASHINGTON	



SCS ENGINEERS
Environmental Consultants and Contractors
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(425) 746-4600 FAX: (425) 746-6747

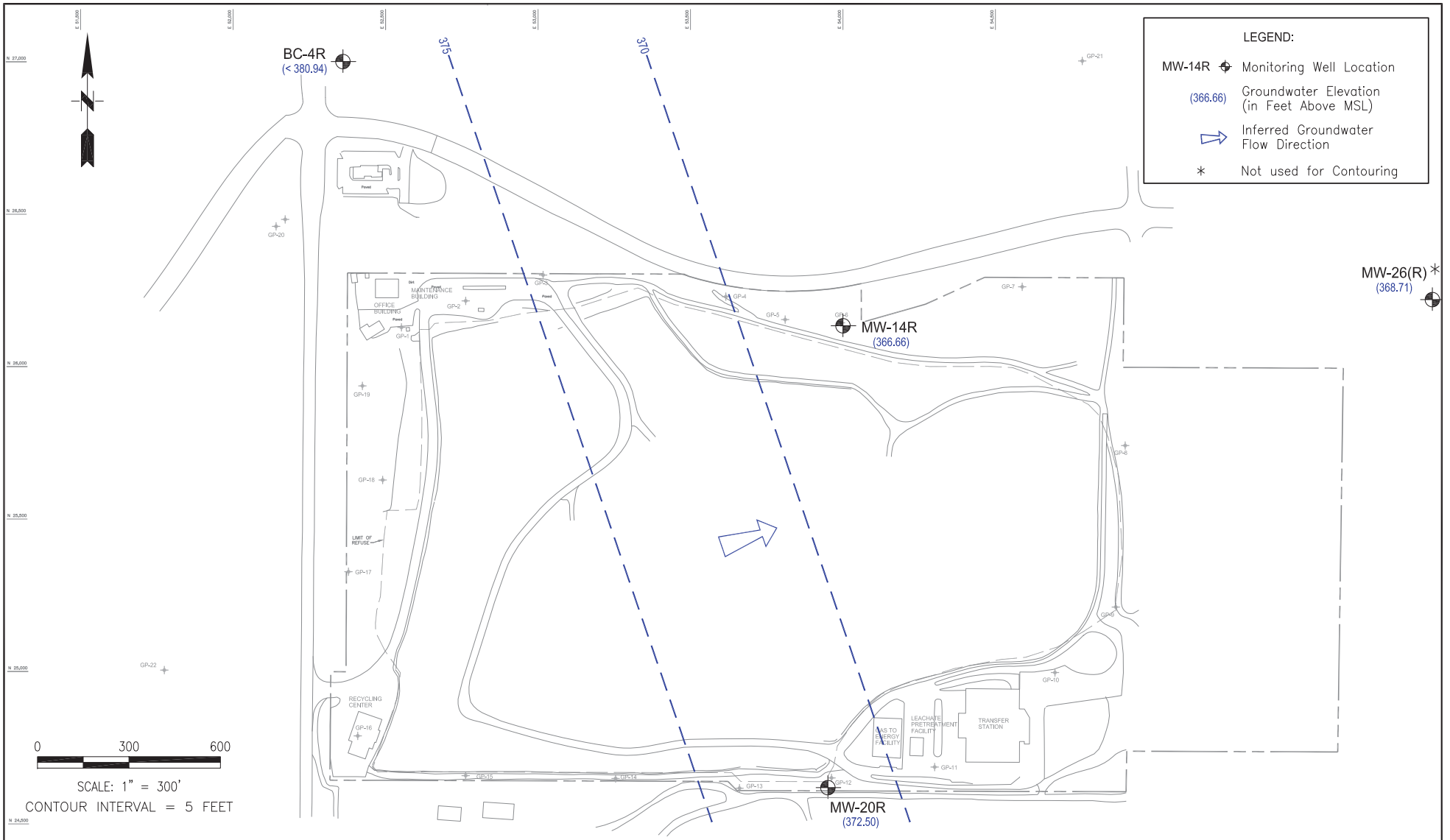
PROJECT NO.	04216002.03
DES BY	SG
SCALE	AS SHOWN
CHK BY	KGL
CAD FILE	FIGURE 2
APP BY	KGL

UPPER REGIONAL AQUIFER
WATER LEVEL MAP
APRIL 21, 2016

HIDDEN VALLEY LANDFILL
PIERCE COUNTY, WASHINGTON

DATE: AUGUST 2016

FIGURE: 2



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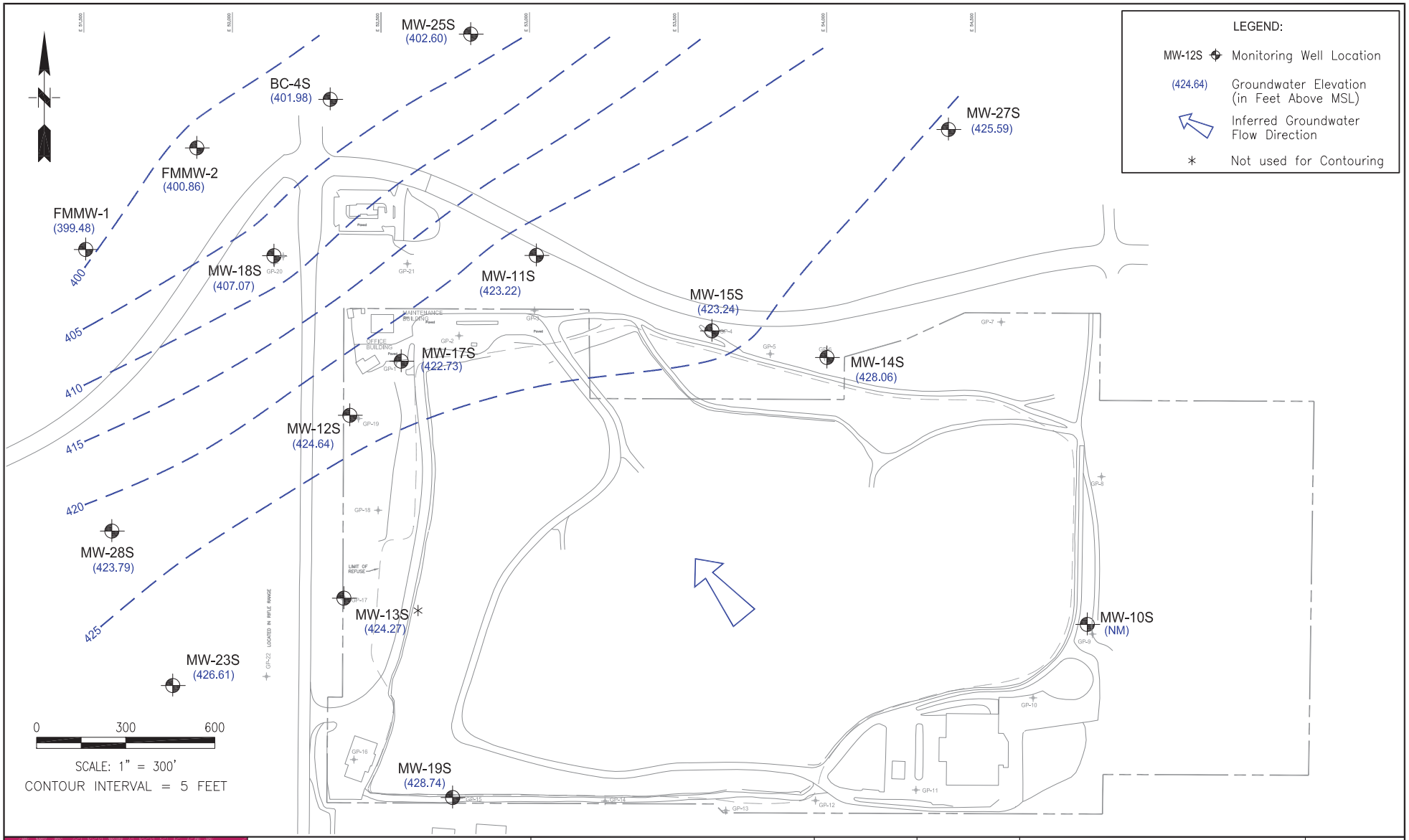
PROJECT NO. 04216002.03	DES BY SG	LOWER REGIONAL AQUIFER WATER LEVEL MAP APRIL 21, 2016	DATE AUGUST 2016
SCALE AS SHOWN	CHK BY KGL		FIGURE 3
CAD FILE FIGURE 3	APP BY KGL	HIDDEN VALLEY LANDFILL PIERCE COUNTY, WASHINGTON	



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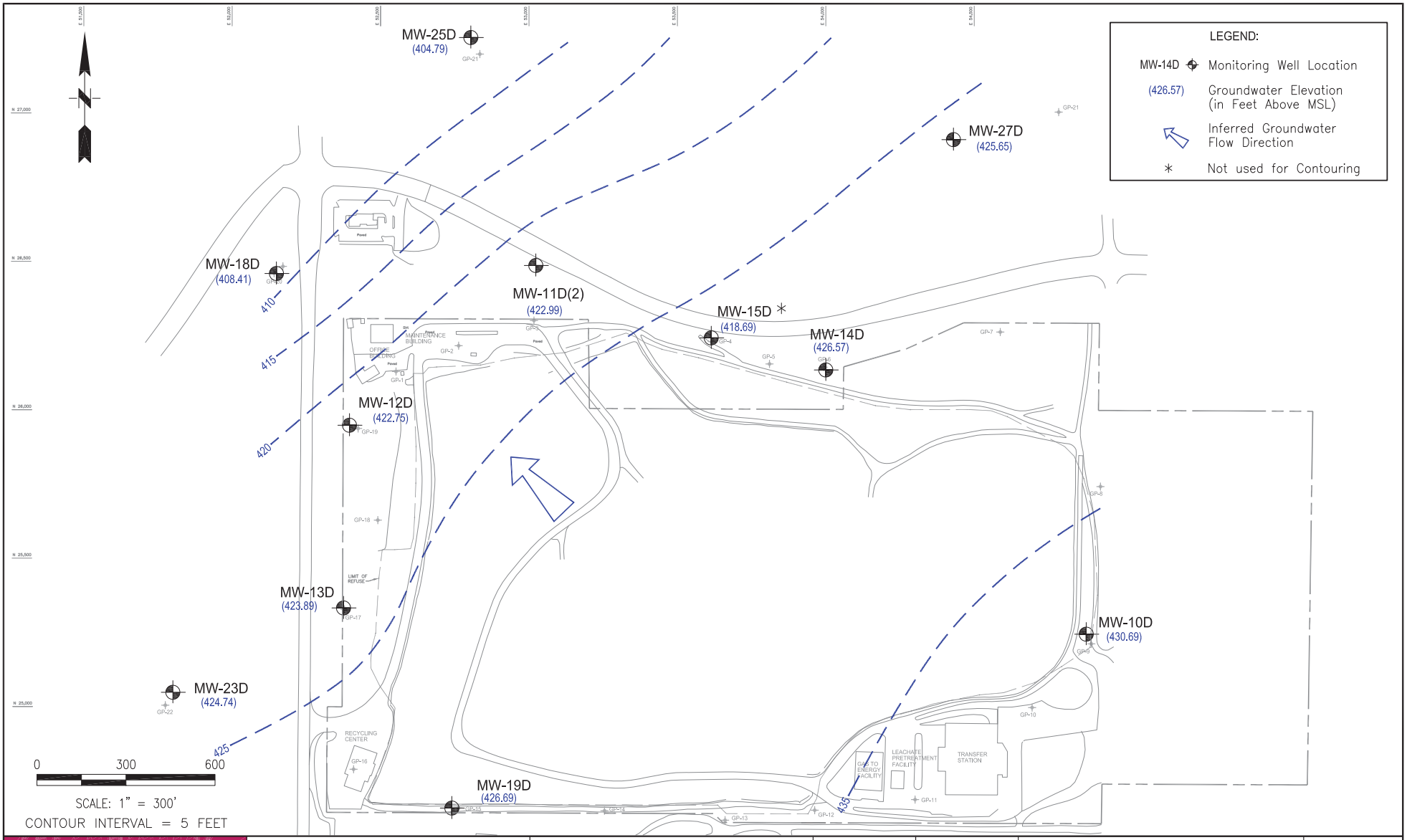
PROJECT NO. 04216002.03	DES BY SG	SHALLOW PERCHED AQUIFER WATER LEVEL MAP JULY 7, 2016	DATE AUGUST 2016
SCALE AS SHOWN	CHK BY KGL		FIGURE 1
CAD FILE FIGURE 1	APP BY KGL	HIDDEN VALLEY LANDFILL PIERCE COUNTY, WASHINGTON	



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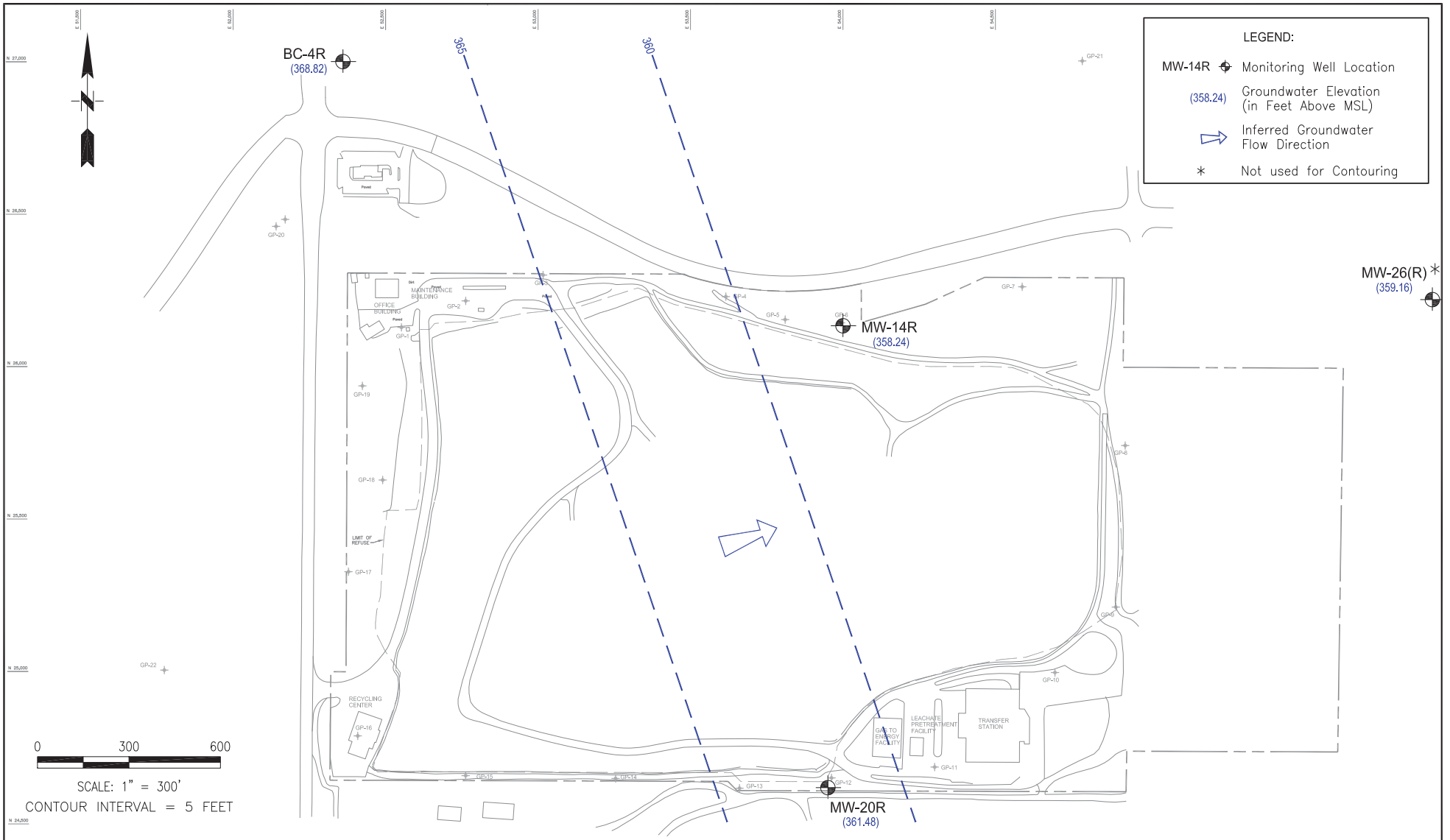
PROJECT NO.	04216002.03
DES BY	SG
SCALE	AS SHOWN
CHK BY	KGL
CAD FILE	FIGURE 2
APP BY	KGL

UPPER REGIONAL AQUIFER
WATER LEVEL MAP
JULY 7, 2016

HIDDEN VALLEY LANDFILL
PIERCE COUNTY, WASHINGTON

DATE: AUGUST 2016

FIGURE: 2



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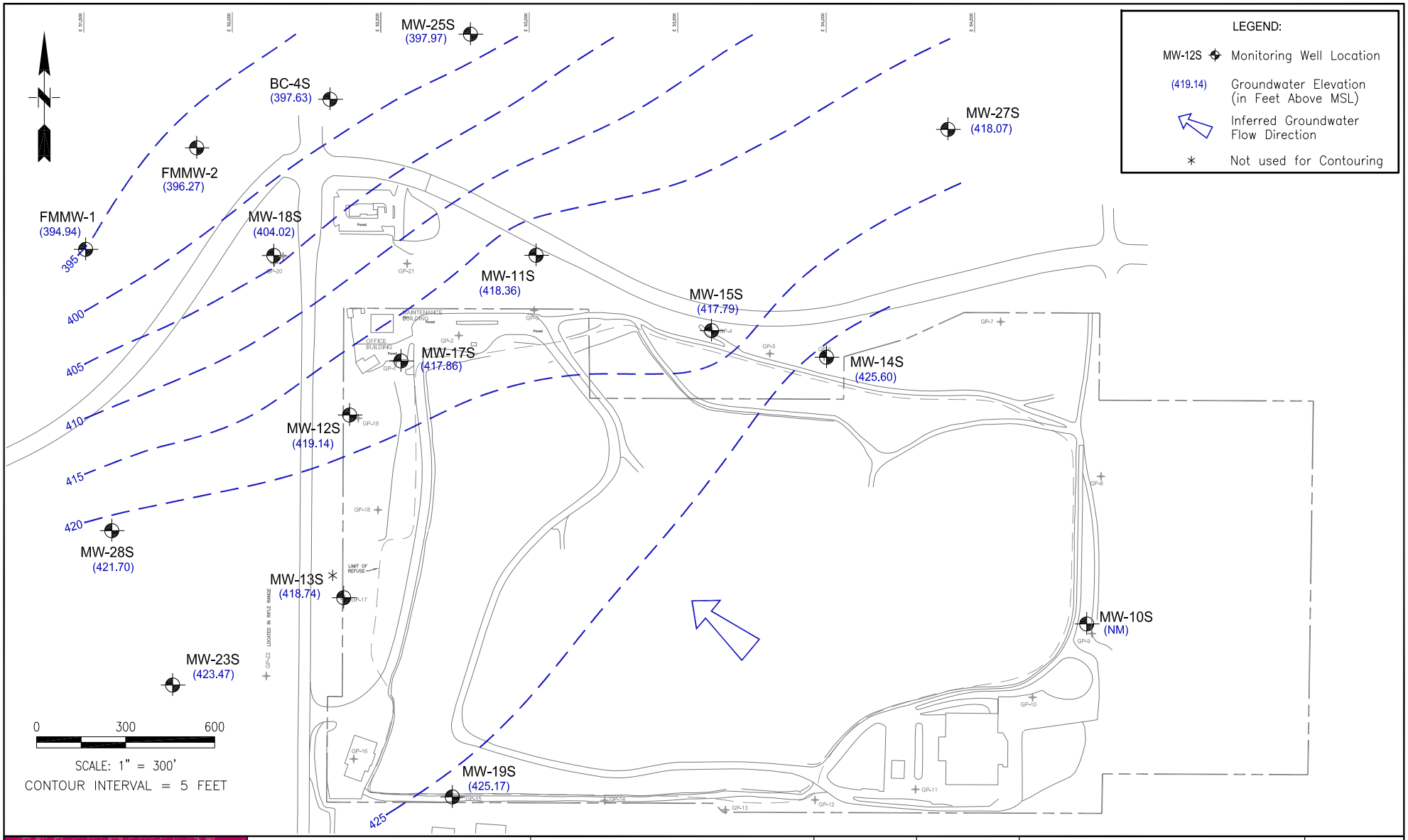
PROJECT NO. 04216002.03	DES BY SG	LOWER REGIONAL AQUIFER WATER LEVEL MAP JULY 7, 2016	DATE AUGUST 2016
SCALE AS SHOWN	CHK BY KGL		FIGURE 3
CAD FILE FIGURE 3	APP BY KGL	HIDDEN VALLEY LANDFILL PIERCE COUNTY, WASHINGTON	



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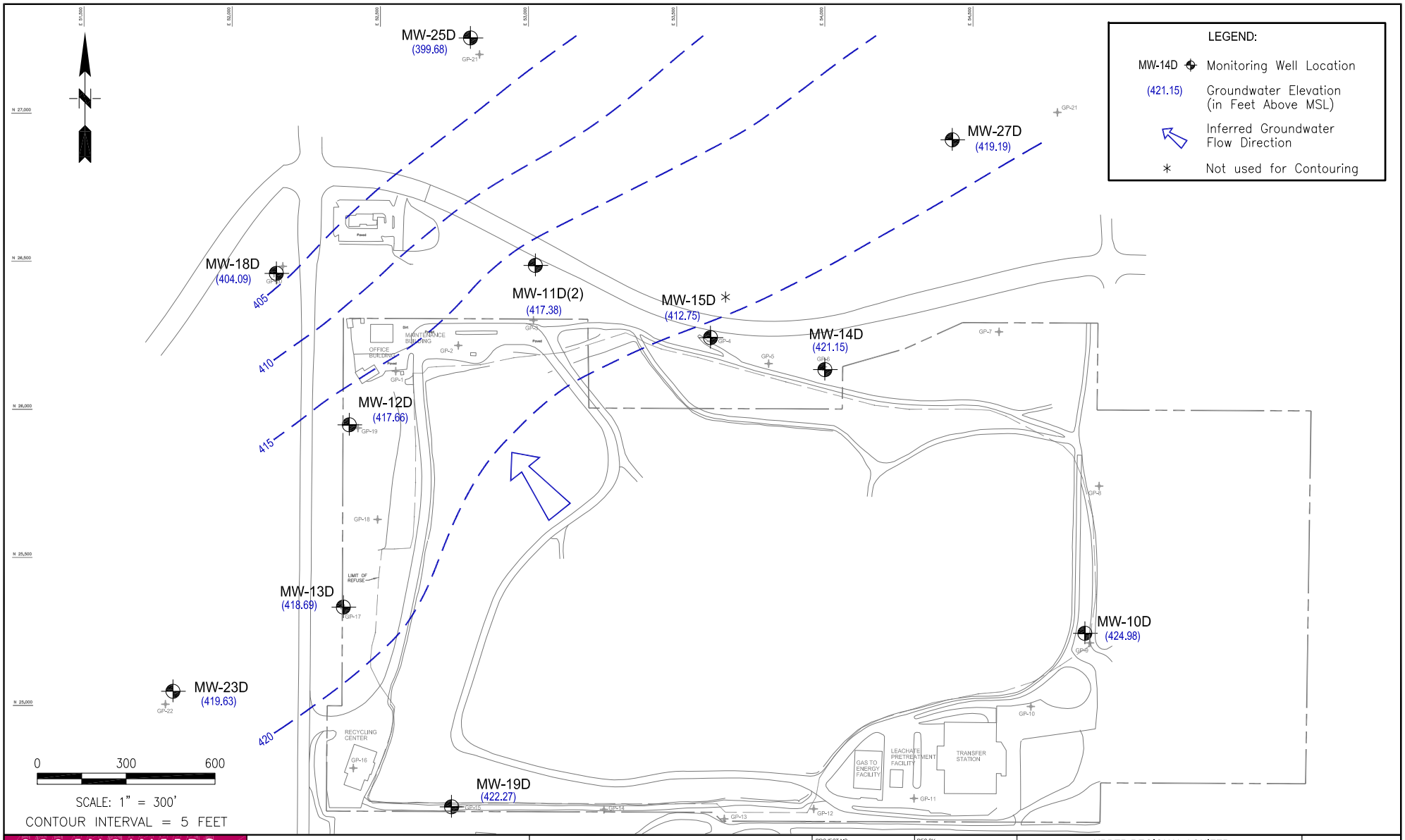
PROJECT NO. 04217003.03	DES BY SG	SHALLOW PERCHED AQUIFER WATER LEVEL MAP OCTOBER 14, 2016	DATE MARCH 2017
SCALE AS SHOWN	CHK BY KGL		FIGURE 1
CAD FILE FIGURE 1	APP BY KGL	HIDDEN VALLEY LANDFILL PIERCE COUNTY, WASHINGTON	



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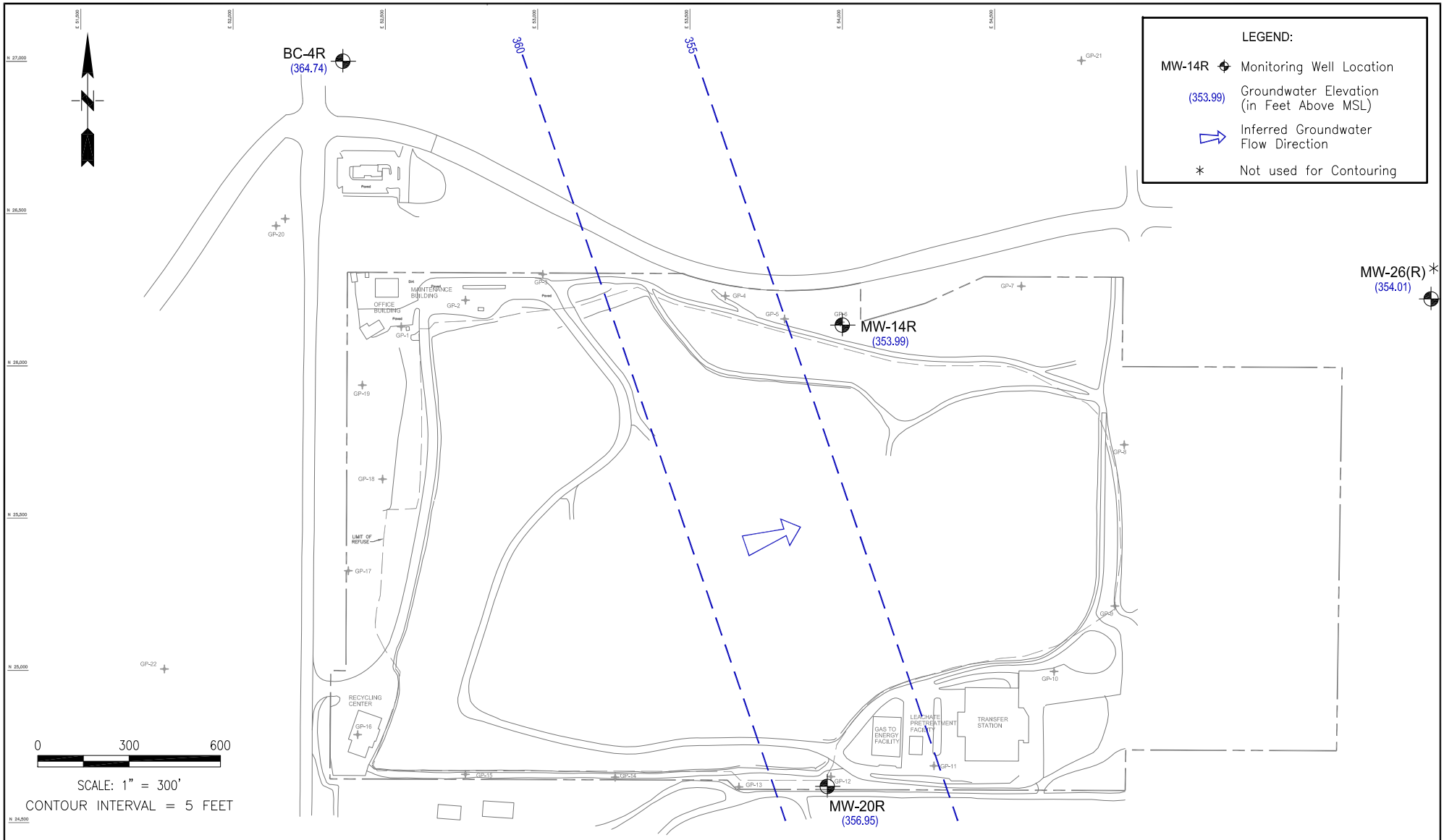
PROJECT NO. 04217003.03	DES BY SG	UPPER REGIONAL AQUIFER WATER LEVEL MAP OCTOBER 14, 2016	DATE MARCH 2017
SCALE AS SHOWN	CHK BY KGL	HIDDEN VALLEY LANDFILL PIERCE COUNTY, WASHINGTON	FIGURE 2
CAD FILE FIGURE 2	APP BY KGL		



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PROJECT NO. 04217003.03	DES BY SG
SCALE AS SHOWN	CHK BY KGL
CAD FILE FIGURE 3	APP BY KGL

LOWER REGIONAL AQUIFER
WATER LEVEL MAP
OCTOBER 14, 2016

HIDDEN VALLEY LANDFILL
PIERCE COUNTY, WASHINGTON

DATE MARCH 2017

FIGURE 3

Water Level Measurements
2016 Annual Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

WELL	TOC ELEV	01/15/88	02/23/88	02/24/88	04/26/88	05/24/88	06/24/88	07/18/88	07/19/88	07/20/88	07/21/88	08/30/88	08/31/88	09/15/88	09/16/88	10/25/88	12/01/88	12/02/88
MW-10S	460.17	424.51	424.01		432.03	432.97	432.63		431.58			428.77		427.30		424.60	430.21	
MW-10D	460.69		421.96		428.06	428.55	389.19		363.77			373.41		423.54		398.74	351.73	
MW-11S	516.44			DRY	422.20	422.59	422.18				420.95					DRY		420.70
MW-11D	516.56			417.65	422.07	422.43					420.79		418.18	417.20		416.27		
MW-11D(2)	515.53																	
MW-12S	489.94		DRY		427.23	DRY				423.27						DRY		
MW-12D	489.97	415.92	416.57		420.16	421.39	421.65			419.80			417.59	416.82		415.66		418.69
MW-13S	448.81			422.29	424.75	425.23	424.71			422.90			420.86		420.33	419.52	422.41	
MW-13D	448.94	418.89		418.12	422.54	422.91				421.28						417.59		
MW-14S	477.95		DRY		427.06	427.33	426.95	425.55					423.05	422.39		DRY	425.35	
MW-14D	477.98	418.33	419.33		424.34	423.65	423.90	422.78					420.45	419.83		418.30	421.39	
MW-14R	476.84				363.04	363.31		362.42								360.31		
MW-15S	498.76				426.86			425.43								421.83		
MW-15D	498.52				423.32			421.73								417.40		
MW-16S	480.27				427.52				425.92							421.67		
MW-16D	480.73				425.67				423.45							419.52		
MW-17S	552.44				422.10					421.14						416.31		
MW-18S	538.40				405.27						404.36	402.61			402.03	401.68		403.28
MW-18D	539.00				406.43						405.61					402.91		
MW-19S	485.71				430.35				429.41							427.19		
MW-19D	485.82				422.65				419.88							416.22		
MW-20R	469.43				361.05				371.54							368.72		
MW-22U	545.92																	
MW-22L	546.07																	
MW-23S	448.34																	
MW-23D	448.25																	
MW-25S	527.80																	
MW-25D	527.52																	
MW-26R	481.81																	
MW-27S	531.81																	
MW-27D	531.92																	
MW-28S	466.87																	
BC-4S	526.68			399.00	401.24								399.08			397.82		
BC-4D	526.94			366.39	369.12							367.19				366.16		
FM-1	542.59																	
FM-2	536.40																	

Notes: Before June 1996 well elevations were: MW-11s 501.48; MW-11d 501.45; MW-15s 490.53; MW-15d 490.61
Between June 1996 and March 2001 well elevations were: MW-11s 512.13; MW-11d 512.06
Before October 30, 1999 well elevations were: MW-27s 531.81; MW-27d 531.92
Before January 21, 2000 well elevations were: MW-10s 455.45; MW-10d 456.19
Before May 18, 2001 well elevations were: MW-23s 449.92; MW-23d 449.96
Before September 2000, well elevations were: BC-4S 524.35; BC-4D 524.46
Before November 19, 2004 well elevations were: MW-25S 526.54; MW-25D 526.66
Before August 2005 well elevations were: MW-18S 546.88; MW-18D 546.01, new elevations are field measurements, not survey results

Water Level Measurements
2016 Annual Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

WELL	12/22/88	01/24/89	03/02/89	03/04/89	03/15/89	03/16/89	04/25/89	05/25/89	06/29/89	06/30/89	07/17/89	07/18/89	07/19/89	09/05/89	10/04/89	10/25/89	10/26/89	10/27/89
MW-10S	429.60	432.60	434.17			436.30	441.21	439.43	435.95		434.50			430.93	428.49	426.70		
MW-10D	398.87	408.23	429.90			432.07	436.45	434.36	374.97		430.18			426.24	424.33	423.15		
MW-11S		422.63		424.13	425.88		430.40	429.02	426.38			425.10		420.67	DRY		DRY	
MW-11D	420.40	422.47					429.35					424.90			418.55		417.12	
MW-11D(2)																		
MW-12S		425.65			428.93		432.23			423.02			427.23	DRY	DRY		DRY	
MW-12D	419.12	421.29	422.67		424.63		428.79	427.21					423.07	419.27	417.66		416.67	
MW-13S	421.86	423.34	424.15		426.35		430.41	428.80		426.41		425.48		422.40	421.35		420.52	
MW-13D		422.76					430.10					424.49						418.22
MW-14S	425.17	427.42		429.20		431.77	437.32	435.15	424.33		429.96			424.96	423.11	DRY		
MW-14D	421.96	424.47		425.58		428.09	432.40	430.60			426.31					419.47		
MW-14R		362.86					368.74					361.22				361.30		
MW-15S		427.43			431.53		436.43			430.68	425.18			424.68	422.97		421.85	
MW-15D		423.45					431.47				429.71						418.47	
MW-16S		427.90					439.37					431.22				422.35		
MW-16D		425.63					433.43					427.26				420.66		
MW-17S		423.04			426.88		430.72			426.88		424.79		420.99	419.02		417.57	
MW-18S	404.51	406.58	407.63		408.64		412.41	411.88		409.73			408.62	406.68	404.41			403.69
MW-18D		406.66					412.61						408.48					403.73
MW-19S		432.97					437.37					432.38						426.78
MW-19D		421.87					428.59					423.90						417.94
MW-20R		371.50					377.61						365.39				369.50	
MW-22U																		
MW-22L																		
MW-23S																		
MW-23D																		
MW-25S																		
MW-25D																		
MW-26R																		
MW-27S																		
MW-27D																		
MW-28S																		
BC-4S		401.83					406.95						403.42					399.12
BC-4D		369.06					374.72						370.05					367.40
FM-1																		
FM-2																		

Water Level Measurements
2016 Annual Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

WELL	11/15/89	12/18/89	01/03/90	01/15/90	01/24/90	01/29/90	02/12/90	02/27/90	03/12/90	03/26/90	04/09/90	04/25/90	05/07/90	05/21/90	06/04/90	06/18/90	07/02/90	07/24/90
MW-10S	427.78	429.68	428.78	435.27		438.49	441.52	442.60	442.83	442.22	441.27	440.44	439.68	438.34	438.12	425.45	436.65	435.11
MW-10D						434.58				437.30		435.54		433.69		433.14		431.02
MW-11S	DRY	420.88	420.15	426.26		427.82	430.91	431.60	431.25	430.89	430.10	429.34	428.78	427.82	427.27	427.53	426.82	425.44
MW-11D						427.58						429.20						425.17
MW-11D(2)																		
MW-12S	DRY	DRY	DRY	428.56	429.00	430.59	433.16	433.09	433.02	432.74	431.96	431.22	430.90	429.95	429.69	429.79	428.89	426.32
MW-12D						426.75						428.24						423.97
MW-13S	421.39	422.37	421.75	427.85	427.90	429.29	432.16	432.60	432.43	431.81	431.07	430.51	429.68	429.34	429.21	429.07	428.27	426.86
MW-13D						428.30						430.42						425.44
MW-14S	423.25	425.29	424.95	432.01	434.11	434.81	438.30	439.52	439.50	438.70	437.47	436.42	435.51	434.01	433.00	433.54	432.42	430.71
MW-14D						430.95						431.68						427.17
MW-14R						366.27						367.42						355.95
MW-15S	422.85	425.50	424.90	431.31		433.53	436.97	438.07	437.73	437.27	436.25	435.32	432.65	433.38	432.76	433.05	432.04	430.29
MW-15D						429.11						430.56						425.99
MW-16S						436.38						433.05						427.06
MW-16D						431.37						432.43						428.09
MW-17S	417.35	420.19	420.58	432.44	427.10	428.38	431.34	431.71	431.47	431.09	430.39	429.67	429.34	428.46	427.90	428.15	427.42	426.04
MW-18S	403.17	405.25	405.18	407.10	408.05	410.02	412.32		414.05	412.96	412.37	411.90	411.73	412.20	410.48	DRY	409.86	408.55
MW-18D	403.79	405.27	405.01	409.03		410.72	413.08	414.39	413.66	413.85	413.31	412.48	412.13	411.36	410.59	410.70	410.21	408.81
MW-19S						436.74						436.71						433.11
MW-19D						428.38						428.57						424.70
MW-20R						374.60						375.22						360.41
MW-22U	DRY	DRY	DRY	DRY		DRY	409.70	410.55	410.23	410.39	410.04	409.47	408.97	408.75	408.72	DRY	408.72	408.47
MW-22L	400.83	402.38	412.21	405.19	406.07	407.12	409.53	410.84	410.65	410.60	409.98	409.25	408.75	408.01	407.21		406.95	405.43
MW-23S						432.63						432.47						429.61
MW-23D						427.92						428.61						424.96
MW-25S						404.32						407.69						402.12
MW-25D						407.37						410.27						405.81
MW-26R																		
MW-27S																		
MW-27D																		
MW-28S																		
BC-4S						404.52						406.70						403.62
BC-4D						372.03						374.99						368.69
FM-1																		
FM-2																		

Water Level Measurements
2016 Annual Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

WELL	09/04/90	10/01/90	10/22/90	11/26/90	12/17/90	01/29/91	02/25/91	03/26/91	04/29/91	06/28/91	07/29/91	01/20/92	04/14/92	07/14/92	10/19/92	03/22/93	06/02/93	09/07/93
MW-10S	432.69	425.32	430.05		435.69	436.67	441.32	433.22	444.30	443.36	435.20	429.35	433.49	430.31	DRY	427.37	433.05	429.61
MW-10D	427.99	431.62				433.89			439.41	433.96	431.16	424.29	428.87	425.25	420.98	423.64	428.63	425.74
MW-11S	422.41	420.58	418.67	427.55	426.78	426.58	430.09	431.22	432.12	428.19	425.83	419.28	422.73	419.60	DRY	420.13	417.27	413.06
MW-11D		420.38				427.61			432.05		425.60	418.97	422.63	419.60	414.86	420.10	417.13	413.00
MW-11D(2)																		
MW-12S				426.09	429.24	429.03	430.76	432.81	430.35	430.08	428.04	DRY	424.73	DRY	416.73	DRY	425.34	
MW-12D	421.01		418.31			427.02			431.85		424.23	417.46	421.17	418.17	414.37	417.47	420.84	418.33
MW-13S	424.68	423.66	423.45	429.03	428.13	430.33	432.43	423.59	434.54	430.83	428.63	419.23	422.47	419.20	415.91	417.76	422.08	419.65
MW-13D		421.13				426.64			433.29		426.07	418.79	422.40	419.15	415.78	417.56	422.02	419.58
MW-14S	427.07	425.03	424.47		432.45	420.35	447.30	438.95	440.39	434.42	431.01	424.05	428.57	424.27	DRY	423.43	428.37	424.16
MW-14D		422.14				433.28			435.84	430.25	427.33	420.45	424.73	420.89	417.55	419.77	424.55	421.64
MW-14R		359.66				367.49			370.24		358.20	361.18	361.44	355.42	356.74	359.29	358.88	355.18
MW-15S	426.96					433.07			438.36		430.88	423.88	427.90	424.26	420.15	423.16	427.81	
MW-15D						429.29			434.82		426.37	419.11	423.59	419.70	416.43	418.66	423.40	420.59
MW-16S						434.89												
MW-16D				405.49		431.36												
MW-17S	422.86	420.92				428.25			431.88		426.56	419.34	423.07	410.72	414.86	418.76	423.44	420.18
MW-18S	406.71	405.51	404.46		409.38		411.88	403.76	413.42	411.32	409.46	DRY	DRY	DRY	402.62	404.70	407.14	404.83
MW-18D	406.71	405.41							415.38	411.78	409.59	404.61	406.61		402.31	403.76	406.46	404.57
MW-19S									437.67		436.20	427.29	429.69	425.96	423.42	426.81	429.59	426.05
MW-19D									431.53		424.40	416.28	420.71	416.74	413.53	415.55	419.27	421.38
MW-20R		365.62				375.93			376.74		362.13	372.01	367.38	359.15	363.22	365.37	365.90	361.92
MW-22U	403.32								401.78		408.83	408.68	408.66	408.68	408.63	408.59	408.58	408.89
MW-22L	403.47					DRY			411.12		406.33	401.89	403.50	401.71	399.72	401.02	403.34	401.49
MW-23S		426.73				431.73			429.94		430.28	426.11	427.38	425.59	422.09	426.54	427.46	425.22
MW-23D						428.00			431.86		425.43	419.36	422.39	419.50	416.24	419.16	422.21	419.55
MW-25S		399.24				404.54			412.34		403.25	399.17	399.99	398.66	397.72	398.29	400.04	398.53
MW-25D						406.91			414.08		406.76	401.69	403.37	401.33	399.65	400.76	403.36	401.38
MW-26R												418.41	422.24	418.64	415.27	417.27	419.19	418.28
MW-27S												418.61	423.23	418.89	416.24	417.80	423.19	418.84
MW-27D												419.12	423.47	419.53	416.07	418.44	423.34	419.84
MW-28S																		
BC-4S									409.35			400.69	402.05		397.85	399.65	401.91	399.98
BC-4D									366.55			367.82	369.21		364.26	366.06	367.48	364.51
FM-1																		
FM-2																		

Water Level Measurements
2016 Annual Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

WELL	12/07/93	03/14/94	06/07/94	09/19/94	12/05/94	03/18/95	06/19/95	09/19/95	12/13/95	03/19/96	06/12/96	09/03/96	12/10/96	12/11/96	03/25/97	06/09/97	09/08/97	12/15/97
MW-10S	424.88	427.86	427.72	DRY	425.98	438.16	434.82	428.32	433.15	444.11	440.80	433.97		436.16	445.61	439.49	433.31	432.19
MW-10D	422.47	424.73	424.07	419.79	422.56	435.70	431.53	424.59	430.60	440.31	437.51	430.54		434.00	442.38	436.18	429.66	427.41
MW-11S	410.27	414.64	412.38	407.22	414.56	421.87	418.51	413.36	419.71	421.50	429.48	414.41	417.75		423.39	418.63	412.39	412.87
MW-11D	410.19	414.50	412.28	407.18	414.34	421.77	418.43	413.26	419.50	421.45	429.42	414.32	416.59		423.34	418.51	413.28	412.78
MW-11D(2)																		
MW-12S						430.21					431.24	426.37			433.87			
MW-12D	415.55	418.14	416.80	413.23	416.49	428.03					429.82	422.98			433.87			
MW-13S		419.49	418.12	414.48	417.91	429.13	425.05	418.71	425.06	433.50	431.04	424.23	427.59		434.98	429.54	423.56	422.52
MW-13D	416.81	419.38	418.04	414.42	417.86	429.06	424.98	418.58	424.90	433.35	430.96	424.12	427.49		434.90	429.43	423.42	422.39
MW-14S	422.73	425.00	423.78	DRY	424.23	434.94	430.66	423.86	429.78	440.34	437.20	429.49	432.92		441.55	435.71	428.32	427.05
MW-14D	418.74	421.42	420.20	416.51	419.40	432.14	427.68	420.79	427.28	436.82	434.40	426.88	430.49		438.83	432.64	425.79	424.31
MW-14R	358.09	358.96	357.64	354.24	356.62	365.61				369.81					372.37	369.35		
MW-15S	421.51	424.97	423.51	419.66	423.86	433.81					427.78	429.11			435.18			
MW-15D	417.67	420.36	419.13	415.39	418.49	431.00					425.25	425.50			427.38			
MW-16S																		
MW-16D																		
MW-17S	416.45	421.45	419.24	413.79	420.11	428.54	425.98	420.54	426.26	431.64	429.74	425.04	427.53		432.24	428.74	424.01	439.79
MW-18S	403.39	406.60	405.20	403.10	405.74	411.72					DRY	408.31			414.02		Dry	Dry
MW-18D	402.82	404.78	403.96	401.86	403.78	412.14	408.71	404.27	408.24	416.00	414.02	408.47		410.41	417.25	412.99	407.54	416.88
MW-19S	423.79	427.18	425.62	422.10	427.13	434.65					435.56	430.05			438.73			
MW-19D	417.80	418.42	423.53	412.11	415.87	430.29					430.78	422.34			434.56			
MW-20R	364.98	365.22	364.22	359.17	363.85	373.56				377.05					374.66			
MW-22U	408.63	408.64	408.63	408.57	408.54	409.08					410.29	405.03			411.65			
MW-22L	400.09	401.97	401.20	399.45	401.09	408.62					409.88	408.78			413.61		404.22	
MW-23S	423.01	426.11	424.79	420.91	426.02	430.94	427.78	424.75	429.37	433.76	431.80	427.50		427.10	434.60	431.35	427.15	427.01
MW-23D	417.14	419.74	418.50	414.73	418.86	427.76					429.71	423.78			433.41		423.11	422.29
MW-25S	397.87	399.47	397.06	397.58	399.71	407.39			401.96		410.74	402.43			415.13		401.39	
MW-25D	399.88	401.89	400.91	399.23	401.32	409.70	405.91	401.29	405.30		412.72	404.96			416.69	411.61	404.92	403.70
MW-26R	415.67	418.73	417.29	413.53	416.61	428.77				434.35					436.69			
MW-27S	416.44	419.39	417.93	415.62	417.69	430.84					433.34	426.05			436.35			
MW-27D	416.84	419.92	418.69	415.20	417.89	430.78					433.07	425.86			437.98			
MW-28S																		
BC-4S	398.21	400.45	399.62	397.63	399.46	406.34					407.84	402.93			410.54			
BC-4D	359.84	366.08	365.16	362.99	364.10	373.21					376.22	368.33			380.40			
FM-1																		
FM-2																		

Water Level Measurements
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WELL	03/16/98	06/24/98	09/16/98	12/21/98	04/09/99	06/07/99	09/13/99	12/13/99	03/15/00	06/09/00	09/12/00	01/18/01	03/22/01	04/19/01	07/12/01	10/23/01	01/18/02	04/25/02
MW-10S	437.30	433.77	428.00	433.79	442.47	436.83	431.71	430.83		436.94	432.19	428.97	427.53	421.97	428.15	420.04	435.69	438.75
MW-10D	434.53	429.96	423.75	431.90	438.93	433.70	426.89	431.44	436.77	433.55	427.03	424.19	424.34	425.08	423.72	419.61	433.32	435.80
MW-11S	417.79	414.02	408.99	415.83	420.90	416.45	412.06	415.73	423.34	426.51	421.59	419.72	418.59	420.17	418.34	413.80	426.51	428.58
MW-11D	417.61	413.91	408.90	415.74	420.83	416.35	411.36	414.93	423.39	426.35	421.50		418.50	420.07	418.27	413.73	426.55	428.29
MW-11D(2)										425.56	419.62	416.78	416.74	417.20	415.95	412.88	425.34	427.79
MW-12S		425.82			431.86	427.97		427.32	430.54	427.78	423.13	421.56	419.49	421.98	419.94	416.82	428.12	429.76
MW-12D		422.07			430.90	426.27	419.38	423.50	428.36	425.58	419.44	417.88	417.07	417.34	416.12	412.92	425.48	427.70
MW-13S	428.26	423.57	418.03	426.12	432.13	427.19	421.46	425.30	429.86	427.12	421.34	421.16	419.02	419.17	417.86	414.65	427.30	429.86
MW-13D	428.09	423.70	417.90	425.97	432.01	427.04	421.08	425.06	430.60	427.02	421.03	419.24	418.65	418.89	417.62	414.36	426.99	429.28
MW-14S	433.69	428.75	422.95	430.34	438.56	432.56	425.72	430.83	436.56	432.40	425.90	424.15	423.07	424.36	422.73	418.24	431.60	434.77
MW-14D	430.99	426.18	419.88	428.76	435.53	430.66	421.99	427.70	432.97	429.91	423.00	420.48	420.38	420.88	419.58	416.36	429.53	432.06
MW-14R	368.84	365.64		364.34	373.99	367.36	356.76	363.30	369.84	366.37	359.91	360.24	351.60	351.25	344.49	345.94	352.63	357.03
MW-15S		424.03			432.64		421.22		430.58	427.04	421.28	419.49	418.65	419.71	418.49	414.65	426.65	429.36
MW-15D		514.69			424.18		411.73		421.54									
MW-16S																		
MW-16D																		
MW-17S	427.79	424.56	419.45	425.71	430.27	426.52	421.82	425.80	427.62	426.16	421.84	419.87	418.51	419.89	418.49	413.12	426.54	428.14
MW-18S	410.57	407.51		408.63	412.72	Dry	Dry	408.54	411.43	408.98	405.65	404.28	403.78	404.29	403.73	402.93	409.63	412.72
MW-18D	411.08	407.44	403.67	408.40	415.00	410.69	405.37	407.87	412.18	409.91	399.71	403.71	403.36	403.75	403.09	401.44	409.31	410.30
MW-19S		429.57			436.29		427.23		435.42	432.31	427.38	426.66	425.04	426.53	425.59	422.06	432.98	434.46
MW-19D		420.63			430.58		418.87		428.76	426.35	418.67		419.13	416.48	418.04	412.43	427.77	427.43
MW-20R	375.28	369.21			377.97				377.63	372.31	366.82	366.18	359.06	357.77	348.98	353.10	360.85	363.44
MW-22U		408.60		408.55	410.21	408.62	408.74	408.52	408.87	408.49	408.65		415.11		408.52	408.51	408.58	408.71
MW-22L		404.12		404.66	411.54	407.15	402.27	404.35	408.62	406.42	402.24		400.35	402.85	400.12	398.94	405.67	408.34
MW-23S	430.92	427.28	424.07	428.77	432.50	427.83	426.17	429.15	431.62	428.74	426.10	425.11	424.28	424.38	424.02	420.01	429.36	430.66
MW-23D	427.46	423.22		425.09		425.35			428.71	426.04	420.98		418.31	418.24	417.24	414.80	425.84	428.05
MW-25S		401.46		403.13	412.72	406.26	399.65	402.07	408.62	405.62	399.66	399.04	398.49	399.12	398.45	397.69	403.93	408.25
MW-25D	408.83	404.80	401.02	405.80	414.14	408.78	402.74	405.09	410.31	408.06	402.82		399.04	401.61	400.66	399.30	406.84	410.29
MW-26R	428.69			426.31	433.49				430.47	427.51	420.53	417.96	418.40	419.10	417.36	414.16	426.39	429.08
MW-27S		425.22			435.18				431.83	429.31	421.77		417.86	418.95	417.81	415.59	427.92	431.41
MW-27D		425.02			434.74				431.95	428.99	422.76		418.61	419.53	418.49	415.18	428.07	431.16
MW-28S										427.07	423.74						427.42	428.56
BC-4S		401.92		402.72							400.12		397.88	398.36	397.90	396.63	403.56	405.74
BC-4D		371.40		369.96							367.67		364.58	364.70	361.47	360.01	366.94	371.19
FM-1									404.48	401.66	397.12	395.29	395.11	395.14	395.03	394.20	400.29	404.03
FM-2									405.20	402.76	398.67	396.75	396.35	396.50	397.80	395.30	400.88	404.80

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WELL	07/25/02	10/24/02	01/30/03	04/24/03	07/24/03	10/30/03	01/22/04	04/15/04	06/29/04	10/21/04	01/27/05	02/23/05	04/21/05	07/22/05	10/17/05	01/18/06	04/14/06	08/08/06
MW-10S	432.88	425.14	430.66	433.54	428.64	426.52	432.67	432.97	423.80	426.31	431.62		432.98	430.84	425.93	440.79	438.37	431.52
MW-10D	428.84	422.88	427.50	430.82	424.40	423.28	429.32	430.20	421.95	423.54	427.69		429.57	426.49	422.63	437.31	435.68	426.74
MW-11S	423.19	416.94	425.25	424.44	418.96	418.20	423.74	423.49	417.12	417.45	421.87		422.93	421.08	416.47	430.09	433.19	420.89
MW-11D	423.10	416.88	424.98	424.33	418.88	418.11	423.67	423.42			421.76		422.85	420.98	416.40	429.95	428.09	420.77
MW-11D(2)	421.18	414.99	420.21	422.49	416.52	415.89	421.73	422.53	414.92	415.64	419.73		421.50	419.03	414.94	428.78	427.98	419.00
MW-12S	424.84	418.13	423.57	425.56	420.23	418.73	425.10	427.12	418.39	418.79				422.63			429.50	422.32
MW-12D	421.22	415.87	420.27	422.59	416.69	416.13	421.69	422.66	415.12	415.71	420.12		421.66	419.09	415.19	428.69	427.81	418.97
MW-13S	423.87	418.02	422.46	424.50	418.68	418.22	423.64	424.45	416.60	417.58	421.86		423.36	420.64	416.81	430.15	429.04	420.11
MW-13D	423.06	417.18	423.58	425.19	418.12	417.81	423.27	424.20	416.29	417.31	421.64		423.20	420.49	416.65	430.04	428.97	419.92
MW-14S	427.58	421.26	426.91	429.14	422.85	422.70	427.86	428.02	421.45	422.76	425.78		427.26	425.00	421.19	436.81	435.05	424.99
MW-14D	424.95	418.65	423.28	426.58	420.23	419.66	425.59	423.17	418.46	419.77	423.61		425.37	422.64	418.65	432.93	432.11	422.65
MW-14R	348.54	350.49	352.16	356.12	347.33	351.66	355.57	358.31	348.28	352.96	355.64		359.64	354.42	354.06	360.01	365.51	350.93
MW-15S	423.02	416.69	421.63	423.99	418.43	418.04	423.14	423.40	416.59	417.34	421.18		422.66	420.53	416.50	430.91	429.01	420.43
MW-15D						411.39	417.25	425.34	417.27	418.73	415.41		417.13	414.42	417.49	424.63	423.80	414.42
MW-16S																		
MW-16D																		
MW-17S	423.46	417.19	422.29	424.13	419.13	417.88	423.59	423.63	417.01	416.56	421.87		422.78	421.20	416.32	429.49	427.73	420.97
MW-18S	406.88	403.06	405.43	407.56	403.93	403.45	407.29	407.34	403.52	403.27		405.68	406.27	405.74		403.62	410.66	405.63
MW-18D	406.80	402.61	405.07	407.43	403.58	402.96	406.68	407.33	402.80	402.86		404.87	406.10	404.95		405.80	412.59	405.57
MW-19S	428.75	423.15	428.49	430.11	424.68	425.14	429.91	429.94	422.85	423.99			429.68	427.13	423.14	436.89	433.99	426.70
MW-19D	420.61	417.61	423.12	422.82	416.52	415.85	421.87	425.71	417.37	416.98	423.55		424.87	419.51	416.31	431.44	429.22	418.33
MW-20R	352.90	356.14	357.16	361.74	351.00	356.61	361.66	364.08	351.66	359.30	361.23		367.10	365.10	359.88	364.98	371.55	353.35
MW-22U	408.63	408.60	408.58	408.58	408.58	408.54	408.55	408.55	408.51	408.53			408.48	408.45	408.42	409.31	408.68	408.66
MW-22L	403.40	399.76	401.60	403.97	400.42	400.03	403.19	398.80	399.89	399.84			402.44	401.68	399.67	408.36	408.67	401.95
MW-23S	426.72	421.88	426.86	427.36	423.52	423.38	427.33	426.98	421.90	423.12	426.42		427.22	426.81		434.54	431.58	426.99
MW-23D	422.13	417.02	421.05	423.50	418.02	417.75	422.92	423.21	416.77	417.47	420.82		422.38	421.50		431.53	429.77	421.75
MW-25S	401.21	397.96	400.43	401.87	398.56	398.62	401.25	401.40			400.23		400.86	398.32	396.69	407.84	407.33	398.24
MW-25D	404.55	400.28	402.89	405.11	401.15	400.71	404.54	404.80			401.62		402.57	400.62	398.08	408.45	408.77	400.76
MW-26R	421.86	415.99	420.47	423.51	417.02	416.39	422.04	422.59	414.50	415.49	419.60		420.93	418.16	414.26	427.64	427.15	417.51
MW-27S	424.01	416.90	421.45	425.44	418.43	417.81	424.31	424.72	416.86	417.50	421.54		423.09	421.01	416.89	431.74	431.41	421.17
MW-27D	424.05	417.41	421.92	425.55	419.02	418.27	424.47	425.08	417.15	418.02	422.11		423.70	421.51	417.15	431.58	431.22	421.57
MW-28S	424.95	422.18		425.82	422.21		424.25	425.50			421.63		423.30			430.34	428.30	423.12
BC-4S	401.04	397.08	399.11	401.71	397.90	397.53	400.87	400.42	397.20	397.06	399.05		399.65	399.63	397.03	405.98	406.21	399.62
BC-4D	365.29	363.26	364.35	367.83	362.29	362.80	366.45	368.67	361.83	362.51	365.58		367.62	366.14	363.33	370.34	374.62	364.84
FM-1	398.34	394.69	395.29	398.80	395.20	394.49	397.28	398.92	394.84	395.27	398.88		395.77	396.29	394.54	402.96	404.72	396.37
FM-2	399.46	395.89	396.75	400.20	396.65	395.70	398.82	400.29	396.07	395.61	396.69		397.47	398.29	395.79	404.02	405.29	398.29

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WELL	10/26/06	01/18/07	04/26/07	07/19/07	10/11/07	01/24/08	04/17/08	07/10/08	10/23/08	01/12/09	04/16/09	07/09/09	10/29/09	01/28/10	04/08/10	07/15/10	10/14/10	01/06/11
MW-10S	427.17	442.36	438.36	432.94	430.61	435.04	435.58	431.82	423.99	435.75	435.81	432.63	428.51	436.03	436.53	434.81		
MW-10D	423.53	439.31	436.82	428.95	425.67	431.93	432.69	427.35	421.94	432.42	433.37	428.97	424.31	433.40	435.08	431.80	431.80	433.13
MW-11S	416.76	430.96	428.60	422.56	419.23	425.37	425.56	421.17	416.01	427.07	425.90	422.45	418.70	421.84	426.40	424.64	420.33	425.99
MW-11D	416.72	431.28	428.63	422.47	419.15	425.58	425.45	421.10	415.93	426.96	425.83	422.37	418.63	425.89	426.29	424.98	420.24	425.57
MW-11D(2)	415.75	431.30	429.01	421.14	417.51	424.15	424.91	419.73	414.67	424.94	425.62	421.34	416.91	425.12	425.91	423.95	418.26	425.12
MW-12S	417.51	432.11	429.76	424.03		426.45	426.78	421.84		428.32	427.09			426.12	427.57	447.94		426.83
MW-12D	415.93	430.87	428.67	421.10	417.45	423.68	424.52	419.37	414.83	424.81	425.39	421.36	416.99	425.05	426.23	423.77	418.34	424.98
MW-13S	417.49	432.11	429.85	422.44	419.00	424.94	425.80	420.50	416.34	426.40	426.75	422.59	418.68	426.92	427.13	425.06	420.00	426.07
MW-13D	417.35	432.02	429.77	422.27	418.93	424.96	425.58	420.39	416.19	426.24	426.58	422.47	418.50	426.73	426.92	424.88	419.73	426.21
MW-14S	421.40	438.52	435.52	426.92	424.48	430.14	430.98	425.26		431.42	431.29	426.75	423.62	431.34	432.26	429.93	424.64	431.29
MW-14D	419.35	435.41	433.26	424.94	421.12	427.89	428.77	423.10	418.21	428.23	429.45	424.96	420.31	429.20	429.85	427.91	422.51	428.70
MW-14R	354.43	365.69	364.03	352.31	355.75	359.78	362.63	356.22	353.58	358.61	364.57	355.98	354.34	359.90	362.73	356.73	358.48	359.76
MW-15S	416.74	432.43	429.92	422.23	418.84	425.20	425.92	420.69	415.96	426.49	426.16	422.11	418.51	426.24	426.91	424.79	420.05	426.08
MW-15D	411.10	427.02	424.90	416.71	412.77	419.63	420.02	414.79	409.93	420.11	421.20	416.80	412.07	420.91	421.50	419.47	414.28	420.71
MW-16S																		
MW-16D																		
MW-17S	414.66	430.35	428.03	422.45	417.86	424.52	425.14	421.19		426.49	425.30	422.33	418.25	425.41	425.64	424.14	420.28	425.15
MW-18S	403.63	404.80	402.66	398.23	395.80	408.59	408.98	405.77	403.16	409.61	409.13	406.63	403.75	409.42	409.53	408.14	405.00	409.08
MW-18D	403.23	408.12	406.42	400.03	397.25	408.89	409.69	405.62	402.77	409.36	409.93	406.99	403.83	409.87	410.50	409.13	404.88	409.62
MW-19S	423.21	437.47	434.32	427.92	425.69	431.40	431.34	426.83	422.49	434.55	432.12	428.13	425.61	432.46	432.53	430.20	426.67	432.10
MW-19D	416.38	431.65	430.83	420.54	418.63	425.59	422.96	419.45	416.83	426.70	427.71	424.29	419.98	430.51	431.67	425.29	414.40	426.03
MW-20R	360.35	372.19	369.70	354.75	359.85	363.34	366.95	360.29	357.26	363.90	372.20	360.80	358.55	364.03	367.05	359.84	365.51	365.03
MW-22U	408.67	410.75	409.12	403.21	408.66	408.63	408.68	408.64	408.65	408.63	408.61	408.63	408.62	408.49	408.46	408.55	408.47	408.52
MW-22L	399.93	411.13	409.53	408.84	400.70	404.84	405.84	402.06	399.66	405.39	405.97	403.27	400.42	405.88	406.56	405.19	401.33	405.71
MW-23S	423.52	434.74	432.07	428.03	426.22	428.13	427.94	425.67	421.36	432.59	430.26	427.99	424.66	430.57	427.64	429.01	426.85	428.60
MW-23D	418.56	432.41	430.17	423.10	420.33	424.12	425.12	419.94	415.95	427.22	427.34	423.39	418.20	427.19	430.65	425.72	421.05	425.28
MW-25S	396.69	410.92	408.72	399.75	397.52	402.59	404.10	399.63	397.85	403.98	402.73	399.34	398.60	402.62	403.99	402.02	398.86	403.64
MW-25D	398.27	411.43	409.96	402.42	399.38	404.63	406.01	401.67	398.85	405.31	405.16	402.10	399.77	404.93	406.04	404.43	399.05	400.66
MW-26R	416.03	431.96	429.28	420.27	420.27	422.65	423.93	417.77	412.87	421.81	423.97	418.88	413.99	422.47	423.20		416.44	421.15
MW-27S	417.03	434.62	432.82	423.82	419.02	426.60	428.13	421.57	416.64	426.62	427.87	423.46	418.19	427.68	428.89	426.90	420.24	427.77
MW-27D	417.67	434.38	432.58	424.02	419.79	426.33	427.98	422.01	416.76	426.75	428.09	423.75	418.77	427.73	428.97	426.83	420.75	427.81
MW-28S		430.59	428.57	423.37	422.21	426.60	426.59	422.20		428.75	426.91	423.73		427.12	427.21	426.05	422.12	426.83
BC-4S	397.42	408.86	405.70	401.11	398.20	402.59	403.49	399.51	396.97	402.94	402.94	400.94	397.50	403.68	404.21	402.97	399.19	403.27
BC-4D	364.03	375.24	375.48	366.10	365.42	369.13	370.84	366.13	362.86	367.21	371.11	366.80	363.75			368.16		
FM-1	394.77	407.49	407.03	398.64	395.16	399.50	401.03	396.45	394.63	397.95	400.76	398.56	395.01	408.44	401.49	400.27	395.53	400.45
FM-2	395.96	408.00	406.24	399.82	396.59	401.02	402.38	398.39	395.85	399.52	402.25	399.71	396.36	394.49	402.89	401.76	397.37	401.98

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WELL	04/21/11	07/07/11	10/27/11	01/26/12	04/27/12	07/19/12	10/11/12	01/17/13	04/23/13	07/25/13	10/10/13	01/06/14	04/09/14	07/07/14	10/29/14	01/15/15	04/20/15	07/28/15
MW-10S				NM														
MW-10D	438.59	434.89	427.08	429.64	435.29	431.89	425.34	432.96	434.69	428.83	429.93	428.44	438.39	432.16	426.71	432.14	432.68	425.24
MW-11S	439.94	426.99	420.44	424.08	427.21	424.31	419.24	426.02	426.89	422.45	423.53	421.63	429.57	425.14	420.59	424.43	425.34	419.25
MW-11D		426.87	420.36	423.92	427.06	424.16	419.16	425.85	427.61	422.36	423.00	421.46	426.41	421.30	415.65	419.11	425.16	419.20
MW-11D(2)	430.73	427.83	419.03	422.03	427.27	423.77	417.64	425.38	426.58	421.10	422.28	419.92	429.89	424.78	418.93	422.58	424.94	417.78
MW-12S	430.74	428.05		425.27	428.27	425.87	424.39	427.14	427.73		429.72		431.44			425.44	426.71	420.42
MW-12D	430.97	426.80	419.51	422.20	427.19	424.05	417.36	425.02	426.16	420.88	422.63	420.96	431.00	424.79	419.07	422.50	424.70	417.67
MW-13S	431.11	427.91	421.27	423.90	428.38	425.74	418.78	426.20	427.26	422.06	423.81	422.61	431.26	425.29	420.94	426.36	426.54	419.11
MW-13D	430.92	427.65	421.07	423.69	428.79	425.44	418.59	425.98	427.19	421.90	423.69	422.34	431.15	425.34	420.74	425.84	426.21	418.94
MW-14S	437.49	433.33	424.75	428.94	433.25	429.47	423.21	431.40	432.84	427.06	428.05	425.90	436.85	430.66	425.29	430.17	430.71	423.24
MW-14D	435.03	431.36	422.72	425.72	431.43	428.18	420.98	429.35	430.98	424.81	425.68	424.08	434.58	428.73	422.53	427.98	429.16	421.23
MW-14R	362.68	362.71	356.39	357.34	362.73	355.53	351.39	358.93	361.72	350.22	356.52	361.20	365.59	355.06	354.03	360.16	363.84	350.29
MW-15S	431.56	427.99	420.24	423.86	427.88	424.57	418.77	426.33	427.65	422.49	424.26	421.26	431.45	425.66	420.33	425.22	425.71	418.74
MW-15D	426.63	423.43		417.12	423.17	420.02	412.56	421.08	422.12	416.60	417.52	416.26	426.12	420.52	414.27	420.17	420.65	412.95
MW-16S																	480.27	
MW-16D																	480.73	
MW-17S	428.94	426.19	420.39	423.30	426.41	423.99	419.44	425.44	426.09	422.34	423.23	421.44	428.61	424.66	419.74	424.79	424.79	419.36
MW-18S	412.37	409.96	405.09	406.83	410.15	407.87	404.69	409.43	409.41	404.55	408.55	406.09	413.40	408.57	404.80	411.80	408.76	404.58
MW-18D	414.67	412.11	405.15	407.34	411.34	408.97	404.59	410.13	410.68	404.95	408.89	406.29	414.68	410.23	405.08	408.60	410.12	404.76
MW-19S	435.63	432.64	426.96	431.25	433.59	429.13	425.31	432.40	432.84	428.38	430.49	428.41	436.80	433.39	426.51	433.29	432.36	425.21
MW-19D	434.34	423.97	424.97	426.29	432.47	428.82	413.1	427.16	431.82		417.79	422.87	435.79	433.79	413.86	431.44	420.92	413.59
MW-20R	364.26	366.50	360.18	360.47	365.47	360.16	353.18	363.58	365.12	351.28	358.18	368.18	369.16	357.48	359.32	364.68	367.23	353.66
MW-22U		408.59	408.58	408.55	408.53	408.59	410.72	408.67	407.52	402.40	415.56	404.42	411.57	406.91	400.37	408.56	408.59	408.59
MW-22L		408.30	401.69	403.42	407.40	405.2	401.18	406.22	406.57	401.44	405.98	401.85	410.52	406.07	399.47	407.41	406.28	401.25
MW-23S	433.36	430.65	427.04	428.54	429.91	427.39	424.23	448.34		426.52	427.77	426.28	427.29	427.45			428.10	424.24
MW-23D	431.53	431.51	421.34	423.14	426.84	423.84	419.35	426.05	426.45	421.45	423.18	422.05	430.98	424.81	420.99	427.52	425.60	419.15
MW-25S	410.32	406.94	397.98	401.60	406.43	403.1	398.56	404.35	405.68	400.97	401.44	399.76	408.85	405.19	399.10	403.28	404.56	398.59
MW-25D	411.06	408.46	400.34	403.42	407.77	405.22	400.45	406.21	407.27	403.32	403.66	402.27	410.54	408.36	401.15	405.15	406.34	400.50
MW-26R		423.31	414.36	416.29	422.11	418.41	411.81	421.61		415.23	415.50	414.80	423.73	354.16		356.81	358.39	349.04
MW-27S	434.21	430.81	420.43	424.02	430.11	426.56	418.93	428.23	429.31	423.86	422.84	424.21	433.28	429.46	421.79	429.16	428.21	419.19
MW-27D	433.82	430.84	421.07	424.15	430.02	426.79	419.64	428.23	429.02	423.92	424.08	424.12	433.00	428.92	421.85	428.93	428.07	419.91
MW-28S	429.44	427.4	422.19	424.67	427.77	NM	422.07	421.75			424.77						426.37	422.17
BC-4S	408.19	405.68	399.08	400.62	404.73	402.68	398.69	403.71	403.88	401.18	402.62	399.25	407.92	404.80	393.68	405.91	403.68	398.48
BC-4D				367.04	371.79	383.51	382.23	369.29	370.94				374.59	386.54		369.24	371.86	387.62
FM-1	407.24	404.19	395.63	404.79	402.84	400.23	395.59	400.93	402.29	398.94	396.69	396.97	406.29	401.84	395.37	400.01	401.23	395.44
FM-2	408.19	404.75	397.45	390.61	403.65	401.73	397.31	402.47	402.53	400.03	398.58	398.70	406.80	402.90	396.93	401.55	402.58	397.08

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WELL	10/15/15	01/14/16	04/21/16	07/07/16	10/13/16
MW-10S					
MW-10D	422.47	437.59	437.81	430.69	424.98
MW-11S		429.04	428.79	423.22	418.36
MW-11D	415.96	428.95	428.69	423.14	418.31
MW-11D(2)	415.43	430.08	430.53	422.99	417.38
MW-12S	416.89	430.00	429.62	424.64	419.14
MW-12D	415.54	429.75	429.56	422.75	417.66
MW-13S	417.24	430.41	430.56	424.27	418.74
MW-13D	417.26	430.27	430.42	423.89	418.69
MW-14S		436.43	435.72	428.06	425.60
MW-14D	418.88	434.08	434.55	426.57	421.15
MW-14R	352.99	364.01	366.66	358.24	353.99
MW-15S	416.11	430.48	430.06	423.24	417.79
MW-15D	410.65	425.65	426.17	418.69	412.75
MW-16S					
MW-16D					
MW-17S	415.83	427.94	427.60	422.73	417.86
MW-18S	403.23	411.95	411.40	407.07	404.02
MW-18D	403.06	413.79	414.45	408.41	404.09
MW-19S	422.99	435.59	434.28	428.74	425.17
MW-19D	420.32	425.82	427.99	426.69	422.27
MW-20R	357.23	368.53	372.50	361.48	356.95
MW-22U	408.60	409.42	409.34	408.63	408.58
MW-22L	399.87	409.62	410.58	404.81	400.65
MW-23S		431.34	430.21	426.61	423.47
MW-23D	416.35	429.00	433.87	423.03	417.92
MW-25S	397.52	409.97	411.10	402.60	397.97
MW-25D	398.73	410.44	411.85	404.79	399.68
MW-26R	350.61	364.41	368.71	394.81	354.01
MW-27S	416.61	433.21	433.70	425.59	418.07
MW-27D	416.92	433.20	433.70	425.65	419.19
MW-28S	422.17	428.97	428.38	423.79	421.70
BC-4S	397.08	406.97	412.49	401.98	397.63
BC-4D	386.28	373.20		368.82	364.74
FM-1	394.57	405.59	406.46	399.48	394.94
FM-2	395.74	406.21	407.01	400.86	396.27

Appendix D

GROUNDWATER MONITORING DATA

Table 2. Water Level Elevations - October 14, 2016
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Location	Well Casing Elevation	Depth to Water (FT)	Water Level Elevation
Shallow Perched Aquifer			
MW-10S	460.17	NM	NM
MW-11S	516.44	98.08	418.36
MW-12S	489.94	70.80	419.14
MW-13S	448.81	30.07	418.74
MW-14S	477.95	52.35	425.60
MW-15S	498.76	80.97	417.79
MW-17S	552.44	134.58	417.86
MW-18S	538.40	134.38	404.02
MW-19S	485.71	60.54	425.17
MW-23S	448.34	24.87	423.47
MW-25S	527.80	129.83	397.97
MW-27S	531.81	113.74	418.07
MW-28S	466.87	45.17	421.70
FMMW-1	542.59	147.65	394.94
FMMW-2	536.40	140.13	396.27
BC-4S	526.68	129.05	397.63
Upper Regional Aquifer			
MW-10D	460.69	35.71	424.98
MW-11D	512.06	98.25	413.81
MW-11D(2)	515.53	98.15	417.38
MW-12D	489.97	72.31	417.66
MW-13D	448.94	30.25	418.69
MW-14D	477.98	56.83	421.15
MW-15D	498.52	85.77	412.75
MW-18D	539.00	134.91	404.09
MW-19D	485.82	63.55	422.27
MW-22U	545.92	137.34	408.58
MW-23D	449.96	30.33	419.63
MW-25D	527.52	127.84	399.68
MW-27D	531.92	112.73	419.19
Lower Regional Aquifer			
MW-14R	476.84	122.85	353.99
MW-20R	469.43	112.48	356.95
MW-22L	546.07	145.42	400.65
MW-26R	481.81	71.46	410.35
BC-4R	526.94	162.20	364.74

Notes:

NM = Not Measured due to blockage in well

Table 3. Field Parameters
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Location	Sample Number	Date	Method	pH	Specific Conductivity	Temperature
Units				(SU)	(µS/cm)	(°C)
HVL Cleanup Level				—	700	—
WAC 173-200 Criteria				6.5 - 8.5	700[b]	—
Shallow Perched Aquifer						
(BG) MW-10S	HVL-101016-04	10/10/16	DP	**6.14**	254	13.33
MW-11S	HVL-101216-16	10/12/16	DP	**5.73**	245	15.88
MW-12S	HVL-101216-13	10/12/16	DB	**5.98**	362	17.62
MW-13S	HVL-101116-11	10/11/16	DP	**5.87**	366	18.21
MW-14S	HVL-101416-23	10/14/16	DP	**5.55**	231	13.67
MW-15S	HVL-101016-02	10/10/16	DP	**5.65**	270	15.04
MW-17S	HVL-101316-18	10/13/16	DP	**5.79**	411	19.17
MW-18S	HVL-101116-10	10/11/16	DP	**5.81**	337	15.81
MW-23S	HVL-101316-22	10/13/16	DB	**5.96**	183	13.62
MW-23S*	HVL-120116-28	12/1/16	DB	**5.62**	217	11.89
MW-25S	HVL-101316-21	10/13/16	DP	**6.28**	247	13.14
MW-25S*	HVL-120116-27	12/1/16	DP	**6.08**	249	12.62
MW-28S	Insufficient Water	10/13/16	-	-	-	-
FMMW-1	HVL-101116-07	10/11/16	DP	**5.88**	320	12.08
FMMW-2	HVL-101116-08	10/11/16	DP	**5.70**	362	17.06
Upper Regional Aquifer						
(BG) MW-10D	HVL-101016-05	10/10/16	DP	**6.23**	243	12.30
MW-11D(2)	HVL-101216-17	10/12/16	DP	**6.48**	214	15.02
MW-12D	HVL-101216-12	10/12/16	DP	**6.28**	293	16.82
MW-13D	HVL-101016-06	10/10/16	DP	**6.16**	345	17.20
MW-14D	HVL-101016-01	10/10/16	DP	**5.76**	264	13.50
MW-15D	HVL-101016-03	10/10/16	DP	**6.29**	291	15.15
MW-18D	HVL-101116-09	10/11/16	DP	**6.35**	262	15.74
Lower Regional Aquifer						
MW-14R	HVL-101216-14	10/12/16	DP	6.56	104	13.87
MW-20R	HVL-101316-20	10/13/16	DP	6.70	100	11.24
MW-26R	HVL-101216-15	10/12/16	DP	6.71	191	12.08

Notes:

µS/cm = microsiemens per centimeter
°C = degrees Celsius
BG = Background
DP = dedicated bladder-pump
DB = disposable bailer
b = Secondary Drinking Water Standard
— indicates not analyzed or not applicable
* = resample for VOCs and Nitrate

Table 4. Inorganic Parameters
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Location	Alkalinity, Bicarbonate	Alkalinity, Total	Ammonia	Chloride	Nitrate	Sulfate	Total Dissolved Solids	Total Organic Carbon	Total Suspended Solids
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MRL	5.0	5.0	0.1	0.2-0.4	0.2	0.2	10	1.0	4.0
HVL Cleanup Level	—	—	—	250	10	250	500	—	—
WAC 173-200 Criteria	—	—	—	250[b]	10[a]	250[b]	500[b]	—	—
Shallow Perched Aquifer									
(BG) MW-10S	100	100	*	7.8	0.81	12	150	1.1	*
MW-11S	78	78	*	19	0.76	12	150	1.0	*
MW-12S	150	150	1.8	20	1.4	2.1	210	2.1	220
MW-13S	150	150	*	18	*	16	220	1.2	*
MW-14S	74	74	0.27	14	2.2	8.2	140	2.2	5.6
MW-15S	89	89	2.8	19	*	11	150	1.7	*
MW-17S	170	170	4.2	22	*	4.7	250	2.0	*
MW-18S	140	140	*	21	*	3.4	210	1.4	*
MW-23S	67	67	*	5.4	0.93	13	120	1.5	220
MW-25S	120	120	*	8.1	1.6	7.8	160	*	*
MW-28S	-	-	-	-	-	-	-	-	-
FMMW-1	110	110	*	22	1.3	12	240	*	*
FMMW-2	130	130	0.11	22	3.9	5.7	230	1.5	*
Upper Regional Aquifer									
(BG) MW-10D	96	96	*	7.3	0.66	13	140	1	*
MW-11D(2)	86	86	*	6.2	1.9	8.0	140	*	*
MW-12D	130	130	*	9.2	1.3	6.4	180	*	*
MW-13D	150	150	*	14	0.58	14	200	*	*
MW-14D	91	91	4.1	15	*	12	140	1.5	*
MW-15D	120	120	*	9.9	0.80	8.6	160	*	*
MW-18D	110	110	*	8.1	1.6	6.5	170	*	*
Lower Regional Aquifer									
MW-14R	47	47	*	1.8	*	3.6	96	*	*
MW-20R	47	47	*	1.7	*	2.8	100	*	*
MW-26R	91	91	*	4.5	*	8.8	110	*	7.6

Notes:

Parameter concentrations that are greater than cleanup levels are shown in **bold**
mg/L = milligrams per liter
* indicates not reported at or above the MRL (Method Reporting Limit)
— indicates not analyzed or not applicable
a = Primary Drinking Water Standard
b = Secondary Drinking Water Standard
BG = Background/upgradient wells

Table 5. Total Metals
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Location	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MRL	0.002	0.005	0.005	0.005	0.005	0.005	0.01	0.01	0.002	0.02	0.005	0.01	0.005	0.01	0.01
HVL Cleanup Level	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
WAC 173-200 Criteria	—	0.00005	1.0	—	0.01	0.05	—	1.0[b]	0.05	—	0.01	0.05	—	—	5.0[b]
Shallow Perched Aquifer															
(BG) MW-10S	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW-11S	*	*	0.011	*	*	*	*	*	*	*	*	*	*	*	*
MW-12S	*	*	0.064	*	*	0.009	*	0.083	0.002	*	*	*	*	0.018	0.100
MW-13S	*	*	0.011	*	*	*	*	*	*	*	*	*	*	*	*
MW-14S	*	*	0.010	*	*	*	*	*	*	*	*	*	*	*	*
MW-15S	*	*	0.013	*	*	*	*	*	*	*	*	*	*	*	*
MW-17S	*	*	0.021	*	*	*	*	*	*	*	*	*	*	*	*
MW-18S	*	*	0.014	*	*	*	*	*	*	*	*	*	*	*	*
MW-23S	0.003	*	0.026	*	*	*	*	0.016	**0.088**	*	*	*	*	*	0.300
MW-25S	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW-28S	-	**-**	**-**	-	**-**	**-**	-	**-**	**-**	-	**-**	**-**	-	-	**-**
FMMW-1	*	*	0.008	*	*	*	*	*	*	*	*	*	*	*	*
FMMW-2	*	*	0.018	*	*	*	*	*	*	*	*	*	*	*	*
Upper Regional Aquifer															
(BG) MW-10D	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW-11D(2)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW-12D	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW-13D	*	*	0.007	*	*	*	*	*	*	*	*	*	*	*	*
MW-14D	*	*	0.013	*	*	*	*	*	*	*	*	*	*	*	0.015
MW-15D	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW-18D	*	*	0.005	*	*	*	*	*	*	*	*	*	*	*	*
Lower Regional Aquifer															
MW-14R	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW-20R	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW-26R	*	*	0.008	*	*	*	*	*	*	*	*	*	*	*	*

Notes:

Parameter concentrations that are greater than site cleanup levels or WAC 173-200 criteria are shown in **bold**
Metals not listed were not present at concentrations exeeding the MRL
mg/L = milligrams per liter
BG = Background
* indicates not reported at or above the MRL (Method Reporting Limit)
— indicates not analyzed or not applicable
b = Secondary Drinking Water Standard

Table 6. Dissolved Metals
Fourth Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Location	Calcium	Iron	Magnesium	Manganese	Potassium	Sodium
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MRL	0.2	0.029	0.1	0.001	2.0	1.0
HVL Cleanup Level	—	0.30	—	0.05	—	—
WAC 173-200 Criteria	—	0.30[b]	—	0.05[b]	—	—
Shallow Perched Aquifer						
(BG) MW-10S	31.0	*	11.0	*	2.1	8.8
MW-11S	19.0	*	5.7	0.01	6.7	18
MW-12S	28.0	*	8.3	**0.83**	14	28
MW-13S	36.0	*	10.0	**0.15**	6.5	30
MW-14S	21.0	0.04	6.5	**0.11**	4.5	11
MW-15S	20.0	0.10	6.7	**0.88**	10	17
MW-17S	28.0	*	9.5	**0.86**	16	29
MW-18S	27.0	*	8.2	0.01	10	27
MW-23S	17.0	0.16	5.4	0.02	2.0	11
MW-25S	23.0	*	9.6	*	2.9	13
MW-28S	-	**-**	-	**-**	-	-
FMMW-1	29.0	*	8.5	*	4.8	30
FMMW-2	28.0	*	9.1	**0.07**	12	27
Upper Regional Aquifer						
(BG) MW-10D	27.0	*	9.2	*	2.0	7.8
MW-11D(2)	22.0	*	9.4	*	2.6	8.1
MW-12D	27.0	*	11.0	*	3.4	17
MW-13D	36.0	*	14.0	0.04	4.7	19
MW-14D	21.0	**2.6**	6.6	**1.2**	9.2	14
MW-15D	28.0	*	12.0	0.01	3.4	21
MW-18D	26.0	*	11.0	*	3.7	12
Lower Regional Aquifer						
MW-14R	8.3	0.06	4.8	**0.19**	2.2	5.3
MW-20R	7.4	*	3.9	0.00	2.2	5.9
MW-26R	19.0	**0.69**	8.9	**0.40**	2.4	6.2

Notes:

Parameter concentrations that are greater than site cleanup levels or WAC 173-200 criteria are shown in **bold**

Analyses performed by TestAmerica in Denver, Colorado

b = Secondary Drinking Water Standard (concentrations measured as total metals)

mg/L = milligrams per liter

* indicates not reported at or above the MRL (Method Reporting Limit)

— indicates not analyzed or not applicable

BG = Background

Table 7. Volatile Organic Compounds
Fourth Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Location		Methylene Chloride	Tetrachloroethene
Units		µg/L	µg/L
MRL		2.0	0.5
HVL Cleanup Level		—	—
WAC 173-200 Criteria		5.0	0.80
Shallow Perched Aquifer			
(BG)	MW-10S	*	*
	MW-11S	*	*
	MW-12S	*	*
	MW-13S	*	*
	MW-14S	*	*
	MW-15S	*	*
	MW-17S	*	*
	MW-18S	*	*
	MW-23S	*	*
	MW-25S	*	*
	MW-28S	—	—
	FMMW-1	*	*
	FMMW-2	*	*
Upper Regional Aquifer			
(BG)	MW-10D	*	*
	MW-11D(2)	*	**0.82**
	MW-12D	*	*
	MW-13D	*	*
	MW-14D	*	*
	MW-15D	3.5	*
	MW-18D	*	*
Lower Regional Aquifer			
	MW-14R	*	*
	MW-20R	*	*
	MW-26R	*	*

Notes:

Volatile organic compounds not listed were not present at concentrations exeeding the MRL
BG = Background
µg/L = micrograms per liter
* = not reported at or above the MRL (Method Reporting Limit)
— = not analyzed or not applicable

Table 8. Duplicate Sample Evaluation
Fourth Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Parameter	MRL	MW-17S	MW-17S (DUP)	RPD (%)
Volatile Organic Compunds (µg/L)		.		
No Detections	—	ND	ND	—
Dissolved Metals (mg/L)				
Calcium	0.2	28.0	30.0	6.9
Magnesium	0.1	9.5	10.0	5.1
Manganese	0.001	0.86	0.86	0.0
Potassium	2.0	16.0	16.0	0.0
Sodium	1.0	29.0	31.0	6.7
Total Metals (mg/L)				
Barium	0.005	0.021	0.021	0.0
Inorganic Parameters (mg/L)				
Alkalinity	5.0	170	170	0.0
Alkalinity, Bicarbonate (as CaCO3)	5.0	170	170	0.0
Ammonia	0.1	4.2	4.1	2.4
Chloride	0.2	22.0	22.0	0.0
Sulfate	0.2	4.7	4.6	2.2
Total Dissolved Solids	10	250	230	8.3
Total Organic Carbon	1.0	2	2	0.0

Analysis performed by TestAmerica, Arvada, Colorado
Analytes not listed were not present at concentrations exceeding the MRL
RPD = relative percent difference
µg/L = micrograms per liter
mg/L = milligrams per liter
*= RPD based on result as compared to the Reporting Limit (RL) for a non-detection in the compared sample
— = not applicable
ND= No Detection

Table 9. Water Supply Wells
Fourth Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Parameter	Units	MRL	Corliss	Paul Bunyan
Field Parameters				
pH	SU	—	6.44	6.08
Specific Conductivity	µS/cm	—	224	283
Temperature	deg C	—	13.7	11.7
Volatile Organic Compounds				
(No detections)	µg/L	—	*	*
Metals (total)				
Iron	mg/L	0.029	*	0.05
Manganese	mg/L	0.001	0.003	*
Zinc	mg/L	0.01	0.034	0.016
Inorganic Parameters				
Chemical Oxygen Demand	mg/L	5.0	9.5	8.9
Chloride	mg/L	0.2	5.7	5.9
Nitrate (as N)	mg/L	0.2	1.5	2.5
Sulfate	mg/L	0.3	10.0	10.0
Other				
Color	PCU	5.0	*	*

Notes:

Analyses performed by TestAmerica in Denver, Colorado.

Analytes not listed were not present at concentrations exceeding the MRL.

Color reported in color units

µg/L = micrograms per liter

mg/L = milligrams per liter

PCU = platinum-cobalt units

* = not reported at or above the MRL (Method Reporting Limit)

SU = Standard Units

µS/cm = microsiemens per centimeter

°C = degrees Celsius

— = Not Applicable

Table 10. Cation-Anion Balance
Fourth Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Cations	mg/L					meq/L					% of Total		
	Ca	Mg	K	Na	Total	Ca	Mg	K	Na	Total	Na+K	Ca	Mg
MW-10S	31.0	11.0	2.1	8.8	52.90	1.55	0.91	0.05	0.38	2.89	15	54	31
MW-11S	19.0	5.7	6.7	18.0	49.40	0.95	0.47	0.17	0.78	2.37	40	40	20
MW-12S	28.0	8.3	14.0	28.0	78.30	1.40	0.68	0.36	1.22	3.66	43	38	19
MW-13S	36.0	10.0	6.5	30.0	82.50	1.80	0.82	0.17	1.31	4.09	36	44	20
MW-14S	21.0	6.5	4.5	11.0	43.00	1.05	0.53	0.12	0.48	2.18	27	48	25
MW-15S	20.0	6.7	10.0	17.0	53.70	1.00	0.55	0.26	0.74	2.54	39	39	22
MW-17S	28.0	9.5	16.0	29.0	82.50	1.40	0.78	0.41	1.26	3.85	43	36	20
MW-18S	27.0	8.2	10.0	27.0	72.20	1.35	0.67	0.26	1.17	3.45	41	39	20
MW-23S*	17.0	5.4	2.0	11.0	35.40	0.85	0.44	0.05	0.48	1.82	29	47	24
MW-25S*	23.0	9.6	2.9	13.0	48.50	1.15	0.79	0.07	0.57	2.58	25	45	31
MW-28S	--	--	--	--									
FMMW-1	29.0	8.5	4.8	30.0	72.30	1.45	0.70	0.12	1.31	3.57	40	40	20
FMMW-2	28.0	9.1	12.0	27.0	76.10	1.40	0.75	0.31	1.17	3.63	41	39	21
MW-10D	27.0	9.2	2.0	7.8	46.00	1.35	0.76	0.05	0.34	2.49	16	54	30
MW-11D(2)	22.0	9.4	2.6	8.1	42.10	1.10	0.77	0.07	0.35	2.29	18	48	34
MW-12D	27.0	11.0	3.4	17.0	58.40	1.35	0.91	0.09	0.74	3.08	27	44	29
MW-13D	36.0	14.0	4.7	19.0	73.70	1.80	1.15	0.12	0.83	3.90	24	46	30
MW-14D	21.0	6.6	9.2	14.0	50.80	1.05	0.54	0.24	0.61	2.44	35	43	22
MW-15D	28.0	12.0	3.4	21.0	64.40	1.40	0.99	0.09	0.91	3.39	30	41	29
MW-18D	26.0	11.0	3.7	12.0	52.70	1.30	0.91	0.09	0.52	2.82	22	46	32
MW-14R	8.3	4.8	2.2	5.3	20.60	0.41	0.40	0.06	0.23	1.10	26	38	36
MW-20R	7.4	3.9	2.2	5.9	19.40	0.37	0.32	0.06	0.26	1.00	31	37	32
MW-26R	19.0	8.9	2.4	6.2	36.50	0.95	0.73	0.06	0.27	2.01	16	47	36

Anions	mg/L					meq/L					% of Total			Total Ions (meq/L)	Cation - Anion Balance	Applicable Ratio (%)	Ratio Exceedance
	Alk	Cl	NO_3	SO_4	Total	Alk	Cl	NO_3	SO_4	Total	Cl	Alk	SO_4				
MW-10S	100.0	7.8	0.8	12.0	120.61	1.64	0.22	0.01	0.25	2.12	10	77	12	5.01	**15.29**	10	Exceeds
MW-11S	78.0	19.0	0.8	12.0	109.76	1.28	0.54	0.01	0.25	2.08	26	62	12	4.45	6.63	10	-
MW-12S	150.0	20.0	1.4	2.1	173.50	2.46	0.56	0.02	0.04	3.09	18	80	1	6.75	**8.40**	5	Exceeds
MW-13S	150.0	18.0	0.2	16.0	184.20	2.46	0.51	0.00	0.33	3.30	15	74	10	7.39	**10.65**	5	Exceeds
MW-14S	74.0	14.0	2.2	8.2	98.40	1.21	0.39	0.04	0.17	1.81	22	67	9	3.99	9.07	10	-
MW-15S	89.0	19.0	0.2	11.0	119.20	1.46	0.54	0.00	0.23	2.23	24	66	10	4.77	6.65	10	-
MW-17S	170.0	22.0	0.2	4.7	196.90	2.79	0.62	0.00	0.10	3.51	18	79	3	7.36	4.63	5	-
MW-18S	140.0	21.0	0.2	3.4	164.60	2.30	0.59	0.00	0.07	2.96	20	78	2	6.41	**7.65**	5	Exceeds
MW-23S	67.0	5.4	0.8	13.0	86.19	1.10	0.15	0.01	0.27	1.53	10	72	18	3.36	8.59	10	-
MW-25S	120.0	8.1	1.5	7.8	137.40	1.97	0.23	0.02	0.16	2.38	10	83	7	4.96	3.93	10	-
MW-28S	--	--	--	--													
FMMW-1	110.0	22.0	1.3	12.0	145.30	1.80	0.62	0.02	0.25	2.69	23	67	9	6.27	**14.03**	5	Exceeds
FMMW-2	130.0	22.0	3.9	5.7	161.60	2.13	0.62	0.06	0.12	2.93	21	73	4	6.56	**10.58**	10	Exceeds
MW-10D	96.0	7.3	0.7	13.0	116.96	1.57	0.21	0.01	0.27	2.06	10	76	13	4.56	9.52	10	-
MW-11D(2)	86.0	6.2	1.9	8.0	102.10	1.41	0.17	0.03	0.17	1.78	10	79	9	4.07	**12.48**	10	Exceeds
MW-12D	130.0	9.2	1.3	6.4	146.90	2.13	0.26	0.02	0.13	2.55	10	84	5	5.62	**9.49**	5	Exceeds
MW-13D	150.0	14.0	0.6	14.0	178.58	2.46	0.39	0.01	0.29	3.16	13	78	9	7.05	**10.50**	5	Exceeds
MW-14D	91.0	15.0	0.2	12.0	118.20	1.49	0.42	0.00	0.25	2.17	20	69	12	4.60	5.81	10	-
MW-15D	120.0	9.9	0.8	8.6	139.30	1.97	0.28	0.01	0.18	2.44	11	81	7	5.82	**16.25**	5	Exceeds
MW-18D	110.0	8.1	1.6	6.5	126.20	1.80	0.23	0.03	0.14	2.19	10	82	6	5.01	**12.49**	10	Exceeds
MW-14R	47.0	1.8	0.2	3.6	52.60	0.77	0.05	0.00	0.07	0.90	6	86	8	2.00	9.84	10	-
MW-20R	47.0	1.7	0.2	2.8	51.70	0.77	0.05	0.00	0.06	0.88	5	88	7	1.88	6.53	10	-
MW-26R	91.0	4.5	0.2	8.8	104.50	1.49	0.13	0.00	0.18	1.81	7	83	10	3.82	5.40	10	-

Notes:

-- = Not monitored or analyzed. See report for details.

* = Values for Nitrate from resample collected on 12/1/2016. See report for details.

Table 2. Water Level Elevations - January 14, 2016
First Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Location	Well Casing Elevation	Depth to Water (FT)	Water Level Elevation
Shallow Perched Aquifer			
MW-10S	460.17	NM	NM
MW-11S	516.44	87.40	429.04
MW-12S	489.94	59.94	430.00
MW-13S	448.81	18.40	430.41
MW-14S	477.95	41.52	436.43
MW-15S	498.76	68.28	430.48
MW-17S	552.44	124.50	427.94
MW-18S	538.40	126.45	411.95
MW-19S	485.71	50.12	435.59
MW-23S	448.34	17.00	431.34
MW-25S	527.80	117.83	409.97
MW-27S	531.81	98.60	433.21
MW-28S	466.87	37.90	428.97
FMMW-1	542.59	137.00	405.59
FMMW-2	536.40	130.19	406.21
BC-4S	526.68	119.71	406.97
Upper Regional Aquifer			
MW-10D	460.69	23.10	437.59
MW-11D	512.06	87.61	424.45
MW-11D(2)	515.53	85.45	430.08
MW-12D	489.97	60.22	429.75
MW-13D	448.94	18.67	430.27
MW-14D	477.98	43.90	434.08
MW-15D	498.52	72.87	425.65
MW-18D	539.00	125.21	413.79
MW-19D	485.82	60.00	425.82
MW-22U	545.92	136.50	409.42
MW-23D	449.96	19.25	430.71
MW-25D	527.52	117.08	410.44
MW-27D	531.92	98.72	433.20
Lower Regional Aquifer			
MW-14R	476.84	112.83	364.01
MW-20R	469.43	100.90	368.53
MW-22L	546.07	136.45	409.62
MW-26R	481.81	117.40	364.41
BC-4R	526.94	153.74	373.20

Notes:

NM = Not Measured due to blockage in well

Table 3. Field Parameters
First Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Location	Sample Number	Date	Method	pH	Specific Conductivity	Temperature
Units **Cleanup Levels**				**(SU)**	**(µS/cm)** **700[b]**	**(°C)**
Shallow Perched Aquifer						
MW-10S	HVL-011316-21	1/13/16	DP	6.37	243	13.1
MW-11S	HVL-011116-05	1/11/16	DP	5.92	293	14.8
MW-12S	HVL-011416-27	1/14/16	DB	5.27	284	17.8
MW-13S	HVL-011316-24	1/13/16	DP	5.82	383	15.6
MW-14S	HVL-011316-17	1/13/16	DP	5.71	178	11.8
MW-15S	HVL-011316-18	1/13/16	DP	5.89	235	14.4
MW-17S	HVL-011216-14	1/12/16	DP	6.03	564	20.0
MW-18S	HVL-011116-04	1/11/16	DP	6.37	410	15.1
MW-23S	HVL-011416-30	1/14/16	DB	5.69	209	11.7
MW-25S	HVL-011316-25	1/13/16	DP	6.01	162	12.3
MW-28S	HVL-011416-29	1/14/16	DB	5.91	122	11.7
FMMW-1	HVL-011116-01	1/11/16	DP	6.35	257	14.5
FMMW-2	HVL-011116-02	1/11/16	DP	6.07	501	15.8
Upper Regional Aquifer						
MW-10D	HVL-011316-22	1/13/16	DP	6.46	226	12.3
MW-11D(2)	HVL-011116-06	1/11/16	DP	6.77	216	13.7
MW-12D	HVL-011416-26	1/14/16	DP	6.19	297	16.8
MW-13D	HVL-011316-23	1/13/16	DP	6.42	360	15.3
MW-14D	HVL-011316-16	1/13/16	DP	6.08	190	12.3
MW-15D	HVL-011316-19	1/13/16	DP	6.64	294	13.6
MW-18D	HVL-011116-03	1/11/16	DP	6.70	260	14.9
Lower Regional Aquifer						
MW-14R	HVL-011216-07	1/12/16	DP	7.08	103	11.0
MW-20R	HVL-011216-13	1/12/16	DP	7.13	94	10.8
MW-26R	HVL-011216-08	1/12/16	DP	7.22	193	11.2

Notes:

The groundwater cleanup level for specific conductance is 700 (µS).
µS/cm = microsiemens per centimeter
°C = degrees Celsius
DP = dedicated bladder-pump
DB = disposable bailer
b = Secondary Drinking Water Standard

Table 4. Inorganic Parameters
First Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Parameter	Alkalinity, Bicarbonate	Alkalinity, Total	Ammonia	Chloride	Nitrate	Sulfate	Total Dissolved Solids	Total Organic Carbon	Total Suspended Solids
Units	mg $CaCO_3$/L	mg $CaCO_3$/L	mg /L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MRL	5	5	0.1	0.2-0.4	0.2-0.21	0.2-1	10	1	4
Cleanup Levels	—	—	—	250[b]	10[a]	250[b]	500[b]	—	—
Shallow Perched Aquifer									
(BG) MW-10S	91	91	*	13.0	1.5	12.0	140	1.1	*
MW-11S	69	69	*	15.0	**11.0**	16.0	200	1.4	*
MW-12S	110	110	*	20.0	2.4	4.2	200	2.5	5.2
MW-13S	110	110	*	16.0	10.0	17.0	250	1	*
MW-14S	64	64	0.36	8.2	1.3	7.4	110	1.5	*
MW-15S	85	85	3.3	10.0	1.1	8.4	130	1.6	*
MW-17S	150	150	6.5	23.0	**21.0**	7.7	340	2	*
MW-18S	120	120	*	17.0	**11.0**	10.0	260	1.4	*
MW-23S	77	77	*	11.0	0.95	11.0	150	1.8	280
MW-25S	58	58	*	3.7	2.7	6.4	110	*	*
MW-28S	55	55	*	2.7	0.5	5.1	100	*	340
FMMW-1	95	95	*	8.3	2.0	15.0	170	1.1	*
FMMW-2	110	110	*	15.0	**22.0**	20.0	330	1.4	*
Upper Regional Aquifer									
(BG) MW-10D	93	93	0.38	5.9	2.1	7.9	150	*	*
MW-11D(2)	87	87	*	5.4	1.8	7.8	260	*	*
MW-12D	140	140	*	9.4	1.4	6.5	190	*	*
MW-13D	140	140	*	14.0	3.8	16.0	230	*	*
MW-14D	72	72	2.8	8.1	*	8.4	110	1.5	*
MW-15D	130	130	*	9.7	0.58	10.0	170	1.1	*
MW-18D	120	120	*	7.6	1.6	6.5	170	*	*
Lower Regional Aquifer									
MW-14R	56	56	*	1.8	*	3.5	94	*	*
MW-20R	46	46	*	1.6	*	3.0	88	*	*
MW-26R	85	85	*	4.4	*	9.7	130	*	*

Notes:

Parameter concentrations that are greater than cleanup levels are shown in **bold**

mg/L = milligrams per liter

* indicates not reported at or above the MRL (Method Reporting Limit)

a = Primary Drinking Water Standard

b = Secondary Drinking Water Standard

BG = Background/upgradient wells

Table 5. WAC 173-351 Appendix I Metals (Total and Dissolved Fractions)
First Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Parameter		Antimony- D	Antimony- T	Arsenic- D	Arsenic- T	Barium- D	Barium- T	Beryllium- D	Beryllium- T	Cadmium- D	Cadmium- T	Chromium- D	Chromium- T	Cobalt- D	Cobalt- T	Copper- D	Copper- T	Lead- D	Lead- T	Nickel- D	Nickel- T	Selenium- D	Selenium- T	Silver- D	Silver- T	Thallium- D	Thallium- T	Vanadium- D	Vanadium- T	Zinc- D	Zinc- T
Units		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MRL		0.002	0.002	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.01	0.01	0.01	0.002	0.002	0.02	0.02	0.005	0.005	0.01	0.01	0.005	0.005	0.01	0.01	0.01	0.01
WAC 173-200 Criteria		—	—	0.00005	0.00005	1.0	1.0	—	—	—	0.01	0.05	0.05	—	—	1	1	0.05	0.05	—	—	0.01	0.01	0.05	0.05	—	—	—	—	5	5
Shallow Perched Aquifer																															
(BG)	MW-10S	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-11S	*	*	*	*	0.0100	0.0110	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-12S	*	*	*	*	0.0150	0.0140	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.230	0.560
	MW-13S	*	*	*	*	0.0110	0.0098	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-14S	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-15S	*	*	*	*	0.0082	0.0098	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-17S	*	*	*	*	0.0330	0.0300	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-18S	*	*	*	*	0.0120	0.0120	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-23S	*	0.003	*	*	0.0072	0.0330	*	*	*	*	*	0.0063	*	*	*	0.022	*	**0.13**	*	*	*	*	*	*	*	*	*	0.013	0.027	0.370
	MW-25S	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-28S	*	*	*	*	*	0.0610	*	*	*	*	*	0.0099	*	*	*	0.0210	*	0.005	*	*	*	*	*	*	*	*	*	0.022	*	0.064
	FMMW-1	*	*	*	*	0.0055	0.0050	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	FMMW-2	*	*	*	*	0.0230	0.0230	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Upper Regional Aquifer																															
(BG)	MW-10D	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-11D(2)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-12D	*	*	*	*	0.0051	0.0050	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-13D	*	*	*	*	0.0076	0.0063	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-14D	*	*	*	*	0.0088	0.0085	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-15D	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-18D	*	*	*	*	0.0061	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Lower Regional Aquifer																															
	MW-14R	*	*	*	*	0.0058	0.0052	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-20R	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-26R	*	*	*	*	0.0072	0.0074	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Notes:

Parameter concentrations that are greater than cleanup levels are shown in **bold**
Metals not listed were not present at concentrations exeeding the MRL
mg/L = milligrams per liter
BG = Background
* indicates not reported at or above the MRL (Method Reporting Limit)
— indicates not analyzed or not applicable

Table 6. WAC 173-351 Appendix II Dissolved Metals
First Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Parameter		Calcium	Iron	Magnesium	Manganese	Potassium	Sodium
Units		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MRL		0.2	0.02-0.029	0.1	0.001	2.0	1.0
Cleanup Levels		—	0.3[b]	—	0.05[b]	—	—
Shallow Perched Aquifer							
BG	MW-10S	25	*	8.5	*	*	7.4
	MW-11S	22	*	7.0	*	7.2	21.0
	MW-12S	19	*	5.9	0.016	12.0	23.0
	MW-13S	33	*	10.0	0.0076	5.9	23.0
	MW-14S	16	*	5.7	**0.110**	3.8	6.8
	MW-15S	14	*	4.6	**0.670**	8.8	16.0
	MW-17S	35	*	13.0	**1.800**	20.0	35.0
	MW-18S	35	*	11.0	*	9.3	22.0
	MW-23S	18	0.21	6.2	0.014	*	12.0
	MW-25S	15	*	5.4	*	*	7.4
	MW-28S	8.2	*	2.3	*	*	14.0
	FMMW-1	19	*	5.6	*	3.6	27.0
	FMMW-2	40	*	13.0	0.028	14.0	32.0
Upper Regional Aquifer							
	MW-10D	22	0.029	9.3	*	*	6.9
	MW-11D(2)	20	*	9.1	*	2.6	8.3
	MW-12D	26	*	11.0	*	3.1	18.0
	MW-13D	35	*	14.0	*	3.9	17.0
	MW-14D	13	*	4.2	**0.770**	6.3	11.0
	MW-15D	23	*	10.0	**0.190**	2.9	23.0
	MW-18D	25	*	11.0	*	3.8	14.0
Lower Regional Aquifer							
	MW-14R	7.7	0.045	4.8	**0.200**	2.0	4.9
	MW-20R	7.4	*	4.2	*	2.0	5.2
	MW-26R	18	**0.68**	8.8	**0.400**	2.1	5.7

Notes:

Parameter concentrations that are greater than cleanup levels are shown in **bold**

Analyses performed by TestAmerica in Denver, Colorado

b = Secondary Drinking Water Standard

mg/L = milligrams per liter

* indicates not reported at or above the MRL (Method Reporting Limit)

— indicates not analyzed or not applicable

BG = Background/upgradient wells

created by	SP	16-Mar
checked by	SG	4/8/2016

Table 7. Volatile Organic Compounds
First Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Parameter		Tetrachloroethene	Chloroform
Units		µg/L	µg/L
MRL		0.5	0.5
Cleanup Levels		5.0[a]	7.0[b]
Shallow Perched Aquifer			
(BG)	MW-10S	*	*
	MW-11S	*	*
	MW-12S	*	*
	MW-13S	*	*
	MW-14S	*	*
	MW-15S	*	*
	MW-17S	*	*
	MW-18S	*	*
	MW-23S	*	*
	MW-25S	*	0.91
	MW-28S	*	*
	FMMW-1	*	*
	FMMW-2	*	*
Upper Regional Aquifer			
(BG)	MW-10D	*	*
	MW-11D(2)	0.98	*
	MW-12D	*	*
	MW-13D	*	*
	MW-14D	*	*
	MW-15D	*	*
	MW-18D	*	*
Lower Regional Aquifer			
	MW-14R	*	*
	MW-20R	*	*
	MW-26R	*	*

Notes:

Volatile organic compounds not listed were not present at concentrations exeeding the MRL

a = MTCA Method A table value, Federal and State Groundwater MCL

b = WAC-173-200-040 criteria value

BG = Background monitoring location

µg/L = micrograms per liter

* = not reported at or above the MRL (Method Reporting Limit)

— = not analyzed or not applicable

Table 8. Duplicate Sample Evaluation
First Quarter 2016 Groundwater Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Parameter Type	MRL	MW-15D	MW-15D (DUP 1)	RPD (%)
Volatile Organic Compunds (µg/L)				
No Detections	—	*	*	—
Dissolved Metals (mg/L)				
Calcium	0.2	23.0	23.0	0.0
Magnesium	0.1	10.0	10.0	0.0
Manganese	0.001	0.190	0.190	0.0
Potassium	2.0	2.9	3.0	3.4
Sodium	1.0	23.0	23.0	0.0
Total Metals (mg/L)				
Barium	0.005	*	0.0055	**
Inorganic Parameters (mg/L)				
Alkalinity, Total (as CaCO3)	5.0	130	130	0.0
Alkalinity, Bicarbonate (as CaCO3)	5.0	130	130	0.0
Chloride	0.2-0.4	9.7	9.7	0.0
Nitrate	0.2-0.21	0.58	0.58	0.0
Sulfate	0.2	10	10	0.0
Total Dissolved Solids	10	170	170	0.0
Total Organic Carbon	1.0	1.1	1.1	0.0

Analysis performed by TestAmerica, Arvada, Colorado
Analytes not listed were not present at concentrations exceeding the MRL
RPD = relative percent difference
µg/L = micrograms per liter
mg/L = milligrams per liter
* = not reported at or above the MRL (Method Reporting Limit)
(**) = indicates less than 5X the MRL
— = not applicable

created by	SP	16-Mar
checked by	SG	4/8/2016

Table 9. Water Supply Wells
First Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Parameter Type	Units	MRL	Corliss	Paul Bunyan
Field Parameters				
pH	SU	—	6.97	7.04
Specific Conductivity	µS/cm	—	243	269
Temperature	deg C	—	9.93	10.75
Volatile Organic Compounds				
(No VOCs detected)	µg/L	—	*	*
Metals (total)				
Arsenic	mg/L	0.005	*	*
Iron	mg/L	0.02	0.046	0.440
Manganese	mg/L	1.0	0.008	0.020
Zinc	mg/L	0.01	0.060	0.036
Inorganic Parameters				
Ammonia	mg/L	0.1	*	*
Chemical Oxygen Demand	mg/L	5.0	*	*
Chloride	mg/L	0.2	5.6	5.1
Nitrate	mg/L	0.2	1.3	1.7
Nitrite (as N)	mg/L	0.5	*	*
Sulfate	mg/L	0.2	9.2	9.4
Total Organic Carbon	mg/L	1.0	*	*
Other				
Color	PCU	5.0	5.0	5.0

Notes:

Analyses performed by TestAmerica in Denver, Colorado.

Analytes not listed were not present at concentrations exceeding the MRL.

Color reported in color units

µg/L = micrograms per liter

mg/L = milligrams per liter

PCU = platinum-cobalt units

* = not reported at or above the MRL (Method Reporting Limit)

SU = Standard Units

µS/cm = microsiemens per centimeter

°C = degrees Celsius

— = Not Applicable

Table 10. Cation-Anion Balance
First Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Cations	mg/L					meq/L					% of Total		
	Ca	Mg	K	Na	Total	Ca	Mg	K	Na	Total	Na+K	Ca	Mg
MW-10S	25.0	8.5	2.0	7.4	42.90	1.25	0.70	0.05	0.32	2.32	16	54	30
MW-11S	22.0	7.0	7.2	21.0	57.20	1.10	0.58	0.18	0.91	2.77	40	40	21
MW-12S	19.0	5.9	12.0	23.0	59.90	0.95	0.49	0.31	1.00	2.74	48	35	18
MW-13S	33.0	10.0	5.9	23.0	71.90	1.65	0.82	0.15	1.00	3.62	32	45	23
MW-14S	16.0	5.7	3.8	6.8	32.30	0.80	0.47	0.10	0.30	1.66	24	48	28
MW-15S	14.0	4.6	8.8	16.0	43.40	0.70	0.38	0.23	0.70	2.00	46	35	19
MW-17S	35.0	13.0	20.0	35.0	103.00	1.75	1.07	0.51	1.52	4.85	42	36	22
MW-18S	35.0	11.0	9.3	22.0	77.30	1.75	0.91	0.24	0.96	3.85	31	45	24
MW-23S	18.0	6.2	2.0	12.0	38.20	0.90	0.51	0.05	0.52	1.98	29	45	26
MW-25S	15.0	5.4	2.0	7.4	29.80	0.75	0.44	0.05	0.32	1.57	24	48	28
MW-28S	8.2	2.3	2.0	14.0	26.50	0.41	0.19	0.05	0.61	1.26	52	33	15
FMMW-1	19.0	5.6	3.6	27.0	55.20	0.95	0.46	0.09	1.17	2.68	47	35	17
FMMW-2	40.0	13.0	14.0	32.0	99.00	2.00	1.07	0.36	1.39	4.82	36	41	22
MW-10D	22.0	9.3	2.0	6.9	40.20	1.10	0.77	0.05	0.30	2.21	16	50	35
MW-11D(2)	20.0	9.1	2.6	8.3	40.00	1.00	0.75	0.07	0.36	2.17	20	46	34
MW-12D	26.0	11.0	3.1	18.0	58.10	1.30	0.91	0.08	0.78	3.07	28	42	30
MW-13D	35.0	14.0	3.9	17.0	69.90	1.75	1.15	0.10	0.74	3.74	22	47	31
MW-14D	13.0	4.2	6.3	11.0	34.50	0.65	0.35	0.16	0.48	1.63	39	40	21
MW-15D	23.0	10.0	2.9	23.0	58.90	1.15	0.82	0.07	1.00	3.05	35	38	27
MW-18D	25.0	11.0	3.8	14.0	53.80	1.25	0.91	0.10	0.61	2.86	25	44	32
MW-14R	7.7	4.8	2.0	4.9	19.40	0.38	0.40	0.05	0.21	1.04	25	37	38
MW-20R	7.4	4.2	2.0	5.2	18.80	0.37	0.35	0.05	0.23	0.99	28	37	35
MW-26R	18.0	8.8	2.1	5.7	34.60	0.90	0.72	0.05	0.25	1.92	16	47	38

Anions	mg/L					meq/L					% of Total			Total Ions (meq/L)	Cation - Anion Balance	Applicable Ratio (%)	Ratio Exceedance
	Alk	Cl	NO_3	SO_4	Total	Alk	Cl	NO_3	SO_4	Total	Cl	Alk	SO_4				
MW-10S	109.2	13.0	1.5	12.0	135.70	1.79	0.37	0.02	0.25	2.43	15	74	10	4.75	2.34	10	--
MW-11S	82.8	15.0	11.0	16.0	124.80	1.36	0.42	0.18	0.33	2.29	18	59	15	5.06	9.50	10	--
MW-12S	132.0	20.0	2.4	4.2	158.60	2.16	0.56	0.04	0.09	2.85	20	76	3	5.60	2.03	5	--
MW-13S	132.0	16.0	10.0	17.0	175.00	2.16	0.45	0.16	0.35	3.13	14	69	11	6.75	7.27	5	Exceeds
MW-14S	76.8	8.2	1.3	7.4	93.70	1.26	0.23	0.02	0.15	1.67	14	76	9	3.33	0.15	10	--
MW-15S	102.0	10.0	1.1	8.4	121.50	1.67	0.28	0.02	0.17	2.15	13	78	8	4.15	3.59	10	--
MW-17S	180.0	23.0	21.0	7.7	231.70	2.95	0.65	0.34	0.16	4.10	16	72	4	8.95	8.40	10	--
MW-18S	144.0	17.0	11.0	10.0	182.00	2.36	0.48	0.18	0.21	3.23	15	73	6	7.07	8.78	10	--
MW-23S	92.4	11.0	1.0	11.0	115.35	1.52	0.31	0.02	0.23	2.07	15	73	11	4.05	2.17	10	--
MW-25S	69.6	3.7	2.7	6.4	82.40	1.14	0.10	0.04	0.13	1.42	7	80	9	2.99	4.81	10	--
MW-28S	66.0	2.7	0.5	5.1	74.30	1.08	0.08	0.01	0.11	1.27	6	85	8	2.53	0.55	10	—
FMMW-1	114.0	8.3	2.0	15.0	139.30	1.87	0.23	0.03	0.31	2.45	10	76	13	5.12	4.45	5	--
FMMW-2	132.0	15.0	22.0	20.0	189.00	2.16	0.42	0.35	0.42	3.36	13	64	12	8.17	17.84	5	Exceeds
MW-10D	111.6	5.9	2.1	7.9	127.50	1.83	0.17	0.03	0.16	2.19	8	83	7	4.41	0.45	10	--
MW-11D(2)	104.4	5.4	1.8	7.8	119.40	1.71	0.15	0.03	0.16	2.06	7	83	8	4.23	2.81	10	--
MW-12D	168.0	9.4	1.4	6.5	185.30	2.76	0.27	0.02	0.14	3.18	8	87	4	6.24	1.81	5	--
MW-13D	168.0	14.0	3.8	16.0	201.80	2.76	0.39	0.06	0.33	3.54	11	78	9	7.28	2.66	5	--
MW-14D	86.4	8.1	0.2	8.4	103.10	1.42	0.23	0.00	0.17	1.82	13	78	10	3.46	5.47	10	--
MW-15D	156.0	9.7	0.6	10.0	176.28	2.56	0.27	0.01	0.21	3.05	9	84	7	6.09	0.06	5	--
MW-18D	144.0	7.6	1.6	6.5	159.70	2.36	0.21	0.03	0.14	2.74	8	86	5	5.60	2.18	5	--
MW-14R	67.2	1.8	0.2	3.5	72.70	1.10	0.05	0.00	0.07	1.23	4	90	6	2.27	8.15	10	--
MW-20R	55.2	1.6	0.2	3.0	60.00	0.91	0.05	0.00	0.06	1.02	4	89	6	2.01	1.18	10	--
MW-26R	102.0	4.4	0.2	9.7	116.30	1.67	0.12	0.00	0.20	2.00	6	84	10	3.93	1.98	10	--

Table 11
Leachate and Leak Detection Monitoring
First Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Parameters	MRL	Leachate-East Area	Hydraulic Control-East Area	Leak Detection-Side Slope
Volatile Organics (µg/L)				
1,4-Dichlorobenzene	0.5	1.8	2.1	*
2-Butanone (MEK)	6	7.80	*	*
Acetone	10.0	46	35	17
Benzene	0.5	1.2	1.4	1.1
Carbon disulfide	0.5-0.9	0.56	1.10	*
cis-1,2-Dichloroethene	0.5	*	*	0.94
Ethylbenzene	1.0	1.6	2.2	*
m-Xylene & p-Xylene	0.5-0.68	2.8	4.0	*
o-Xylene	0.5	1.3	1.8	*
Toluene	0.5	1.9	2.4	1.8
Total Metals (mg/L)				
Antimony	0.002	0.0065	0.0072	0.0720
Arsenic	0.005	0.051	0.053	0.120
Barium	0.005	0.48	0.57	0.38
Calcium	0.2	87	88	12
Chromium	0.005	0.130	0.150	0.048
Cobalt	0.01	0.012	0.014	0.021
Copper	0.01	0.26	*	0.32
Iron	0.058	10.0	2.3	2.9
Lead	0.002	0.0130	0.0023	0.0220
Magnesium	0.1	54	58	14
Manganese	0.005	1.90	1.80	0.17
Nickel	0.02	0.36	0.41	0.41
Potassium	2	260	290	390
Selenium	0.005	*	*	0.0094
Sodium	1	2900	3400	5700
Vanadium	0.01	0.10	0.13	0.15
Zinc	0.01	0.230	0.036	0.500
Inorganic Parameters (mg/L)				
Alkalinity	5	4500	5500	7100
Bicarbonate Alkalinity as CaCO3	5	4500	5500	7100
Ammonia	2.2-4.4	360	490	450
Chloride	40	2000	2200	4400
Nitrate as N	0.5	1.5	1.8	1.8
Sulfate	1.0	49	19	35
Total Dissolved Solids	47	8200	9600	15000
Total Organic Carbon - Quad	2.6-3.1	590	670	760
Total Suspended Solids	4	130	*	79
Field Parameters				
Dissolved Oxygen	—	3.92	3.66	0.80
Oxidation Reduction Potential	—	-100	-211	182
pH	—	7.61	7.48	7.91
Specific Conductivity	—	13530	15800	2320
Temperature	—	15.62	14.85	28.73

Notes:
Analyses performed by TestAmerica, Arvada, Colorado
Volatile organic compounds not listed were not present at concentrations exceeding the MRL
µg/L = micrograms per liter
mg/L = milligrams per liter
µS = microsiemens
°C = degrees celcius
— = not applicable or not analyzed
* = not reported at or above the MRL (Method Reporting Limit)

Table 2. Water Level Elevations - April 21, 2016
Second Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Location	Well Casing Elevation	Depth to Water (FT)	Water Level Elevation
Shallow Perched Aquifer			
MW-10S	460.17	NM	NM
MW-11S	516.44	87.65	428.79
MW-12S	489.94	60.32	429.62
MW-13S	448.81	18.25	430.56
MW-14S	477.95	42.23	435.72
MW-15S	498.76	68.70	430.06
MW-17S	552.44	124.84	427.60
MW-18S	538.40	127.00	411.40
MW-19S	485.71	51.43	434.28
MW-23S	448.34	18.13	430.21
MW-25S	527.80	116.70	411.10
MW-27S	531.81	98.11	433.70
MW-28S	466.87	38.49	428.38
FMMW-1	542.59	136.13	406.46
FMMW-2	536.40	129.39	407.01
BC-4S	526.68	114.19	412.49
Upper Regional Aquifer			
MW-10D	460.69	22.88	437.81
MW-11D	512.06	87.87	424.19
MW-11D(2)	515.53	85.00	430.53
MW-12D	489.97	60.41	429.56
MW-13D	448.94	18.52	430.42
MW-14D	477.98	43.43	434.55
MW-15D	498.52	72.35	426.17
MW-18D	539.00	124.55	414.45
MW-19D	485.82	57.83	427.99
MW-22U	545.92	136.58	409.34
MW-23D	449.96	19.38	430.58
MW-25D	527.52	115.67	411.85
MW-27D	531.92	98.22	433.70
Lower Regional Aquifer			
MW-14R	476.84	110.18	366.66
MW-20R	469.43	46.43	423.00
MW-22L	546.07	135.49	410.58
MW-26R	481.81	113.10	368.71
BC-4R	526.94	Dry	Dry

Notes:

NM = Not Measured due to blockage in well

Dry = No water was present in well casing

Table 3. Field Parameters
Second Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Location	Sample Number	Date	Method	pH	Specific Conductivity	Temperature
Units **Cleanup Levels**				**(SU)**	**(µS/cm)** **700[b]**	**(°C)**
Shallow Perched Aquifer						
MW-10S	HVL-041816-07	4/18/16	DP	6.69	236	12.44
MW-11S	HVL-041916-15	4/19/16	DP	5.58	204	14.49
MW-12S	HVL-041916-10	4/19/16	DB	6.19	428	19.61
MW-13S	HVL-041916-11	4/19/16	DP	6.11	420	17.98
MW-14S	HVL-041816-04	4/18/16	DP	6.10	192	14.96
MW-15S	HVL-041816-01	4/18/16	DP	6.06	259	14.69
MW-17S	HVL-041916-17	4/19/16	DP	6.04	442	21.08
MW-18S	HVL-041916-16	4/19/16	DP	6.13	360	17.44
MW-23S	HVL-042116-27	4/21/16	DB	6.11	234	11.76
MW-25S	HVL-042016-22	4/20/16	DP	6.26	184	13.08
MW-28S	HVL-042116-26	4/21/16	DB	6.09	210	15.14
FMMW-1	HVL-042016-18	4/20/16	DP	6.14	330	14.92
FMMW-2	HVL-042016-20	4/20/16	DP	5.94	336	17.89
Upper Regional Aquifer						
MW-10D	HVL-041916-19	4/19/16	DP	5.63	229	12.18
MW-11D(2)	HVL-041916-13	4/19/16	DP	6.40	217	14.52
MW-12D	HVL-041916-08	4/19/16	DP	6.58	278	17.33
MW-13D	HVL-041916-09	4/19/16	DP	6.28	379	17.30
MW-14D	HVL-041816-05	4/18/16	DP	6.28	206	13.99
MW-15D	HVL-041816-03	4/18/16	DP	6.67	266	16.20
MW-18D	HVL-041916-14	4/19/16	DP	6.71	269	17.41
Lower Regional Aquifer						
MW-14R	HVL-041816-06	4/18/16	DP	7.45	106	13.06
MW-20R	HVL-041916-21	4/19/16	DP	6.02	102	10.86
MW-26R	HVL-041916-12	4/19/16	DP	7.29	197	12.46

Notes:

The groundwater cleanup level for specific conductance is 700 (µS).
µS/cm = microsiemens per centimeter
°C = degrees Celsius
DP = dedicated bladder-pump
DB = disposable bailer
b = Secondary Drinking Water Standard

Table 4. Inorganic Parameters
Second Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Parameter	Alkalinity, Bicarbonate	Alkalinity, Total	Ammonia	Chloride	Nitrate	Sulfate	Total Dissolved Solids	Total Organic Carbon	Total Suspended Solids
Units	mg $CaCO_3$/L	mg $CaCO_3$/L	mg /L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MRL	5	5	0.1	0.2-0.4	0.2	0.2	10	1	4
Cleanup Levels	—	—	—	250[b]	10[a]	250[b]	500[b]	—	—
Shallow Perched Aquifer									
(BG) MW-10S	87	87	*	9.0	1.10	14.0	130	1.4	*
MW-11S	53	53	*	12.0	3.50	14.0	130	1.5	*
MW-12S	170	170	2.0	28.0	*	1.2	240	4.6	4.4
MW-13S	140	140	*	28.0	0.65	19.0	240	1.7	*
MW-14S	63	63	0.28	9.8	0.86	11.0	120	1.7	*
MW-15S	95	95	2.9	12.0	0.41	10.0	150	1.6	4.4
MW-17S	190	190	4.4	26.0	0.66	5.7	240	2.7	*
MW-18S	140	140	*	26.0	0.55	4.8	210	2.1	*
MW-23S	89	89	*	11.0	0.98	14.0	130	1.2	44.0
MW-25S	72	72	*	8.0	1.10	6.4	110	*	*
MW-28S	60	60	*	15.0	3.40	11.0	120	1.0	140.0
FMMW-1	110	110	*	20.0	2.90	11.0	190	1.2	*
FMMW-2	110	110	*	23.0	1.30	14.0	190	1.8	*
Upper Regional Aquifer									
(BG) MW-10D	92	92	*	6.6	2.10	10.0	150	*	*
MW-11D(2)	86	86	*	6.2	1.80	8.0	140	*	*
MW-12D	120	120	*	8.3	1.60	6.9	230	*	*
MW-13D	150	150	*	17.0	0.84	15.0	230	1.2	*
MW-14D	76	76	2.7	9.6	*	11.0	120	1.6	5.6
MW-15D	110	110	*	8.1	1.00	9.6	160	*	*
MW-18D	120	120	*	8.2	1.70	6.6	170	*	*
Lower Regional Aquifer									
MW-14R	47	47	*	1.7	*	3.6	96	*	*
MW-20R	48	48	*	1.8	*	3.1	97	*	*
MW-26R	87	87	*	4.6	*	9.9	130	*	*

Notes:

Parameter concentrations that are greater than cleanup levels are shown in **bold**

mg/L = milligrams per liter

* indicates not reported at or above the MRL (Method Reporting Limit)

a = Primary Drinking Water Standard

b = Secondary Drinking Water Standard

BG = Background/upgradient wells

Table 5. WAC 173-351 Appendix I Metals (Total and Dissolved Fractions)
Second Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Parameter		Antimony- D	Antimony- T	Arsenic- D	Arsenic- T	Barium- D	Barium- T	Beryllium- D	Beryllium- T	Cadmium- D	Cadmium- T	Chromium- D	Chromium- T	Cobalt- D	Cobalt- T	Copper- D	Copper- T	Lead- D	Lead- T	Nickel- D	Nickel- T	Selenium- D	Selenium- T	Silver- D	Silver- T	Thallium- D	Thallium- T	Vanadium- D	Vanadium- T	Zinc- D	Zinc- T
Units		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MRL		0.002	0.002	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.01	0.01	0.01	0.002	0.002	0.02	0.02	0.005	0.005	0.01	0.01	0.005	0.005	0.01	0.01	0.01	0.01
WAC 173-200 Criteria		—	—	0.00005	0.00005	1.0	1.0	—	—	0.01	0.01	0.05	0.05	—	—	1.0	1.0	0.05	0.05	—	—	0.01	0.01	0.05	0.05	—	—	—	—	5.0	5.0
Shallow Perched Aquifer																															
(BG)	MW-10S	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-11S	*	*	*	*	0.0078	0.0077	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-12S	*	*	*	*	0.0220	0.0230	*	*	*	*	*	*	*	*	*	0.010	*	*	*	*	*	*	*	*	*	*	*	*	0.270	0.290
	MW-13S	*	*	*	*	0.0120	0.0120	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-14S	*	*	*	*	0.0056	0.0065	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-15S	*	*	*	*	0.0110	0.0110	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-17S	*	*	*	*	0.0230	0.0230	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-18S	*	*	*	*	0.0130	0.0120	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-23S	*	*	*	*	0.0063	0.0100	*	*	*	*	*	*	*	*	*	*	*	0.016	*	*	*	*	*	*	*	*	*	*	0.026	0.065
	MW-25S	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-28S	*	*	*	*	*	0.0210	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.015	0.035
	FMMW-1	*	*	*	*	0.0074	0.0071	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	FMMW-2	*	*	*	*	0.0150	0.0150	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Upper Regional Aquifer																															
(BG)	MW-10D	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-11D(2)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-12D	*	*	*	*	*	0.0050	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-13D	*	*	*	*	0.0068	0.0076	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-14D	*	*	*	*	0.0092	0.0088	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-15D	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-18D	*	*	*	*	0.0050	0.0052	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Lower Regional Aquifer																															
	MW-14R	*	*	*	*	*	0.0050	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-20R	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
	MW-26R	*	*	*	*	0.0081	0.0077	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Notes:

Parameter concentrations that are greater than cleanup levels are shown in **bold**
Metals not listed were not present at concentrations exeeding the MRL
mg/L = milligrams per liter
BG = Background
* indicates not reported at or above the MRL (Method Reporting Limit)
— indicates not analyzed or not applicable

Table 6. WAC 173-351 Appendix II Dissolved Metals
Second Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Parameter		Calcium	Iron	Magnesium	Manganese	Potassium	Sodium
Units		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MRL		0.2	0.029	0.1	0.001	2.0	1.0
Cleanup Levels		—	0.3[b]	—	0.05[b]	—	—
Shallow Perched Aquifer							
BG	MW-10S	28	*	8.7	*	*	8.1
	MW-11S	15	*	4.6	0.0014	5.9	17.0
	MW-12S	31	*	9.3	**0.350**	16.0	32.0
	MW-13S	35	0.054	10.0	0.024	6.2	29.0
	MW-14S	18	*	5.6	**0.180**	3.8	7.4
	MW-15S	17	0.029	5.2	**0.740**	8.8	19.0
	MW-17S	29	*	10.0	**1.200**	16.0	32.0
	MW-18S	30	*	9.6	*	8.5	26.0
	MW-23S	21	0.16	7.4	0.015	2.3	13.0
	MW-25S	17	*	6.3	*	2.0	9.1
	MW-28S	17	*	4.5	*	*	18.0
	FMMW-1	27	*	7.9	*	4.2	28.0
	FMMW-2	25	*	8.2	**0.055**	11.0	24.0
Upper Regional Aquifer							
	MW-10D	23	*	9.4	*	2.2	7.7
	MW-11D(2)	20	*	8.9	*	2.4	8.3
	MW-12D	24	*	9.8	*	3.4	18.0
	MW-13D	36	*	14.0	*	4.4	20.0
	MW-14D	15	*	4.7	**0.820**	6.2	12.0
	MW-15D	21	*	9.0	0.006	2.7	21.0
	MW-18D	26	*	11.0	*	3.6	14.0
Lower Regional Aquifer							
	MW-14R	8	0.059	4.6	**0.200**	2.0	5.2
	MW-20R	7.7	*	4.1	*	2.2	6.0
	MW-26R	19	**0.66**	9.1	**0.380**	2.4	6.8

Notes:

Parameter concentrations that are greater than cleanup levels are shown in **bold**

Analyses performed by TestAmerica in Denver, Colorado

b = Secondary Drinking Water Standard (concentrations measured as total metals)

mg/L = milligrams per liter

* indicates not reported at or above the MRL (Method Reporting Limit)

— indicates not analyzed or not applicable

BG = Background/upgradient wells

created by SG 22-Jul
checked by

Table 7. Volatile Organic Compounds
Second Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Parameter		Tetrachloroethene	Chloroform	1,4-Dichlorobenzene
Units		µg/L	µg/L	µg/L
MRL		0.5	0.5	0.5
Cleanup Levels		5.0[a]	7.0[b]	4.0[b]
Shallow Perched Aquifer				
(BG)	MW-10S	*	*	*
	MW-11S	*	*	*
	MW-12S	*	*	0.73
	MW-13S	*	*	*
	MW-14S	*	*	*
	MW-15S	*	*	*
	MW-17S	*	*	*
	MW-18S	*	*	*
	MW-23S	*	*	*
	MW-25S	*	0.69	*
	MW-28S	*	*	*
	FMMW-1	*	*	*
	FMMW-2	*	*	*
Upper Regional Aquifer				
(BG)	MW-10D	*	*	*
	MW-11D(2)	0.82	*	*
	MW-12D	*	*	*
	MW-13D	*	*	*
	MW-14D	*	*	*
	MW-15D	*	*	*
	MW-18D	*	*	*
Lower Regional Aquifer				
	MW-14R	*	*	*
	MW-20R	*	*	*
	MW-26R	*	*	*

Notes:

Volatile organic compounds not listed were not present at concentrations exeeding the MRL

a = MTCA Method A table value, Federal and State Groundwater MCL

b = WAC-173-200-040 criteria value

BG = Background monitoring location

µg/L = micrograms per liter

* = not reported at or above the MRL (Method Reporting Limit)

— = not analyzed or not applicable

Table 8. Duplicate Sample Evaluation
Second Quarter 2016 Groundwater Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Parameter Type	MRL	MW-15S	MW-15S (DUP 1)	RPD (%)
Volatile Organic Compunds (µg/L)				
No Detections	—	ND	ND	—
Dissolved Metals (mg/L)				
Barium	0.005	0.011	0.011	0.0
Calcium	0.2	17.0	17.0	0.0
Iron	0.029	0.029	0.029	0.0*
Magnesium	0.1	5.1	5.2	1.94
Manganese	0.001	0.74	0.73	1.36
Potassium	2.0	8.7	8.8	1.14
Sodium	1.0	18.0	19.0	5.41
Total Metals (mg/L)				
Barium	0.005	0.011	0.010	9.52
Inorganic Parameters (mg/L)				
Alkalinity	5.0	95	95	0.0
Alkalinity, Bicarbonate (as CaCO3)	5.0	95	95	0.0
Ammonia	0.1	2.9	2.9	0.0
Chloride	0.2	12.0	12.0	0.0
Nitrate	0.2	0.41	0.42	2.41
Sulfate	0.2	10.0	10.0	0.0
Total Dissolved Solids	10	150	140	6.90
Total Organic Carbon	1.0	1.6	1.5	6.45
Total Suspended Solids	4.0	4.4	4.0	9.52*

Analysis performed by TestAmerica, Arvada, Colorado
Analytes not listed were not present at concentrations exceeding the MRL
RPD = relative percent difference
µg/L = micrograms per liter
mg/L = milligrams per liter
*= RPD based on result as compared to the Reporting Limit (RL) for a non-detection in the compared sample
— = not applicable
ND= No Detection

created by SG 1-Aug
checked by

Table 9. Water Supply Wells
Second Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Parameter Type	Units	MRL	Corliss	Paul Bunyan
Field Parameters				
pH	SU	—	6.64	6.85
Specific Conductivity	µS/cm	—	237	279
Temperature	deg C	—	20.0	18.27
Volatile Organic Compounds				
(No VOCs detected)	µg/L	—	*	*
Metals (total)				
Arsenic	mg/L	0.005	*	*
Iron	mg/L	0.029	0.11	*
Manganese	mg/L	0.001	0.014	*
Zinc	mg/L	0.01	0.019	0.027
Inorganic Parameters				
Ammonia	mg/L	0.1	*	*
Chemical Oxygen Demand	mg/L	5.0	*	*
Chloride	mg/L	0.2	5.9	5.6
Nitrate	mg/L	0.2	1.2	2.0
Nitrite (as N)	mg/L	0.5	*	*
Sulfate	mg/L	0.2	10.0	10.0
Total Organic Carbon	mg/L	1.0	*	*
Other				
Color	PCU	5.0	*	*

Notes:

Analyses performed by TestAmerica in Denver, Colorado.

Analytes not listed were not present at concentrations exceeding the MRL.

Color reported in color units

µg/L = micrograms per liter

mg/L = milligrams per liter

PCU = platinum-cobalt units

* = not reported at or above the MRL (Method Reporting Limit)

SU = Standard Units

µS/cm = microsiemens per centimeter

°C = degrees Celsius

— = Not Applicable

Table 10. Cation-Anion Balance
Second Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Cations	mg/L					meq/L					% of Total		
	Ca	Mg	K	Na	Total	Ca	Mg	K	Na	Total	Na+K	Ca	Mg
MW-10S	28.0	8.7	2.0	8.1	46.80	1.40	0.72	0.05	0.35	2.52	16	56	28
MW-11S	15.0	4.6	5.9	17.0	42.50	0.75	0.38	0.15	0.74	2.02	44	37	19
MW-12S	31.0	9.3	16.0	32.0	88.30	1.55	0.77	0.41	1.39	4.11	44	38	19
MW-13S	35.0	10.0	6.2	29.0	80.20	1.75	0.82	0.16	1.26	3.99	36	44	21
MW-14S	18.0	5.6	3.8	7.4	34.80	0.90	0.46	0.10	0.32	1.78	24	51	26
MW-15S	17.0	5.1	8.7	18.0	48.80	0.85	0.42	0.22	0.78	2.27	44	37	18
MW-17S	29.0	10.0	16.0	32.0	87.00	1.45	0.82	0.41	1.39	4.07	44	36	20
MW-18S	30.0	9.6	8.5	26.0	74.10	1.50	0.79	0.22	1.13	3.64	37	41	22
MW-23S	21.0	7.4	2.3	13.0	43.70	1.05	0.61	0.06	0.57	2.28	27	46	27
MW-25S	17.0	6.3	2.0	9.1	34.40	0.85	0.52	0.05	0.40	1.81	25	47	29
MW-28S	17.0	4.5	2.0	18.0	41.50	0.85	0.37	0.05	0.78	2.05	41	41	18
FMMW-1	27.0	7.9	4.2	28.0	67.10	1.35	0.65	0.11	1.22	3.32	40	41	20
FMMW-2	25.0	8.2	11.0	24.0	68.20	1.25	0.67	0.28	1.04	3.25	41	38	21
MW-10D	23.0	9.4	2.2	7.7	42.30	1.15	0.77	0.06	0.33	2.31	17	50	33
MW-11D(2)	20.0	8.9	2.4	8.3	39.60	1.00	0.73	0.06	0.36	2.15	20	46	34
MW-12D	24.0	9.8	3.4	18.0	55.20	1.20	0.81	0.09	0.78	2.87	30	42	28
MW-13D	36.0	14.0	4.4	20.0	74.40	1.80	1.15	0.11	0.87	3.93	25	46	29
MW-14D	15.0	4.7	6.2	12.0	37.90	0.75	0.39	0.16	0.52	1.82	37	41	21
MW-15D	21.0	9.0	2.7	21.0	53.70	1.05	0.74	0.07	0.91	2.77	35	38	27
MW-18D	26.0	11.0	3.6	14.0	54.60	1.30	0.91	0.09	0.61	2.90	24	45	31
MW-14R	8.0	4.6	2.0	5.2	19.80	0.40	0.38	0.05	0.23	1.06	26	38	36
MW-20R	7.7	4.1	2.2	6.0	20.00	0.38	0.34	0.06	0.26	1.04	31	37	32
MW-26R	19.0	9.1	2.4	6.8	37.30	0.95	0.75	0.06	0.30	2.05	17	46	36

Anions	mg/L					meq/L					% of Total			Total Ions (meq/L)	Cation - Anion Balance	Applicable Ratio (%)	Ratio Exceedance
	Alk	Cl	NO_3	SO_4	Total	Alk	Cl	NO_3	SO_4	Total	Cl	Alk	SO_4				
MW-10S	104.4	9.0	1.1	14.0	128.50	1.71	0.25	0.02	0.29	2.27	11	75	13	4.79	5.05	10	--
MW-11S	63.6	12.0	3.5	14.0	93.10	1.04	0.34	0.06	0.29	1.73	20	60	17	3.75	7.70	10	--
MW-12S	204.0	28.0	0.2	1.2	233.40	3.35	0.79	0.00	0.02	4.16	19	80	1	8.28	0.60	5	--
MW-13S	168.0	28.0	0.7	19.0	215.65	2.76	0.79	0.01	0.40	3.95	20	70	10	7.94	0.49	5	--
MW-14S	75.6	9.8	0.9	11.0	97.26	1.24	0.28	0.01	0.23	1.76	16	70	13	3.54	0.55	10	--
MW-15S	114.0	12.0	0.4	10.0	136.41	1.87	0.34	0.01	0.21	2.42	14	77	9	4.70	3.17	10	--
MW-17S	228.0	26.0	0.7	5.7	260.36	3.74	0.73	0.01	0.12	4.60	16	81	3	8.67	6.11	10	--
MW-18S	168.0	26.0	0.6	4.8	199.35	2.76	0.73	0.01	0.10	3.60	20	77	3	7.23	0.53	10	--
MW-23S	106.8	11.0	1.0	14.0	132.78	1.75	0.31	0.02	0.29	2.37	13	74	12	4.65	1.88	10	--
MW-25S	86.4	8.0	1.1	6.4	101.90	1.42	0.23	0.02	0.13	1.79	13	79	7	3.61	0.57	10	--
MW-28S	72.0	15.0	3.4	11.0	101.40	1.18	0.42	0.05	0.23	1.89	22	63	12	3.94	4.20	10	—
FMMW-1	132.0	20.0	2.9	11.0	165.90	2.16	0.56	0.05	0.23	3.00	19	72	8	6.33	5.04	5	Exceeds
FMMW-2	132.0	23.0	1.3	14.0	170.30	2.16	0.65	0.02	0.29	3.13	21	69	9	6.37	1.92	5	--
MW-10D	110.4	6.6	2.1	10.0	129.10	1.81	0.19	0.03	0.21	2.24	8	81	9	4.55	1.63	10	--
MW-11D(2)	103.2	6.2	1.8	8.0	119.20	1.69	0.17	0.03	0.17	2.06	8	82	8	4.22	2.14	10	--
MW-12D	144.0	8.3	1.6	6.9	160.80	2.36	0.23	0.03	0.14	2.76	8	85	5	5.64	1.94	5	--
MW-13D	180.0	17.0	0.8	15.0	212.84	2.95	0.48	0.01	0.31	3.76	13	79	8	7.69	2.27	5	--
MW-14D	91.2	9.6	0.2	11.0	112.00	1.50	0.27	0.00	0.23	2.00	14	75	11	3.81	4.78	10	--
MW-15D	132.0	8.1	1.0	9.6	150.70	2.16	0.23	0.02	0.20	2.61	9	83	8	5.38	3.02	5	--
MW-18D	144.0	8.2	1.7	6.6	160.50	2.36	0.23	0.03	0.14	2.76	8	86	5	5.66	2.59	5	--
MW-14R	56.4	1.7	0.2	3.6	61.90	0.92	0.05	0.00	0.07	1.05	5	88	7	2.11	0.20	10	--
MW-20R	57.6	1.8	0.2	3.1	62.70	0.94	0.05	0.00	0.06	1.06	5	89	6	2.10	1.15	10	--
MW-26R	104.4	4.6	0.2	9.9	119.10	1.71	0.13	0.00	0.21	2.05	6	83	10	4.11	0.08	10	--

Table 2. Water Level Elevations - July 7, 2016
Third Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Location	Well Casing Elevation	Depth to Water (FT)	Water Level Elevation
Shallow Perched Aquifer			
MW-10S	460.17	NM	NM
MW-11S	516.44	93.22	423.22
MW-12S	489.94	65.30	424.64
MW-13S	448.81	24.54	424.27
MW-14S	477.95	49.89	428.06
MW-15S	498.76	75.52	423.24
MW-17S	552.44	129.71	422.73
MW-18S	538.40	131.33	407.07
MW-19S	485.71	56.97	428.74
MW-23S	448.34	21.73	426.61
MW-25S	527.80	125.20	402.60
MW-27S	531.81	106.22	425.59
MW-28S	466.87	43.08	423.79
FMMW-1	542.59	143.11	399.48
FMMW-2	536.40	135.54	400.86
BC-4S	526.68	124.70	401.98
Upper Regional Aquifer			
MW-10D	460.69	30.00	430.69
MW-11D	512.06	93.42	418.64
MW-11D(2)	515.53	92.54	422.99
MW-12D	489.97	67.22	422.75
MW-13D	448.94	25.05	423.89
MW-14D	477.98	51.41	426.57
MW-15D	498.52	79.83	418.69
MW-18D	539.00	130.59	408.41
MW-19D	485.82	59.13	426.69
MW-22U	545.92	137.29	408.63
MW-23D	449.96	25.22	424.74
MW-25D	527.52	122.73	404.79
MW-27D	531.92	106.27	425.65
Lower Regional Aquifer			
MW-14R	476.84	118.60	358.24
MW-20R	469.43	107.95	361.48
MW-22L	546.07	141.26	404.81
MW-26R	481.81	87.00	394.81
BC-4R	526.94	158.12	368.82

Notes:

NM = Not Measured due to blockage in well

Dry = No water was present in well casing

Table 3. Field Parameters
Third Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Location	Sample Number	Date	Method	pH	Specific Conductivity	Temperature
Units				(SU)	(µS/cm)	(°C)
HVL Cleanup Level				—	700	—
WAC 173-200 Criteria				—	700[b]	—
Shallow Perched Aquifer						
(BG) MW-10S	HVL-070516-06	7/5/16	DP	6.39	235	11.72
MW-11S	HVL-070516-05	7/5/16	DP	5.63	250	15.43
MW-12S	HVL-070616-10	7/6/16	DB	6.42	384	18.96
MW-13S	HVL-070616-14	7/6/16	DP	6.30	383	18.93
MW-14S	HVL-070616-20	7/6/16	DP	6.25	216	14.97
MW-15S	HVL-070616-16	7/6/16	DP	6.21	273	15.22
MW-17S	HVL-070616-09	7/6/16	DP	5.97	400	19.81
MW-18S	HVL-070616-13	7/6/16	DP	6.02	343	16.96
MW-23S	HVL-080416-32	8/4/16	DB	6.04	233	18.42
MW-25S	HVL-070516-03	7/5/16	DP	6.35	251	13.03
MW-28S	HVL-070716-26	7/7/16	DB	6.53	192	12.84
FMMW-1	HVL-070516-01	7/5/16	DP	5.87	331	15.09
FMMW-2	HVL-070516-02	7/5/16	DP	5.71	300	16.78
Upper Regional Aquifer						
(BG) MW-10D	HVL-070516-07	7/5/16	DP	6.38	231	11.61
MW-11D(2)	HVL-070516-04	7/5/16	DP	6.47	217	14.65
MW-12D	HVL-070616-08	7/6/16	DP	6.89	282	17.18
MW-13D	HVL-070616-12	7/6/16	DP	6.70	366	17.80
MW-14D	HVL-080416-28	8/4/16	DP	6.01	235	15.38
MW-15D	HVL-070616-15	7/6/16	DP	6.55	266	15.41
MW-18D	HVL-070616-11	7/6/16	DP	6.54	269	16.80
Lower Regional Aquifer						
MW-14R	HVL-070616-17	7/6/16	DP	7.06	103	13.47
MW-20R	HVL-070616-21	7/6/16	DP	7.02	100	12.25
MW-26R	HVL-070616-19	7/6/16	DP	6.93	195	12.00

Notes:

µS/cm = microsiemens per centimeter
°C = degrees Celsius
BG = Background
DP = dedicated bladder-pump
DB = disposable bailer
b = Secondary Drinking Water Standard
— indicates not analyzed or not applicable

Table 4. Inorganic Parameters
Third Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Location	Alkalinity, Bicarbonate	Alkalinity, Total	Ammonia	Chloride	Nitrate	Sulfate	Total Dissolved Solids	Total Organic Carbon	Total Suspended Solids
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MRL	5.0	5.0	0.1	0.2-0.4	0.2	0.2	10	1.0	4.0
HVL Cleanup Level	—	—	—	250	10	250	500	—	—
WAC 173-200 Criteria	—	—	—	250[b]	10[a]	250[b]	500[b]	—	—
Shallow Perched Aquifer									
(BG) MW-10S	88	88	*	8.0	0.75	15.0	130	1.2	*
MW-11S	73	73	*	19.0	1.10	13.0	150	1.2	*
MW-12S	160	160	3.9	20.0	*	0.7	210	3.3	*
MW-13S	150	150	0.1	20.0	*	8.8	210	1.6	*
MW-14S	70	70	*	13.0	0.42	14.0	130	1.3	*
MW-15S	90	90	3.2	17.0	*	11.0	140	1.8	*
MW-17S	160	160	4.6	21.0	*	4.8	220	2.1	*
MW-18S	140	140	*	22.0	*	4.6	200	1.6	*
MW-23S	83	83	*	11.0	0.85	14.0	150	1.7	190
MW-25S	100	100	*	8.4	1.50	7.9	150	*	*
MW-28S	—	—	—	—	—	—	—	—	—
FMMW-1	120	120	*	22.0	1.70	12.0	210	*	*
FMMW-2	100	100	*	19.0	1.50	13.0	200	1.3	*
Upper Regional Aquifer									
(BG) MW-10D	87	87	*	8.0	0.99	14.0	130	1.1	*
MW-11D(2)	85	85	*	6.0	1.80	7.9	130	*	*
MW-12D	120	120	*	7.4	1.60	7.0	170	*	*
MW-13D	150	150	*	15.0	0.54	12.0	220	*	*
MW-14D	95	95	4.0	10.0	*	13.0	140	2	*
MW-15D	110	110	*	8.8	0.94	9.9	160	*	*
MW-18D	110	110	*	7.7	1.60	6.7	170	*	*
Lower Regional Aquifer									
MW-14R	47	47	*	1.7	*	3.7	89	*	*
MW-20R	46	46	*	1.7	*	3.1	79	*	*
MW-26R	84	84	*	4.6	*	9.2	120	*	*

Notes:

Parameter concentrations that are greater than cleanup levels are shown in **bold**
mg/L = milligrams per liter
* indicates not reported at or above the MRL (Method Reporting Limit)
— indicates not analyzed or not applicable

a = Primary Drinking Water Standard
b = Secondary Drinking Water Standard
BG = Background/upgradient wells

Table 5. Total Metals
Third Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Location	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MRL	0.002	0.005	0.005	0.005	0.005	0.005	0.01	0.01	0.002	0.02	0.005	0.01	0.005	0.01	0.01
HVL Cleanup Level	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
WAC 173-200 Criteria	—	0.00005	1.0	—	0.01	0.05	—	1.0[b]	0.05	—	0.01	0.05	—	—	5.0[b]
Shallow Perched Aquifer															
(BG) MW-10S	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW-11S	*	*	0.009	*	*	*	*	*	*	*	*	*	*	*	*
MW-12S	*	*	0.022	*	*	*	*	*	*	*	*	*	*	*	0.110
MW-13S	*	*	0.011	*	*	*	*	*	*	*	*	*	*	*	*
MW-14S	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW-15S	*	*	0.011	*	*	*	*	*	*	*	*	*	*	*	*
MW-17S	*	*	0.022	*	*	*	*	*	*	*	*	*	*	*	*
MW-18S	*	*	0.013	*	*	*	*	*	*	*	*	*	*	*	*
MW-23S	0.003	*	0.034	*	*	0.005	*	0.020	**0.099**	*	*	*	*	0.012	0.260
MW-25S	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW-28S	*	0.006	0.100	*	*	0.019	0.015	0.040	0.012	0.023	*	*	*	0.042	0.086
FMMW-1	*	*	0.009	*	*	*	*	*	*	*	*	*	*	*	*
FMMW-2	*	*	0.013	*	*	*	*	*	*	*	*	*	*	*	*
Upper Regional Aquifer															
(BG) MW-10D	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW-11D(2)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW-12D	*	*	0.005	*	*	*	*	*	*	*	*	*	*	*	*
MW-13D	*	*	0.007	*	*	*	*	*	*	*	*	*	*	*	*
MW-14D	*	*	0.011	*	*	*	*	*	*	*	*	*	*	*	*
MW-15D	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW-18D	*	*	0.006	*	*	*	*	*	*	*	*	*	*	*	*
Lower Regional Aquifer															
MW-14R	*	*	0.005	*	*	*	*	*	*	*	*	*	*	*	*
MW-20R	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW-26R	*	*	0.008	*	*	*	*	*	*	*	*	*	*	*	*

Notes:

Parameter concentrations that are greater than site cleanup levels or WAC 173-200 criteria are shown in **bold**
Metals not listed were not present at concentrations exeeding the MRL
mg/L = milligrams per liter
BG = Background
* indicates not reported at or above the MRL (Method Reporting Limit)
— indicates not analyzed or not applicable
b = Secondary Drinking Water Standard

Table 6. Dissolved Metals
Third Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Location	Calcium	Iron	Magnesium	Manganese	Potassium	Sodium
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
MRL	0.2	0.029	0.1	0.001	2.0	1.0
HVL Cleanup Level	—	0.30	—	0.05	—	—
WAC 173-200 Criteria	—	0.30[b]	—	0.05[b]	—	—
Shallow Perched Aquifer						
(BG) MW-10S	24	*	8.0	*	*	7.1
MW-11S	19	*	6.0	0.003	6.9	18.0
MW-12S	28	*	8.2	**0.690**	16.0	24.0
MW-13S	30	*	8.5	**0.051**	6.1	28.0
MW-14S	23	*	6.8	0.029	2.9	8.4
MW-15S	18	0.04	5.6	**0.810**	9.4	16.0
MW-17S	27	*	9.3	**1.100**	17.0	27.0
MW-18S	28	*	9.1	0.001	9.4	27.0
MW-23S	21	0.29	7.1	**0.057**	2	15.0
MW-25S	23	*	10	*	2.7	11.0
MW-28S	15	0.05	4.2	*	*	19.0
FMMW-1	27	*	7.9	*	4.7	26.0
FMMW-2	19	*	6.3	0.041	8.8	19.0
Upper Regional Aquifer						
(BG) MW-10D	23	*	8.9	*	*	7.4
MW-11D(2)	20	*	9.3	*	2.5	8.1
MW-12D	24	*	9.7	*	3.1	16.0
MW-13D	34	*	13.0	*	4.3	18.0
MW-14D	16	**1.60**	5.0	**1.100**	7.3	12.0
MW-15D	22	*	9.3	**0.096**	2.8	19.0
MW-18D	25	*	10.0	*	3.3	11.0
Lower Regional Aquifer						
MW-14R	8	0.05	4.8	**0.180**	2.1	5.3
MW-20R	8.2		4.3	*	2.2	6.1
MW-26R	19	**0.70**	8.9	**0.370**	2.3	6.3

Notes:

Parameter concentrations that are greater than site cleanup levels or WAC 173-200 criteria are shown in **bold**

Analyses performed by TestAmerica in Denver, Colorado

b = Secondary Drinking Water Standard (concentrations measured as total metals)

mg/L = milligrams per liter

* indicates not reported at or above the MRL (Method Reporting Limit)

— indicates not analyzed or not applicable

BG = Background

Table 7. Volatile Organic Compounds
Third Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Location		Methylene Chloride	Tetrachloroethene
Units		µg/L	µg/L
MRL		2.0	0.5
HVL Cleanup Level		—	—
WAC 173-200 Criteria		5.0	0.80
Shallow Perched Aquifer			
(BG)	MW-10S	*	*
	MW-11S	*	*
	MW-12S	*	*
	MW-13S	*	*
	MW-14S	*	*
	MW-15S	*	*
	MW-17S	*	*
	MW-18S	*	*
	MW-23S	2.0	*
	MW-25S	*	*
	MW-28S	—	—
	FMMW-1	*	*
	FMMW-2	*	*
Upper Regional Aquifer			
(BG)	MW-10D	*	*
	MW-11D(2)	*	**0.96**
	MW-12D	*	*
	MW-13D	*	*
	MW-14D	2.1	*
	MW-15D	*	*
	MW-18D	*	*
Lower Regional Aquifer			
	MW-14R	*	*
	MW-20R	*	*
	MW-26R	*	*

Notes:

Volatile organic compounds not listed were not present at concentrations exeeding the MRL
BG = Background
µg/L = micrograms per liter
* = not reported at or above the MRL (Method Reporting Limit)
— = not analyzed or not applicable

Table 8. Duplicate Sample Evaluation
Third Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Parameter	MRL	MW-15S	MW-15S (DUP)	RPD (%)
Volatile Organic Compunds (µg/L)				
No Detections	—	ND	ND	—
Dissolved Metals (mg/L)				
Calcium	0.2	18.0	18.0	0.0
Iron	0.029	0.037	0.054	37.4
Magnesium	0.1	5.6	5.8	3.5
Manganese	0.001	0.81	0.81	0.0
Potassium	2.0	9.4	9.6	2.1
Sodium	1.0	16.0	16.0	0.0
Total Metals (mg/L)				
Barium	0.005	0.011	0.012	8.7
Inorganic Parameters (mg/L)				
Alkalinity	5.0	90	91	1.1
Alkalinity, Bicarbonate (as CaCO3)	5.0	90	91	1.1
Ammonia	0.1	3.2	3.4	6.1
Chloride	0.2	17.0	17.0	0.0
Sulfate	0.2	11.0	11.0	0.0
Total Dissolved Solids	10	140	140	0.0
Total Organic Carbon	1.0	1.8	1.8	0.0

Analysis performed by TestAmerica, Arvada, Colorado
Analytes not listed were not present at concentrations exceeding the MRL
RPD = relative percent difference
µg/L = micrograms per liter
mg/L = milligrams per liter
*= RPD based on result as compared to the Reporting Limit (RL) for a non-detection in the compared sample
— = not applicable
ND= No Detection

Table 9. Water Supply Wells
Third Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Parameter	Units	MRL	Corliss	Paul Bunyan
Field Parameters				
pH	SU	—	6.67	6.19
Specific Conductivity	µS/cm	—	224	275
Temperature	deg C	—	18.5	15.9
Volatile Organic Compounds				
(No VOCs detected)	µg/L	—	*	*
Metals (total)				
Iron	mg/L	0.029	0.10	0.16
Manganese	mg/L	0.001	0.002	0.002
Zinc	mg/L	0.010	0.031	*
Inorganic Parameters				
Chemical Oxygen Demand	mg/L	5.0	*	7.9
Chloride	mg/L	0.2	5.8	5.7
Nitrate (as N)	mg/L	0.5	1.6	2.4
Sulfate	mg/L	0.2	9.7	10.0
Other				
Color	PCU	5.0	*	5.0

Notes:

Analyses performed by TestAmerica in Denver, Colorado.

Analytes not listed were not present at concentrations exceeding the MRL.

Color reported in color units

µg/L = micrograms per liter

mg/L = milligrams per liter

PCU = platinum-cobalt units

* = not reported at or above the MRL (Method Reporting Limit)

SU = Standard Units

µS/cm = microsiemens per centimeter

°C = degrees Celsius

— = Not Applicable

Table 10. Cation-Anion Balance
Third Quarter 2016 Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Cations	mg/L					meq/L					% of Total		
	Ca	Mg	K	Na	Total	Ca	Mg	K	Na	Total	Na+K	Ca	Mg
MW-10S	24.0	8.0	2.0	7.1	41.10	1.20	0.66	0.05	0.31	2.22	16	54	30
MW-11S	19.0	6.0	6.9	18.0	49.90	0.95	0.49	0.18	0.78	2.40	40	39	21
MW-12S	28.0	8.2	16.0	24.0	76.20	1.40	0.67	0.41	1.04	3.53	41	40	19
MW-13S	30.0	8.5	6.1	28.0	72.60	1.50	0.70	0.16	1.22	3.57	38	42	20
MW-14S	23.0	6.8	2.9	8.4	41.10	1.15	0.56	0.07	0.37	2.15	20	53	26
MW-15S	18.0	5.6	9.4	16.0	49.00	0.90	0.46	0.24	0.70	2.30	41	39	20
MW-17S	27.0	9.3	17.0	27.0	80.30	1.35	0.77	0.44	1.17	3.72	43	36	21
MW-18S	28.0	9.1	9.4	27.0	73.50	1.40	0.75	0.24	1.17	3.56	40	39	21
MW-23S	21.0	7.1	2.0	15.0	45.10	1.05	0.58	0.05	0.65	2.34	30	45	25
MW-25S	23.0	10.0	2.7	11.0	46.70	1.15	0.82	0.07	0.48	2.52	22	46	33
MW-28S	15.0	4.2	2.0	19.0	40.20	0.75	0.35	0.05	0.83	1.97	45	38	18
FMMW-1	27.0	7.9	4.7	26.0	65.60	1.35	0.65	0.12	1.13	3.25	39	41	20
FMMW-2	19.0	6.3	8.8	19.0	53.10	0.95	0.52	0.23	0.83	2.52	42	38	21
MW-10D	23.0	8.9	2.0	7.4	41.30	1.15	0.73	0.05	0.32	2.25	17	51	33
MW-11D(2)	20.0	9.3	2.5	8.1	39.90	1.00	0.77	0.06	0.35	2.18	19	46	35
MW-12D	24.0	9.7	3.1	16.0	52.80	1.20	0.80	0.08	0.70	2.77	28	43	29
MW-13D	34.0	13.0	4.3	18.0	69.30	1.70	1.07	0.11	0.78	3.66	24	46	29
MW-14D	16.0	5.0	7.3	12.0	40.30	0.80	0.41	0.19	0.52	1.92	37	42	21
MW-15D	22.0	9.3	2.8	19.0	53.10	1.10	0.77	0.07	0.83	2.76	33	40	28
MW-18D	25.0	10.0	3.3	11.0	49.30	1.25	0.82	0.08	0.48	2.63	21	47	31
MW-14R	8.0	4.8	2.1	5.3	20.20	0.40	0.40	0.05	0.23	1.08	26	37	37
MW-20R	8.2	4.3	2.2	6.1	20.80	0.41	0.35	0.06	0.27	1.08	30	38	33
MW-26R	19.0	8.9	2.3	6.3	36.50	0.95	0.73	0.06	0.27	2.01	17	47	36

Anions	mg/L					meq/L					% of Total			Total Ions (meq/L)	Cation - Anion Balance	Applicable Ratio (%)	Ratio Exceedance
	Alk	Cl	NO_3	SO_4	Total	Alk	Cl	NO_3	SO_4	Total	Cl	Alk	SO_4				
MW-10S	88.0	8.0	0.8	15.0	111.75	1.44	0.23	0.01	0.31	1.99	11	72	16	4.21	5.30	10	-
MW-11S	73.0	19.0	1.1	13.0	106.10	1.20	0.54	0.02	0.27	2.02	27	59	13	4.42	8.60	10	-
MW-12S	160.0	20.0	0.2	0.7	180.86	2.62	0.56	0.00	0.01	3.20	18	82	0	6.73	4.76	5	-
MW-13S	150.0	20.0	0.2	8.8	179.00	2.46	0.56	0.00	0.18	3.21	18	77	6	6.78	5.32	5	Exceeds
MW-14S	70.0	13.0	0.4	14.0	97.42	1.15	0.37	0.01	0.29	1.81	20	63	16	3.96	8.45	10	-
MW-15S	90.0	17.0	0.2	11.0	118.20	1.48	0.48	0.00	0.23	2.19	22	67	10	4.48	2.42	10	-
MW-17S	160.0	21.0	0.2	4.8	186.00	2.62	0.59	0.00	0.10	3.32	18	79	3	7.04	5.72	5	Exceeds
MW-18S	140.0	22.0	0.2	4.6	166.80	2.30	0.62	0.00	0.10	3.02	21	76	3	6.58	8.30	5	Exceeds
MW-23S	83.0	11.0	0.9	14.0	108.85	1.36	0.31	0.01	0.29	1.98	16	69	15	4.31	8.34	10	-
MW-25S	100.0	8.4	1.5	7.9	117.80	1.64	0.24	0.02	0.16	2.07	11	79	8	4.58	9.88	10	-
MW-28S	--	--	--	--													
FMMW-1	120.0	22.0	1.7	12.0	155.70	1.97	0.62	0.03	0.25	2.87	22	69	9	6.11	6.27	5	Exceeds
FMMW-2	100.0	19.0	1.5	13.0	133.50	1.64	0.54	0.02	0.27	2.47	22	66	11	4.99	0.96	10	-
MW-10D	87.0	8.0	1.0	14.0	109.99	1.43	0.23	0.02	0.29	1.96	12	73	15	4.21	6.97	10	-
MW-11D(2)	85.0	6.0	1.8	7.9	100.70	1.39	0.17	0.03	0.16	1.76	10	79	9	3.94	10.75	10	Exceeds
MW-12D	120.0	7.4	1.6	7.0	136.00	1.97	0.21	0.03	0.15	2.35	9	84	6	5.12	8.27	5	Exceeds
MW-13D	150.0	15.0	0.5	12.0	177.54	2.46	0.42	0.01	0.25	3.14	13	78	8	6.80	7.62	5	Exceeds
MW-14D	95.0	10.0	0.2	13.0	118.20	1.56	0.28	0.00	0.27	2.11	13	74	13	4.03	4.83	10	-
MW-15D	110.0	8.8	0.9	9.9	129.64	1.80	0.25	0.02	0.21	2.27	11	79	9	5.03	9.70	5	Exceeds
MW-18D	110.0	7.7	1.6	6.7	126.00	1.80	0.22	0.03	0.14	2.19	10	83	6	4.82	9.28	10	-
MW-14R	47.0	1.7	0.2	3.7	52.60	0.77	0.05	0.00	0.08	0.90	5	86	9	1.98	9.08	10	-
MW-20R	46.0	1.7	0.2	3.1	51.00	0.75	0.05	0.00	0.06	0.87	6	87	7	1.95	10.98	10	Exceeds
MW-26R	84.0	4.6	0.2	9.2	98.00	1.38	0.13	0.00	0.19	1.70	8	81	11	3.72	8.39	10	-

Notes:

-- = Not analyzed due to transit delay of sample. See report for details.

Appendix E

TIME SERIES PLOTS

Figure 1

Specific Conductivity

Shallow Perched Aquifer, Hidden Valley Landfill
Wells MW-11S, MW-13S, MW-14S, and MW-17S

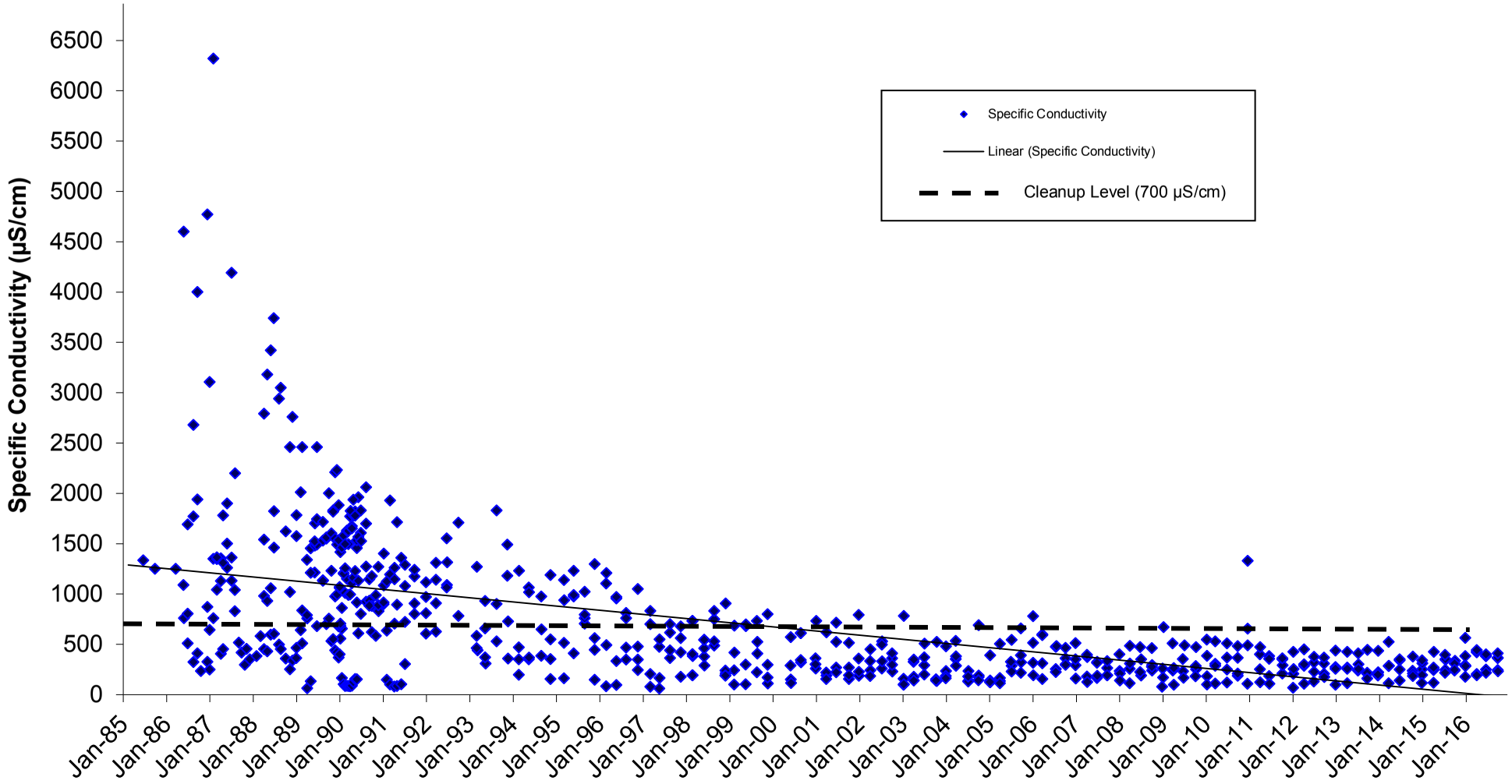


Figure 2

Ammonia

Shallow Perched Aquifer, Hidden Valey Landfill
Wells MW-11S, MW-13S, MW-14S, and MW-17S

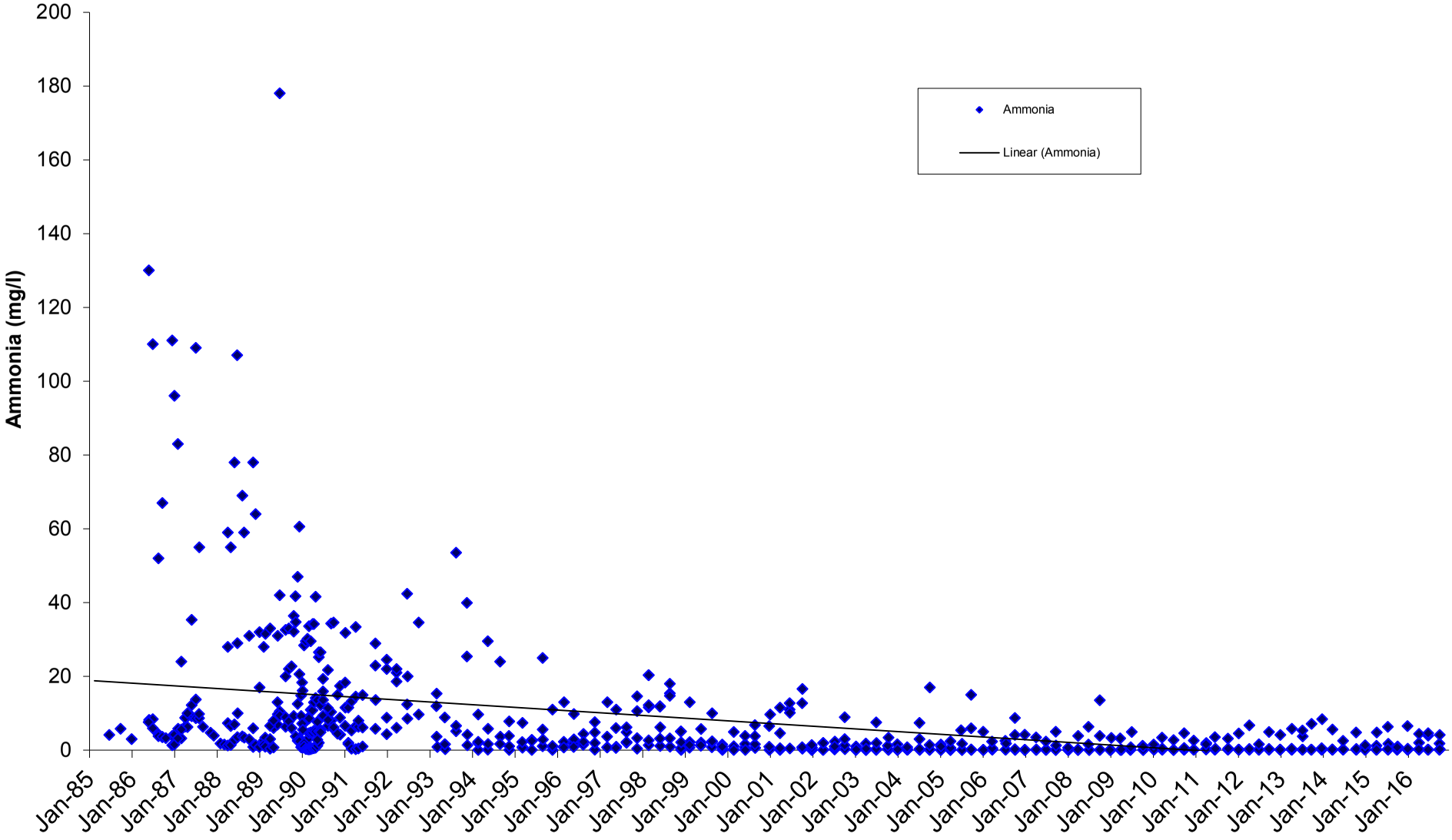


Figure 3

Nitrate

Shallow Perched Aquifer, Hidden Valley Landfill
Wells MW-11S, MW-13S, MW-14S, and MW-17S

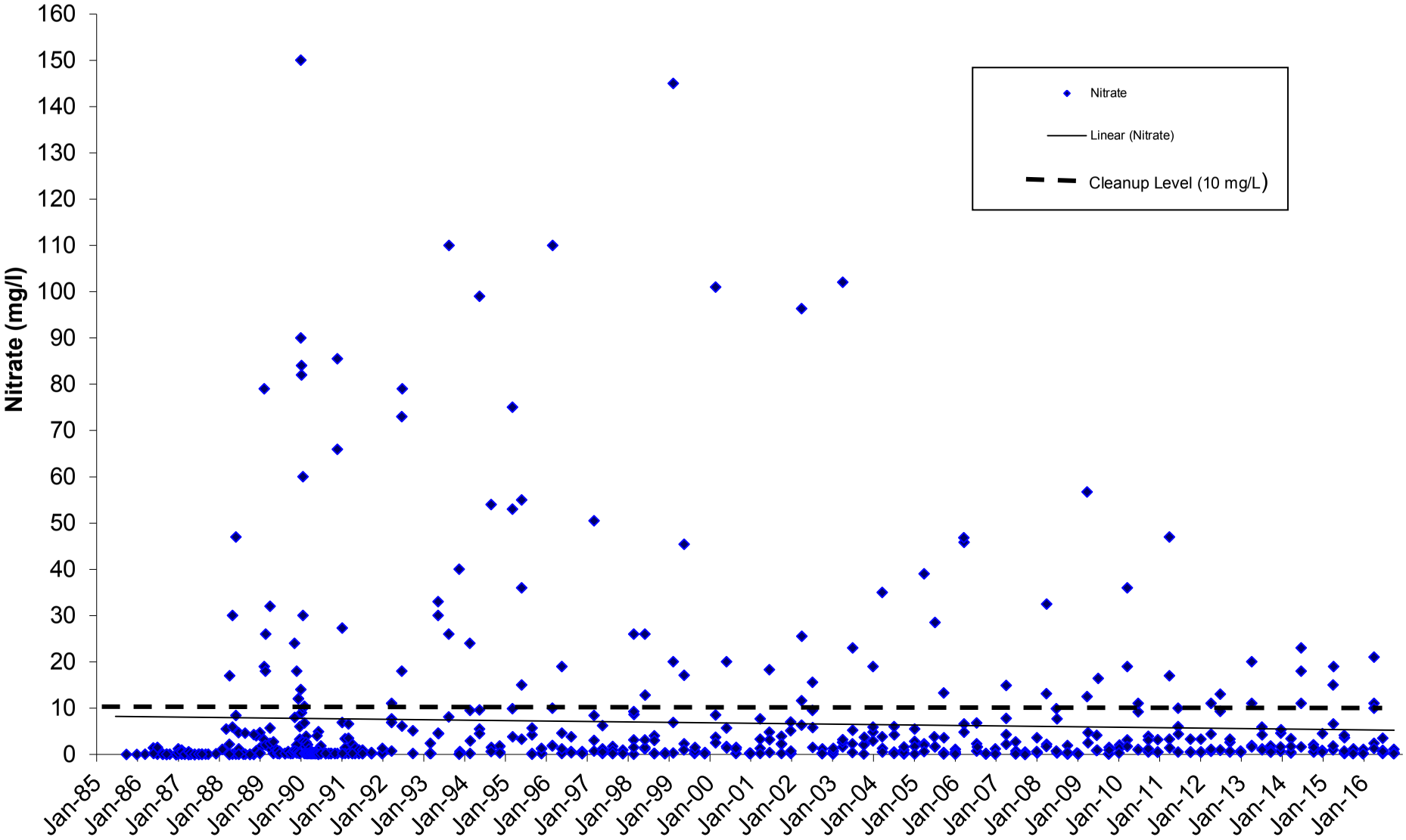


Figure 4

Dissolved Iron

Shallow Perched Aquifer, Hidden Valley Landfill

Wells MW-11S, MW-13S, MW-14S, and MW-17

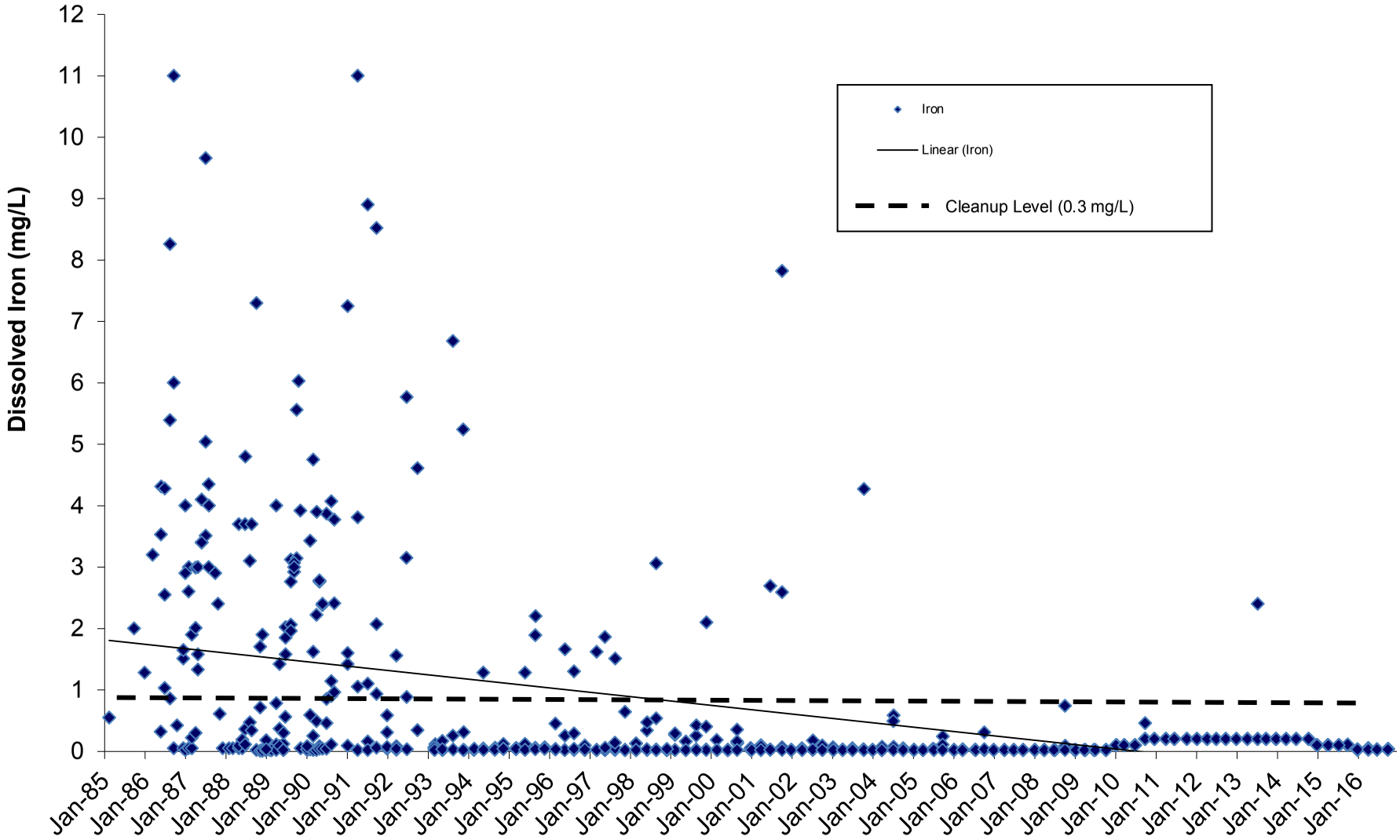


Figure 5

Dissolved Manganese

Shallow Perched Aquifer, Hidden Valley Landfill
Wells MW-11D(2), MW-13D, MW-14D

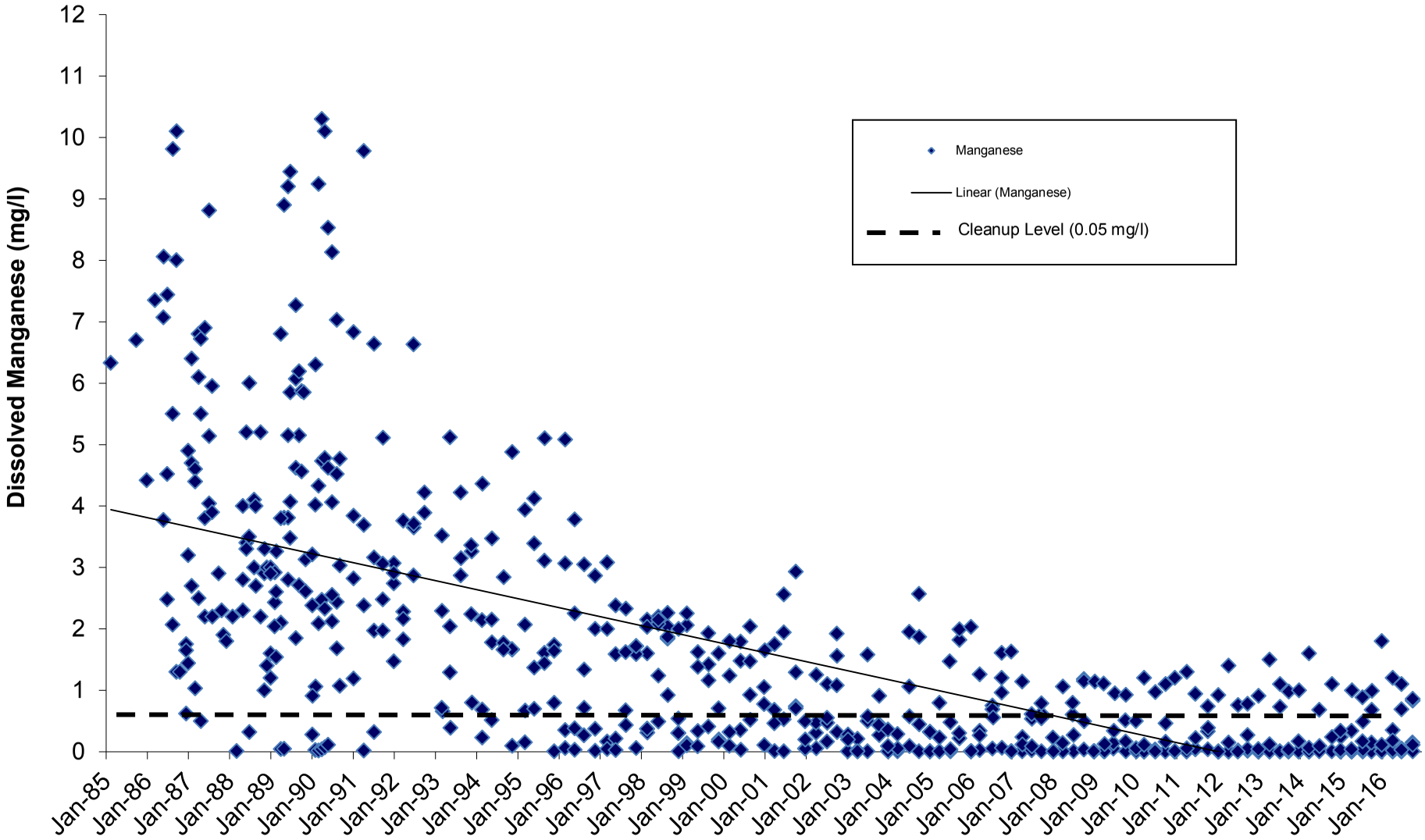


Figure 6

Specific Conductivity

Upper Regional Aquifer, Hidden Valley Landfill
Wells MW-11D(2), MW-13D and MW-14D

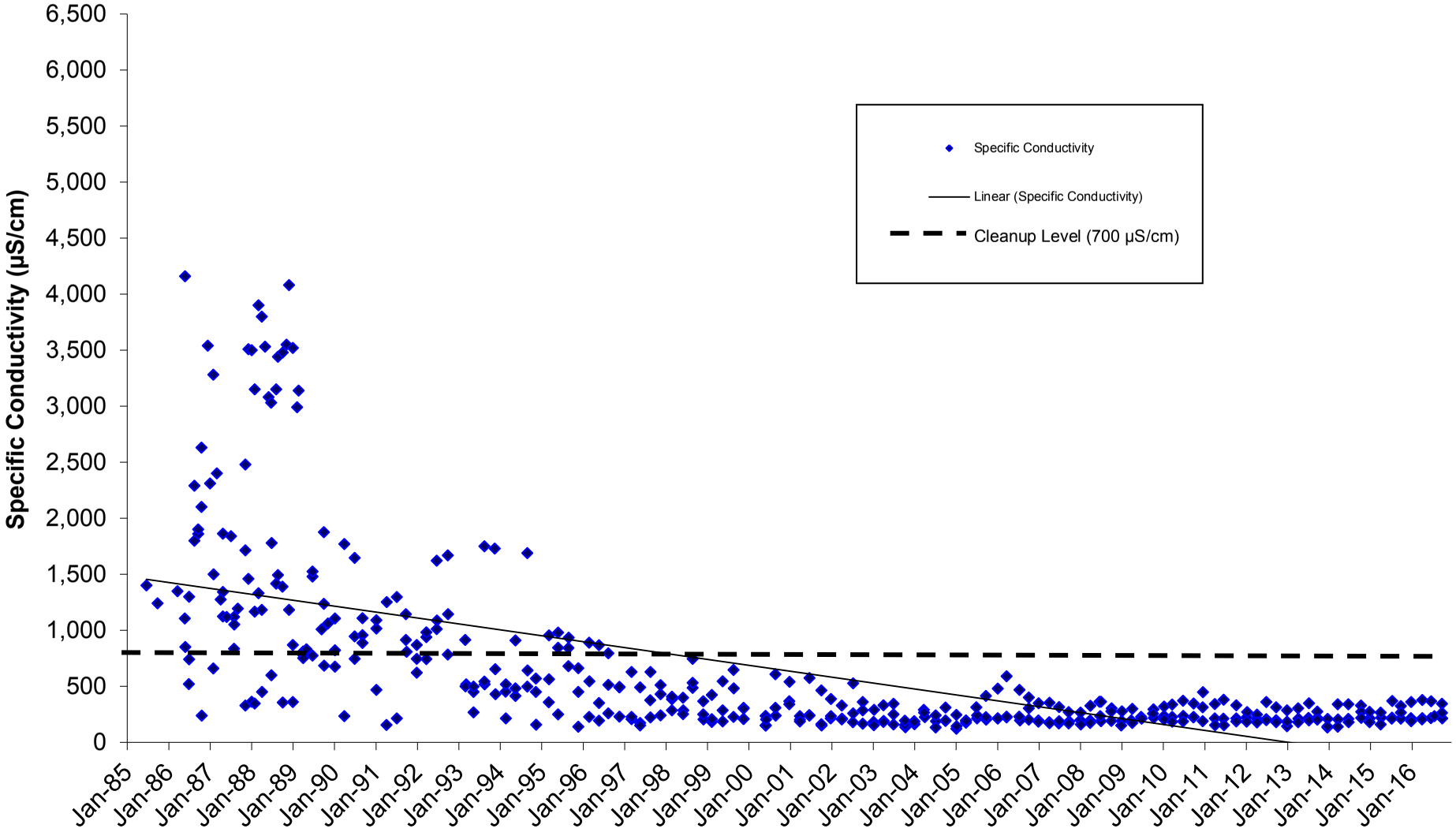


Figure 7

Ammonia

Upper Regional Aquifer, Hidden Valley Landfill
Wells MW-11D(2), MW-13D and MW-14D

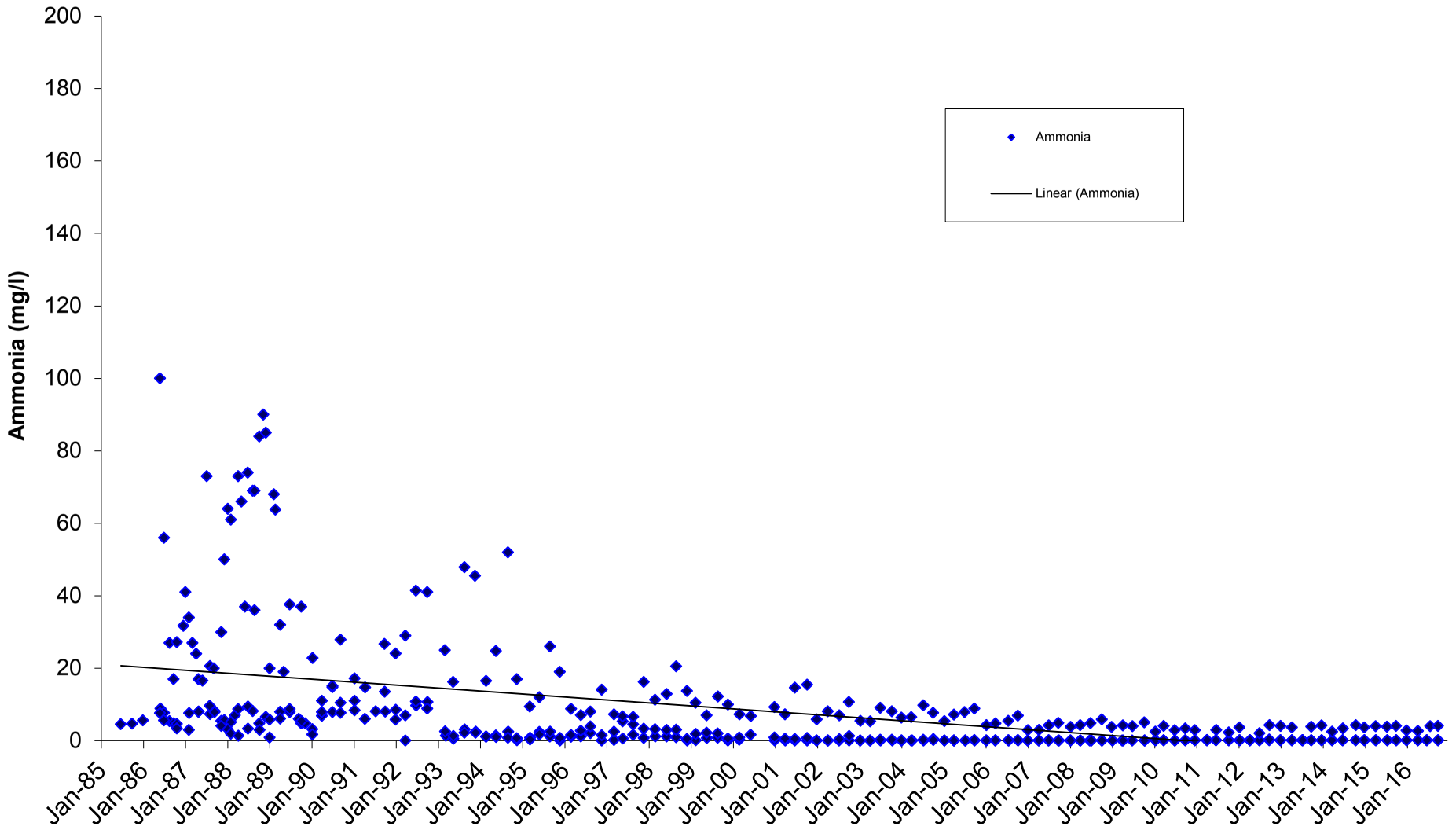


Figure 8

Nitrate

Upper Regional Aquifer, Hidden Valley Landfill
Wells MW-11D(2), MW-13D and MW-14D

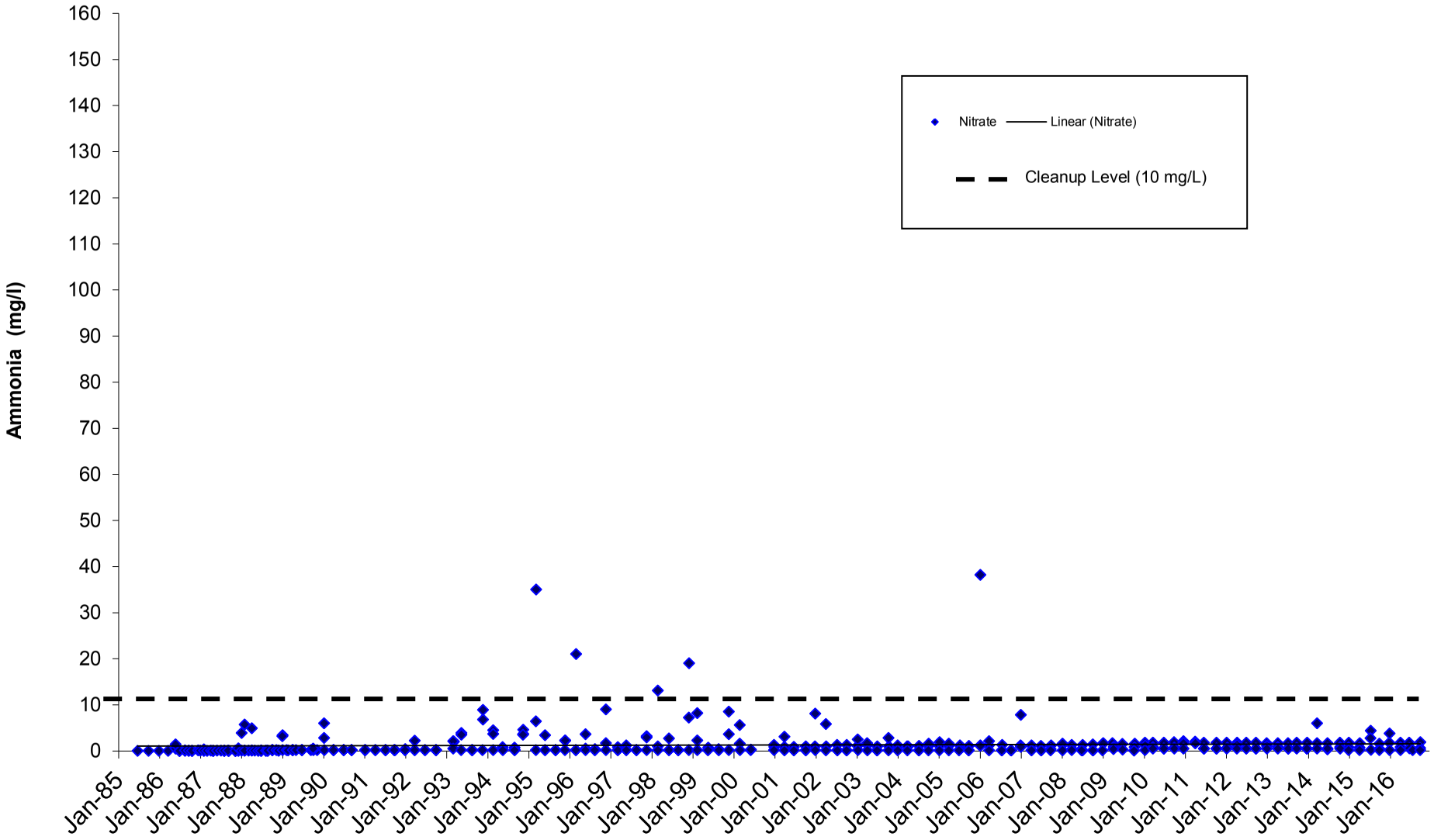


Figure 9

Dissolved Iron

Upper Regional Aquifer, Hidden Valley Landfill
Wells MW-11D(2), MW-13D, MW-14D

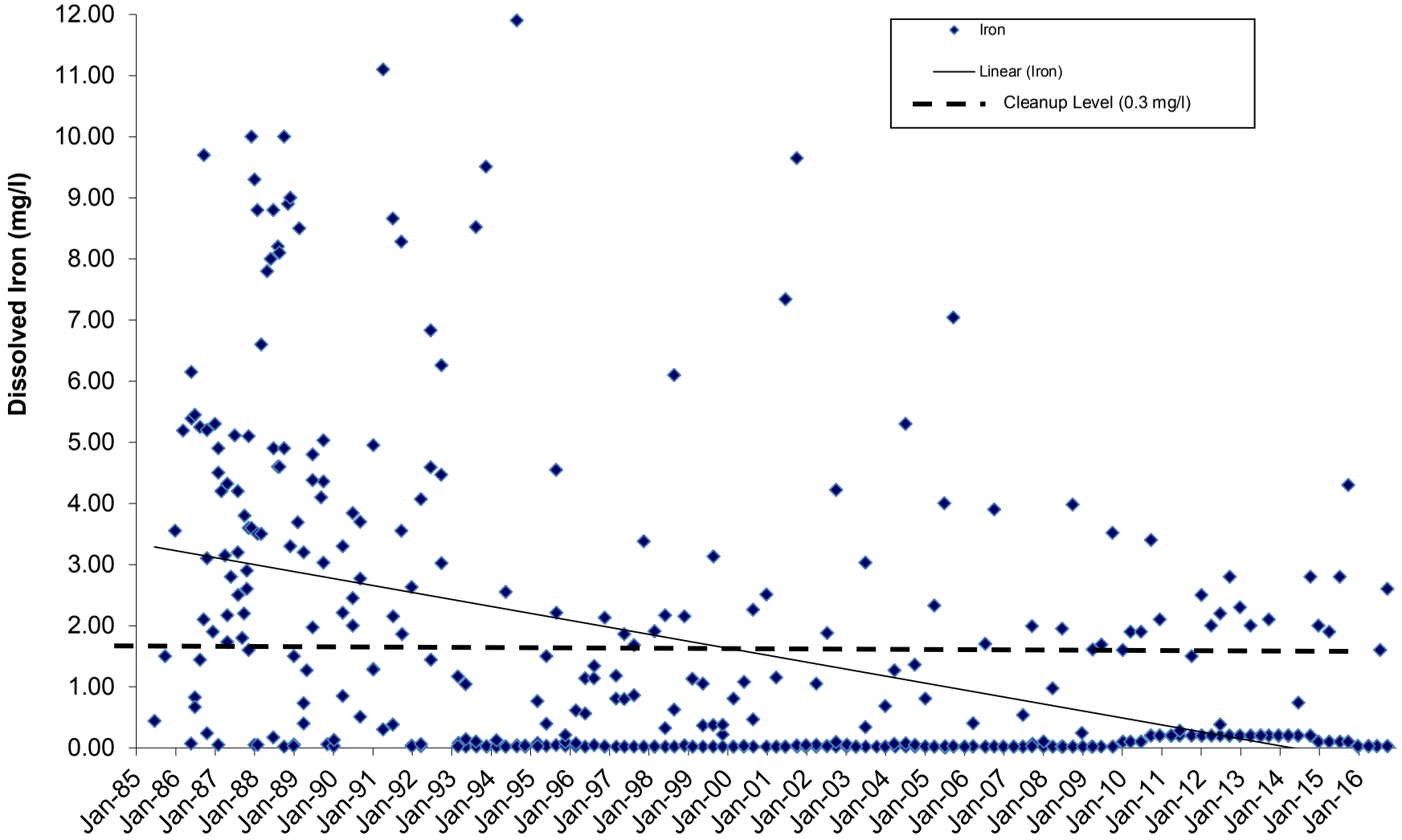
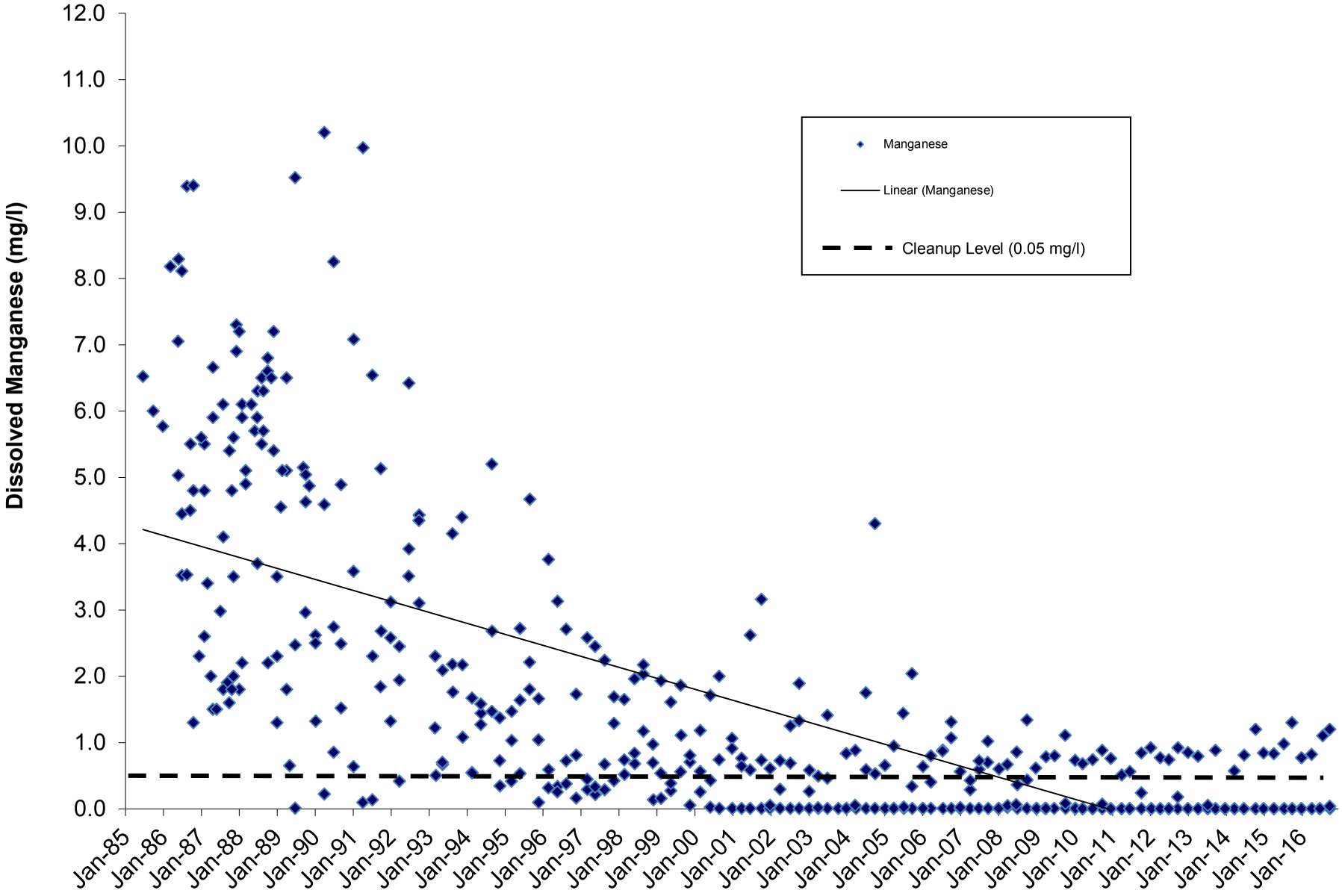


Figure 10

Dissolved Manganese

Upper Regional Aquifer, Hidden Valley Landfill

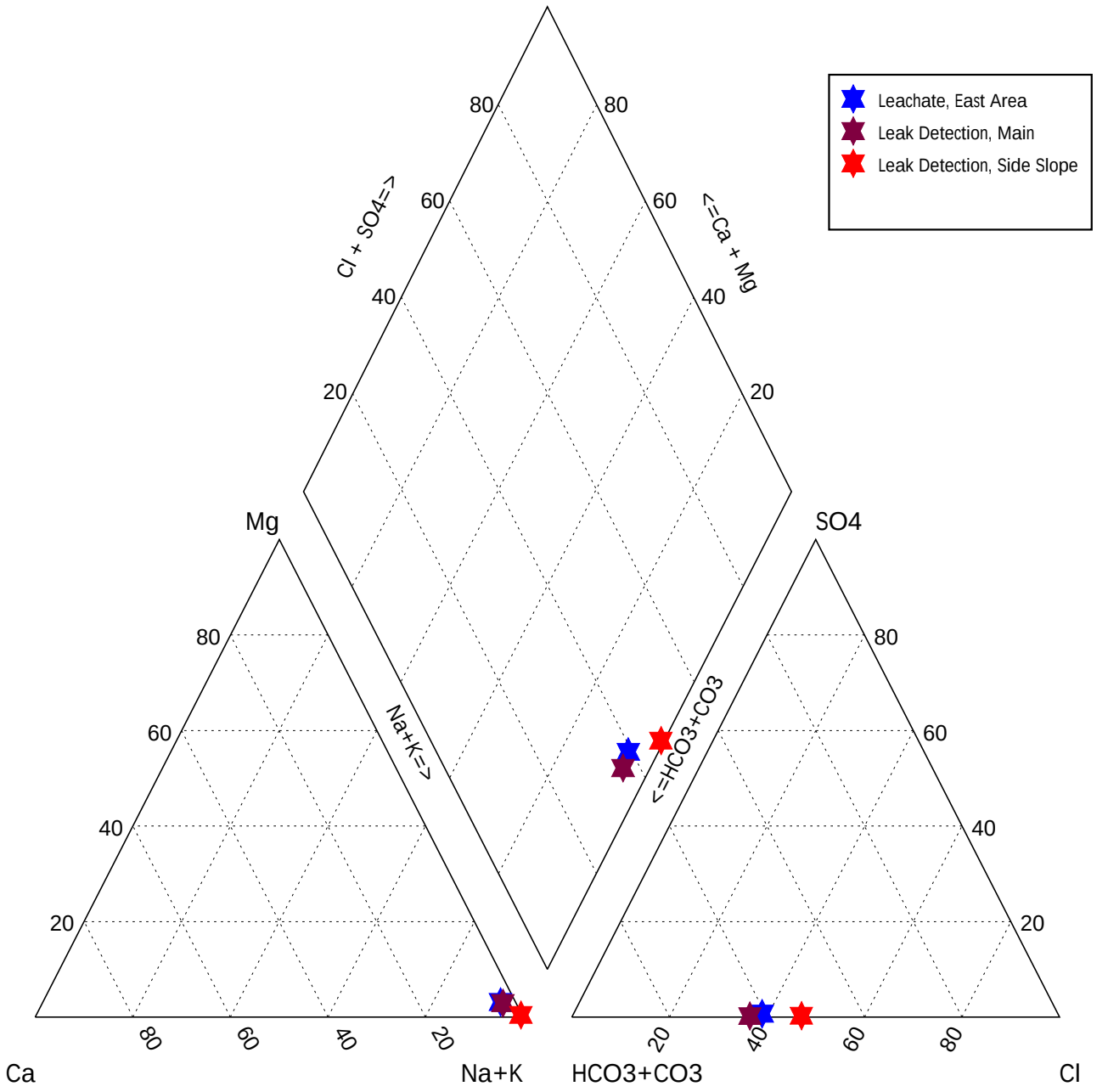
Wells MW-11D(2), MW-13D, MW-14D



Appendix F

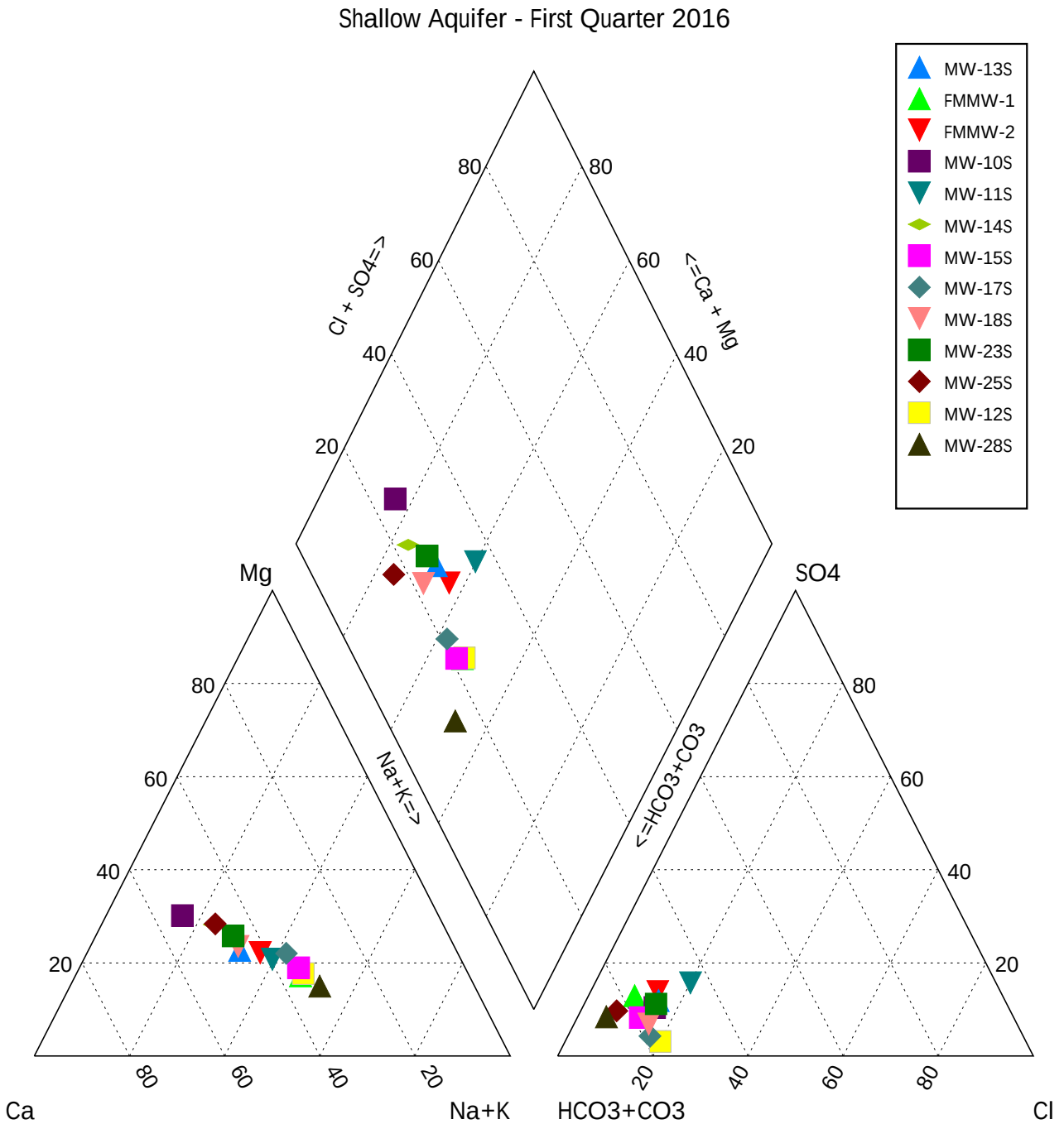
TRILINEAR DIAGRAMS

Leachate and Leak Detection Locations - First Quarter 2016



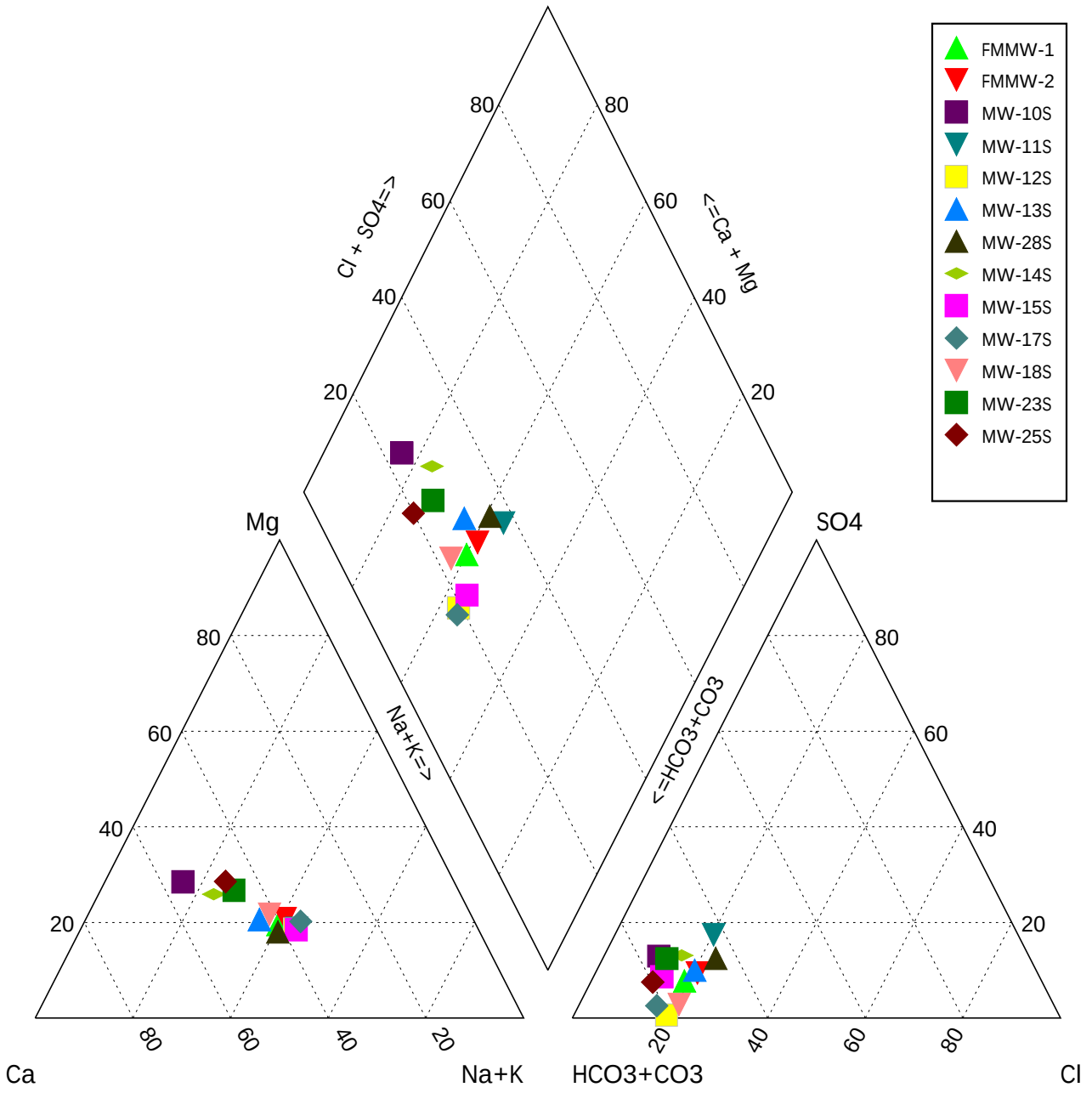
DESCRIPTION: Trilinear Diagram: Leachate and Leak Detection, First Quarter 2016

	PROJECT: Hidden Valley Landfill	PROJECT NO: 04216002.03
	CLIENT: LRI	DATE: May 2016

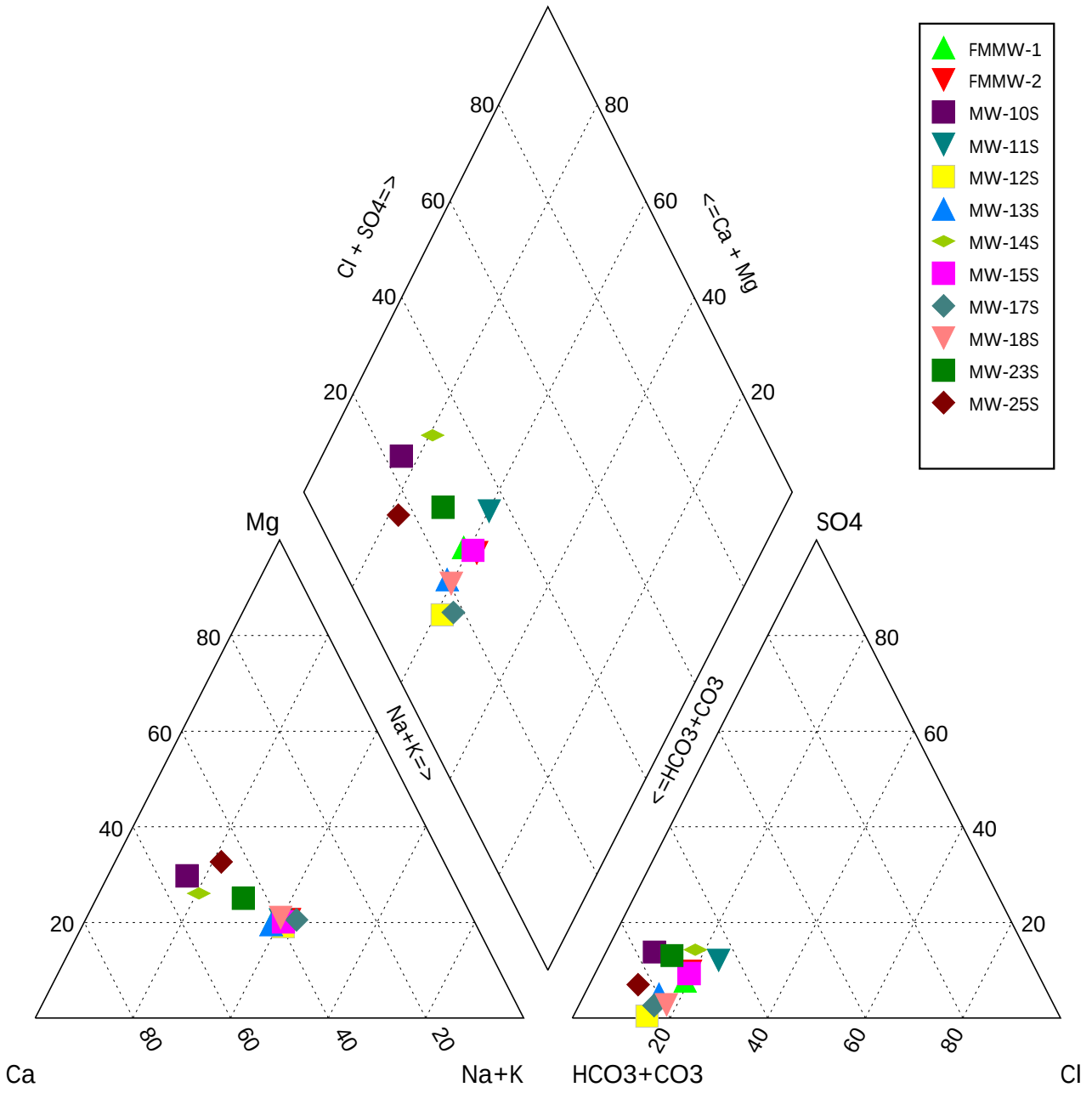


DESCRIPTION: Trilinear Diagram: Shallow Aquifer, First Quarter 2016

	PROJECT: Hidden Valley Landfill	PROJECT NO: 04216002.03
	CLIENT: LRI	DATE: May 2016

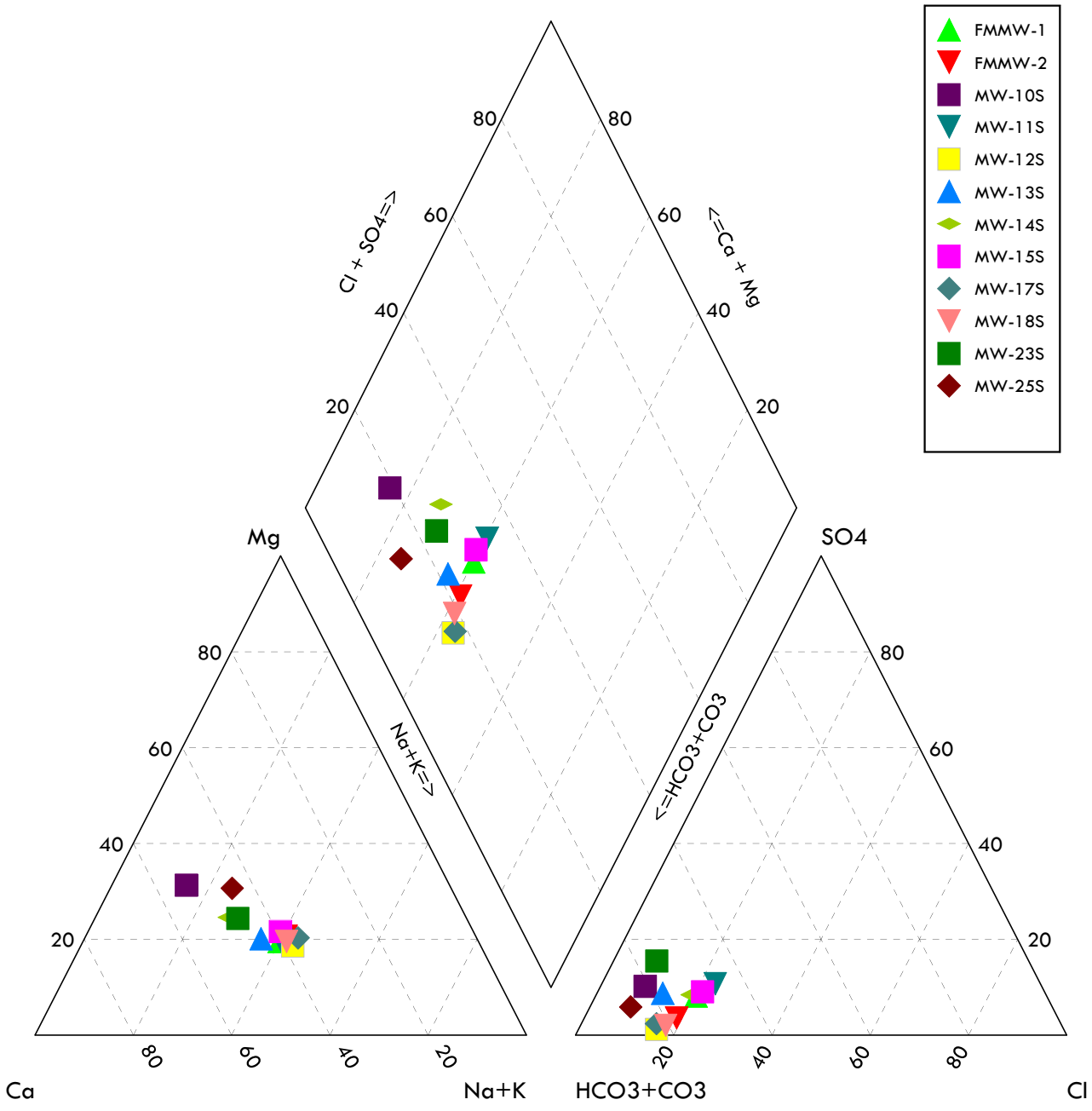


DESCRIPTION: Trilinear Diagram: Shallow Aquifer, Second Quarter 2016		
	PROJECT: Hidden Valley Landfill	PROJECT NO: 04216002.03
	CLIENT: LRI	DATE: August 2016



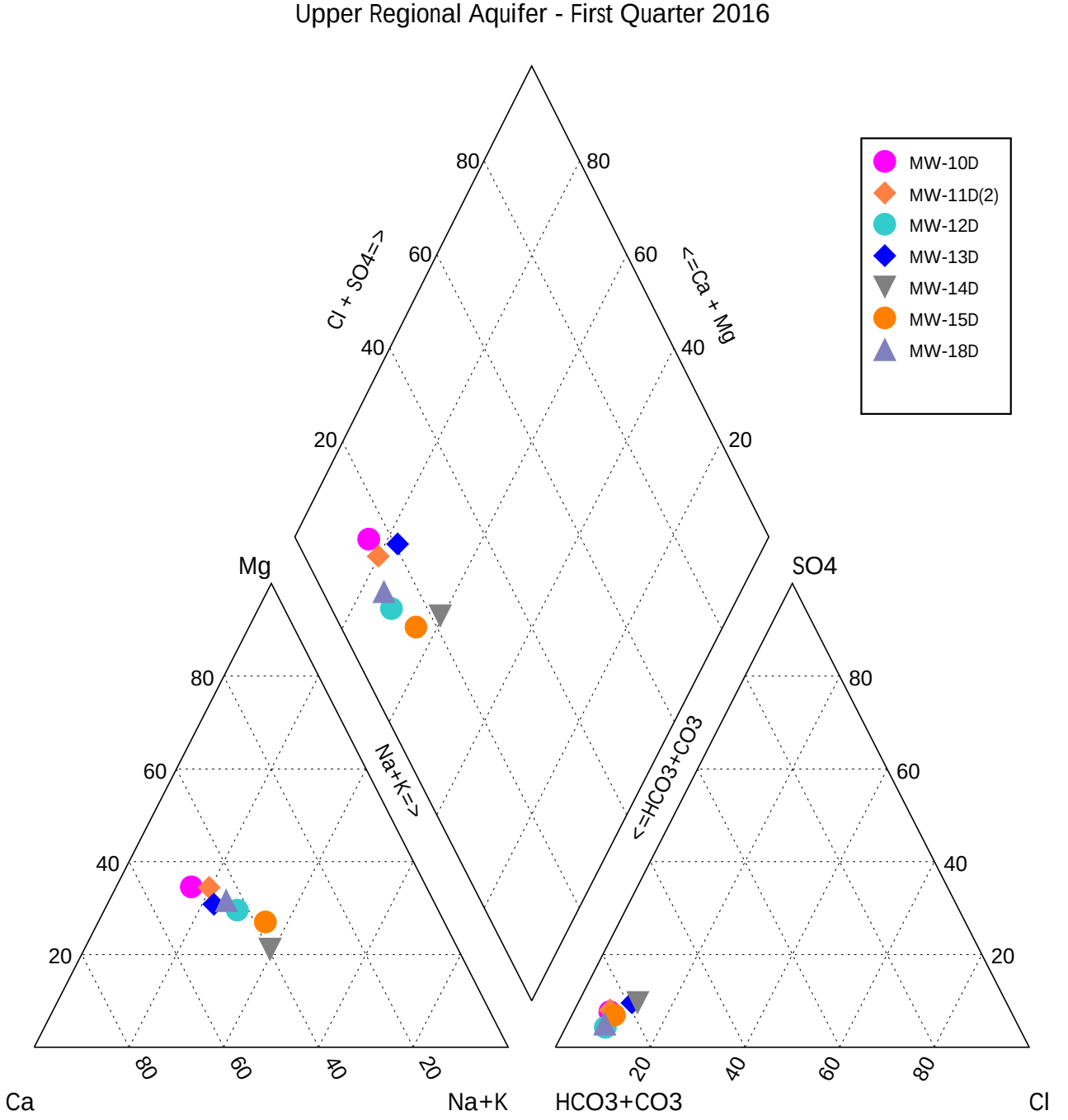
DESCRIPTION: Trilinear Diagram: Shallow Aquifer, Third Quarter 2016		
	PROJECT: Hidden Valley Landfill	PROJECT NO: 04216002.03
	CLIENT: LRI Hidden Valley	DATE: November 2016

Shallow Aquifer - Fourth Quarter 2016



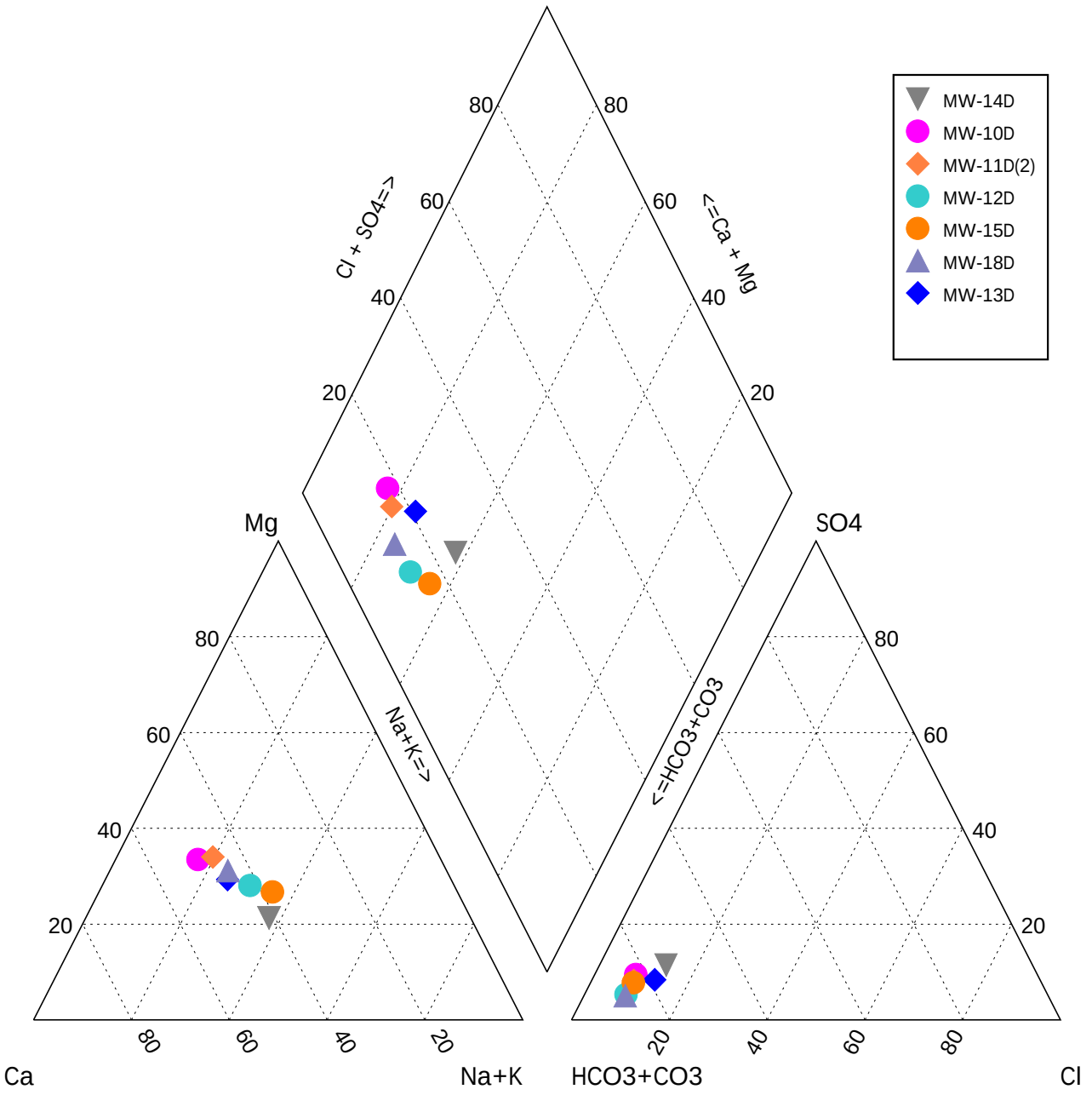
DESCRIPTION: Trilinear Diagram: Shallow Aquifer, Fourth Quarter 2016

	PROJECT: Hidden Valley Landfill	PROJECT NO: 04216002.03
	CLIENT: LRI Hidden Valley	DATE: March 2017



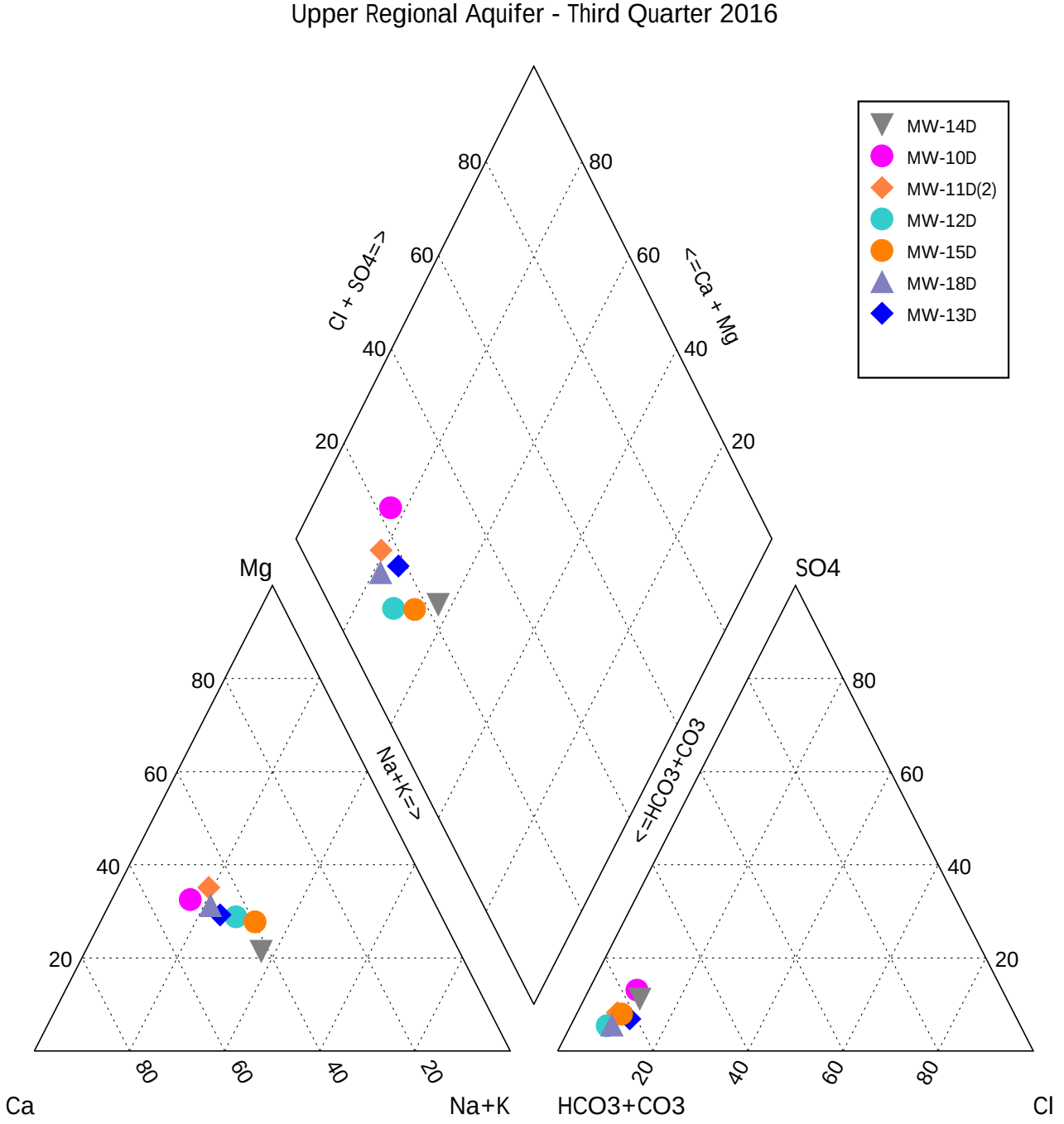
DESCRIPTION: Trilinear Diagram: Upper Regional Aquifer, First Quarter 2016		
	PROJECT: Hidden Valley Landfill	PROJECT NO: 04216002.03
	CLIENT: LRI	DATE: May 2016

Upper Regional Aquifer - Second Quarter 2016



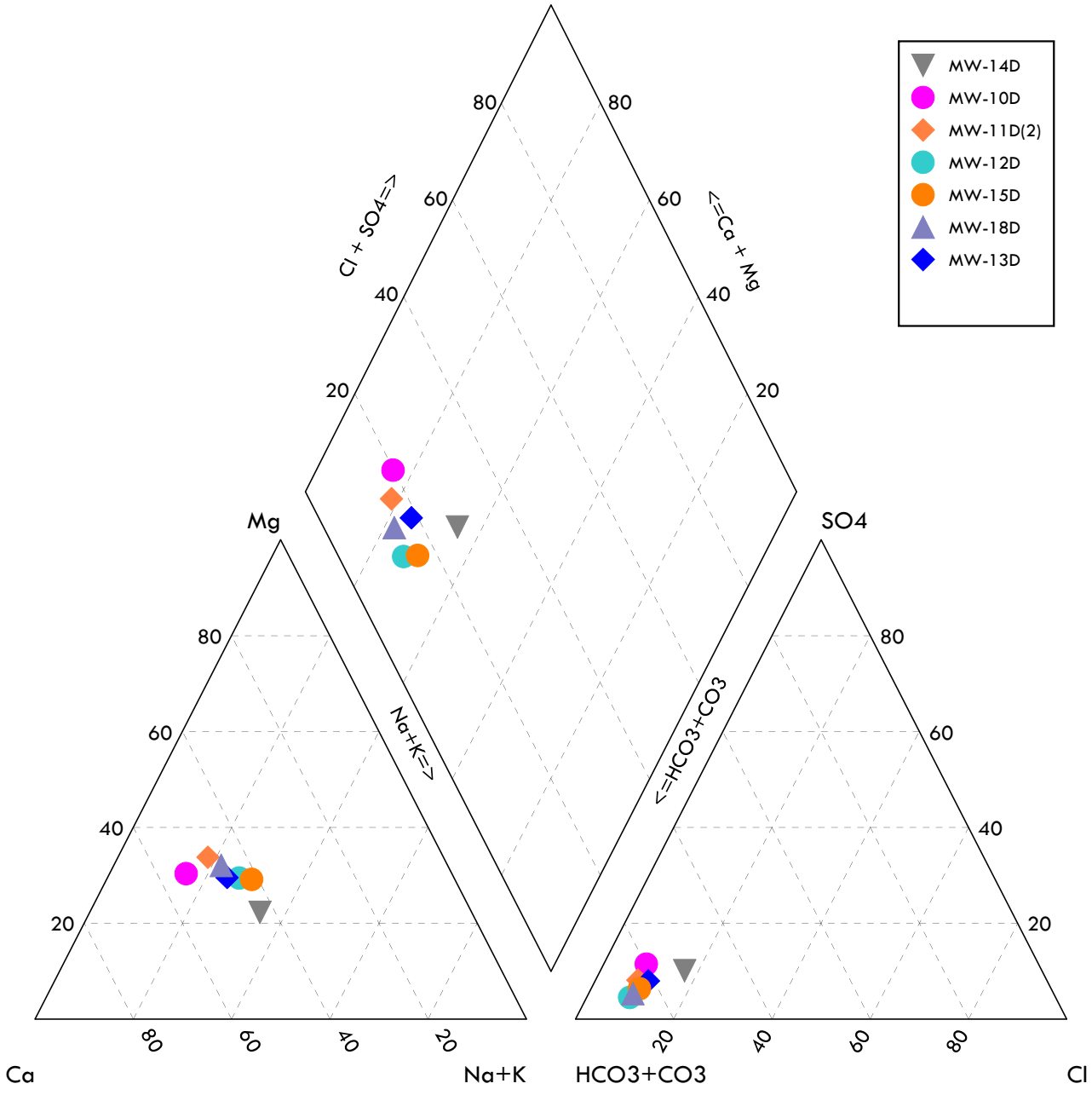
DESCRIPTION: Trilinear Diagram: Upper Regional Aquifer, Second Quarter 2016

	PROJECT: Hidden Valley Landfill	PROJECT NO: 04216002.03
	CLIENT: LRI	DATE: August 2016



DESCRIPTION: Trilinear Diagram: Upper Regional Aquifer, Third Quarter 2016		
	PROJECT: Hidden Valley Landfill	PROJECT NO: 04216002.03
	CLIENT: LRI Hidden Valley	DATE: November 2016

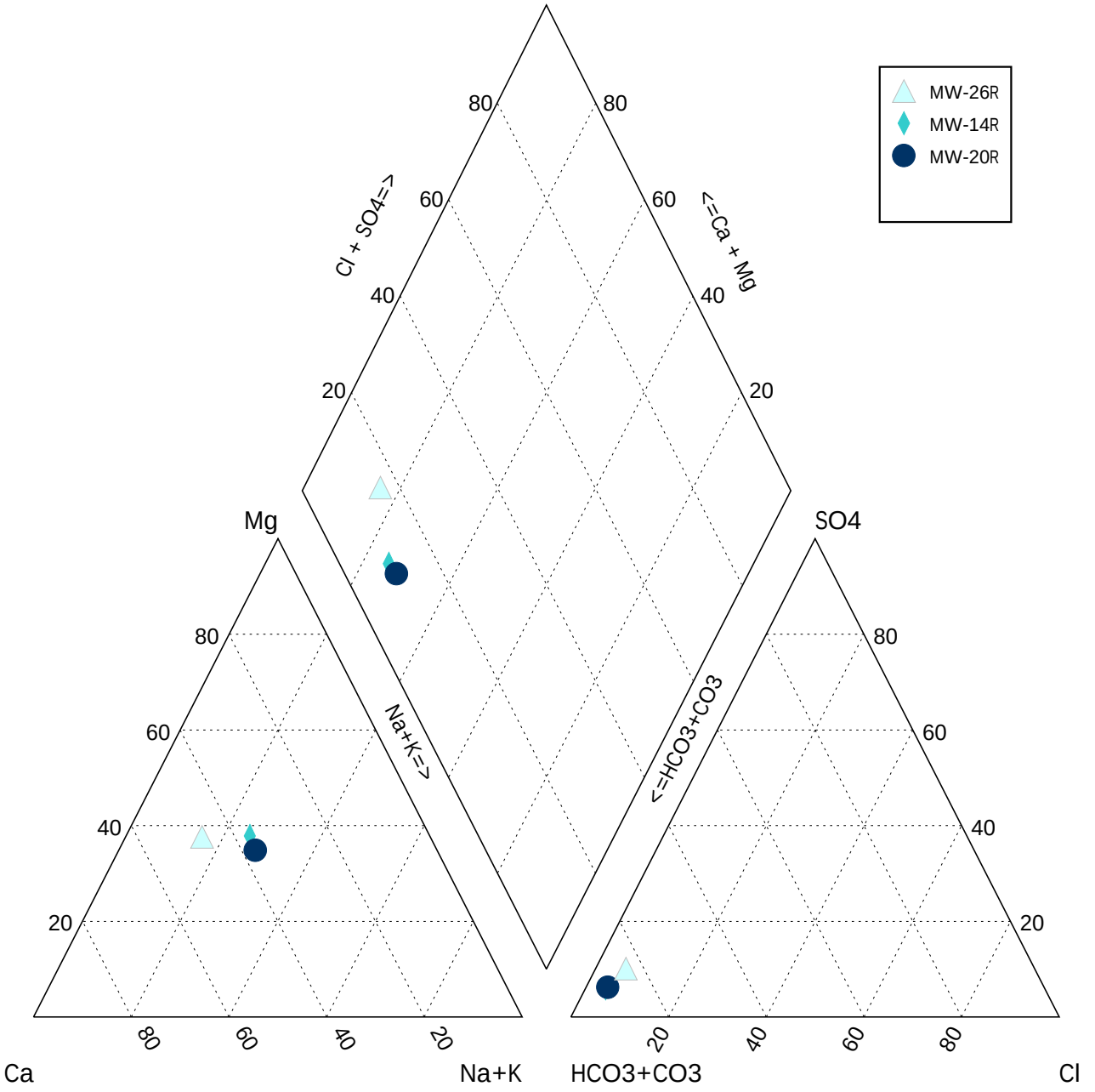
Upper Regional Aquifer - Fourth Quarter 2016



DESCRIPTION: Trilinear Diagram: Upper Regional Aquifer, Fourth Quarter 2016

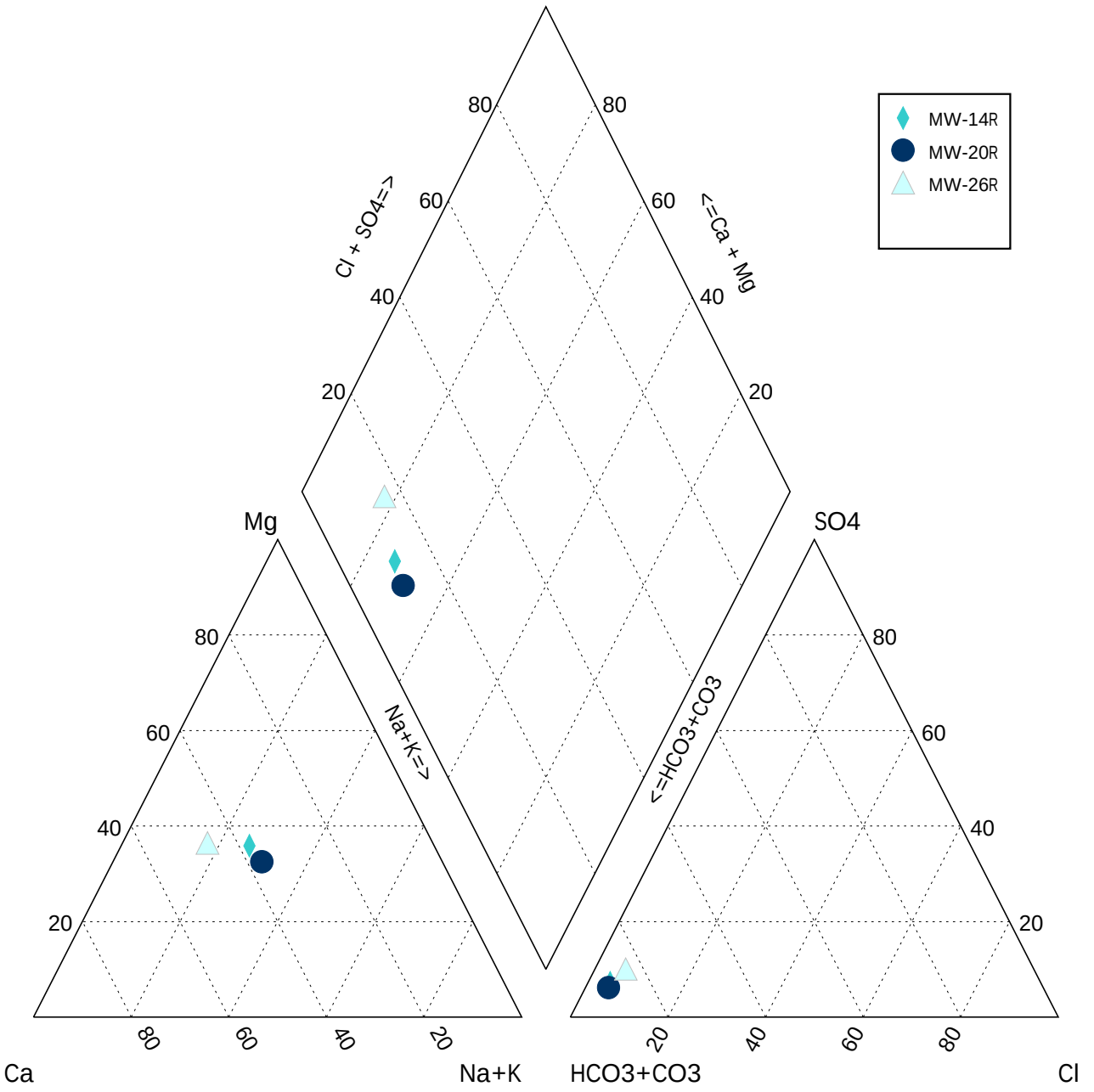
	PROJECT: Hidden Valley Landfill	PROJECT NO: 04216002.03
	CLIENT: LRI Hidden Valley	DATE: March 2017

Lower Regional Aquifer - First Quarter 2016



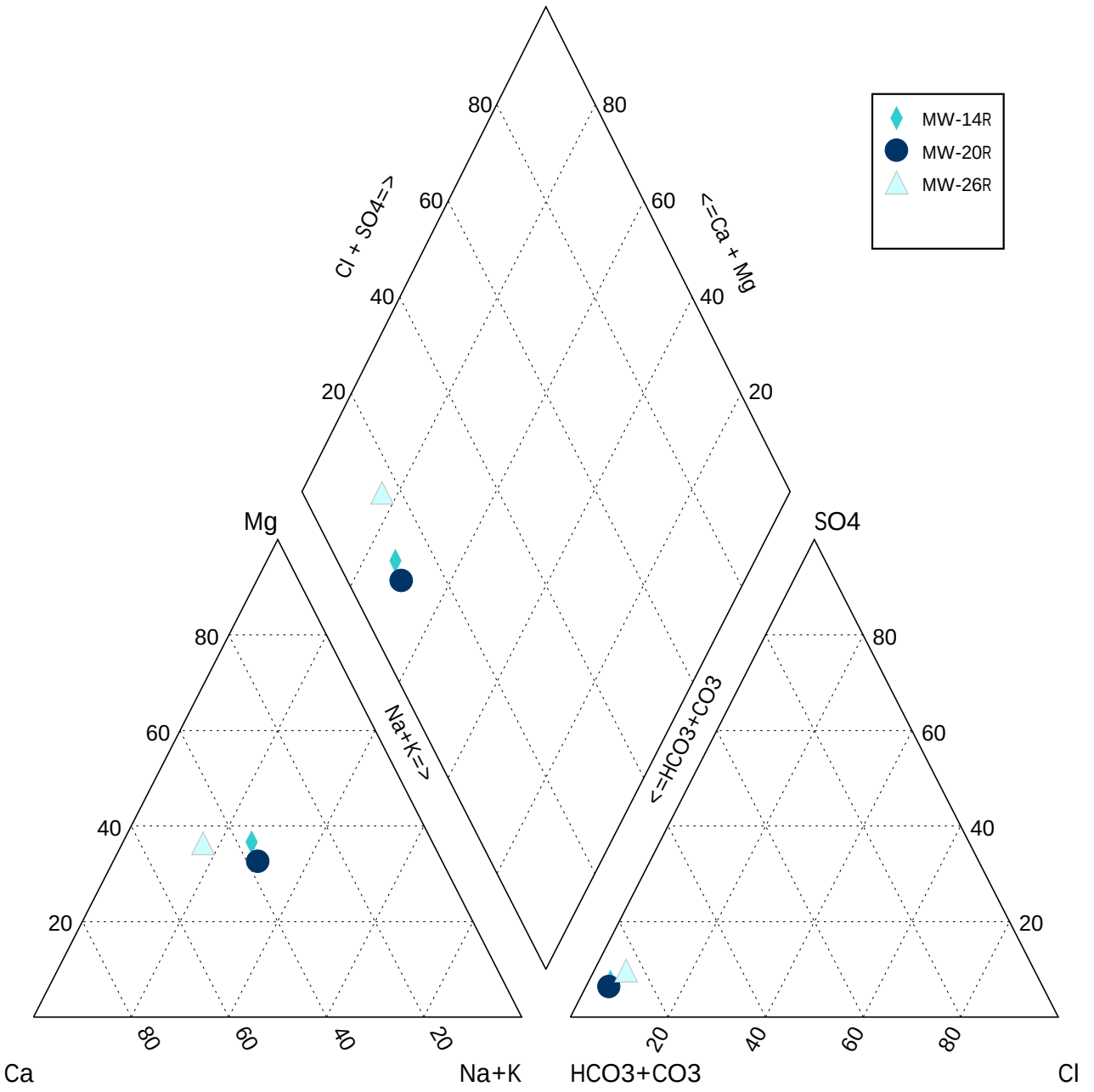
DESCRIPTION: Trilinear Diagram: Lower Regional Aquifer, First Quarter 2016		
	PROJECT: Hidden Valley Landfill	PROJECT NO: 04216002.03
	CLIENT: LRI	DATE: May 2016

Lower Regional Aquifer - Second Quarter 2016



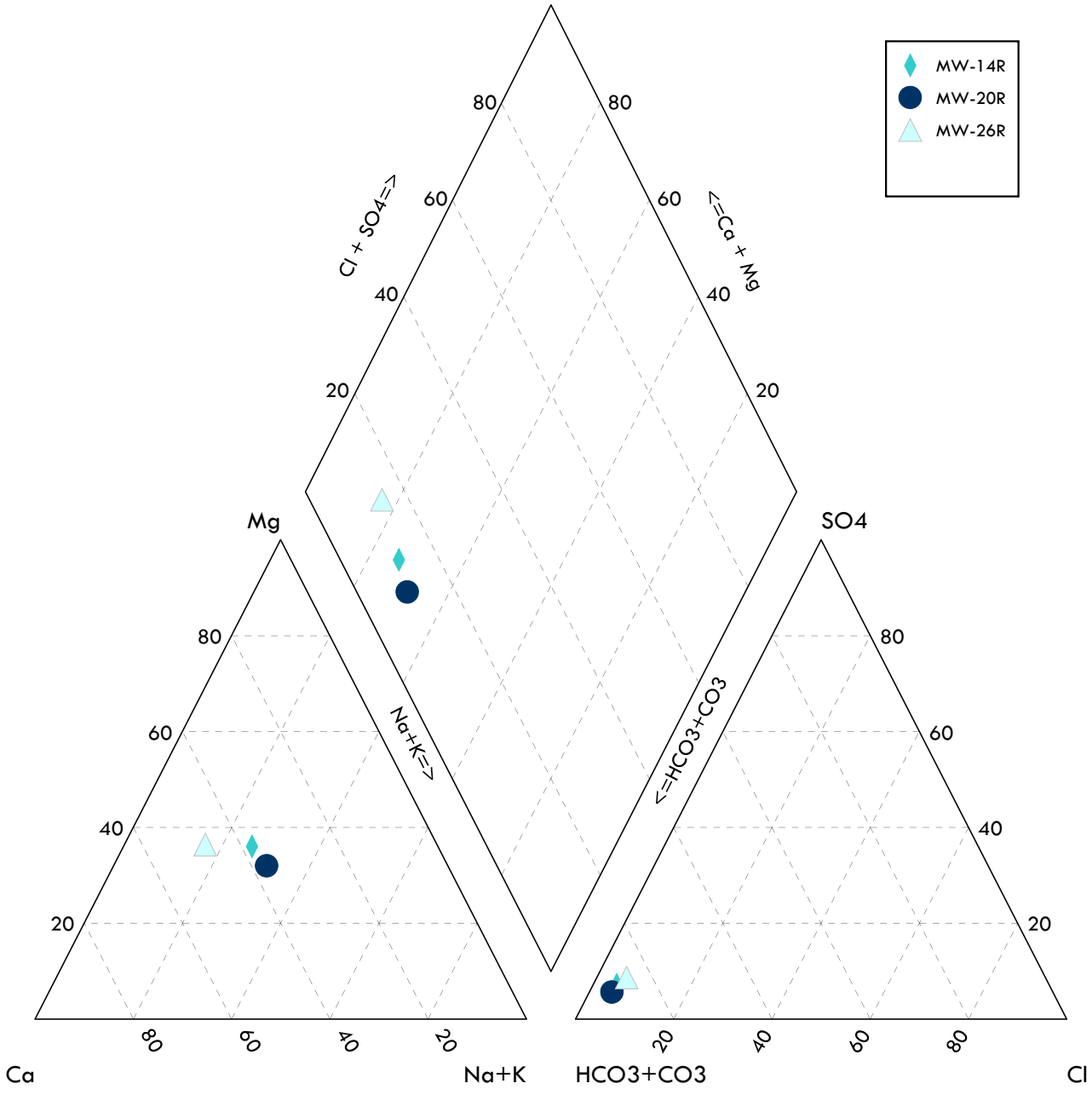
DESCRIPTION: Trilinear Diagram: Lower Regional Aquifer, Second Quarter 2016		
	PROJECT: Hidden Valley Landfill	PROJECT NO: 04216002.03
	CLIENT: LRI	DATE: August 2016

Lower Regional Aquifer - Third Quarter 2016



DESCRIPTION: Trilinear Diagram: Lower Regional Aquifer, Third Quarter 2016		
	PROJECT: Hidden Valley Landfill	PROJECT NO: 04216002.03
	CLIENT: LRI Hidden Valley	DATE: November 2016

Lower Regional Aquifer - Fourth Quarter 2016



DESCRIPTION: Trilinear Diagram: Lower Regional Aquifer, Fourth Quarter 2016		
	PROJECT: Hidden Valley Landfill	PROJECT NO: 04216002.03
	CLIENT: LRI Hidden Valley	DATE: March 2017

Appendix G

STATISTICAL CALCULATIONS

Statistical Summary of Groundwater Data - Inorganics
2016 Annual Monitoring Report
Hidden Valley Landfill, Pierce County, Washington

Monitoring Well	Date	Specific Conductance		Alkalinity		Chloride		Ammonia		Nitrate		Sulfate		TDS		TOC	
		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-10D																	
MW-10D	1/24/2012	130	130	66	66	11.7	11.7	0.1 L	0.05	0.57	0.57	9.9	9.9	96	96	1.4	1.4
MW-10D	4/24/2012	199	199	87	87	4.4	4.4	0.1 L	0.05	1.7	1.7	10.2	10.2	140	140	1 L	0.5
MW-10D	7/16/2012	173	173	69	69	5.0	5.0	0.1 L	0.05	1.1	1.1	7.5	7.5	110	110	1 L	0.5
MW-10D	10/11/2012	113	113	66	66	4.9	4.9	0.1 L	0.05	0.5 L	0.25	4.6	4.6	83	83	1 L	0.5
MW-10D	1/15/2013	139	139	78	78	5.8	5.8	0.1 L	0.05	1.6	1.6	8.2	8.2	120	120	1 L	0.5
MW-10D	4/23/2013	184	184	73	73	4.9	4.9	0.1 L	0.05	1.7	1.7	9.3	9.3	120	120	1 L	0.5
MW-10D	7/26/2013	133	133	49	49	4.8	4.8	0.1 L	0.05	0.5 L	0.25	4.9	4.9	87	87	1 L	0.5
MW-10D	10/8/2013	161	161	63	63	8.1	8.1	0.1 L	0.05	0.9	0.9	8.8	8.8	110	110	1 L	0.5
MW-10D	1/6/2014	100	100	65	65	8.6	8.6	0.1 L	0.05	0.8 H	0.8	13	13	120	120	1 L	0.5
MW-10D	4/7/2014	152	152	65	65	7.0	7.0	0.1 L	0.05	0.97	0.97	9.3	9.3	110	110	1 L	0.5
MW-10D	7/10/2014	210	210	83	83	5.5	5.5	0.1 L	0.05	1.8 J	1.8	8.1	8.1	140	140	1 L	0.5
MW-10D	10/29/2014	160	160	74	74	6.3	6.3	0.1 L	0.05	0.69	0.69	7.8	7.8	120	120	1 L	0.5
MW-10D	1/12/2015	195	195	88	88	5.9	5.9	0.1 L	0.05	1.8	1.8	7.5	7.5	140	140	1 L	0.5
MW-10D	4/20/2015	181	181	89	89	5.2	5.2	0.1 L	0.05	2.2	2.2	7.6	7.6	140	140	1 L	0.5
MW-10D	7/30/2015	195	195	67	67	6.7	6.7	0.1 L	0.05	0.79	0.79	11	11	120	120	1 L	0.5
MW-10D	10/13/2015	210	210	94	94	6.2	6.2	0.1 L	0.05	2.20	2.2	8.1	8.1	140	140	1 L	0.5
MW-10D	1/13/2016	226	226	93	93	5.9	5.9	0.38	0.38	2.1	2.1	7.9	7.9	150	150	1 L	0.5
MW-10D	4/19/2016	229	229	92	92	6.6	6.6	0.1 L	0.05	2.1	2.1	10	10	150	150	1 L	0.5
MW-10D	7/5/2016	231	231	87	87	8.0	8.0	0.1 L	0.05	0.99	0.99	14	14	130	130	1.1	1.1
MW-10D	10/10/2016	243	243	96	96	7.3	7.3	0.1 L	0.05	0.66	0.66	13.0	13	140	140	1	1
No. Analyzed		20		20		20		20		20		20		20		20	
No. Detect		20		20		20		1		16		20		20		3	
Minimum conc.			100		49		4.4		0.050		0.3		4.6		83		0.5
Maximum conc.			243		96		11.7		0.380		2.2		14		150		1.4
Average conc.			178		77		6.4		0.067		1.3		9.0		123		0.6
Distribution			Lognormal		Lognormal		Lognormal		NC		Normal		Lognormal		Lognormal		NC
UCL 95			198		83		7.1		NC		1.5		10.2		132		NC

Statistical Summary of Groundwater Data - Inorganics
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Monitoring Well	Date	Specific Conductance		Alkalinity		Chloride		Ammonia		Nitrate		Sulfate		TDS		TOC	
		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-10S																	
MW-10S	1/24/2012	155	155	72	72	10.6	10.6	0.1 L	0.05	0.8	0.8	9.0	9.0	110	110	1.5	1.5
MW-10S	4/24/2012	133	133	53	53	5.4	5.4	0.036	0.036	0.93	0.93	6.5	6.5	85	85	1.0 L	0.5
MW-10S	7/16/2012	133	133	53	53	5.3	5.3	0.1 L	0.05	0.5 L	0.25	4.7	4.7	80	80	1.0 L	0.5
MW-10S	10/11/2012	116	116	55	55	5.1	5.1	0.1 L	0.05	0.5 L	0.25	4.7	4.7	83	83	1.0	1.0
MW-10S	1/15/2013	149	149	60	60	8.1	8.1	0.1 L	0.05	1.3	1.3	7.0	7.0	89	89	1.0 L	0.5
MW-10S	4/23/2013	127	127	48	48	5.0	5.0	0.1 L	0.05	1.1	1.1	5.9	5.9	69	69	1.2	1.2
MW-10S	7/26/2013	133	133	52	52	5.0	5.0	0.1 L	0.05	0.5 L	0.25	5.1	5.1	88	88	1.0 L	0.5
MW-10S	10/8/2013	169	169	65	65	6.9	6.9	0.1 L	0.05	0.91	0.91	7.8	7.8	100	100	1.0 L	0.5
MW-10S	1/6/2014	160	160	65	65	9.4	9.4	0.1 L	0.05	0.82 H	0.82	12.0	12.0	120	120	2.0 L	1.0
MW-10S	4/7/2014	145	145	55	55	8.8	8.8	0.1 L	0.05	1.2	1.2	9.7	9.7	99	99	1.0	1.0
MW-10S	7/10/2014	160	160	62	62	6.3	6.3	0.1 L	0.05	0.59 J	0.59	8.7	8.7	100	100	1.0 L	0.5
MW-10S	10/29/2014	166	166	76	76	6.0	6.0	0.1 L	0.05	0.81	0.81	7.2	7.2	110	110	1.0 L	0.5
MW-10S	1/12/2015	173	173	70	70	8.3	8.3	0.1 L	0.05	1	1	9.7	9.7	110	110	1.0 L	0.5
MW-10S	4/20/2015	147	147	68	68	6.4	6.4	0.1 L	0.05	1	1	11.0	11.0	110	110	1.0	1.0
MW-10S	7/30/2015	195	195	70	70	6.8	6.8	0.1 L	0.05	0.79	0.79	11.0	11.0	120	120	1.0 L	0.5
MW-10S	10/13/2015	214	214	88	88	8.6	8.6	0.1 L	0.05	1.4	1.4	10.0	10.0	130	130	1.4	1.4
MW-10S	1/13/2016	243	243	91	91	13	13.0	0.1 L	0.05	1.5	1.5	12	12.0	140	140	1.1	1.1
MW-10S	4/18/2016	236	236	87	87	9	9.0	0.1 L	0.05	1.1	1.1	14.0	14.0	130	130	1.4	1.4
MW-10S	7/5/2016	235	235	88	88	8	8.0	0.1 L	0.05	0.75	0.75	15.0	15.0	130	130	1.2	1.2
MW-10S	10/10/2016	254	254	100	100	7.8	7.8	0.1 L	0.05	0.81	0.81	12.0	12.0	150	150	1.1	1.1
No. Analyzed		20		20		20		20		20		20		20		20	
No. Detect		20		20		20		1		15		20		20		10	
Minimum conc.			116		48		5.0		0.04		0.3		4.7		69		0.5
Maximum conc.			254		100		13.0		0.05		1.5		15.0		150		1.5
Average conc.			172		69		7.5		0.05		0.9		9.2		108		0.9
Distribution			Lognormal		Lognormal		Lognormal		NC		Normal		Lognormal		Lognormal		Neither
UCL 95			190		75		8.4		NC		1.0		10.7		117		1.5*

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Monitoring Well	Date	Specific Conductance		Alkalinity		Chloride		Ammonia		Nitrate		Sulfate		TDS		TOC	
		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-11D(2)																	
MW-11D(2)	1/25/2012	224	224	100	100	5.7	5.7	0.1 L	0.05	1.8	1.8	5.5	5.5	140	140	1 L	0.5
MW-11D(2)	4/25/2012	209	209	100	100	5.7	5.7	0.1 L	0.05	1.8	1.8	6.5	6.5	150	150	1 L	0.5
MW-11D(2)	7/17/2012	207	207	100	100	5.7	5.7	0.1 L	0.05	1.8	1.8	6.1	6.1	150	150	1 L	0.5
MW-11D(2)	10/10/2012	199	199	100	100	5.2	5.2	0.13	0.13	1.8	1.8	6	6	150	150	1 L	0.5
MW-11D(2)	1/14/2013	144	144	89	89	5.5	5.5	0.1 L	0.05	1.7	1.7	6.2	6.2	140	140	1 L	0.5
MW-11D(2)	4/24/2013	212	212	88	88	5.3	5.3	0.1 L	0.05	1.7	1.7	6.6	6.6	140	140	1 L	0.5
MW-11D(2)	7/23/2013	219	219	89	89	5.3	5.3	0.1 L	0.05	1.7	1.7	6.5	6.5	160	160	1 L	0.5
MW-11D(2)	10/9/2013	218	218	95	95	4.9	4.9	0.1 L	0.05	1.8	1.8	6.7	6.7	140	140	1 L	0.5
MW-11D(2)	1/8/2014	210	210	99	99	6.2	6.2	0.1 L	0.05	1.8	1.8	6.9	6.9	140	140	1 L	0.5
MW-11D(2)	4/8/2014	204	204	94	94	6.8	6.8	0.1 L	0.05	1.7	1.7	7	7	150	150	1 L	0.5
MW-11D(2)	7/8/2014	210	210	85	85	6.5	6.5	0.1 L	0.05	1.7 J	1.7	6.9	6.9	140	140	1 L	0.5
MW-11D(2)	10/27/2014	329	329	88	88	6.5	6.5	0.1 L	0.05	1.8	1.8	7.7	7.7	140	140	1 L	0.5
MW-11D(2)	1/14/2015	214	214	100	100	7.2	7.2	0.1 L	0.05	1.8	1.8	7.1	7.1	140	140	1 L	0.5
MW-11D(2)	4/23/2015	221	221	90	90	6.0	6	0.1 L	0.05	1.7	1.7	7.7	7.7	140	140	1 L	0.5
MW-11D(2)	7/29/2015	220	220	89	89	6.2	6.2	0.1 L	0.05	1.8	1.8	7.8	7.8	130	130	1 L	0.5
MW-11D(2)	10/14/2015	211	211	91	91	6.9	6.9	0.1 L	0.05	1.6	1.6	8.5	8.5	140	140	1 L	0.5
MW-11D(2)	1/11/2016	216	216	87	87	5.4	5.4	0.1 L	0.05	1.8	1.8	7.8	7.8	260	260	1 L	0.5
MW-11D(2)	4/19/2016	217	217	86	86	6.2	6.2	0.1 L	0.05	1.8	1.8	8	8	140	140	1 L	0.5
MW-11D(2)	7/5/2016	217	217	85	85	6	6	0.1 L	0.05	1.8	1.8	7.9	7.9	130	130	1 L	0.5
MW-11D(2)	10/12/2016	214	214	86	86	6.2	6.2	0.1 L	0.05	1.9	1.9	8.0	8	140	140	1 L	0.5
No. Analyzed		20		20		20		20		20		20		20		20	
No. Detect		20		20		20		1		19		20		20		0	
Minimum conc.			144		85		4.9		0.05		1.6		5.5		130		0.5
Maximum conc.			329		100		7.2		0.13		1.9		8.5		260		0.5
Average conc.			216		92		6.0		0.05		1.8		7.1		148		0.5
Distribution			Neither		Neither		Lognormal		NC		Neither		Lognormal		Neither		NC
UCL 95			329*		100*		6.2		NC		1.9*		7.4		260*		NC

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Monitoring Well	Date	Specific Conductance		Alkalinity		Chloride		Ammonia		Nitrate		Sulfate		TDS		TOC	
		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-11S																	
MW-11S	1/25/2012	206	206	48	48	16.7	16.7	0.1 L	0.05	4.4	4.4	11.6	11.6	130	130	1 L	0.5
MW-11S	4/25/2012	285	285	68	68	16.2	16.2	0.1 L	0.05	9.3	9.3	22.5	22.5	210	210	1.5	1.5
MW-11S	7/17/2012	227	227	100	100	12.0	12.0	0.14	0.14	2.6	2.6	17	17	170	170	1.5	1.5
MW-11S	10/10/2012	207	207	80	80	11.0	11.0	0.1 L	0.05	0.73	0.73	14	14	150	150	1.3	1.3
MW-11S	1/14/2013	275	275	63	63	14.0	14.0	0.13	0.13	11	11	20	20	200	200	1.1	1.1
MW-11S	4/24/2013	270	270	66	66	17.0	17.0	0.1 L	0.05	5.9	5.9	20	20	170	170	1.5	1.5
MW-11S	7/23/2013	238	238	69	69	15.0	15.0	0.1 L	0.05	1.8	1.8	15	15	1100	1100	1 L	0.5
MW-11S	10/9/2013	207	207	51	51	11.0	11.0	0.1 L	0.05	4.6	4.6	13	13	140	140	1 L	0.5
MW-11S	1/8/2014	221	221	69	69	15.0	15.0	0.1 L	0.05	3.4	3.4	12	12	150	150	1.1	1.1
MW-11S	4/8/2014	283	283	57	57	17.0	17.0	0.1 L	0.05	11	11	19	19	210	210	1.2	1.2
MW-11S	7/8/2014	250	250	67	67	20.0	20.0	0.29	0.29	2.1 J	2.1	15	15	170	170	1.2	1.2
MW-11S	10/27/2014	236	236	65	65	21.0	21.0	0.1 L	0.05	4.5	4.5	11	11	170	170	1 L	0.5
MW-11S	1/14/2015	251	251	66	66	15.0	15.0	0.1 L	0.05	6.6	6.6	15	15	170	170	1 L	0.5
MW-11S	4/21/2015	262	262	78	78	13.0	13.0	0.1 L	0.05	3.6	3.6	16	16	170	170	1.2	1.2
MW-11S	7/29/2015	246	246	89	89	14.0	14.0	0.1 L	0.05	0.87	0.87	11	11	150	150	1 L	0.5
MW-11S	10/14/2015	238	238	95	95	15.0	15.0	0.1 L	0.05	0.2 L	0.1	11.0	11	150	150	1.2	1.2
MW-11S	1/11/2016	293	293	69	69	15.0	15.0	0.1 L	0.05	11	11	16	16	200	200	1.4	1.4
MW-11S	4/19/2016	204	204	53	53	12.0	12.0	0.1 L	0.05	3.5	3.5	14	14	130	130	1.5	1.5
MW-11S	7/5/2016	250	250	73	73	19.0	19.0	0.1 L	0.05	1.1	1.1	13	13	150	150	1.2	1.2
MW-11S	10/12/2016	245	245	78	78	19.0	19.0	0.1 L	0.05	0.76	0.76	12.0	12	150	150	1.0	1.0
No. Analyzed		20		20		20		20		20		20		20		20	
No. Detect		20		20		20		3		18		20		20		14	
Minimum conc.			204		48		11.0		0.05		0.1		11.0		130		0.5
Maximum conc.			293		100		21.0		0.29		11.0		22.5		1100		1.5
Average conc.			245		70		15.4		0.07		4.4		14.9		212		1.0
Distribution			Lognormal		Lognormal		Lognormal		Neither		Neither		Lognormal		Neither		Neither
UCL 95			256		76		16.6		0.29*		**11.0***		16.3		**1100***		1.5*

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Monitoring Well	Date	Specific Conductance		Alkalinity		Chloride		Ammonia		Nitrate		Sulfate		TDS		TOC	
		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-12S																	
MW-12S	1/30/2012	466	466	30	30	10.9	10.9	0.76	0.76	43.0	43.0	5.9	5.9	350	350	1.5	1.5
MW-12S	7/16/2012	324	324	140	140	13.0	13.0	0.86	0.86	1.1	1.1	1.3	1.3	200	200	2.9	2.9
MW-12S	1/16/2013	250	250	48	48	9.8	9.8	0.48	0.48	12.0	12.0	6.1	6.1	180	180	1.8	1.8
MW-12S	1/15/2015	312	312	54	54	18.0	18.0	0.76	0.76	15.0	15.0	6.6	6.6	220	220	1.8	1.8
MW-12S	4/20/2015	243	243	130	130	13.0	13.0	1.20	1.2	0.2 L	0.1	1.6	1.6	180	180	3.1	3.1
MW-12S	7/31/2015	346	346	130	130	14.0	14.0	1.70	1.7	1.2	1.2	1.8	1.8	200	200	2.4	2.4
MW-12S	10/19/2015	337	337	150	150	13.0	13.0	1.00	1	1.1	1.1	4.0	4	210	210	2.4	2.4
MW-12S	1/14/2016	284	284	110	110	20.0	20.0	0.10 L	0.05	2.4	2.4	4.2	4.2	200	200	2.5	2.5
MW-12S	4/19/2016	428	428	170	170	28.0	28.0	2.00	2	0.2 L	0.1	1.2	1.2	240	240	4.6	4.6
MW-12S	7/6/2016	384	384	160	160	20.0	20.0	3.90	3.9	0.2 L	0.1	0.7	0.66	210	210	3.3	3.3
MW-12S	10/12/2016	362	362	150	150	20.0	20.0	1.80	1.8	1.4	1.4	2.1	2.1	210	210	2.1	2.1
No. Analyzed		11		11		11		11		11		11		11		11	
No. Detect		11		11		11		10		8		11		11		11	
Minimum conc.			243		30		9.8		0.05		0.1		0.7		180		1.5
Maximum conc.			466		170		28.0		3.90		43.0		6.6		350		4.6
Average conc.			340		116		16.3		1.32		7.0		3.2		218		2.6
Distribution			Lognormal		Neither		Lognormal		Neither		Lognormal		Lognormal		Neither		Lognormal
UCL 95			384		170*		20.0		3.9*		**43.0***		6.4		350*		3.16
MW-12D																	
MW-12D	1/30/2012	329	329	160	160	9.8	9.8	0.1 L	0.05	1.1	1.1	5.1	5.1	190	190	1 L	0.5
MW-12D	7/16/2012	310	310	150	150	10	10	0.1 L	0.05	1.3	1.3	5.4	5.4	200	200	1 L	0.5
MW-12D	1/16/2013	327	327	140	140	9.6	9.6	0.1 L	0.05	1.2	1.2	5.5	5.5	190	190	1	1.0
MW-12D	7/26/2013	299	299	120	120	8.7	8.7	0.1 L	0.05	1.3	1.3	5.7	5.7	190	190	1 L	0.5
MW-12D	1/7/2014	310	310	150	150	10.0	10.0	0.1 L	0.05	1.1	1.1	5.7	5.7	200	200	1 L	0.5
MW-12D	7/11/2014	270	270	120	120	9.0	9.0	0.1 L	0.05	1.4 J	1.4	6.0	6	180	180	1 L	0.5
MW-12D	10/30/2014	294	294	150	150	13.0	13.0	0.1 L	0.05	1.1	1.1	6.0	6	190	190	1 L	0.5
MW-12D	1/13/2015	289	289	150	150	13.0	13.0	0.1 L	0.05	1.2	1.2	5.9	5.9	200	200	1 L	0.5
MW-12D	4/20/2015	244	244	130	130	9.3	9.3	0.1 L	0.05	1.3	1.3	6.4	6.4	190	190	1 L	0.5
MW-12D	7/31/2015	315	315	130	130	9.2	9.2	0.1 L	0.05	1.1	1.1	6.2	6.2	190	190	1 L	0.5
MW-12D	10/19/2015	316	316	140	140	9.3	9.3	0.1 L	0.05	1.1	1.1	6.1	6.1	210	210	1 L	0.5
MW-12D	1/14/2016	297	297	140	140	9.4	9.4	0.1 L	0.05	1.4	1.4	6.5	6.5	190	190	1 L	0.5
MW-12D	4/19/2016	278	278	120	120	8.3	8.3	0.1 L	0.05	1.6	1.6	6.9	6.9	230	230	1 L	0.5
MW-12D	7/6/2016	282	282	120	120	7.4	7.4	0.1 L	0.05	1.6	1.6	7.0	7	170	170	1 L	0.5
MW-12D	10/12/2016	293	293	130	130	9.2	9.2	0.1 L	0.05	1.3	1.3	6.4	6.4	180	180	1 L	0.5
No. Analyzed		15		15		15		15		15		15		15		15	
No. Detect		15		15		15		0		14		15		15		1	
Minimum conc.			244		120		7.4		0.05		1.1		5.1		170		0.5
Maximum conc.			329		160		13.0		0.05		1.6		7.0		230		1.0
Average conc.			297		137		9.7		0.05		1.3		6.1		193		0.5
Distribution			Lognormal		Lognormal		Neither		NC		Neither		Lognormal		Neither		NC
UCL 95			308		143		13*		NC		1.6*		6.3		230*		NC

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		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-13D																	
MW-13D	1/30/2012	270	270	120	120	10.1	10.1	0.1 L	0.05	0.73	0.73	12.6	12.6	170	170	1 L	0.5
MW-13D	4/25/2012	247	247	94	94	12.8	12.8	0.1 L	0.05	1.3	1.3	19.8	19.8	190	190	1.5	1.5
MW-13D	7/16/2012	361	361	150	150	13.0	13.0	0.1 L	0.05	0.53	0.53	15	15	220	220	1.2	1.2
MW-13D	10/10/2012	313	313	140	140	13.0	13.0	0.33	0.33	0.5 L	0.25	20	20	230	230	1.5	1.5
MW-13D	1/15/2013	285	285	140	140	12.0	12.0	0.1 L	0.05	1.1	1.1	13	13	190	190	1	1
MW-13D	4/23/2013	304	304	130	130	12.0	12.0	0.1 L	0.05	0.87	0.87	13	13	190	190	1.2	1.2
MW-13D	7/26/2013	350	350	140	140	12.0	12.0	0.1 L	0.05	0.5 L	0.25	17	17	220	220	1.3	1.3
MW-13D	10/8/2013	275	275	120	120	9.2	9.2	0.1 L	0.05	0.66	0.66	12	12	180	180	1 L	0.5
MW-13D	1/6/2014	133	133	140	140	10.0	10.0	0.1 L	0.05	0.52 H	0.52	18	18	220	220	2 L	1
MW-13D	4/7/2014	340	340	140	140	17.0	17.0	0.1 L	0.05	6	6	16	16	240	240	1 L	0.5
MW-13D	7/8/2014	340	340	140	140	21.0	21.0	0.1 L	0.05	0.33 J	0.33	14	14	240	240	1.1	1.1
MW-13D	10/29/2014	272	272	120	120	9.9	9.9	0.1 L	0.05	0.83	0.83	12	12	180	180	1 L	0.5
MW-13D	1/12/2015	272	272	120	120	12.0	12.0	0.1 L	0.05	0.78	0.78	12	12	180	180	1 L	0.5
MW-13D	4/20/2015	266	266	130	130	12.0	12.0	0.1 L	0.05	0.73	0.73	15	15	210	210	1	1
MW-13D	7/30/2015	370	370	142	142	13.0	13.0	0.1 L	0.05	0.21	0.21	19	19	220	220	1.3	1.3
MW-13D	10/14/2015	324	324	140	140	11.0	11.0	0.1 L	0.05	0.4	0.43	18.0	18	200	200	1.1	1.1
MW-13D	1/13/2016	360	360	140	140	14.0	14.0	0.1 L	0.05	3.8	3.8	16	16	230	230	1 L	0.5
MW-13D	4/19/2016	379	379	150	150	17.0	17.0	0.1 L	0.05	0.84	0.84	15	15	230	230	1.2	1.2
MW-13D	7/6/2016	366	366	150	150	15.0	15.0	0.1 L	0.05	0.54	0.54	12	12	220	220	1 L	0.5
MW-13D	10/10/2016	345	345	150	150	14.0	14.0	0.1 L	0.05	0.6	0.58	14.0	14	200	200	1.0 L	0.5
No. Analyzed		20		20		20		20		20		20		20		20	
No. Detect		20		20		20		1		16		20		20		11	
Minimum conc.			133		94		9.2		0.05		0.2		12.0		170		0.5
Maximum conc.			379		150		21.0		0.33		6.0		20.0		240		1.5
Average conc.			309		135		13.0		0.06		1.1		15.2		208		0.9
Distribution			Neither		Neither		Lognormal		NC		Neither		Lognormal		Lognormal		Neither
UCL 95			379*		150*		14.1		NC		6.0*		16.3		217		1.5*

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		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-13S																	
MW-13S	1/27/2012	255	255	87	87	13	13	0.1 L	0.05	0.65	0.65	11.2	11.2	140	140	1.1	1.1
MW-13S	4/24/2012	300	300	140	140	11.5	11.5	0.1 L	0.05	0.86	0.86	12.2	12.2	190	190	1.0 L	0.5
MW-13S	7/17/2012	318	318	150	150	13	13	0.1 L	0.05	0.5 L	0.25	19.0	19.0	220	220	1.4	1.4
MW-13S	10/10/2012	309	309	140	140	13	13	0.1 L	0.05	0.5 L	0.25	17.0	17.0	210	210	1.2	1.2
MW-13S	1/15/2013	257	257	93	93	10	10	0.1 L	0.05	1.9	1.9	15.0	15.0	160	160	1.2	1.2
MW-13S	4/23/2013	257	257	92	92	11	11	0.1 L	0.05	1.2	1.2	19.0	19.0	170	170	1.5	1.5
MW-13S	7/26/2013	300	300	110	110	12	12	0.1 L	0.05	1.0	1.0	20.0	20.0	190	190	1.2	1.2
MW-13S	10/8/2013	217	217	89	89	6.4	6.4	0.1 L	0.05	0.64	0.64	11.0	11.0	140	140	1.2	1.2
MW-13S	1/6/2014	190	190	120	120	9.7	9.7	0.1 L	0.05	0.33 H	0.33	20.0	20.0	210	210	2.3	2.3
MW-13S	4/9/2014	286	286	58	58	20	20	0.1 L	0.05	18	18	19.0	19.0	230	230	1.1	1.1
MW-13S	7/8/2014	340	340	130	130	22	22	0.1 L	0.05	0.5 L	0.25	16.0	16.0	230	230	1.6	1.6
MW-13S	10/29/2014	209	209	99	99	7.1	7.1	0.1 L	0.05	0.8	0.8	8.4	8.4	150	150	1.0 L	0.5
MW-13S	1/13/2015	195	195	89	89	8.8	8.8	0.1 L	0.05	1.0	1	11.0	11.0	140	140	1.0 L	0.5
MW-13S	4/20/2015	268	268	120	120	14	14	0.1 L	0.05	0.27	0.27	20.0	20.0	200	200	1.2	1.2
MW-13S	7/30/2015	352	352	160	160	13	13	0.1 L	0.05	0.2 L	0.1	22.0	22.0	220	220	1.3	1.3
MW-13S	10/14/2015	308	308	140	140	9.7	9.7	0.1 L	0.05	0.2 L	0.1	19.0	19.0	190	190	1.2	1.2
MW-13S	1/13/2016	383	383	110	110	16	16	0.1 L	0.05	10.0	10	17.0	17.0	250	250	1.0	1.0
MW-13S	4/19/2016	420	420	140	140	28	28	0.1 L	0.05	0.65	0.65	19.0	19.0	240	240	1.7	1.7
MW-13S	7/6/2016	383	383	150	150	20	20	0.1	0.1	0.2 L	0.1	8.8	8.8	210	210	1.6	1.6
MW-13S	10/11/2016	366	366	150	150	18.0	18	0.1 L	0.05	0.2 L	0.1	16.0	16.0	220	220	1.2	1.2
No. Analyzed		20		20		20		20		20		20		20		20	
No. Detect		20		20		20		1		12		20		20		17	
Minimum conc.			190		58		6.4		0.05		0.1		8.4		140		0.5
Maximum conc.			420		160		28.0		0.10		18.0		22.0		250		2.3
Average conc.			296		118		13.8		0.05		1.9		16.0		196		1.2
Distribution			Lognormal		Lognormal		Lognormal		NC		Lognormal		Normal		Lognormal		Neither
UCL 95			326		132		16.3		NC		4.4		17.6		211		2.3*

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		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-14D																	
MW-14D	1/24/2012	185	185	80	80	10.2	10.2	3.7	3.7	0.5 L	0.25	10.5	10.5	120	120	1.7	1.7
MW-14D	4/24/2012	177	177	67	67	6.6	6.6	0.1 L	0.05	0.5 L	0.25	10.6	10.6	110	110	1.6	1.6
MW-14D	7/16/2012	198	198	72	72	6.4	6.4	2.1	2.1	0.5 L	0.25	12.0	12.0	120	120	1.5	1.5
MW-14D	10/11/2012	180	180	74	74	8.7	8.7	4.3	4.3	0.5 L	0.25	11.0	11.0	130	130	1.6	1.6
MW-14D	1/15/2013	185	185	78	78	9.4	9.4	4.1	4.1	0.5 L	0.25	10.0	10.0	110	110	1.9	1.9
MW-14D	4/23/2013	181	181	65	65	6.8	6.8	3.7	3.7	0.5 L	0.25	10.0	10.0	100	100	1.9	1.9
MW-14D	7/26/2013	196	196	74	74	23	23	0.16	0.16	0.5 L	0.25	7.4	7.4	150	150	2	2
MW-14D	10/8/2013	202	202	72	72	11	11	3.9	3.9	0.5 L	0.25	11.0	11.0	120	120	1.6	1.6
MW-14D	1/6/2014	142	142	88	88	10	10	4.2	4.2	0.2 L	0.10	11.0	11.0	150	150	1.7	1.7
MW-14D	4/7/2014	139	139	58	58	8.7	8.7	2.5	2.5	0.5 L	0.25	8.9	8.9	100	100	1.4	1.4
MW-14D	7/10/2014	180	180	63	63	7.8	7.8	3.4	3.4	0.5 L	0.25	11.0	11.0	120	120	1.3	1.3
MW-14D	10/29/2014	218	218	76	76	16.0	16	4.3	4.3	0.5 L	0.25	12.0	12.0	150	150	1.3	1.3
MW-14D	1/12/2015	181	181	70	70	11.0	11	3.7	3.7	0.2 L	0.10	9.8	9.8	120	120	1.5	1.5
MW-14D	4/20/2015	159	159	72	72	7.7	7.7	4.0	4	0.2 L	0.10	11.0	11.0	110	110	1.7	1.7
MW-14D	7/27/2015	212	212	75	75	9.7	9.7	3.9	3.9	0.2 L	0.10	12.0	12.0	140	140	1.3	1.3
MW-14D	10/13/2015	265	265	100	100	15.0	15	4.1	4.1	0.2 L	0.10	10.0	10.0	150	150	1.9	1.9
MW-14D	1/13/2016	190	190	72	72	8.1	8.1	2.8	2.8	0.2 L	0.10	8.4	8.4	110	110	1.5	1.5
MW-14D	4/18/2016	206	206	76	76	9.6	9.6	2.7	2.7	0.2 L	0.10	11.0	11.0	120	120	1.6	1.6
MW-14D	8/4/2016	235	235	95	95	10.0	10	4.0	4	0.2 L	0.10	13.0	13.0	140	140	2.0	2
MW-14D	10/10/2016	264	264	91	91	15.0	15	4.1	4.1	0.2 L	0.10	12.0	12.0	140	140	1.5	1.5
No. Analyzed		20		20		20		20		20		20		20		20	
No. Detect		20		20		20		19		0		20		20		20	
Minimum conc.			139		58		6.4		0.05		0.1		7.4		100		1.3
Maximum conc.			265		100		23		4.3		0.25		13		150		2.0
Average conc.			195		76		11		3.3		0.2		11		126		1.6
Distribution			Lognormal		Lognormal		Lognormal		Neither		NC		Lognormal		Lognormal		Lognormal
UCL 95			209		80		12.1		4.3*		NC		11.2		133		1.72
MW-14R																	
MW-14R	1/27/2012	128	128	49	49	1.7	1.7	0.1 L	0.05	0.5 L	0.25	3.8	3.8	98	98	1 L	0.5
MW-14R	1/15/2013	105	105	49	49	1.7	1.7	0.1 L	0.05	0.5 L	0.25	3.5	3.5	93	93	1 L	0.5
MW-14R	1/7/2014	98	98	47	47	1.7	1.7	0.1 L	0.05	0.21	0.21	3.6	3.6	95	95	1 L	0.5
MW-14R	7/11/2014	100	100	45	45	1.7	1.7	0.1 L	0.05	0.2 J	0.20	3.6	3.6	99	99	1 L	0.5
MW-14R	10/28/2014	92	92	47	47	2.1	2.1	0.1 L	0.05	0.5 L	0.25	3.6	3.6	97	97	1 L	0.5
MW-14R	1/13/2015	92	92	49	49	2.2	2.2	0.1 L	0.05	0.2 L	0.10	3.6	3.6	94	94	1 L	0.5
MW-14R	4/22/2015	106	106	47	47	1.8	1.8	0.1 L	0.05	0.2 L	0.10	3.6	3.6	99	99	1 L	0.5
MW-14R	7/30/2015	105	105	46	46	1.7	1.7	0.1 L	0.05	0.2 L	0.10	3.6	3.6	100	100	1 L	0.5
MW-14R	10/13/2015	102	102	50	50	1.7	1.7	0.1 L	0.05	0.2 L	0.10	3.9	3.9	95	95	1 L	0.5
MW-14R	1/12/2016	103	103	56	56	1.8	1.8	0.1 L	0.05	0.2 L	0.10	3.5	3.5	94	94	1 L	0.5
MW-14R	4/18/2016	106	106	47	47	1.7	1.7	0.1 L	0.05	0.2 L	0.10	3.6	3.6	96	96	1 L	0.5
MW-14R	7/6/2016	103	103	47	47	1.7	1.7	0.1 L	0.05	0.2 L	0.10	3.7	3.7	89	89	1 L	0.5
MW-14R	10/12/2016	104	104	47	47	1.8	1.8	0.1 L	0.05	0.2 L	0.10	3.6	3.6	96	96	1 L	0.5
No. Analyzed		13		13		13		13		13		13		13		13	
No. Detect		13		13		13		0		1		13		13		0	
Minimum conc.			92		45		1.7		0.05		0.1		3.5		89		0.5
Maximum conc.			128		56		2.2		0.05		0.3		3.9		100		0.5
Average conc.			103		48		1.8		0.05		0.2		3.6		96		0.5
Distribution			Neither		Neither		Neither		NC		NC		Neither		Lognormal		NC
UCL 95			128*		56*		2.2*		NC		NC		3.9*		97		NC

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		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-14S																	
MW-14S	1/24/2012	67	67	25	25	2.1	2.1	0.1 L	0.05	1.1	1.1	4.6	4.6	56	56	2.1	2.1
MW-14S	4/24/2012	109	109	40	40	0.2 L	0.1	0.34	0.34	0.96	0.96	0.5 L	0.25	69	69	1.4	1.4
MW-14S	7/16/2012	130	130	43	43	6.1	6.1	0.1 L	0.05	0.64	0.64	9.2	9.2	86	86	1.1	1.1
MW-14S	10/11/2012	175	175	78	78	16	16	0.33	0.33	0.5 L	0.25	8.7	8.7	120	120	1.8	1.8
MW-14S	1/14/2013	98	98	37	37	4.1	4.1	0.13	0.13	1.6	1.6	5.9	5.9	73	73	1.7	1.7
MW-14S	4/23/2013	114	114	38	38	4.8	4.8	0.39	0.39	0.99	0.99	7.3	7.3	64	64	1.8	1.8
MW-14S	7/26/2013	254	254	66	66	6.6	6.6	3.7	3.70	0.5 L	0.25	12	12	120	120	1.3	1.3
MW-14S	10/8/2013	160	160	56	56	9.3	9.3	0.1	0.10	1.6	1.6	6.6	6.6	110	110	2.3	2.3
MW-14S	1/6/2014	200	200	86	86	16	16	0.51	0.51	0.2 L	0.1	8.8	8.8	150	150	2	2
MW-14S	4/7/2014	114	114	39	39	7.1	7.1	0.18	0.18	1.6	1.6	7.7	7.7	83	83	1.3	1.3
MW-14S	7/9/2014	140	140	43	43	8.8	8.8	0.2	0.20	0.56 J	0.56	9.5	9.5	98	98	1.1	1.1
MW-14S	10/29/2014	185	185	63	63	12	12	0.35	0.35	0.78	0.78	7.1	7.1	120	120	2	2
MW-14S	1/12/2015	115	115	41	41	4.9	4.9	0.1 L	0.05	1.8	1.8	6.1	6.1	85	85	1.3	1.3
MW-14S	4/20/2015	117	117	49	49	7.4	7.4	0.1 L	0.05	0.74	0.74	9.3	9.3	89	89	1.5	1.5
MW-14S	7/27/2015	217	217	74	74	17	17	0.35	0.35	0.2 L	0.1	8.2	8.2	130	130	1.5	1.5
MW-14S	10/15/2015	246	246	96	96	22	22	0.78	0.78	0.2 L	0.1	7.7	7.7	160	160	2	2
MW-14S	1/13/2016	178	178	64	64	8.2	8.2	0.36	0.36	1.3	1.3	7.4	7.4	110	110	1.5	1.5
MW-14S	4/18/2016	192	192	63	63	9.8	9.8	0.28	0.28	0.86	0.86	11	11	120	120	1.7	1.7
MW-14S	7/6/2016	216	216	70	70	13	13	0.1 L	0.05	0.42	0.42	14	14	130	130	1.3	1.3
MW-14S	10/14/2016	231	231	74	74	14	14	0.27	0.27	2.2	2.2	8.2	8.2	140	140	2.2	2.2
No. Analyzed		20		20		20		20		20		20		20		20	
No. Detect		20		20		19		15		14		19		20		20	
Minimum conc.			67		25		0.1		0.05		0.1		0.25		56		1.1
Maximum conc.			254		96		22.0		3.7		2.2		14.0		160		2.3
Average conc.			163		57		9.5		0.426		0.9		8.0		106		1.6
Distribution			Lognormal		Lognormal		Normal		Neither		Normal		Normal		Lognormal		Lognormal
UCL 95			192		67		11.6		3.7*		1.1		9.1		120		1.81
MW-15D																	
MW-15D	1/26/2012	318	318	160	160	12.7	12.7	0.1 L	0.05	0.59	0.59	8.2	8.2	200	200	1	1
MW-15D	7/17/2012	282	282	140	140	9.9	9.9	0.1 L	0.05	0.61	0.61	9.3	9.3	190	190	1.1	1.1
MW-15D	1/14/2013	212	212	150	150	11.0	11	0.1 L	0.05	0.5 L	0.25	9.2	9.2	190	190	1.3	1.3
MW-15D	7/25/2013	293	293	120	120	9.3	9.3	0.1 L	0.05	0.54	0.54	9.4	9.4	170	170	1 L	0.5
MW-15D	1/7/2014	272	272	120	120	8.8	8.8	0.1 L	0.05	0.79 H	0.79	9.2	9.2	180	180	1 L	0.5
MW-15D	7/9/2014	270	270	140	140	11.0	11	0.1	0.1	0.52 J	0.52	9.5	9.5	180	180	1.2	1.2
MW-15D	10/28/2014	291	291	140	140	13.0	13	0.1 L	0.05	0.53	0.53	9.3	9.3	200	200	1 L	0.5
MW-15D	1/13/2015	281	281	140	140	12.0	12	0.1 L	0.05	0.5	0.5	9.6	9.6	190	190	1 L	0.5
MW-15D	4/21/2015	296	296	130	130	9.5	9.5	0.1 L	0.05	0.55	0.55	10	10	180	180	1.2	1.2
MW-15D	7/27/2015	282	282	120	120	10.0	10	0.1 L	0.05	0.65	0.65	9.7	9.7	180	180	1 L	0.5
MW-15D	7/27/2015	282	282	120	120	10.0	10	0.1 L	0.05	0.65	0.65	9.7	9.7	180	180	1 L	0.5
MW-15D	1/13/2016	294	294	130	130	9.7	9.7	0.1 L	0.05	0.58	0.58	10	10	170	170	1.1	1.1
MW-15D	4/18/2016	266	266	110	110	8.1	8.1	0.1 L	0.05	1	1	9.6	9.6	160	160	1 L	0.5
MW-15D	7/6/2016	266	266	110	110	8.8	8.8	0.1 L	0.05	0.94	0.94	9.9	9.9	160	160	1 L	0.5
MW-15D	10/10/2016	291	291	120	120	9.9	9.9	0.1 L	0.05	0.80	0.8	8.6	8.6	160	160	1.0 L	0.5
No. Analyzed		15		15		15		15		15		15		15		15	
No. Detect		15		15		15		1		12		15		15		6	
Minimum conc.			212		110		8.1		0.05		0.25		8.2		160		0.5
Maximum conc.			318		160		13.0		0.10		1.00		10.0		200		1.3
Average conc.			280		130		10.2		0.05		0.63		9.4		179		0.8
Distribution			Neither		Lognormal		Lognormal		NC		Normal		Neither		Lognormal		NC
UCL 95			318*		137		10.9		NC		0.7		10.0*		186		NC

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		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-15S																	
MW-15S	1/25/2012	299	299	78	78	18	18	3.2	3.2	9.8	9.8	11.3	11.3	210	210	1.7	1.7
MW-15S	7/17/2012	217	217	88	88	10	10	1.9	1.9	0.5 L	0.25	12.0	12.0	130	130	1.6	1.6
MW-15S	1/14/2013	253	253	95	95	16	16	4.3	4.3	1.6	1.6	10.0	10.0	160	160	1.9	1.9
MW-15S	7/25/2013	208	208	65	65	12	12	3.7	3.7	0.5 L	0.25	14.0	14.0	120	120	1.2	1.2
MW-15S	1/7/2014	257	257	100	100	14	14	4.3	4.3	0.2 L	0.1	11.0	11.0	160	160	1.7	1.7
MW-15S	7/9/2014	230	230	67	67	20	20	2.9	2.9	0.5 L	0.25	9.9	9.9	140	140	1.8	1.8
MW-15S	10/28/2014	271	271	81	81	17	17	3.9	3.9	6.1	6.1	8.8	8.8	170	170	1.9	1.9
MW-15S	1/13/2015	232	232	86	86	15	15.0	3.0	3.00	2.5	2.5	9.3	9.3	150	150	1.4	1.4
MW-15S	4/21/2015	240	240	88	88	13	13.0	3.6	3.60	0.2 L	0.1	9.4	9.4	140	140	1.9	1.9
MW-15S	7/27/2015	252	252	94	94	15	15.0	4.4	4.40	0.2 L	0.1	8.3	8.3	150	150	1.6	1.6
MW-15S	10/13/2015	297	297	150	150	16	16.0	4.7	4.70	0.2 L	0.1	7.3	7.3	160	160	2.1	2.1
MW-15S	1/13/2016	235	235	85	85	10	10.0	3.3	3.30	1.1	1.1	8.4	8.4	130	130	1.6	1.6
MW-15S	4/18/2016	259	259	95	95	12	12.0	2.9	2.90	0.42	0.42	10	10	150	150	1.6	1.6
MW-15S	7/6/2016	273	273	91	91	17	17.0	3.4	3.40	0.2 L	0.1	11	11	140	140	1.8	1.8
MW-15S	10/10/2016	270	270	89	89	19	19.0	2.8	2.80	0.2 L	0.1	11	11	150	150	1.7	1.7
No. Analyzed		15		15		15		15		15		15		15		15	
No. Detect		15		15		15		15		6		15		15		15	
Minimum conc.			208		65		10.0		1.9		0.1		7.3		120		1.2
Maximum conc.			299		150		20.0		4.7		9.8		14.0		210		2.1
Average conc.			253		90		14.9		3.5		1.5		10.1		151		1.7
Distribution			Lognormal		Neither		Lognormal		Lognormal		NC		Lognormal		Lognormal		Lognormal
UCL 95			266		150*		16.6		3.92		NC		11.0		160		1.82
MW-17S																	
MW-17S	1/25/2012	424	424	150	150	14.5	14.5	4.5	4.5	11	11	4.8	4.8	260	260	1.9	1.9
MW-17S	4/25/2012	449	449	160	160	18.8	18.8	6.7	6.7	13	13	6.9	6.9	300	300	2.5	2.5
MW-17S	7/17/2012	375	375	160	160	17.0	17.0	1.6	1.6	3.3	3.3	7.3	7.3	240	240	2	2
MW-17S	10/10/2012	368	368	190	190	12.0	12.0	4.9	4.9	0.5 L	0.25	3.7	3.7	250	250	2.3	2.3
MW-17S	1/15/2013	438	438	120	120	16.0	16.0	4.1	4.1	20	20	7.1	7.1	290	290	1.8	1.8
MW-17S	4/24/2013	426	426	180	180	17.0	17.0	5.8	5.8	4.2	4.2	5.6	5.6	260	260	2.6	2.6
MW-17S	7/25/2013	411	411	180	180	15.0	15.0	5.3	5.3	0.5 L	0.25	3.8	3.8	220	220	1.7	1.7
MW-17S	10/10/2013	445	445	180	180	13.0	13.0	7.0	7.0	3.6	3.6	3.8	3.8	240	240	2	2
MW-17S	1/9/2014	434	434	200	200	13.0	13.0	8.4	8.4	1.7	1.7	4.4	4.4	240	240	2.1	2.1
MW-17S	4/8/2014	523	523	140	140	27.0	27.0	5.6	5.6	23	23	10	10	350	350	2	2
MW-17S	7/8/2014	350	350	120	120	23.0	23.0	2.5	2.5	1.5 J	1.5	8.2	8.2	220	220	1.8	1.8
MW-17S	10/28/2014	377	377	170	170	20.0	20.0	4.8	4.8	0.5 L	0.25	4.1	4.1	230	230	2.4	2.4
MW-17S	1/13/2015	340	340	79	79	17.0	17.0	1.3	1.3	19	19	4.9	4.9	260	260	1.4	1.4
MW-17S	4/23/2015	424	424	160	160	18.0	18.0	4.8	4.8	4.1	4.1	5.4	5.4	240	240	1.9	1.9
MW-17S	7/27/2015	395	395	180	180	14.0	14.0	6.3	6.3	0.2 L	0.1	2.9	2.9	230	230	1.7	1.7
MW-17S	10/15/2015	404	404	200	200	13.0	13.0	10	10.0	0.2 L	0.1	1.5	1.5	220	220	2.2	2.2
MW-17S	1/12/2016	564	564	150	150	23.0	23.0	6.5	6.5	21	21	7.7	7.7	340	340	2	2
MW-17S	4/19/2016	442	442	190	190	26.0	26.0	4.4	4.4	0.66	0.66	5.7	5.7	240	240	2.7	2.7
MW-17S	7/6/2016	400	400	160	160	21.0	21.0	4.6	4.6	0.2 L	0.1	4.8	4.8	220	220	2.1	2.1
MW-17S	10/13/2016	411	411	170	170	22.0	22.0	4.2	4.2	0.2 L	0.1	4.7	4.7	250	250	2	2
No. Analyzed		20		20		20		20		20		20		20		20	
No. Detect		20		20		20		20		13		20		20		20	
Minimum conc.			340		79		12.0		1.30		0.1		1.5		220		1.4
Maximum conc.			564		200		27.0		10.00		23.0		10.0		350		2.7
Average conc.			420		162		18.0		5.17		6.4		5.4		255		2.1
Distribution			Lognormal		Normal		Lognormal		Normal		Lognormal		Lognormal		Neither		Lognormal
UCL 95			441		174		20.0		5.97		**23.0***		6.6		350*		2.19

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		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-18D																	
MW-18D	1/14/2013	212	212	130	130	8.8	8.8	0.1 L	0.05	1.7	1.7	5.1	5.1	170	170	1 L	0.5
MW-18D	7/23/2013	275	275	120	120	8.1	8.1	0.1 L	0.05	1.7	1.7	5.3	5.3	180	180	1 L	0.5
MW-18D	1/9/2014	268	268	120	120	8.4	8.4	0.1 L	0.05	1.7	1.7	5.4	5.4	180	180	1 L	0.5
MW-18D	7/9/2014	260	260	110	110	9.6	9.6	0.1 L	0.05	1.6 J	1.6	5.5	5.5	170	170	1 L	0.5
MW-18D	10/27/2014	247	247	110	110	9.2	9.2	0.1 L	0.05	1.7	1.7	5.8	5.8	180	180	1 L	0.5
MW-18D	1/14/2015	263	263	120	120	9.6	9.6	0.1 L	0.05	1.6	1.6	5.5	5.5	170	170	1 L	0.5
MW-18D	4/23/2015	274	274	120	120	8.9	8.9	0.1 L	0.05	1.5	1.5	6	6	170	170	1 L	0.5
MW-18D	7/29/2015	274	274	120	120	8.9	8.9	0.1 L	0.05	1.6	1.6	6.3	6.3	170	170	1 L	0.5
MW-18D	10/16/2015	263	263	110	110	9.6	9.6	0.1 L	0.05	1.6	1.6	6.8	6.8	170	170	1 L	0.5
MW-18D	1/11/2016	260	260	120	120	7.6	7.6	0.1 L	0.05	1.6	1.6	6.5	6.5	170	170	1 L	0.5
MW-18D	4/19/2016	269	269	120	120	8.2	8.2	0.1 L	0.05	1.7	1.7	6.6	6.6	170	170	1 L	0.5
MW-18D	7/6/2016	269	269	110	110	7.7	7.7	0.1 L	0.05	1.6	1.6	6.7	6.7	170	170	1 L	0.5
MW-18D	10/11/2016	262	262	110	110	8.1	8.1	0.1 L	0.05	1.6	1.6	6.5	6.5	170	170	1 L	0.5
No. Analyzed		13		13		13		13		13		13		13		13	
No. Detect		13		13		13		0		12		13		13		0	
Minimum conc.			212		110		7.6		0.05		1.5		5.1		170		0.5
Maximum conc.			275		130		9.6		0.05		1.7		6.8		180		0.5
Average conc.			261		117		8.7		0.05		1.6		6.0		172		0.5
Distribution			Neither		Neither		Lognormal		NC		Neither		Lognormal		Neither		NC
UCL 95			275*		130*		9.0		NC		1.7*		6.3		180*		NC
MW-18S																	
MW-18S	1/25/2012	369	369	120	120	14.9	14.9	0.1 L	0.05	11	11	6.2	6.2	240	240	1.3	1.3
MW-18S	7/18/2012	306	306	130	130	13.0	13.0	0.1 L	0.05	2.6	2.6	7.3	7.3	220	220	1.3	1.3
MW-18S	1/14/2013	347	347	130	130	13.0	13.0	0.1 L	0.05	9.8	9.8	8.3	8.3	250	250	1.4	1.4
MW-18S	7/23/2013	304	304	130	130	12.0	12.0	0.1 L	0.05	0.61	0.61	5.5	5.5	190	190	1.5	1.5
MW-18S	1/9/2014	327	327	130	130	12.0	12.0	0.1 L	0.05	5.0 H	5	5.2	5.2	220	220	1.1	1.1
MW-18S	7/9/2014	310	310	120	120	20.0	20.0	0.1 L	0.05	0.84 J	0.84	6.2	6.2	210	210	1.4	1.4
MW-18S	10/27/2014	295	295	130	130	17.0	17.0	0.1 L	0.05	0.20	0.2	4.5	4.5	190	190	1.1	1.1
MW-18S	1/14/2015	371	371	130	130	15.0	15.0	0.1 L	0.05	9.20	9.2	6.3	6.3	240	240	1.1	1.1
MW-18S	4/23/2015	334	334	120	120	14.0	14.0	0.1 L	0.05	4.0	4	7.8	7.8	200	200	1.5	1.5
MW-18S	7/29/2015	315	315	140	140	14.0	14.0	0.1 L	0.05	0.36	0.36	5.3	5.3	190	190	1.6	1.6
MW-18S	10/16/2015	317	317	140	140	15.0	15.0	0.1 L	0.05	0.34	0.34	4.2	4.2	200	200	1.7	1.7
MW-18S	1/11/2016	410	410	120	120	17.0	17.0	0.1 L	0.05	11	11	10	10	260	260	1.4	1.4
MW-18S	4/19/2016	360	360	140	140	26.0	26.0	0.1 L	0.05	0.55	0.55	4.8	4.8	210	210	2.1	2.1
MW-18S	7/6/2016	343	343	140	140	22.0	22.0	0.1 L	0.05	0.2 L	0.1	4.6	4.6	200	200	1.6	1.6
MW-18S	10/11/2016	337	337	140	140	21.0	21.0	0.1 L	0.05	0.20 L	0.1	3.4	3.4	210	210	1.4	1.4
No. Analyzed		15		15		15		15		15		15		15		15	
No. Detect		15		15		15		0		11		15		15		15	
Minimum conc.			295		120		12.0		0.05		0.1		3.4		190		1.1
Maximum conc.			410		140		26.0		0.05		11.0		10.0		260		2.1
Average conc.			336		131		16.4		0.05		3.7		6.0		215		1.4
Distribution			Lognormal		Neither		Lognormal		NC		Lognormal		Lognormal		Lognormal		Lognormal
UCL 95			351		140*		18.4		NC		**11.0***		6.9		226		1.56

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		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-20R																	
MW-20R	1/16/2013	91	91	45	45	1.6	1.6	0.1 L	0.05	0.5 L	0.25	2.9	2.9	80	80	1 L	0.5
MW-20R	1/10/2014	97	97	48	48	1.8	1.8	0.1 L	0.05	0.2 L	0.1	3.0	3.0	91	91	1 L	0.5
MW-20R	7/11/2014	99	99	44	44	1.7	1.7	0.1 L	0.05	0.5 L	0.25	2.9	2.9	200	200	1 L	0.5
MW-20R	10/30/2014	91	91	46	46	2.0	2.0	0.1 L	0.05	0.5 L	0.25	3.0	3.0	94	94	1 L	0.5
MW-20R	1/12/2015	90	90	45	45	2.0	2.0	0.1 L	0.05	0.2 L	0.1	2.9	2.9	89	89	1 L	0.5
MW-20R	4/23/2015	100	100	47	47	1.8	1.8	0.1 L	0.05	0.2 L	0.1	3.0	3.0	90	90	1 L	0.5
MW-20R	7/28/2015	100	100	47	47	1.8	1.8	0.1 L	0.05	0.2 L	0.1	3.1	3.1	85	85	1 L	0.5
MW-20R	10/14/2015	97	97	48	48	1.7	1.7	0.1 L	0.05	0.2 L	0.1	3.2	3.2	85	85	1 L	0.5
MW-20R	1/12/2016	94	94	46	46	1.6	1.6	0.1 L	0.05	0.2 L	0.1	3	3.0	88	88	1 L	0.5
MW-20R	4/19/2016	102	102	48	48	1.8	1.8	0.1 L	0.05	0.2 L	0.1	3.1	3.1	97	97	1 L	0.5
MW-20R	7/6/2016	100	100	46	46	1.7	1.7	0.1 L	0.05	0.2 L	0.1	3.1	3.1	79	79	1 L	0.5
MW-20R	10/13/2016	100	100	47	47	1.7	1.7	0.1 L	0.05	0.2 L	0.1	2.8	2.8	100	100	1 L	0.5
No. Analyzed		12		12		12		12		12		12		12		12	
No. Detect		12		12		12		0		0		12		12		0	
Minimum conc.			90		44		1.6		0.05		0.1		2.8		79		0.5
Maximum conc.			102		48		2.0		0.05		0.3		3.2		200		0.5
Average conc.			97		46		1.8		0.05		0.1		3.0		98		0.5
Distribution			Neither		Lognormal		Neither		NC		NC		Lognormal		Neither		NC
UCL 95			102*		47		2.0*		NC		NC		3.1		200*		NC
MW-23S																	
MW-23S	1/26/2012	209	209	78	78	11.9	11.9	0.1 L	0.05	0.93	0.93	16.7	16.7	150	150	1 L	0.5
MW-23S	7/19/2012	287	287	55	55	5.6	5.6	0.1 L	0.05	0.78	0.78	4.9	4.9	84	84	1 L	0.5
MW-23S	1/7/2014	190	190	76	76	8.2	8.2	0.1 L	0.05	1.1 H	1.1	14	14	140	140	1.3	1.3
MW-23S	7/10/2014	210	210	69	69	12	12	0.1 L	0.05	1.6 J	1.6	15	15	140	140	1.3	1.3
MW-23S	1/15/2015	196	196	89	89	12	12	0.1 L	0.05	0.54	0.54	12	12	140	140	1.1	1.1
MW-23S	4/23/2015	204	204	89	89	7.5	7.5	0.1 L	0.05	0.73	0.73	9.7	9.7	150	150	2	2
MW-23S	7/28/2015	228	228	76	76	8	8	0.1 L	0.05	1.1	1.1	12	12	140	140	8.4	8.4
MW-23S	1/14/2016	209	209	77	77	11	11	0.1 L	0.05	0.95	0.95	11	11	150	150	1.8	1.8
MW-23S	4/21/2016	234	234	89	89	11	11	0.1 L	0.05	0.98	0.98	14	14	130	130	1.2	1.2
MW-23S	8/4/2016	233	233	83	83	11	11	0.1 L	0.05	0.85	0.85	14	14	150	150	1.7	1.7
MW-23S	10/13/2016	183	183	67	67	5.4	5.4	0.1 L	0.05	0.93	0.93	13	13	120	120	1.5	1.5
No. Analyzed		11		11		11		11		11		11		11		11	
No. Detect		11		11		11		0		9		11		11		9	
Minimum conc.			183		55		5.4		0.05		0.54		4.9		84		0.5
Maximum conc.			287		89		12.0		0.05		1.60		16.7		150		8.4
Average conc.			217		77		9.4		0.1		0.95		12.4		136		1.9
Distribution			Lognormal		Normal		Neither		NC		Lognormal		Neither		Neither		Neither
UCL 95			233		83		12.0*		NC		1.1		16.7*		150*		8.4*

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		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-25S																	
MW-25S	1/25/2012	74	74	120	120	8.2	8.2	0.1 L	0.05	1.8	1.8	6.4	6.4	170	170	1 L	0.5
MW-25S	7/17/2012	252	252	120	120	8.8	8.8	0.1 L	0.05	1.7	1.7	6.4	6.4	180	180	1 L	0.5
MW-25S	1/17/2013	260	260	110	110	8.0	8.0	0.1 L	0.05	1.8	1.8	6.7	6.7	160	160	1 L	0.5
MW-25S	7/25/2013	263	263	110	110	8.0	8.0	0.1 L	0.05	1.4	1.4	6.6	6.6	150	150	1 L	0.5
MW-25S	1/9/2014	257	257	110	110	9.9	9.9	0.1 L	0.05	1.6	1.6	6.9	6.9	170	170	1 L	0.5
MW-25S	7/8/2014	150	150	57	57	6.5	6.5	0.1 L	0.05	1.2 J	1.2	6.2	6.2	110	110	1 L	0.5
MW-25S	10/28/2014	234	234	110	110	10	10	0.1 L	0.05	1.4	1.4	7.1	7.1	160	160	1 L	0.5
MW-25S	1/14/2015	250	250	110	110	9.6	9.6	0.1 L	0.05	1.6	1.6	7	7	170	170	1 L	0.5
MW-25S	4/21/2015	253	253	100	100	7.8	7.8	0.1 L	0.05	1.5	1.5	7.3	7.3	200	200	1 L	0.5
MW-25S	7/31/2015	257	257	96	96	8.3	8.3	0.1 L	0.05	1.3	1.3	7.4	7.4	160	160	1 L	0.5
MW-25S	10/16/2015	246	246	110	110	11.0	11	0.1 L	0.05	1.6	1.6	8.0	8	160	160	1 L	0.5
MW-25S	1/13/2016	162	162	58	58	3.7	3.7	0.1 L	0.05	2.7	2.7	6.4	6.4	110	110	1 L	0.5
MW-25S	4/20/2016	184	184	72	72	8.0	8	0.1 L	0.05	1.1	1.1	6.4	6.4	110	110	1 L	0.5
MW-25S	7/5/2016	251	251	100	100	8.4	8.4	0.1 L	0.05	1.5	1.5	7.9	7.9	150	150	1 L	0.5
MW-25S	10/13/2016	247	247	120	120	8.1	8.1	0.1 L	0.05	1.6	1.6	7.8	7.8	160	160	1 L	0.5
No. Analyzed		15		15		15		15		15		15		15		15	
No. Detect		15		15		15		0		14		15		15		0	
Minimum conc.			74		57		3.7		0.05		1.10		6.2		110		0.5
Maximum conc.			263		120		11.0		0.05		2.7		8.0		200		0.5
Average conc.			223		100		8.3		0.05		1.59		7.0		155		0.5
Distribution			Neither		Neither		Neither		NC		Neither		Lognormal		Neither		NC
UCL 95			263*		120*		11.0*		NC		2.7*		7.3		200*		NC
MW-26R																	
MW-26R	1/30/2012	69	69	42	42	2.3	2.3	0.30	0.3	0.5 L	0.25	0.5 L	0.25	52	52	1	1
MW-26R	1/17/2013	174	174	77	77	3.9	3.9	0.10 L	0.05	0.5 L	0.25	9.1	9.1	110	110	1 L	0.5
MW-26R	1/10/2014	141	141	66	66	3.9	3.9	0.10 L	0.05	0.2 L	0.1	7.9	7.9	110	110	1 L	0.5
MW-26R	7/10/2014	160	160	69	69	3.9	3.9	0.10 L	0.05	0.5 L	0.25	8.5	8.5	120	120	1 L	0.5
MW-26R	10/30/2014	156	156	75	75	4.6	4.6	0.10 L	0.05	0.5 L	0.25	9.3	9.3	140	140	1 L	0.5
MW-26R	1/12/2015	167	167	78	78	4.7	4.7	0.10 L	0.05	0.2 L	0.10	9.0	9.0	120	120	1 L	0.5
MW-26R	4/23/2015	189	189	82	82	4.5	4.5	0.10 L	0.05	0.2 L	0.10	9.4	9.4	120	120	1 L	0.5
MW-26R	7/31/2015	186	186	75	75	4.4	4.4	0.10 L	0.05	0.2 L	0.10	8.9	8.9	120	120	1 L	0.5
MW-26R	10/14/2015	183	183	82	82	4.4	4.4	0.10 L	0.05	0.2 L	0.10	10	10.0	130	130	1 L	0.5
MW-26R	1/12/2016	193	193	85	85	4.4	4.4	0.10 L	0.05	0.2 L	0.10	9.7	9.7	130	130	1 L	0.5
MW-26R	4/19/2016	197	197	87	87	4.6	4.6	0.10 L	0.05	0.2 L	0.10	9.9	9.9	130	130	1 L	0.5
MW-26R	7/6/2016	195	195	84	84	4.6	4.6	0.10 L	0.05	0.2 L	0.10	9.2	9.2	120	120	1 L	0.5
MW-26R	10/12/2016	191	191	91	91	4.5	4.5	0.10 L	0.05	0.2 L	0.10	8.8	8.8	110	110	1 L	0.5
No. Analyzed		13		13		13		13		13		13		13		13	
No. Detect		13		13		13		1		0		12		13		1	
Minimum conc.			69		42		2.3		0.05		0.10		0.3		52		0.5
Maximum conc.			197		91		4.7		0.30		0.25		10.0		140		1.0
Average conc.			169		76		4.2		0.07		0.15		8.5		116		0.5
Distribution			Neither		Neither		Neither		NC		NC		Neither		Neither		NC
UCL 95			197*		91*		4.7*		NC		NC		10.0*		140*		NC

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		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-28S																	
MW-28S	1/26/2012	233	233	14	14	15.4	15.4	0.1 L	0.05	3.0	3.0	17.2	17.2	160	160	1 L	0.5
MW-28S	4/26/2012	116	116	57	57	3.6	3.6	0.1 L	0.05	0.5 L	0.25	5.6	5.6	90	90	1 L	0.5
MW-28S	7/19/2012	127	127	55	55	5.6	5.6	0.1 L	0.05	0.78	0.78	4.9	4.9	84	84	1 L	0.5
MW-28S	10/9/2013	173	173	58	58	7.0	7.0	0.1 L	0.05	0.91	0.91	9.5	9.5	130	130	1	1
MW-28S	4/22/2015	227	227	57	57	4.1	4.1	0.1 L	0.05	0.5	0.51	4.8	4.8	95	95	1.0 L	0.5
MW-28S	1/14/2016	122	122	55	55	2.7	2.7	0.1 L	0.05	0.5	0.5	5.1	5.1	100	100	1.0 L	0.5
MW-28S	4/21/2016	210	210	60	60	15.0	15.0	0.1 L	0.05	3.4	3.4	11.0	11	120	120	1.0	1
No. Analyzed		7		7		7		7		7		7		7		7	
No. Detect		7		7		7		0		6		7		7		2	
Minimum conc.			116		14		2.7		0.05		0.3		4.8		84		0.5
Maximum conc.			233		60		15.4		0.05		3.4		17.2		160		1.0
Average conc.			173		51		7.6		0.05		1.3		8.3		111		0.6
Distribution			Neither		Neither		Lognormal		NC		Lognormal		Neither		Lognormal		NC
UCL 95			233*		60*		15.4*		NC		3.4*		17.2*		135		NC

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Monitoring Well	Date	Specific Conductance		Alkalinity		Chloride		Ammonia		Nitrate		Sulfate		TDS		TOC	
		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
FMMW-1																	
FMMW-1	1/27/2012	342	342	120	120	19.4	19.4	0.1 L	0.05	1.4	1.4	15.8	15.8	190	190	1 L	0.5
FMMW-1	4/25/2012	259	259	95	95	15.8	15.8	0.1 L	0.05	2.5	2.5	15.6	15.6	180	180	1.5	1.5
FMMW-1	7/18/2012	259	259	98	98	13.0	13.0	0.1 L	0.05	1.6	1.6	15	15	180	180	1 L	0.5
FMMW-1	10/10/2012	244	244	89	89	13.0	13.0	0.1 L	0.05	1.2	1.2	15	15	180	180	1.1	1.1
FMMW-1	1/16/2013	270	270	94	94	11.0	11.0	0.1 L	0.05	1.9	1.9	15	15	160	160	1.3	1.3
FMMW-1	4/24/2013	261	261	110	110	12.0	12.0	0.1 L	0.05	1.3	1.3	16	16	160	160	1.5	1.5
FMMW-1	7/24/2013	271	271	99	99	12.0	12.0	0.1 L	0.05	0.87	0.87	15	15	160	160	1.0 L	0.5
FMMW-1	10/9/2013	281	281	110	110	12.0	12.0	0.1 L	0.05	0.55	0.55	15	15	170	170	1.0	1.0
FMMW-1	1/8/2014	270	270	110	110	11.0	11.0	0.1 L	0.05	1.1 H	1.1	15	15	180	180	1.1	1.1
FMMW-1	4/8/2014	229	229	90	90	11.0	11.0	0.1 L	0.05	1.7	1.7	15	15	170	170	1.0	1.0
FMMW-1	7/9/2014	300	300	100	100	21.0	21.0	0.1 L	0.05	3.1 J	3.1	13	13	200	200	1.0 L	0.5
FMMW-1	10/27/2014	293	293	100	100	23.0	23.0	0.1 L	0.05	2.5	2.5	17	17	200	200	1.0 L	0.5
FMMW-1	1/14/2015	293	293	110	110	18.0	18.0	0.1 L	0.05	2.1	2.1	15	15	180	180	1.0 L	0.5
FMMW-1	4/22/2015	271	271	98	98	12.0	12.0	0.1 L	0.05	1.5	1.5	15	15	170	170	1.1	1.1
FMMW-1	7/29/2015	276	276	140	140	13.0	13.0	0.1 L	0.05	1.2	1.2	16	16	170	170	1.0 L	0.5
FMMW-1	10/16/2015	278	278	110	110	15.0	15.0	0.1 L	0.05	0.9	0.85	17	17	180	180	1.2	1.2
FMMW-1	1/11/2016	257	257	95	95	8.3	8.3	0.1 L	0.05	2.0	2	15	15	170	170	1.1	1.1
FMMW-1	4/20/2016	330	330	110	110	20.0	20.0	0.1 L	0.05	2.9	2.9	11	11	190	190	1.2	1.2
FMMW-1	7/5/2016	331	331	120	120	22.0	22.0	0.1 L	0.05	1.7	1.7	12	12	210	210	1 L	0.5
FMMW-1	10/11/2016	320	320	110	110	22.0	22.0	0.1 L	0.05	1.3	1.3	12	12	240	240	1 L	0.5
No. Analyzed		20		20		20		20		20		20		20		20	
No. Detect		20		20		20		0		18		20		20		11	
Minimum conc.			229		89		8.3		0.05		0.6		11.0		160		0.5
Maximum conc.			342		140		23.0		0.05		3.1		17.0		240		1.5
Average conc.			282		105		15.2		0.05		1.7		14.8		182		0.9
Distribution			Lognormal		Lognormal		Lognormal		NC		Lognormal		Neither		Neither		Neither
UCL 95			294		110		17.3		NC		2.0		17.0*		240*		1.5*

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		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
FMMW-2																	
FMMW-2	1/27/2012	408	408	110	110	17.0	17.0	0.28	0.28	13.0	13.0	8.9	8.9	250	250	1.5	1.5
FMMW-2	4/25/2012	259	259	100	100	14.3	14.3	0.10 L	0.05	13.0	13.0	10.8	10.8	260	260	1.9	1.9
FMMW-2	7/18/2012	315	315	140	140	14.0	14.0	0.11	0.11	1.7	1.7	8.5	8.5	220	220	1.5	1.5
FMMW-2	10/10/2012	309	309	140	140	13.0	13.0	0.22	0.22	2.6	2.6	5.3	5.3	230	230	1.9	1.9
FMMW-2	1/16/2013	400	400	110	110	12.0	12.0	0.12	0.12	15.0	15.0	11	11	270	270	1.6	1.6
FMMW-2	4/24/2013	333	333	120	120	13.0	13.0	0.10 L	0.05	3.9	3.9	13	13	210	210	1.8	1.8
FMMW-2	7/24/2013	339	339	140	140	15.0	15.0	0.11	0.11	1.0	1.0	7.6	7.6	200	200	1.3	1.3
FMMW-2	10/9/2013	402	402	120	120	15.0	15.0	0.34	0.34	13	13	8.8	8.8	260	260	1.5	1.5
FMMW-2	1/8/2014	345	345	140	140	14.0	14.0	0.31	0.31	5.2 H	5.2	5.9	5.9	240	240	1.6	1.6
FMMW-2	4/8/2014	467	467	150	150	21.0	21.0	0.10 L	0.05	15	15	19	19	330	330	1.5	1.5
FMMW-2	7/9/2014	300	300	110	110	20.0	20.0	0.11	0.11	0.84 J	0.84	12	12	210	210	1.3	1.3
FMMW-2	10/28/2014	344	344	130	130	22.0	22.0	0.33	0.33	5.1	5.1	6.1	6.1	230	230	1.4	1.4
FMMW-2	1/14/2015	403	403	100	100	19.0	19.0	0.28	0.28	16	16	10	10	260	260	1.1	1.1
FMMW-2	4/22/2015	321	321	110	110	15.0	15.0	0.14	0.14	3.9	3.9	8.6	8.6	200	200	1.5	1.5
FMMW-2	7/29/2015	350	350	140	140	15.0	15.0	0.14	0.14	2.8	2.8	4.6	4.6	220	220	1.4	1.4
FMMW-2	10/16/2015	359	359	140	140	16.0	16.0	0.15	0.15	4.5	4.5	5.4	5.4	220	220	1.7	1.7
FMMW-2	1/11/2016	501	501	110	110	15.0	15.0	0.1 L	0.05	22	22	20	20	330	330	1.4	1.4
FMMW-2	4/20/2016	336	336	110	110	23.0	23.0	0.1 L	0.05	1.3	1.3	14	14	190	190	1.8	1.8
FMMW-2	7/5/2016	300	300	100	100	19.0	19.0	0.1 L	0.05	1.5	1.5	13	13	200	200	1.3	1.3
FMMW-2	10/11/2016	362	362	130	130	22.0	22.0	0.11	0.11	3.9	3.9	5.7	5.7	230	230	1.5	1.5
No. Analyzed		20		20		20		20		20		20		20		20	
No. Detect		20		20		20		14		18		20		20		20	
Minimum conc.			259		100		12.0		0.05		0.8		4.6		190		1.1
Maximum conc.			501		150		23.0		0.34		22.0		20.0		330		1.9
Average conc.			358		123		16.7		0.15		7.3		9.9		238		1.5
Distribution			Lognormal		Neither		Lognormal		Neither		Lognormal		Lognormal		Lognormal		Lognormal
UCL 95			381		150*		18.1		0.34*		**14.6**		12.0		253		1.6

Notes:
Bold indicates UCL 95 is greater than Cleanup Level.
L indicates below the given method reporting limit (MRL).
ND indicates not detected.
NC indicates not calculated due to less than 50 percent detection frequency.
* UCL represents maximum concentration detected because the calculated value was greater than the data sample range or the distribution was neither lognormal nor normal.
Statistical calculations use one half the MRL for non-detected parameters.

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Monitoring Well	Date	Iron		Manganese	
		Result	Conc.	Result	Conc.
MW-10D					
MW-10D	01/24/12	0.200 L	0.100	0.001 L	0.0005
MW-10D	04/24/12	0.200 L	0.100	0.001 L	0.0005
MW-10D	07/16/12	0.200 L	0.100	0.001 L	0.0005
MW-10D	10/11/12	0.200 L	0.100	0.002	0.0019
MW-10D	01/15/13	0.200 L	0.100	0.001 L	0.0005
MW-10D	04/23/13	0.200 L	0.100	0.001 L	0.0005
MW-10D	07/26/13	0.200 L	0.100	0.001 L	0.0005
MW-10D	10/08/13	0.200 L	0.100	0.001 L	0.0005
MW-10D	01/06/14	0.100 L	0.050	0.001	0.0010
MW-10D	04/07/14	0.100 L	0.050	0.001 L	0.0005
MW-10D	07/10/14	0.100 L	0.050	0.001 L	0.0005
MW-10D	10/29/14	0.100 L	0.050	0.001 L	0.0005
MW-10D	01/12/15	0.100 L	0.050	0.001 L	0.0005
MW-10D	04/20/15	0.100 L	0.050	0.001 L	0.0005
MW-10D	07/30/15	0.100 L	0.050	0.001 L	0.0005
MW-10D	10/13/15	0.100 L	0.050	0.001 L	0.0005
MW-10D	01/13/16	0.029	0.029	0.001 L	0.0005
MW-10D	04/19/16	0.029 L	0.015	0.001 L	0.0005
MW-10D	07/05/16	0.029 L	0.015	0.001 L	0.0005
MW-10D	10/10/16	0.030 L	0.015	0.001 L	0.0005
No. Analyzed		20		20	
No. Detect		1		2	
Minimum conc.			0.015		0.001
Maximum conc.			0.100		0.002
Average conc.			0.064		0.001
Distribution			NC		NC
UCL 95			NC		NC

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Monitoring Well	Date	Iron		Manganese	
		Result	Conc.	Result	Conc.
MW-10S					
MW-10S	01/24/12	0.200 L	0.100	0.0063	0.0063
MW-10S	04/24/12	0.200 L	0.100	0.001 L	0.0005
MW-10S	07/16/12	0.200 L	0.100	0.001 L	0.0005
MW-10S	10/11/12	0.200 L	0.100	0.001 L	0.0005
MW-10S	01/15/13	0.200 L	0.100	0.001 L	0.0005
MW-10S	04/23/13	0.200 L	0.100	0.001 L	0.0005
MW-10S	07/26/13	0.200 L	0.100	0.001 L	0.0005
MW-10S	10/08/13	0.200 L	0.100	0.001 L	0.0005
MW-10S	01/06/14	0.100	0.100	0.001 L	0.0005
MW-10S	04/07/14	0.100 L	0.050	0.001 L	0.0005
MW-10S	07/10/14	0.100 L	0.050	0.001 L	0.0005
MW-10S	10/29/14	0.100 L	0.050	0.001 L	0.0005
MW-10S	01/12/15	0.100 L	0.050	0.001 L	0.0005
MW-10S	04/20/15	0.100 L	0.050	0.001 L	0.0005
MW-10S	07/30/15	0.100 L	0.050	0.001 L	0.0005
MW-10S	10/13/15	0.100 L	0.050	0.001 L	0.0005
MW-10S	01/13/16	0.029 L	0.015	0.001 L	0.0005
MW-10S	04/18/16	0.029 L	0.015	0.001 L	0.0005
MW-10S	07/05/16	0.029 L	0.015	0.001 L	0.0005
MW-10S	10/10/16	0.030 L	0.015	0.001 L	0.0005
No. Analyzed		20		20	
No. Detect		1		1	
Minimum conc.			0.015		0.001
Maximum conc.			0.100		0.0063
Average conc.			0.065		0.001
Distribution			NC		NC
UCL 95			NC		NC

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Monitoring Well	Date	Iron		Manganese	
		Result	Conc.	Result	Conc.
MW-11D(2)					
MW-11D(2)	01/25/12	0.200 L	0.100	0.001 L	0.0005
MW-11D(2)	04/25/12	0.200 L	0.100	0.001 L	0.0005
MW-11D(2)	07/17/12	0.200 L	0.100	0.001 L	0.0005
MW-11D(2)	10/10/12	0.200 L	0.100	0.001 L	0.0005
MW-11D(2)	01/14/13	0.200 L	0.100	0.001 L	0.0005
MW-11D(2)	04/24/13	0.200 L	0.100	0.001 L	0.0005
MW-11D(2)	07/23/13	0.200 L	0.100	0.001 L	0.0005
MW-11D(2)	10/09/13	0.200 L	0.100	0.001 L	0.0005
MW-11D(2)	01/08/14	0.100 L	0.050	0.001 L	0.0005
MW-11D(2)	04/08/14	0.100 L	0.050	0.001 L	0.0005
MW-11D(2)	07/08/14	0.100 L	0.050	0.001 L	0.0005
MW-11D(2)	10/27/14	0.100 L	0.050	0.001 L	0.0005
MW-11D(2)	01/14/15	0.100 L	0.050	0.001 L	0.0005
MW-11D(2)	04/23/15	0.100 L	0.050	0.001 L	0.0005
MW-11D(2)	07/29/15	0.100 L	0.050	0.001 L	0.0005
MW-11D(2)	10/14/15	0.100 L	0.050	0.001 L	0.0005
MW-11D(2)	01/11/16	0.029 L	0.015	0.001 L	0.0005
MW-11D(2)	04/19/16	0.029 L	0.015	0.001 L	0.0005
MW-11D(2)	07/05/16	0.029 L	0.015	0.001 L	0.0005
MW-11D(2)	10/12/16	0.030 L	0.015	0.001 L	0.0005
No. Analyzed		20		20	
No. Detect		0		0	
Minimum conc.			0.015		0.001
Maximum conc.			0.100		0.001
Average conc.			0.063		0.001
Distribution			NC		NC
UCL 95			NC		NC

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Monitoring Well	Date	Iron		Manganese	
		Result	Conc.	Result	Conc.
MW-11S					
MW-11S	01/25/12	0.200 L	0.100	0.001 L	0.0005
MW-11S	04/25/12	0.200 L	0.100	0.001	0.0014
MW-11S	07/17/12	0.200 L	0.100	0.012	0.0120
MW-11S	10/10/12	0.200 L	0.100	0.016	0.0160
MW-11S	01/14/13	0.200 L	0.100	0.001 L	0.0005
MW-11S	04/24/13	0.200 L	0.100	0.001 L	0.0005
MW-11S	07/23/13	0.200 L	0.100	0.004	0.0043
MW-11S	10/09/13	0.200 L	0.100	0.001 L	0.0005
MW-11S	01/08/14	0.100 L	0.050	0.001 L	0.0005
MW-11S	04/08/14	0.100 L	0.050	0.001	0.0013
MW-11S	07/08/14	0.100 L	0.050	0.021	0.0210
MW-11S	10/27/14	0.100 L	0.050	0.008	0.0079
MW-11S	01/14/15	0.100 L	0.050	0.001 L	0.0005
MW-11S	04/21/15	0.100 L	0.050	0.001	0.0012
MW-11S	07/29/15	0.100 L	0.050	0.003	0.0025
MW-11S	10/14/15	0.100 L	0.050	0.003	0.0028
MW-11S	01/11/16	0.029 L	0.015	0.001 L	0.0005
MW-11S	04/19/16	0.029 L	0.015	0.001	0.0014
MW-11S	07/05/16	0.029 L	0.015	0.003	0.0032
MW-11S	10/12/16	0.030 L	0.015	0.007	0.0072
No. Analyzed		20		20	
No. Detect		0		13	
Minimum conc.			0.015		0.001
Maximum conc.			0.100		0.021
Average conc.			0.063		0.004
Distribution			NC		Lognormal
UCL 95			NC		0.0109
MW-12D					
MW-12D	01/30/12	0.200 L	0.100	0.001 L	0.0005
MW-12D	07/16/12	0.200 L	0.100	0.001 L	0.0005
MW-12D	01/16/13	0.200 L	0.100	0.001 L	0.0005
MW-12D	07/26/13	0.200 L	0.100	0.001 L	0.0005
MW-12D	01/07/14	0.100 L	0.050	0.001 L	0.0005
MW-12D	07/11/14	0.100 L	0.050	0.001 L	0.0005
MW-12D	10/30/14	0.100 L	0.050	0.001 L	0.0005
MW-12D	01/13/15	0.100 L	0.050	0.001 L	0.0005
MW-12D	04/20/15	0.100 L	0.050	0.001 L	0.0005
MW-12D	07/31/15	0.100 L	0.050	0.001 L	0.0005
MW-12D	10/19/15	0.100 L	0.050	0.001 L	0.0005
MW-12D	01/14/16	0.029 L	0.015	0.001 L	0.0005
MW-12D	04/19/16	0.029 L	0.015	0.001 L	0.0005
MW-12D	07/06/16	0.029 L	0.015	0.001 L	0.0005
MW-12D	10/12/16	0.030 L	0.015	0.001 L	0.0005
No. Analyzed		15		15	
No. Detect		0		0	
Minimum conc.			0.015		0.0005
Maximum conc.			0.100		0.0005
Average conc.			0.054		0.0005
Distribution			NC		NC
UCL 95			NC		NC

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Monitoring Well	Date	Iron		Manganese	
		Result	Conc.	Result	Conc.
MW-12S					
MW-12S	01/30/12	0.200 L	0.100	0.440	0.440
MW-12S	07/16/12	0.200 L	0.100	0.400	0.400
MW-12S	01/16/13	0.200 L	0.100	0.170	0.170
MW-12S	01/15/15	0.100 L	0.050	0.240	0.240
MW-12S	04/20/15	0.100 L	0.050	0.340	0.340
MW-12S	07/31/15	0.100 L	0.050	0.511	0.511
MW-12S	10/19/15	0.100 L	0.050	0.990	0.990
MW-12S	01/14/16	0.029 L	0.015	0.016	0.016
MW-12S	04/19/16	0.029 L	0.015	0.350	0.350
MW-12S	07/06/16	0.029 L	0.015	0.690	0.690
MW-12S	10/12/16	0.030 L	0.015	0.830	0.830
No. Analyzed		11		11	
No. Detect		0		11	
Minimum conc.			0.015		0.0160
Maximum conc.			0.100		0.9900
Average conc.			0.051		0.452
Distribution			NC		Normal
UCL 95			NC		**0.6101**
MW-13D					
MW-13D	01/30/12	0.200 L	0.100	0.001 L	0.0005
MW-13D	04/25/12	0.200 L	0.100	0.002	0.002
MW-13D	07/16/12	0.380	0.380	0.001 L	0.0005
MW-13D	10/10/12	0.200 L	0.100	0.180	0.180
MW-13D	01/15/13	0.200 L	0.100	0.001 L	0.0005
MW-13D	04/23/13	0.200 L	0.100	0.001 L	0.0005
MW-13D	07/26/13	0.200 L	0.100	0.001 L	0.0005
MW-13D	10/08/13	0.200 L	0.100	0.001 L	0.0005
MW-13D	01/06/14	0.100 L	0.050	0.001 L	0.0005
MW-13D	04/07/14	0.100 L	0.050	0.001 L	0.0005
MW-13D	07/08/14	0.100 L	0.050	0.001 L	0.0005
MW-13D	10/29/14	0.100 L	0.050	0.001 L	0.0005
MW-13D	01/12/15	0.100 L	0.050	0.001 L	0.0005
MW-13D	04/20/15	0.100 L	0.050	0.001 L	0.0005
MW-13D	07/30/15	0.100 L	0.050	0.001 L	0.0005
MW-13D	10/14/15	0.100 L	0.050	0.001 L	0.0005
MW-13D	01/13/16	0.020 L	0.010	0.001 L	0.0005
MW-13D	04/19/16	0.029 L	0.015	0.001 L	0.0005
MW-13D	07/06/16	0.029 L	0.015	0.001 L	0.0005
MW-13D	10/10/16	0.030 L	0.015	0.039	0.039
No. Analyzed		20		20	
No. Detect		1		3	
Minimum conc.			0.010		0.0005
Maximum conc.			0.380		0.1800
Average conc.			0.077		0.0115
Distribution			NC		NC
UCL 95			NC		NC

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Monitoring Well	Date	Iron		Manganese	
		Result	Conc.	Result	Conc.
MW-13S					
MW-13S	01/27/12	0.200 L	0.100	0.002	0.002
MW-13S	04/24/12	0.200 L	0.100	0.001 L	0.001
MW-13S	07/17/12	0.200 L	0.100	0.020	0.020
MW-13S	10/10/12	0.200 L	0.100	0.047	0.047
MW-13S	01/15/13	0.200 L	0.100	0.003	0.003
MW-13S	04/23/13	0.200 L	0.100	0.001	0.001
MW-13S	07/26/13	0.200 L	0.100	0.003	0.003
MW-13S	10/08/13	0.200 L	0.100	0.007	0.007
MW-13S	01/06/14	0.100 L	0.050	0.007	0.007
MW-13S	04/09/14	0.100 L	0.050	0.002	0.002
MW-13S	07/08/14	0.100 L	0.050	0.007	0.007
MW-13S	10/29/14	0.100 L	0.050	0.012	0.012
MW-13S	01/13/15	0.100 L	0.050	0.001	0.001
MW-13S	04/20/15	0.100 L	0.050	0.001 L	0.001
MW-13S	07/30/15	0.100 L	0.050	0.034	0.034
MW-13S	10/14/15	0.100 L	0.050	0.190	0.190
MW-13S	01/13/16	0.020 L	0.010	0.008	0.008
MW-13S	04/19/16	0.054	0.054	0.024	0.024
MW-13S	07/06/16	0.029 L	0.015	0.051	0.051
MW-13S	10/11/16	0.030 L	0.015	0.150	0.150
No. Analyzed		20		20	
No. Detect		1		18	
Minimum conc.			0.010		0.001
Maximum conc.			0.100		0.190
Average conc.			0.065		0.029
Distribution			NC		Lognormal
UCL 95			NC		**0.1681**

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Monitoring Well	Date	Iron		Manganese	
		Result	Conc.	Result	Conc.
MW-14D					
MW-14D	01/24/12	2.500	2.500	0.920	0.920
MW-14D	04/24/12	2.000	2.000	0.770	0.770
MW-14D	07/16/12	2.200	2.200	0.740	0.740
MW-14D	10/11/12	2.800	2.800	0.920	0.920
MW-14D	01/15/13	2.300	2.300	0.850	0.850
MW-14D	04/23/13	2.000	2.000	0.790	0.790
MW-14D	07/26/13	0.200 L	0.100	0.052	0.052
MW-14D	10/08/13	2.100	2.100	0.880	0.880
MW-14D	01/06/14	3.300	3.300	1.000	1.000
MW-14D	04/07/14	0.100 L	0.050	0.570	0.570
MW-14D	07/10/14	0.740	0.740	0.810	0.810
MW-14D	10/29/14	2.800	2.800	1.200	1.200
MW-14D	01/12/15	2.000	2.000	0.840	0.840
MW-14D	04/20/15	1.900	1.900	0.830	0.830
MW-14D	07/27/15	2.800	2.800	0.980	0.980
MW-14D	10/13/15	4.300	4.300	1.300	1.300
MW-14D	01/13/16	0.029 L	0.015	0.770	0.770
MW-14D	04/18/16	0.029 L	0.015	0.820	0.820
MW-14D	08/04/16	1.600	1.600	1.100	1.100
MW-14D	10/10/16	2.600	2.600	1.200	1.200
No. Analyzed		20		20	
No. Detect		16		20	
Minimum conc.			0.015		0.052
Maximum conc.			4.300		1.300
Average conc.			1.906		0.867
Distribution			Normal		Neither
UCL 95			**2.36**		**1.300***

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Monitoring Well	Date	Iron		Manganese	
		Result	Conc.	Result	Conc.
MW-14S					
MW-14S	01/24/12	0.200 L	0.100	0.0025	0.0025
MW-14S	04/24/12	0.200 L	0.100	0.150	0.1500
MW-14S	07/16/12	0.200 L	0.100	0.004	0.0040
MW-14S	10/11/12	0.200 L	0.100	0.270	0.2700
MW-14S	01/14/13	0.200 L	0.100	0.042	0.0420
MW-14S	04/23/13	0.200 L	0.100	0.120	0.1200
MW-14S	07/26/13	2.400	2.400	0.730	0.7300
MW-14S	10/08/13	0.200 L	0.100	0.034	0.0340
MW-14S	01/06/14	0.100 L	0.050	0.170	0.1700
MW-14S	04/07/14	0.100 L	0.050	0.063	0.0630
MW-14S	07/09/14	0.100 L	0.050	0.097	0.0970
MW-14S	10/29/14	0.100 L	0.050	0.240	0.2400
MW-14S	01/12/15	0.100 L	0.050	0.028	0.0280
MW-14S	04/20/15	0.100 L	0.050	0.042	0.0420
MW-14S	07/27/15	0.100 L	0.050	0.170	0.1700
MW-14S	10/15/15	0.110	0.110	0.680	0.6800
MW-14S	01/13/16	0.029 L	0.015	0.110	0.1100
MW-14S	04/18/16	0.029 L	0.015	0.180	0.1800
MW-14S	07/06/16	0.029 L	0.015	0.029	0.0290
MW-14S	10/14/16	0.043	0.043	0.110	0.1100
No. Analyzed		20		20	
No. Detect		3		20	
Minimum conc.			0.015		0.003
Maximum conc.			2.400		0.730
Average conc.			0.182		0.164
Distribution			NC		Lognormal
UCL 95			NC		**0.6668**
MW-14R					
MW-14R	01/27/12	0.200 L	0.100	0.001 L	0.0005
MW-14R	01/15/13	0.200 L	0.100	0.001 L	0.0005
MW-14R	01/07/14	0.100 L	0.050	0.001 L	0.0005
MW-14R	07/11/14	0.100 L	0.050	0.0014	0.0014
MW-14R	10/28/14	0.100 L	0.050	0.001 L	0.0005
MW-14R	01/13/15	0.100 L	0.050	0.001 L	0.0005
MW-14R	04/22/15	0.100 L	0.050	0.0011	0.001
MW-14R	07/30/15	0.100 L	0.050	0.1700	0.1700
MW-14R	10/13/15	0.100 L	0.050	0.2000	0.2000
MW-14R	01/12/16	0.045	0.045	0.2000	0.2000
MW-14R	04/18/16	0.059	0.059	0.2000	0.2000
MW-14R	07/06/16	0.045	0.045	0.1800	0.1800
MW-14R	10/12/16	0.063	0.063	0.1900	0.1900
No. Analyzed		13		13	
No. Detect		4		8	
Minimum conc.			0.045		0.001
Maximum conc.			0.100		0.200
Average conc.			0.059		0.088
Distribution			NC		Neither
UCL 95			NC		**0.200***

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		Result	Conc.	Result	Conc.
MW-15D					
MW-15D	01/26/12	0.200 L	0.100	0.079	0.0790
MW-15D	07/17/12	0.200 L	0.100	0.001 L	0.0005
MW-15D	01/14/13	0.200 L	0.100	0.260	0.2600
MW-15D	07/25/13	0.200 L	0.100	0.260	0.2600
MW-15D	01/07/14	0.100 L	0.050	0.001 L	0.0005
MW-15D	07/09/14	0.100 L	0.050	0.300	0.3000
MW-15D	10/28/14	0.100 L	0.050	0.220	0.2200
MW-15D	01/13/15	0.100 L	0.050	0.260	0.2600
MW-15D	04/21/15	0.100 L	0.050	0.280	0.2800
MW-15D	07/27/15	0.100 L	0.050	0.087	0.0870
MW-15D	10/13/15	0.100 L	0.050	0.028	0.0280
MW-15D	01/13/16	0.029 L	0.015	0.190	0.1900
MW-15D	04/18/16	0.029 L	0.015	0.006	0.0060
MW-15D	07/06/16	0.029 L	0.015	0.096	0.0960
MW-15D	10/10/16	0.030 L	0.015	0.007	0.0072
No. Analyzed		15		15	
No. Detect		0		13	
Minimum conc.			0.015		0.001
Maximum conc.			0.100		0.300
Average conc.			0.054		0.138
Distribution			NC		Neither
UCL 95			NC		**0.300***
MW-15S					
MW-15S	01/25/12	0.200 L	0.100	0.910	0.9100
MW-15S	07/17/12	0.200 L	0.100	0.630	0.6300
MW-15S	01/14/13	0.200 L	0.100	0.840	0.8400
MW-15S	07/25/13	0.200 L	0.100	0.530	0.5300
MW-15S	01/07/14	0.100 L	0.050	0.880	0.8800
MW-15S	07/09/14	0.100 L	0.050	0.640	0.6400
MW-15S	10/28/14	0.100 L	0.050	0.870	0.8700
MW-15S	01/13/15	0.100 L	0.050	0.780	0.7800
MW-15S	04/21/15	0.100 L	0.050	0.610	0.6100
MW-15S	07/27/15	0.120	0.120	0.870	0.8700
MW-15S	10/13/15	0.100 L	0.050	1.100	1.1000
MW-15S	01/13/16	0.029 L	0.015	0.670	0.6700
MW-15S	04/18/16	0.029	0.029	0.740	0.7400
MW-15S	07/06/16	0.054	0.054	0.810	0.8100
MW-15S	10/10/16	0.100	0.100	0.880	0.8800
No. Analyzed		15		15	
No. Detect		4		15	
Minimum conc.			0.015		0.530
Maximum conc.			0.120		1.100
Average conc.			0.068		0.784
Distribution			NC		Lognormal
UCL 95			NC		**0.8617**

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Monitoring Well	Date	Iron		Manganese	
		Result	Conc.	Result	Conc.
MW-17S					
MW-17S	01/25/12	0.200 L	0.100	0.920	0.9200
MW-17S	04/25/12	0.200 L	0.100	1.400	1.4000
MW-17S	07/17/12	0.200 L	0.100	0.760	0.7600
MW-17S	10/10/12	0.200 L	0.100	0.780	0.7800
MW-17S	01/15/13	0.200 L	0.100	0.910	0.9100
MW-17S	04/24/13	0.200 L	0.100	1.500	1.5000
MW-17S	07/25/13	0.200 L	0.100	1.100	1.1000
MW-17S	10/10/13	0.200 L	0.100	0.970	0.9700
MW-17S	01/09/14	0.100 L	0.050	1.000	1.0000
MW-17S	04/08/14	0.100 L	0.050	1.600	1.6000
MW-17S	07/08/14	0.100 L	0.050	0.680	0.6800
MW-17S	10/28/14	0.100 L	0.050	1.100	1.1000
MW-17S	01/13/15	0.100 L	0.050	0.340	0.3400
MW-17S	04/23/15	0.100 L	0.050	1.000	1.0000
MW-17S	07/27/15	0.100 L	0.050	0.906	0.9060
MW-17S	10/15/15	0.100 L	0.050	1.100	1.1000
MW-17S	01/12/16	0.029 L	0.015	1.800	1.8000
MW-17S	04/19/16	0.029 L	0.015	1.200	1.2000
MW-17S	07/06/16	0.029 L	0.015	1.100	1.1000
MW-17S	10/13/16	0.030 L	0.015	0.860	0.8600
No. Analyzed		20		20	
No. Detect		0		20	
Minimum conc.			0.015		0.340
Maximum conc.			0.100		1.800
Average conc.			0.063		1.051
Distribution			NC		Normal
UCL 95			NC		**1.1800***

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Monitoring Well	Date	Iron		Manganese	
		Result	Conc.	Result	Conc.
MW-18D					
MW-18D	01/25/12	0.200 L	0.100	0.001 L	0.0005
MW-18D	07/17/12	0.200 L	0.100	0.001 L	0.0005
MW-18D	01/14/13	0.200 L	0.100	0.001 L	0.0005
MW-18D	07/23/13	0.200 L	0.100	0.001 L	0.0005
MW-18D	01/09/14	0.100 L	0.050	0.001 L	0.0005
MW-18D	07/09/14	0.100 L	0.050	0.001 L	0.0005
MW-18D	10/27/14	0.100 L	0.050	0.001 L	0.0005
MW-18D	01/14/15	0.100 L	0.050	0.001 L	0.0005
MW-18D	04/23/15	0.100 L	0.050	0.002	0.0019
MW-18D	07/29/15	0.100 L	0.050	0.001 L	0.0005
MW-18D	10/16/15	0.280	0.280	0.001 L	0.0005
MW-18D	01/11/16	0.029 L	0.015	0.001 L	0.0005
MW-18D	04/19/16	0.029 L	0.015	0.001 L	0.0005
MW-18D	07/06/16	0.029 L	0.015	0.001 L	0.0005
MW-18D	10/11/16	0.030 L	0.015	0.001 L	0.0005
No. Analyzed		15		15	
No. Detect		1		1	
Minimum conc.			0.015		0.0005
Maximum conc.			0.280		0.0019
Average conc.			0.069		0.0006
Distribution			NC		NC
UCL 95			NC		NC
MW-18S					
MW-18S	01/25/12	0.200 L	0.100	0.0010 L	0.0005
MW-18S	07/18/12	0.200 L	0.100	0.0010 L	0.0005
MW-18S	01/14/13	0.200 L	0.100	0.0010 L	0.0005
MW-18S	07/23/13	0.200 L	0.100	0.0010 L	0.0005
MW-18S	01/09/14	0.100 L	0.050	0.0010 L	0.0005
MW-18S	07/09/14	0.100 L	0.050	0.0010 L	0.0005
MW-18S	10/27/14	0.100 L	0.050	0.0013 L	0.0007
MW-18S	01/14/15	0.100 L	0.050	0.0013 L	0.0007
MW-18S	04/23/15	0.100 L	0.050	0.0013 L	0.0007
MW-18S	07/29/15	0.100 L	0.050	0.0013 L	0.0007
MW-18S	10/16/15	0.100 L	0.050	0.0013 L	0.0007
MW-18S	01/11/16	0.029 L	0.015	0.0010 L	0.0005
MW-18S	04/19/16	0.029 L	0.015	0.0010 L	0.0005
MW-18S	07/06/16	0.029 L	0.015	0.0014	0.0014
MW-18S	10/11/16	0.030 L	0.015	0.0056	0.0056
No. Analyzed		15		15	
No. Detect		0		2	
Minimum conc.			0.015		0.0005
Maximum conc.			0.100		0.0056
Average conc.			0.054		0.0010
Distribution			NC		NC
UCL 95			NC		NC

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Monitoring Well	Date	Iron		Manganese	
		Result	Conc.	Result	Conc.
MW-20R					
MW-20R	01/24/12	0.200 L	0.100	0.001 L	0.0005
MW-20R	01/16/13	0.200 L	0.100	0.001 L	0.0005
MW-20R	01/10/14	0.100 L	0.050	0.001	0.0014
MW-20R	07/11/14	0.100 L	0.050	0.001 L	0.0005
MW-20R	10/30/14	0.100 L	0.050	0.001 L	0.0005
MW-20R	01/12/15	0.100 L	0.050	0.001 L	0.0005
MW-20R	04/23/15	0.370	0.370	0.001 L	0.0005
MW-20R	07/28/15	0.100 L	0.050	0.042	0.0417
MW-20R	10/14/15	0.100 L	0.050	0.026	0.0260
MW-20R	01/12/16	0.029 L	0.015	0.001 L	0.0005
MW-20R	04/19/16	0.029 L	0.015	0.001 L	0.0005
MW-20R	07/06/16	0.029 L	0.015	0.001 L	0.0005
MW-20R	10/13/16	0.030 L	0.015	0.001	0.0010
No. Analyzed		13		13	
No. Detect		1		4	
Minimum conc.			0.015		0.001
Maximum conc.			0.370		0.042
Average conc.			0.071		0.006
Distribution			NC		NC
UCL 95			NC		NC
MW-23S					
MW-23S	01/26/12	0.200 L	0.100	0.023	0.0230
MW-23S	07/19/12	0.200 L	0.100	0.001 L	0.0005
MW-23S	01/07/14	0.100	0.100	0.022	0.0220
MW-23S	07/10/14	0.100 L	0.050	0.013	0.0130
MW-23S	01/15/15	0.100 L	0.050	0.009	0.0091
MW-23S	04/23/15	0.740	0.740	0.022	0.0220
MW-23S	07/28/15	0.170	0.170	0.027	0.0270
MW-23S	01/14/16	0.210	0.210	0.014	0.0140
MW-23S	04/21/16	0.160	0.160	0.015	0.0150
MW-23S	08/04/16	0.290	0.290	0.057	0.0570
MW-23S	10/13/16	0.160	0.160	0.023	0.0230
No. Analyzed		11		11	
No. Detect		7		10	
Minimum conc.			0.050		0.001
Maximum conc.			0.740		0.057
Average conc.			0.194		0.021
Distribution			Lognormal		Neither
UCL 95			**0.36**		**0.057***

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Monitoring Well	Date	Iron		Manganese	
		Result	Conc.	Result	Conc.
MW-25S					
MW-25S	01/25/12	0.200 L	0.100	0.001 L	0.0005
MW-25S	07/17/12	0.200 L	0.100	0.001 L	0.0005
MW-25S	01/17/13	0.200 L	0.100	0.001 L	0.0005
MW-25S	07/25/13	0.200 L	0.100	0.001 L	0.0005
MW-25S	01/09/14	0.100 L	0.050	0.001 L	0.0005
MW-25S	07/08/14	0.100 L	0.050	0.001 L	0.0005
MW-25S	10/28/14	0.100 L	0.050	0.001 L	0.0005
MW-25S	01/14/15	0.100 L	0.050	0.001 L	0.0005
MW-25S	04/21/15	0.100 L	0.050	0.0025	0.0025
MW-25S	07/31/15	0.100 L	0.050	0.001 L	0.0005
MW-25S	10/16/15	0.100 L	0.050	0.001 L	0.0005
MW-25S	01/13/16	0.020 L	0.010	0.001 L	0.0005
MW-25S	04/20/16	0.029 L	0.015	0.001 L	0.0005
MW-25S	07/05/16	0.029 L	0.015	0.001 L	0.0005
MW-25S	10/13/16	0.030 L	0.015	0.001 L	0.0005
No. Analyzed		15		15	
No. Detect		0		1	
Minimum conc.			0.010		0.001
Maximum conc.			0.100		0.003
Average conc.			0.054		0.001
Distribution			NC		NC
UCL 95			NC		NC
MW-26R					
MW-26R	01/30/12	0.750	0.750	0.260	0.2600
MW-26R	01/17/13	0.590	0.590	0.340	0.3400
MW-26R	01/10/14	0.840	0.840	0.250	0.2500
MW-26R	07/10/14	0.620	0.620	0.340	0.3400
MW-26R	10/30/14	0.680	0.680	0.370	0.3700
MW-26R	01/12/15	0.610	0.610	0.380	0.3800
MW-26R	04/23/15	0.650	0.650	0.400	0.4000
MW-26R	07/31/15	0.570	0.570	0.370	0.3700
MW-26R	10/14/15	0.630	0.630	1.000	1.0000
MW-26R	01/12/16	0.680	0.680	0.400	0.4000
MW-26R	04/19/16	0.660	0.660	0.380	0.3800
MW-26R	07/06/16	0.700	0.700	0.370	0.3700
MW-26R	10/12/16	0.690	0.690	0.400	0.4000
No. Analyzed		13		13	
No. Detect		13		13	
Minimum conc.			0.570		0.250
Maximum conc.			0.840		1.000
Average conc.			0.667		0.405
Distribution			Lognormal		Neither
UCL 95			**0.70**		**1.000***

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Monitoring Well	Date	Iron		Manganese	
		Result	Conc.	Result	Conc.
MW-28S					
MW-28S	01/26/12	0.200 L	0.100	0.001 L	0.0005
MW-28S	04/26/12	0.490	0.490	0.001 L	0.0005
MW-28S	07/19/12	0.200 L	0.100	0.001 L	0.0005
MW-28S	10/09/13	0.200 L	0.100	0.001 L	0.0005
MW-28S	04/22/15	0.100 L	0.050	0.001 L	0.0005
MW-28S	01/14/16	0.029 L	0.015	0.001 L	0.0005
MW-28S	04/21/16	0.029 L	0.015	0.001 L	0.0005
MW-28S	07/07/16	0.050	0.050	0.001 L	0.0005
No. Analyzed		8		8	
No. Detect		2		0	
Minimum conc.			0.015		0.001
Maximum conc.			0.490		0.001
Average conc.			0.115		0.001
Distribution			NC		NC
UCL 95			NC		NC
FMMW-1					
FMMW-1	01/27/12	0.200 L	0.100	0.001 L	0.0005
FMMW-1	04/25/12	0.200 L	0.100	0.001 L	0.0005
FMMW-1	07/18/12	0.200 L	0.100	0.001 L	0.0005
FMMW-1	10/10/12	0.200 L	0.100	0.001 L	0.0005
FMMW-1	01/16/13	0.200 L	0.100	0.001 L	0.0005
FMMW-1	04/24/13	0.200 L	0.100	0.001 L	0.0005
FMMW-1	07/24/13	0.200 L	0.100	0.001 L	0.0005
FMMW-1	10/09/13	0.200 L	0.100	0.001 L	0.0005
FMMW-1	01/08/14	0.100 L	0.050	0.001 L	0.0005
FMMW-1	04/08/14	0.100 L	0.050	0.001 L	0.0005
FMMW-1	07/09/14	0.100 L	0.050	0.001 L	0.0005
FMMW-1	10/27/14	0.100 L	0.050	0.001 L	0.0005
FMMW-1	01/14/15	0.100 L	0.050	0.001 L	0.0005
FMMW-1	04/22/15	0.100 L	0.050	0.001 L	0.0005
FMMW-1	07/29/15	0.100 L	0.050	0.001 L	0.0005
FMMW-1	10/16/15	0.230	0.230	0.001 L	0.0005
FMMW-1	01/11/16	0.029 L	0.015	0.001 L	0.0005
FMMW-1	04/20/16	0.029 L	0.015	0.001 L	0.0005
FMMW-1	07/05/16	0.029 L	0.015	0.001 L	0.0005
FMMW-1	10/11/16	0.030 L	0.015	0.001 L	0.0005
No. Analyzed		20		20	
No. Detect		1		0	
Minimum conc.			0.015		0.001
Maximum conc.			0.230		0.001
Average conc.			0.072		0.001
Distribution			NC		NC
UCL 95			NC		NC

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Monitoring Well	Date	Iron		Manganese	
		Result	Conc.	Result	Conc.
FMMW-2					
FMMW-2	01/27/12	0.200 L	0.100	0.110	0.1100
FMMW-2	04/25/12	0.200 L	0.100	0.100	0.1000
FMMW-2	07/18/12	0.200 L	0.100	0.096	0.0960
FMMW-2	10/10/12	0.200 L	0.100	0.093	0.0930
FMMW-2	01/16/13	0.200 L	0.100	0.089	0.0890
FMMW-2	04/24/13	0.200 L	0.100	0.075	0.0750
FMMW-2	07/24/13	0.200 L	0.100	0.081	0.0810
FMMW-2	10/09/13	0.200 L	0.100	0.110	0.1100
FMMW-2	01/08/14	0.100 L	0.050	0.081	0.0810
FMMW-2	04/08/14	0.100 L	0.050	0.084	0.0840
FMMW-2	07/09/14	0.100 L	0.050	0.072	0.0720
FMMW-2	10/28/14	0.100 L	0.050	0.090	0.0900
FMMW-2	01/14/15	0.100 L	0.050	0.086	0.0860
FMMW-2	04/22/15	0.100 L	0.050	0.070	0.0700
FMMW-2	07/29/15	0.100 L	0.050	0.082	0.0820
FMMW-2	10/16/15	0.100 L	0.050	0.068	0.0680
FMMW-2	01/11/16	0.029 L	0.015	0.028	0.0280
FMMW-2	04/20/16	0.029 L	0.015	0.055	0.0550
FMMW-2	07/05/16	0.029 L	0.015	0.041	0.0410
FMMW-2	10/11/16	0.030 L	0.015	0.067	0.0670
No. Analyzed		20		20	
No. Detect		0		20	
Minimum conc.			0.015		0.028
Maximum conc.			0.100		0.110
Average conc.			0.063		0.079
Distribution			NC		Normal
UCL 95			NC		**0.0869**

Notes:
Bold indicates UCL 95 is greater than Cleanup Level.
L indicates below the given method reporting limit (MRL).
ND indicates not detected.
NC indicates not calculated due to less than 50 percent detection frequency.
* UCL represents maximum concentration detected because the calculated value was greater than the data sample range or the distribution was neither lognormal nor normal.
Statistical calculations use one half the MRL for non-detected parameters.

Statistical Summary of Groundwater Data - Volatile Organic Compounds
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Monitoring Well	Date	1,4-Dichlorobenzene		Chlorobenzene	
		Result	Conc.	Result	Conc.
MW-11S					
MW-11S	01/25/12	0.5 L	0.25	0.5 L	0.25
MW-11S	04/25/12	0.5 L	0.25	0.5 L	0.25
MW-11S	07/17/12	0.5 L	0.25	0.5 L	0.25
MW-11S	10/10/12	0.5 L	0.25	0.5 L	0.25
MW-11S	01/14/13	0.5 L	0.25	0.5 L	0.25
MW-11S	04/24/13	0.5 L	0.25	0.5 L	0.25
MW-11S	07/23/13	0.5 L	0.25	0.5 L	0.25
MW-11S	10/09/13	0.5 L	0.25	0.5 L	0.25
MW-11S	01/08/14	0.5 L	0.25	0.5 L	0.25
MW-11S	04/08/14	0.5 L	0.25	0.5 L	0.25
MW-11S	07/08/14	0.5 L	0.25	0.5 L	0.25
MW-11S	10/27/14	0.5 L	0.25	0.5 L	0.25
MW-11S	01/12/15	0.5 L	0.25	0.5 L	0.25
MW-11S	04/20/15	0.5 L	0.25	0.5 L	0.25
MW-11S	07/30/15	0.5 L	0.25	0.5 L	0.25
MW-11S	10/13/15	0.5 L	0.25	0.5 L	0.25
MW-11S	01/11/16	0.5 L	0.25	0.5 L	0.25
MW-11S	04/19/16	0.5 L	0.25	0.5 L	0.25
MW-11S	07/05/16	0.5 L	0.25	0.5 L	0.25
MW-11S	10/12/16	0.5 L	0.25	0.5 L	0.25
No. Analyzed		20		20	
No. Detect		0		0	
Minimum conc.			0.25		0.25
Maximum conc.			0.25		0.25
Average conc.			0.25		0.25
Distribution			NC		NC
UCL 95			NC		NC

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Monitoring Well	Date	1,4-Dichlorobenzene		Chlorobenzene	
		Result	Conc.	Result	Conc.
MW-12S					
MW-12S	01/30/12	0.5 L	0.25	0.5 L	0.25
MW-12S	07/16/12	0.6	0.63	0.5 L	0.25
MW-12S	01/16/13	0.5 L	0.25	0.5 L	0.25
MW-12S	01/12/15	0.5 L	0.25	0.5 L	0.25
MW-12S	04/20/15	0.5 L	0.25	0.5 L	0.25
MW-12S	07/30/15	0.5 L	0.25	0.5 L	0.25
MW-12S	10/13/15	0.5 L	0.25	0.5 L	0.25
MW-12S	01/14/16	0.5 L	0.25	0.5 L	0.25
MW-12S	04/19/16	0.7	0.73	0.5 L	0.25
MW-12S	07/06/16	0.5 L	0.25	0.5 L	0.25
MW-12S	10/12/16	0.5 L	0.25	0.5 L	0.25
No. Analyzed		11		11	
No. Detect		2		0	
Minimum conc.			0.25		0.25
Maximum conc.			0.73		0.25
Average conc.			0.33		0.25
Distribution			NC		NC
UCL 95			NC		NC
MW-12D					
MW-12D	01/30/12	0.5 L	0.25	0.5 L	0.25
MW-12D	07/16/12	0.5 L	0.25	0.5 L	0.25
MW-12D	01/16/13	0.5 L	0.25	0.5 L	0.25
MW-12D	07/26/13	0.5 L	0.25	0.5 L	0.25
MW-12D	01/07/14	0.5 L	0.25	0.5 L	0.25
MW-12D	07/11/14	0.5 L	0.25	0.5 L	0.25
MW-12D	10/30/14	0.5 L	0.25	0.5 L	0.25
MW-12D	01/12/15	0.5 L	0.25	0.5 L	0.25
MW-12D	04/20/15	0.5 L	0.25	0.5 L	0.25
MW-12D	07/30/15	0.5 L	0.25	0.5 L	0.25
MW-12D	10/13/15	0.5 L	0.25	0.5 L	0.25
MW-12D	01/14/16	0.5 L	0.25	0.5 L	0.25
MW-12D	04/19/16	0.5 L	0.25	0.5 L	0.25
MW-12D	07/06/16	0.5 L	0.25	0.5 L	0.25
MW-12D	10/12/16	0.5 L	0.25	0.5 L	0.25
No. Analyzed		15		15	
No. Detect		0		0	
Minimum conc.			0.25		0.25
Maximum conc.			0.25		0.25
Average conc.			0.25		0.25
Distribution			NC		NC
UCL 95			NC		NC

Statistical Summary of Groundwater Data - Volatile Organic Compounds
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Monitoring Well	Date	1,4-Dichlorobenzene		Chlorobenzene	
		Result	Conc.	Result	Conc.
MW-13D					
MW-13D	01/30/12	0.5 L	0.25	0.5 L	0.25
MW-13D	04/25/12	0.5 L	0.25	0.5 L	0.25
MW-13D	07/16/12	0.5 L	0.25	0.5 L	0.25
MW-13D	10/10/12	0.5 L	0.25	0.5 L	0.25
MW-13D	01/15/13	0.5 L	0.25	0.5 L	0.25
MW-13D	04/23/13	0.5 L	0.25	0.5 L	0.25
MW-13D	07/26/13	0.5 L	0.25	0.5 L	0.25
MW-13D	10/08/13	0.5 L	0.25	0.5 L	0.25
MW-13D	01/06/14	0.5 L	0.25	0.5 L	0.25
MW-13D	04/07/14	0.5 L	0.25	0.5 L	0.25
MW-13D	07/08/14	0.5 L	0.25	0.5 L	0.25
MW-13D	10/29/14	0.5 L	0.25	0.5 L	0.25
MW-13D	01/12/15	0.5 L	0.25	0.5 L	0.25
MW-13D	04/20/15	0.5 L	0.25	0.5 L	0.25
MW-13D	07/30/15	0.5 L	0.25	0.5 L	0.25
MW-13D	10/13/15	0.5 L	0.25	0.5 L	0.25
MW-13D	01/13/16	0.5 L	0.25	0.5 L	0.25
MW-13D	04/19/16	0.5 L	0.25	0.5 L	0.25
MW-13D	07/06/16	0.5 L	0.25	0.5 L	0.25
MW-13D	10/10/16	0.5 L	0.25	0.5 L	0.25
No. Analyzed		20		20	
No. Detect		0		0	
Minimum conc.			0.25		0.25
Maximum conc.			0.25		0.25
Average conc.			0.25		0.25
Distribution			NC		NC
UCL 95			NC		NC

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Monitoring Well	Date	1,4-Dichlorobenzene		Chlorobenzene	
		Result	Conc.	Result	Conc.
MW-13S					
MW-13S	01/27/12	0.5 L	0.25	0.5 L	0.25
MW-13S	04/24/12	0.5 L	0.25	0.5 L	0.25
MW-13S	07/17/12	0.5 L	0.25	0.5 L	0.25
MW-13S	10/10/12	0.5 L	0.25	0.5 L	0.25
MW-13S	01/15/13	0.5 L	0.25	0.5 L	0.25
MW-13S	04/23/13	0.5 L	0.25	0.5 L	0.25
MW-13S	07/26/13	0.5 L	0.25	0.5 L	0.25
MW-13S	10/08/13	0.5 L	0.25	0.5 L	0.25
MW-13S	01/06/14	0.5 L	0.25	0.5 L	0.25
MW-13S	04/09/14	0.5 L	0.25	0.5 L	0.25
MW-13S	07/08/14	0.5 L	0.25	0.5 L	0.25
MW-13S	10/29/14	0.5 L	0.25	0.5 L	0.25
MW-13S	01/12/15	0.5 L	0.25	0.5 L	0.25
MW-13S	04/20/15	0.5 L	0.25	0.5 L	0.25
MW-13S	07/30/15	0.5 L	0.25	0.5 L	0.25
MW-13S	10/13/15	0.5 L	0.25	0.5 L	0.25
MW-13S	01/13/16	0.5 L	0.25	0.5 L	0.25
MW-13S	04/19/16	0.5 L	0.25	0.5 L	0.25
MW-13S	07/06/16	0.5 L	0.25	0.5 L	0.25
MW-13S	10/11/16	0.5 L	0.25	0.5 L	0.25
No. Analyzed		20		20	
No. Detect		0		0	
Minimum conc.			0.25		0.25
Maximum conc.			0.25		0.25
Average conc.			0.25		0.25
Distribution			NC		NC
UCL 95			NC		NC

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Monitoring Well	Date	1,4-Dichlorobenzene		Chlorobenzene	
		Result	Conc.	Result	Conc.
MW-15S					
MW-15S	01/25/12	0.5 L	0.25	0.5 L	0.25
MW-15S	07/17/12	0.5 L	0.25	0.5 L	0.25
MW-15S	01/14/13	0.5 L	0.25	0.5 L	0.25
MW-15S	07/25/13	0.5 L	0.25	0.5 L	0.25
MW-15S	01/07/14	0.5 L	0.25	0.5 L	0.25
MW-15S	07/09/14	0.5 L	0.25	0.5 L	0.25
MW-15S	10/28/14	0.5 L	0.25	0.5 L	0.25
MW-15S	01/12/15	0.5 L	0.25	0.5 L	0.25
MW-15S	04/20/15	0.5 L	0.25	0.5 L	0.25
MW-15S	07/30/15	0.5 L	0.25	0.5 L	0.25
MW-15S	10/13/15	0.5 L	0.25	0.5 L	0.25
MW-15S	01/13/16	0.5 L	0.25	0.5 L	0.25
MW-15S	04/18/16	0.5 L	0.25	0.5 L	0.25
MW-15S	07/06/16	0.5 L	0.25	0.5 L	0.25
MW-15S	10/10/16	0.5 L	0.25	0.5 L	0.25
No. Analyzed		15		15	
No. Detect		0		0	
Minimum conc.			0.25		0.25
Maximum conc.			0.25		0.25
Average conc.			0.25		0.25
Distribution			NC		NC
UCL 95			NC		NC

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Monitoring Well	Date	1,4-Dichlorobenzene		Chlorobenzene	
		Result	Conc.	Result	Conc.
MW-17S					
MW-17S	01/25/12	0.5 L	0.25	0.5 L	0.25
MW-17S	04/25/12	0.5 L	0.25	0.5 L	0.25
MW-17S	07/17/12	0.5 L	0.25	0.5 L	0.25
MW-17S	10/10/12	0.5 L	0.25	0.5 L	0.25
MW-17S	01/15/13	0.5 L	0.25	0.5 L	0.25
MW-17S	04/24/13	0.5 L	0.25	0.5 L	0.25
MW-17S	07/25/13	0.5 L	0.25	0.5 L	0.25
MW-17S	10/10/13	0.5 L	0.25	0.5 L	0.25
MW-17S	01/09/14	0.5 L	0.25	0.5 L	0.25
MW-17S	04/08/14	0.5 L	0.25	0.5 L	0.25
MW-17S	07/08/14	0.5 L	0.25	0.5 L	0.25
MW-17S	10/28/14	0.5 L	0.25	0.5 L	0.25
MW-17S	01/12/15	0.5 L	0.25	0.5 L	0.25
MW-17S	04/20/15	0.5 L	0.25	0.5 L	0.25
MW-17S	07/30/15	0.5 L	0.25	0.5 L	0.25
MW-17S	10/13/15	0.5 L	0.25	0.5 L	0.25
MW-17S	01/12/16	0.5 L	0.25	0.5 L	0.25
MW-17S	04/19/16	0.5 L	0.25	0.5 L	0.25
MW-17S	07/06/16	0.5 L	0.25	0.5 L	0.25
MW-17S	10/13/16	0.5 L	0.25	0.5 L	0.25
No. Analyzed		20		20	
No. Detect		0		0	
Minimum conc.			0.25		0.25
Maximum conc.			0.25		0.25
Average conc.			0.25		0.25
Distribution			NC		NC
UCL 95			NC		NC

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Monitoring Well	Date	1,4-Dichlorobenzene		Chlorobenzene	
		Result	Conc.	Result	Conc.
MW-18S					
MW-18S	01/25/12	0.5 L	0.25	0.5 L	0.25
MW-18S	07/18/12	0.5 L	0.25	0.5 L	0.25
MW-18S	01/14/13	0.5 L	0.25	0.5 L	0.25
MW-18S	07/23/13	0.5 L	0.25	0.5 L	0.25
MW-18S	01/09/14	0.5 L	0.25	0.5 L	0.25
MW-18S	07/09/14	0.5 L	0.25	0.5 L	0.25
MW-18S	10/27/14	0.5 L	0.25	0.5 L	0.25
MW-18S	01/12/15	0.5 L	0.25	0.5 L	0.25
MW-18S	04/20/15	0.5 L	0.25	0.5 L	0.25
MW-18S	07/30/15	0.5 L	0.25	0.5 L	0.25
MW-18S	10/13/15	0.5 L	0.25	0.5 L	0.25
MW-18S	01/11/16	0.5 L	0.25	0.5 L	0.25
MW-18S	04/19/16	0.5 L	0.25	0.5 L	0.25
MW-18S	07/06/16	0.5 L	0.25	0.5 L	0.25
MW-18S	10/11/16	0.5 L	0.25	0.5 L	0.25
No. Analyzed		15		15	
No. Detect		0		0	
Minimum conc.			0.25		0.25
Maximum conc.			0.25		0.25
Average conc.			0.25		0.25
Distribution			NC		NC
UCL 95			NC		NC

Statistical Summary of Groundwater Data - Volatile Organic Compounds
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Monitoring Well	Date	1,4-Dichlorobenzene		Chlorobenzene	
		Result	Conc.	Result	Conc.
FMMW-2					
FMMW-2	01/27/12	0.5 L	0.25	0.5 L	0.25
FMMW-2	04/25/12	0.5 L	0.25	0.5 L	0.25
FMMW-2	07/18/12	0.5 L	0.25	0.5 L	0.25
FMMW-2	10/10/12	0.5 L	0.25	0.5 L	0.25
FMMW-2	01/16/13	0.5 L	0.25	0.5 L	0.25
FMMW-2	04/24/13	0.5 L	0.25	0.5 L	0.25
FMMW-2	07/24/13	0.5 L	0.25	0.5 L	0.25
FMMW-2	10/09/13	0.5 L	0.25	0.5 L	0.25
FMMW-2	01/08/14	0.5 L	0.25	0.5 L	0.25
FMMW-2	04/08/14	0.5 L	0.25	0.5 L	0.25
FMMW-2	07/09/14	0.5 L	0.25	0.5 L	0.25
FMMW-2	10/28/14	0.5 L	0.25	0.5 L	0.25
FMMW-2	01/12/15	0.5 L	0.25	0.5 L	0.25
FMMW-2	04/20/15	0.5 L	0.25	0.5 L	0.25
FMMW-2	07/30/15	0.5 L	0.25	0.5 L	0.25
FMMW-2	10/13/15	0.5 L	0.25	0.5 L	0.25
FMMW-2	01/11/16	0.5 L	0.25	0.5 L	0.25
FMMW-2	04/20/16	0.5 L	0.25	0.5 L	0.25
FMMW-2	07/05/16	0.5 L	0.25	0.5 L	0.25
FMMW-2	10/11/16	0.5 L	0.25	0.5 L	0.25
No. Analyzed		20		20	
No. Detect		0		0	
Minimum conc.			0.25		0.25
Maximum conc.			0.25		0.25
Average conc.			0.25		0.25
Distribution			NC		NC
UCL 95			NC		NC

Notes:
L = below the method reporting limit (MRL)
ND = not detected
NC = not calculated due to less than 50 percent detection frequency or historically no detections
Calculations use half the MRL for non-detected parameters

Volatile Organic Compounds
Statistical Summary of Groundwater Data
Hidden Valley Landfill, Pierce County, Washington

Monitoring Well	Date	1,4-Dichlorobenzene		Chlorobenzene		Tetrachloroethene (PCE)	
		Result	Conc.	Result	Conc.	Result	Conc.
MW-11D(2)							
MW-11D(2)	01/25/12	0.5 L	0.25	0.5 L	0.25	0.5 L	0.25
MW-11D(2)	04/25/12	0.5 L	0.25	0.5 L	0.25	0.9	0.85
MW-11D(2)	07/17/12	0.5 L	0.25	0.5 L	0.25	1.1	1.10
MW-11D(2)	10/10/12	0.5 L	0.25	0.5 L	0.25	0.8	0.80
MW-11D(2)	01/14/13	0.5 L	0.25	0.5 L	0.25	0.5 L	0.25
MW-11D(2)	04/24/13	0.5 L	0.25	0.5 L	0.25	0.9	0.90
MW-11D(2)	07/23/13	0.5 L	0.25	0.5 L	0.25	0.5 L	0.25
MW-11D(2)	10/09/13	0.5 L	0.25	0.5 L	0.25	0.5 L	0.25
MW-11D(2)	01/08/14	0.5 L	0.25	0.5 L	0.25	0.9	0.88
MW-11D(2)	04/08/14	0.5 L	0.25	0.5 L	0.25	0.8	0.77
MW-11D(2)	07/08/14	0.5 L	0.25	0.5 L	0.25	0.7	0.65
MW-11D(2)	10/27/14	0.5 L	0.25	0.5 L	0.25	0.5 L	0.25
MW-11D(2)	01/12/15	0.5 L	0.25	0.5 L	0.25	0.7	0.67
MW-11D(2)	04/20/15	0.5 L	0.25	0.5 L	0.25	0.5 L	0.25
MW-11D(2)	07/30/15	0.5 L	0.25	0.5 L	0.25	0.9	0.85
MW-11D(2)	10/13/15	0.5 L	0.25	0.5 L	0.25	0.8	0.77
MW-11D(2)	01/11/16	0.5 L	0.25	0.5 L	0.25	1.0	0.98
MW-11D(2)	04/19/16	0.5 L	0.25	0.5 L	0.25	0.8	0.82
MW-11D(2)	07/05/16	0.5 L	0.25	0.5 L	0.25	1.0	0.96
MW-11D(2)	10/12/16	0.5 L	0.25	0.5 L	0.25	0.8	0.82
No. Analyzed		20		20		20	
No. Detect		0		0		14	
Minimum conc.			0.25		0.25		0.25
Maximum conc.			0.25		0.25		1.10
Average conc.			0.25		0.25		0.67
Distribution			NC		NC		Neither
UCL 95			NC		NC		1.10*

Notes:
L = below the method reporting limit (MRL)
ND = indicates not detected
NC = not calculated due to less than 50 percent detection frequency or historically no detections
* UCL represents maximum concentration detected because the calculated value was greater than the data sample range or the distribution was neither lognormal nor normal.
Calculations use half the MRL for non-detected parameters

Appendix H

GROUNDWATER OPTIMIZATION REPORT
December 2, 2016

Environmental Consultants
and Contractors

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SCS ENGINEERS

December 2, 2016
File No. 04216002.03

Mohsen Kourehdar, P.E.
Washington Department of Ecology
Toxics Cleanup Program
PO Box 47775
Olympia, WA 98504-7775

Subject: Groundwater Monitoring Optimization Report
Hidden Valley Landfill, Puyallup, Washington

Dear Mohsen:

On behalf of Pierce County Recycling, Composting and Disposal (LRI), SCS Engineers (SCS) presents the following groundwater monitoring optimization report and proposal for an alternate groundwater monitoring program as allowed under WAC 173-351-450 for the Hidden Valley Landfill located in Pierce County, Washington. This proposal is consistent with previous discussions with the Washington Department of Ecology (Ecology) and the Tacoma-Pierce County Health Department (TPCHD), and as described in the Groundwater Monitoring Plan (GWMP) update of August 8, 2014.

The proposed groundwater monitoring program reduces the frequency of groundwater monitoring from quarterly to semi-annually, reduces the number of monitoring locations from 23 to 20 wells, and removes from further monitoring bicarbonate as a redundant parameter with alkalinity and Appendix I metals which are shown little or no value for assessing long-term groundwater quality trends during the ongoing cleanup of the Hidden Valley Landfill.

SITE BACKGROUND

The Hidden Valley Landfill is a closed municipal solid waste (MSW) landfill that began operations in the mid-1960s and accepted waste until December 31, 1998. The landfill is located in central Pierce County at 17925 South Meridian Avenue, Puyallup, Washington. The landfill includes approximately 56 acres of unlined fill and a 30-acre lined cell. The unlined portion of the landfill was closed in phases under WAC 173-304 (Minimum Functional Standards for Solid Waste Handling [MFS]) between 1989 and 1993. The lined portion of the landfill was closed in phases under WAC 173-351 (Criteria for MSW Landfills) between 1998 and 2000.

Post-closure activities are performed consistent with Consent Decree No. 032146876 (January 2004) between the Washington Department of Ecology (Ecology), Pierce County and LRI. The Consent Decree and associated Cleanup Action Plan, Groundwater Monitoring Plan, Post-Closure Plan and Landfill Gas Management Plan address long-term maintenance and monitoring activities at the landfill, establish groundwater points of compliance and cleanup levels, and tie

together the cleanup requirements of WAC 173-340 (Model Toxics Control Act [MTCA]) with the closed landfill requirements of WAC 173-304 and WAC 173-351.

SITE CHARACTERIZATION STUDIES

Groundwater quality investigations at the Hidden Valley Landfill began in 1982. The Hidden Valley Landfill became a U.S. Environmental Protection Agency (EPA) Superfund site in April 1989 due to groundwater detections of nitrate, manganese and volatile organic compounds. Listing on the federal National Priorities List and later on the state Hazardous Sites List required LRI to perform an extensive, multi-phase, Remedial Investigation (RI), Feasibility Study (FS) and Risk Assessment (RA) of the unlined portion of the landfill. Most of the work was performed under Consent Order DE 86-S173 which was executed in 1987 and amended by agreement of the parties in 1988. The RI/FS and RA were finalized in 1992.

In January 2004, Consent Decree No. 032146876 was finalized and signed. In preparation for the 2004 Consent Decree, LRI, Pierce County, the TPCHD and Ecology met over a period of years to discuss remedial action alternatives, groundwater monitoring results, and data gaps. These discussions led Ecology to require an additional hydrogeologic evaluation to further confirm the RI and consider off-site groundwater quality, time trends, and results for both wet and dry seasons. The results of this study were presented in the Hidden Valley Landfill Hydrogeologic Report Addendum (December 1998), which provides extensive discussion of the hydrogeologic features and geochemistry of the Hidden Valley Landfill site. The Consent Decree and associated Cleanup Action Plan address long-term maintenance and monitoring activities at the landfill and establish groundwater cleanup levels.

HYDROGEOLOGY

The Hidden Valley Landfill is underlain by recessional glacial outwash (sand and gravel) of Vashon age. The site lies within a former glacial melt-water channel that trends in an east-west direction.

Three aquifers underlie the Hidden Valley Landfill. The aquifers are referred to as the Shallow Perched Aquifer, the Upper Regional Aquifer, and the Lower Regional Aquifer. The Shallow Perched Aquifer is an unconfined (water table) aquifer that occurs within the Vashon recessional outwash deposit. The Shallow Perched Aquifer is the uppermost-saturated unit at the site. Groundwater flow in the Shallow Perched Aquifer at the site is to the northwest with local components to the north and west. The downgradient extent of the Shallow Perched Aquifer appears to be limited.

The Upper Regional Aquifer is present within Vashon advance outwash deposits. An intermittent aquitard, referred to as the Vashon till aquitard, is present between the Shallow Perched Aquifer and the Upper Regional Aquifer. Groundwater flow, water level gradients, and seasonal water level fluctuations in the Upper Regional Aquifer are similar to the Shallow Perched Aquifer.

The Lower Regional Aquifer is present within the Salmon Springs advance outwash deposits. The Lower Regional Aquifer is confined and is separated from the Upper Regional Aquifer by a thick section of low permeability deposits referred to as the Salmon Springs aquitard.

GROUNDWATER QUALITY

Groundwater impacts downgradient of the Hidden Valley Landfill have included dissolved iron and manganese, chloride, ammonia, nitrate, specific conductance, total dissolved solids, and low levels of volatile organic compounds (VOCs) including benzene, chlorobenzene, tetrachloroethene, 1,1-dichloroethane, and 1,4-dichlorobenzene.

Groundwater cleanup levels were established for the Hidden Valley Landfill Cleanup Action Plan using MTCA Method B. Cleanup levels include nitrate (10 mg/L), chloride (250 mg/L), sulfate (250 mg/L), total dissolved solids (500 mg/L), specific conductance (700 µmhos/cm), iron (0.30 mg/L), manganese, (0.05 mg/L), and 1,4-dichlorobenzene (1.82 µg/L).

Over the last five years, water quality results greater than the site-specific cleanup levels have included the following.

- Nitrate
  - Shallow Perched Aquifer ¾ MW-11S, MW-12S, MW-13S, MW-17S, MW-18S, FMMW-2
- Total Dissolved Solids (TDS)
  - Shallow Perched Aquifer ¾ MW-11S
- Dissolved Iron
  - Shallow Perched Aquifer ¾ MW-14S, MW-15S, MW-17S, MW-23S, MW-28S
  - Upper Regional Aquifer ¾ MW-13D, MW-14D, MW-18D
  - Lower Regional Aquifer ¾ MW-20R, MW-26R
- Dissolved Manganese
  - Shallow Perched Aquifer ¾ MW-12S, MW-13S, MW-14S, MW-15S, MW-17S, MW-23S, FMMW-2.
  - Upper Regional Aquifer ¾ MW-13D, MW-14D, MW-15D
  - Lower Regional Aquifer ¾ MW-14R, MW-26R

Dissolved iron and manganese results for the Lower Regional Aquifer are interpreted to be natural background water quality. This interpretation is based on an overall assessment of groundwater quality data, which include low concentrations of inorganic parameters and an absence of VOCs.

In addition to the parameters listed above, tetrachloroethene has slightly exceeded the WAC 173-200 groundwater quality criteria of 0.80 µg/L on several occasions at MW-11D(2), with a maximum concentration of 1.1 µg/L.

TOTAL AND DISSOLVED METALS TESTING RESULTS

Eight quarters of Appendix I total and dissolved metals testing was conducted beginning with the third quarter (July) of 2014 and completed with the second quarter (April) of 2016. Twenty three monitoring wells were tested with a total of 175 samples collected (nine samples were not collected during the two-year long study due to low water levels). A summary of total and dissolved metals testing results is shown on Table A1 in Attachment A.

Including the third quarter 2016 monitoring event, where only total metals analyses were performed, total barium, at 74 percent detected, and total zinc, at 27 percent detected, are the only Appendix I metals that were detected above the method reporting limit (MRL) in greater than 10 percent of the collected groundwater samples. Of the remaining total metals analyzed, beryllium, selenium, silver and thallium were not detected, and low-level detections were reported for antimony (4 samples), arsenic (5 samples), cadmium (1 sample), chromium (6 samples), cobalt (3 samples), copper (17 samples), lead (11 samples), nickel (8 samples), thallium (3 samples), and vanadium (6 samples). Table A2 in Attachment A provides a summary of total metals data including background (upgradient) water quality and summary statistics through the third quarter of 2016.

On a few occasions, low levels of dissolved barium or zinc were detected without a corresponding total metal detection, but in most cases dissolved metal detections had an associated total metal detection. Low-levels of cadmium, chromium, cobalt, copper, lead, nickel, and vanadium were only detected as total metals. In general, when both total and dissolved metals concentrations were reported, the results were similar with relative percent differences of less than 20 percent. When relative percent differences greater than 20 percent were recorded, the total metal values were generally greater than the dissolved metal values, although the dissolved zinc values were greater than total zinc values on three occasions.

Antimony and cadmium were only detected at MW-23S and chromium, cobalt and vanadium were only detected at MW-23S and MW-28S. These monitoring wells are screened in the Shallow Perched Aquifer and are located within the Paul Bunyan Rifle Range. On several occasions there was insufficient water to collect a sample from MW-23S and/or MW-28S, and the samples that were collected were noted to be turbid (total suspended solids of up to 2,000 mg/L and 340 mg/L, respectively). The presence of suspended solids in the samples collected from these two wells likely resulted in increased total metals concentrations.

All total metals detections were less than the WAC 173-200 Water Quality Criteria, where criteria are established, except for arsenic at MW-23S (1 samples), MW-28S (1 sample) and MW 14D (3 samples), chromium at MW-23S (1 sample), and lead at MW-23S (2 samples). As noted previously, the total metals results from MW-23S and MW-28S appear to have been affected by the presence of suspended solids in the samples. In addition, all arsenic detections were less than the current drinking water standard of 0.01mg/L. An overall assessment of the total and dissolved metals testing results indicates that groundwater contamination of Appendix I metals from the Hidden Valley Landfill has not occurred.

GROUNDWATER MONITORING FREQUENCY

The groundwater monitoring program at the Hidden Valley Landfill has provided over 34 years of groundwater monitoring data. After completion of the RI/FS and the subsequent Hydrogeologic Report Addendum, a Groundwater Compliance Monitoring Plan (GWMP) was submitted to and approved by the TPCHD and Ecology in February 2001 in conjunction with the Consent Decree and Cleanup Action Plan. Subsequently, certain modifications were approved by the TPCHD and Ecology in 2003 (see TPCHD letter dated April 21, 2003). The groundwater monitoring program from 2003 until the third quarter of 2014 consisted of the following:

- January Wet Season Annual Event; 13 wells in the Shallow Perched Aquifer, 7 wells in the Upper Regional Aquifer, and 3 wells in the Lower regional Aquifer (23 wells total)

- July Dry Season Semi-Annual Event; 13 wells in the Shallow Perched Aquifer and 7 wells in the Upper Regional Aquifer (20 wells total)

- April and October Quarterly Events; 8 wells in the Shallow Perched Aquifer and 4 wells in the Upper Regional Aquifer (12 wells total)

As noted above, the GWMP was updated in August of 2014. The 2014 updated plan included the collection of eight (8) rounds of total and dissolved metals data for the 15 metals listed in Appendix I of WAC 173-351 from 23 monitoring wells.

At this time, semi-annual groundwater monitoring is proposed. Groundwater samples will be collected in January (wet season) and August (dry season) each year. The January monitoring event will document groundwater conditions during high water table conditions when the uppermost aquifer will be near to or in contact with the bottom of the unlined portion of the landfill. Groundwater monitoring results from January typically have the highest concentrations of nitrate. The August monitoring event will document groundwater conditions during lower water table conditions when the uppermost aquifer will be below the bottom of the unlined portion of the landfill. The semi-annual monitoring events will bracket annual seasonal variations in groundwater quality.

GROUNDWATER MONITORING NETWORK

The groundwater monitoring network currently includes groundwater sampling at 23 monitoring wells (13 wells completed within the Shallow Perched Aquifer, 7 wells completed in the Upper Regional Aquifer, and 3 wells completed in the Lower Regional Aquifer), as well as two drinking water supply wells and water level measurements at eleven (11) additional monitoring wells. Monitoring wells MW-10S and 10D are upgradient from the landfill and represent background water quality conditions. Figures 1 shows the current monitoring network.

Three monitoring locations screened within the Shallow Perched Aquifer, MW-23S, MW-25S, and MW-28S, are proposed for removal from the monitoring network. Monitoring wells MW-12S, MW-13S, and MW-17S are located closer to, and therefore better represent

groundwater quality downgradient of the landfill than MW-23S and MW-28S. In addition, MW-28S is not screened deep enough to allow for proper well development and consistent water volumes, and MW-23S was partially backfilled with gravel when the well casing separated while removing the well cap during a monitoring event in 2013. Therefore, MW-23S and MW-28S typically have very low, or insufficient, water volumes for sampling which results in either no or turbid groundwater samples. MW-25S is located approximately 975 feet north of the landfill and does not display indications of water quality impacts associated with the landfill.

The seven monitoring wells screened within the Upper Regional Aquifer and the three monitoring wells screened within the Lower Regional Aquifer will be retained. The combined monitoring network will consist of 20 monitoring wells. A complete round of water level measurements will be collected for each monitoring event.

PARAMETER OPTIMIZATION

The parameter optimization process selects parameters that are effective for monitoring long-term water quality trends associated with cleanup of the landfill and eliminates those parameters that do not provide clear indications of changing long-term water quality trends. Using this process, parameters are removed from further monitoring if they are 1) not detected with significant frequency in leachate, 2) are present at low levels in leachate, 3) have a low degree of contrast between concentrations in leachate and background groundwater quality, and/or 4) have low mobility in the subsurface.

Consistent with WAC 173-351-450(3), the parameter optimization evaluation included an assessment of the following:

a) Leachate monitoring results;

b) The types, quantities, and concentrations of constituents in wastes managed at the municipal solid waste (MSW) landfill unit;

c) The mobility, stability, and persistence of waste constituents or their reaction products in the unsaturated zone beneath the MSW landfill unit;

d) The detectability of indicator parameters, waste constituents, and reaction products in groundwater; and

e) The concentration and coefficients of variation of monitoring parameters or constituents in the groundwater background.

A summary of the parameter optimization evaluation is presented in Attachment B. Using the approach summarized in Attachment B and discussed further in the following paragraphs, all of the Appendix I metals are proposed for removal from the monitoring program. The average leachate concentration of each of the Appendix I metals is less than one milligram per liter (mg/L) and most of the metals have high retardation factors which limits mobility in the subsurface. In addition, other than barium and zinc, the detection frequency in groundwater is very low (less than 10 percent) and therefore, these parameters would have little or no value for

assessing long-term ground water quality trends during the ongoing cleanup of the Hidden Valley Landfill.

For the Hidden Valley Landfill, concentrations of groundwater total alkalinity and bicarbonate alkalinity are always equal. Therefore, since these analyses are redundant, the removal of bicarbonate alkalinity from future testing is proposed.

Leachate Monitoring Results

Leachate analytical data from the East Liner Area for the period of March 2000 through January 2016 and from two samples from the unlined area of waste collected in 1988 and 1989 were used to generate a database (see Attachment C). Leachate concentrations were compared to groundwater quality data to determine which parameters are best suited for monitoring long-term groundwater quality over time. This method, which is outlined in the ASTM Standard Guide for Optimization of Ground Water Monitoring Constituents for Detection Monitoring Programs for RCRA Waste Disposal Facilities (ASTM D7045-04, 2004), included an assessment of the following:

- Detection frequency in leachate;
- Concentration in leachate;
- Degree of contrast between leachate concentrations and groundwater concentrations; and
- Mobility.

Detection Frequency in Leachate. Parameters detected in leachate at a frequency of 10 percent or less are considered poor indicators for monitoring long-term groundwater quality.

Concentration in Leachate. Parameters detected in leachate at frequencies greater than 10 percent, but at concentrations less than 1.0 milligram per liter (mg/L), are considered poor indicators for monitoring long-term groundwater quality.

Degree of Contrast. Water quality data for the period of July 2015 through August 2016 were compared to average leachate concentrations. Leachate parameters with 10 times or less of a degree of contrast compared to background groundwater quality data are considered poor indicators for monitoring long-term groundwater quality.

Parameter Mobility. Parameter mobility is the ease with which a given constituent can migrate through the subsurface. Some parameters are easily bound to mineral particulates, organic molecules, or other substances that impede transport under standard geochemical conditions. Many heavy metals such as lead, copper, and nickel, are more strongly absorbed than the major metals such as sodium, calcium, and magnesium. Partition coefficients (Kd) are determined by the ratio of sorbed metal concentration (expressed in mg/kg) to dissolved metal concentration (expressed in mg/L) at equilibrium. For a particular metal, Kd values in soils are dependent on various geochemical characteristics of the soil and pore water. A Kd value of 1.0 indicates an equal concentration distribution between soil and water. Kd values are used to formulate

contaminant retardation factors (Rf) which are commonly used in transport models to describe the rate of contaminant transport relative to that of groundwater. For this assessment, metals with a Kd value greater than 2.5 are considered to have low mobility.

Types, Quantities, and Concentrations of Constituents in Wastes

Wastes disposed of at the Hidden Valley Landfill included municipal solid waste, demolition wastes, commercial waste, industrial wastes, and small quantities of bulk liquids and sludge. The primary components of the waste are organic material, inert material, and water.

Mobility, Stability, and Persistence of Waste Constituents or their Reaction Products

Landfill age affects chemical conditions found within the landfill and, therefore, leachate quality characteristics. In general, as landfills age the leachate becomes more stable with generally lower concentrations of contaminants such as heavy metals and a low BOD/COD ratio. In contrast, the concentration of ammonia does not tend to decrease, and often constitutes a long-term pollutant in leachate. The attached leachate database provides a representative range of expected leachate quality from the Hidden Valley Landfill and includes data from the East Liner Area and the unlined area of the landfill.

Detectability of Indicator Parameters, Waste Constituents, and Reaction Products in Groundwater

The groundwater monitoring network provides for regular monitoring for the presence of leachate indicator parameters such as chloride, ammonia, nitrate, specific conductance, and total dissolved solids. These constituents are used as indicators for monitoring the long-term cleanup of groundwater quality because they are consistently present in the leachate, are present in low concentrations in the groundwater, dissolve readily in water and are mobile.

Concentrations and Coefficients of Variation in Background Groundwater

No Appendix I metals were reported in the samples collected from background wells MW-10S and MW-10D, except one low-level detection of barium in each well.

GROUNDWATER MONITORING PROGRAM OPTIMIZATION SUMMARY

A parameter optimization study was completed for the groundwater monitoring program at the Hidden Valley Landfill. Based on the results of the study, proposed modifications to the groundwater monitoring program include the following:

1. The monitoring frequency will be changed form a quarterly to a semi-annual schedule, with monitoring events in January and August each year.

2. The groundwater monitoring network will include the following 20 wells (see Figure 2):

   Shallow Perched Aquifer
   MW-10S (background), MW-11S, MW-12S, MW-13S, MW-14S, MW-15S, MW-17S, MW-18, FMMW-1, FMMW-2.

   Upper Regional Aquifer
   MW-10D (background), MW-11D(2), MW-12D, MW-13D, MW-14D, MW-15D, MW-18D

   Lower Regional Aquifer
   MW-14R, MW-20R, MW-26R

3. The following parameters will be included for long-term monitoring:

   Appendix I, Volatile Organic Compounds
   no changes

   Appendix I, Inorganic Constituents
   nitrate (elimination of Appendix I total metals)

   Appendix II, Field Parameters:
   pH, specific conductance, temperature, static water level (no changes)

   Appendix II, Geochemical Indicator Parameters:
   alkalinity, chloride, sulfate, total suspended solids (TSS), calcium, sodium, magnesium, potassium, iron, and manganese (elimination of bicarbonate alkalinity)

   Appendix II, Leachate Indicator Parameters:
   ammonia, total dissolved solids, and total organic carbon (no changes)

CLOSING

Upon approval of the proposed alternate groundwater monitoring approach, the Groundwater Monitoring Plan will be revised. We anticipate beginning this program with the wet season monitoring event in January of 2017.

Please don't hesitate to call or email if you have any questions regarding the proposed alternate groundwater monitoring program.

Sincerely,

Kevin Lakey, PE, LHG
Project Director
SCS ENGINEERS

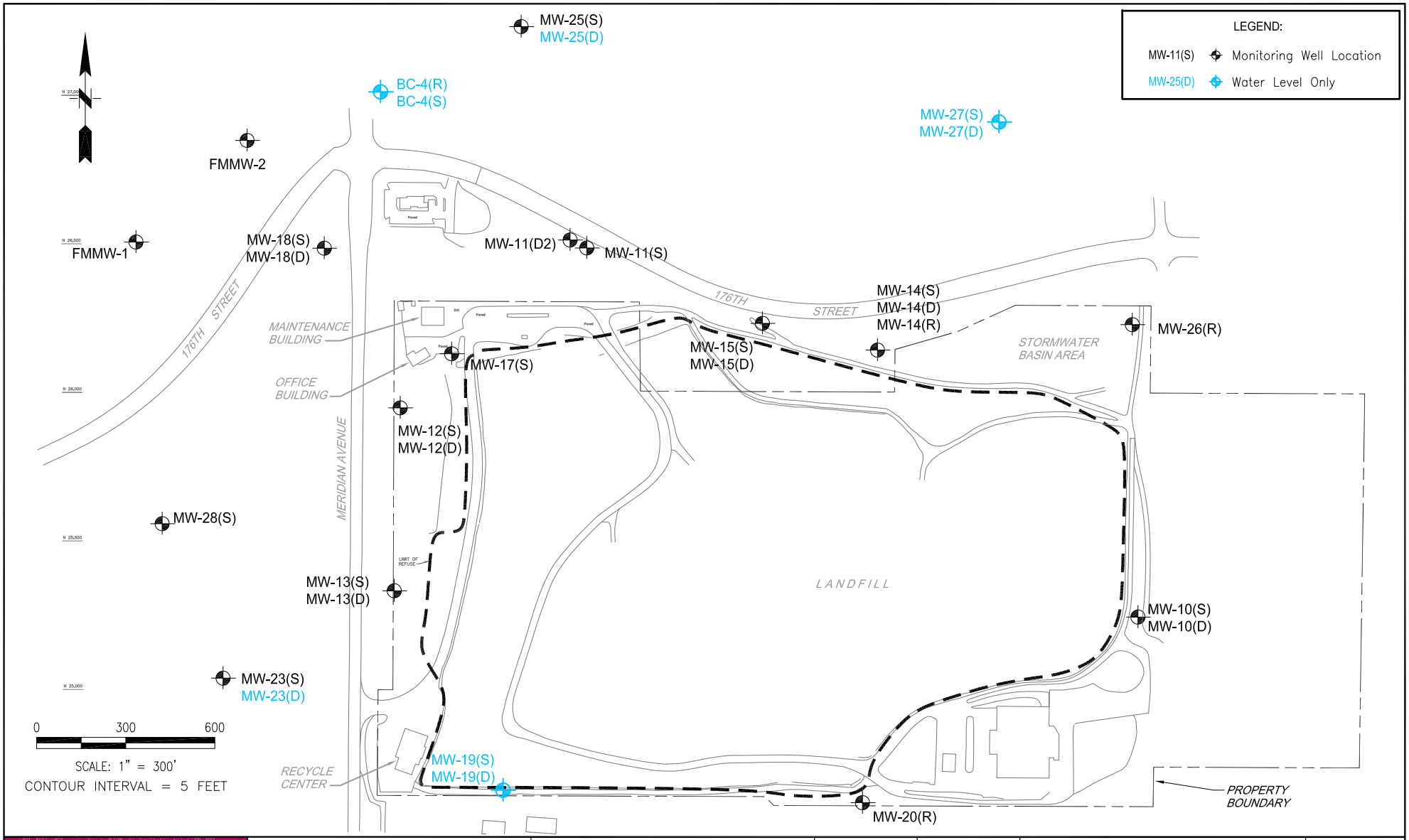
Samuel Adlington, PE
Project Engineer
SCS ENGINEERS

Attachments:

Figure 1:	Current Groundwater Monitoring Network
Figure 2:	Proposed Groundwater Monitoring Network
Attachment A:	Summary of Total and Dissolved Metals Testing Results
Attachment B:	Parameter Optimization Summary
Attachment C:	Leachate Quality Database

cc: David Bosch, TPCHD
Rick Johnston, Pierce County
George Duvendack, LRI
Greg Burrington, LRI
Jody Snyder, LRI

Figures



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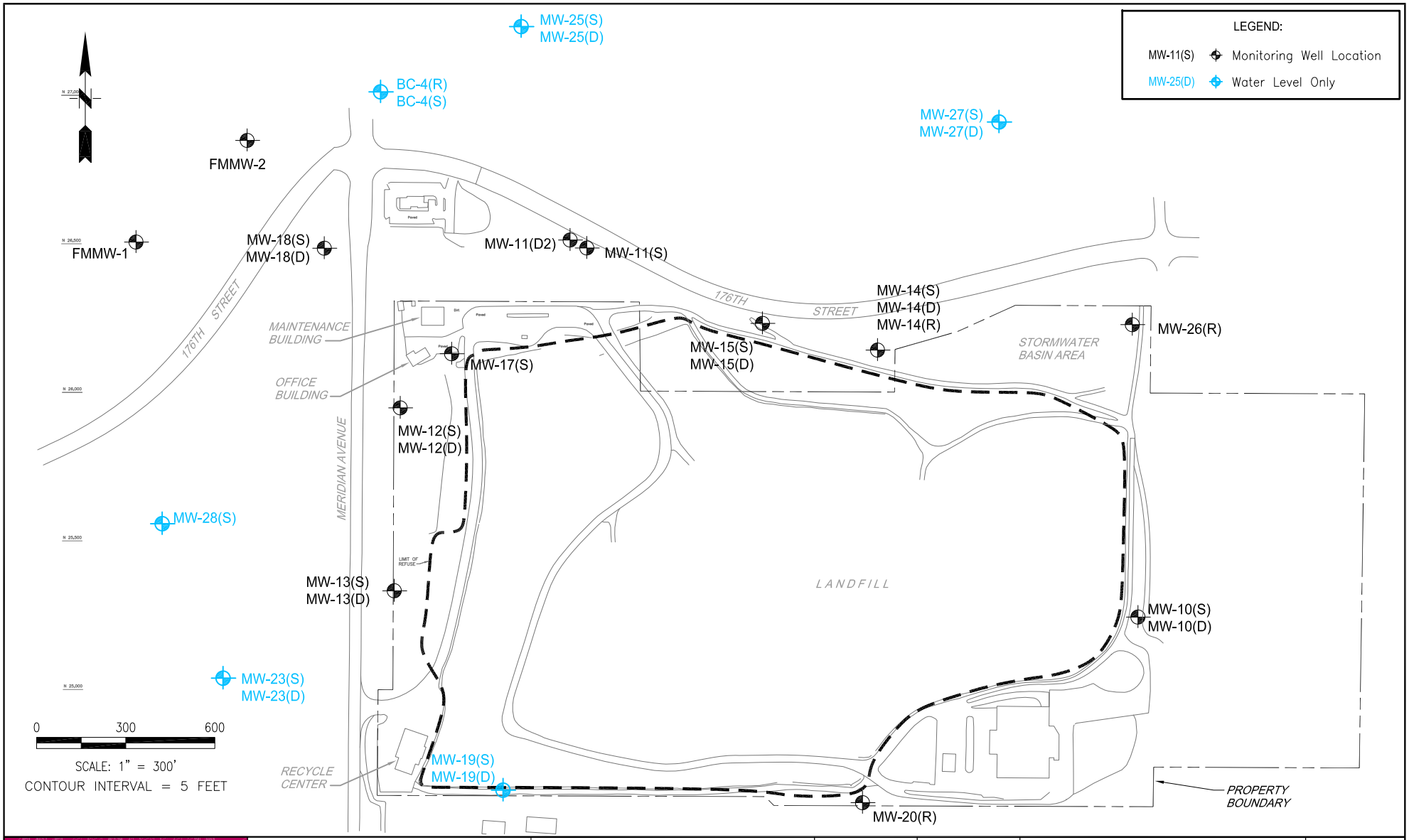
PROJECT NO. 04216002.03	DES BY KGL	CURRENT GROUNDWATER MONITORING NETWORK	DATE DECEMBER 2016
SCALE AS SHOWN	CHK BY S.G.	HIDDEN VALLEY LANDFILL PIERCE COUNTY, WASHINGTON	FIGURE 1
CAD FILE FIGURE 1	APP BY KGL		



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PROJECT NO. 04216002.03	DES BY KGL	PROPOSED GROUNDWATER MONITORING NETWORK HIDDEN VALLEY LANDFILL PIERCE COUNTY, WASHINGTON	DATE DECEMBER 2016
SCALE AS SHOWN	CHK BY S.G.		FIGURE 2
CAD FILE FIGURE 2	APP BY KGL		

Attachment A

Summary of Total and Dissolved Metals Testing Results

Table A1. Summary of Total and Dissolved Metals Data
Groundwater (mg/L)
Hidden Valley Landfill, Pierce County, Washington

Well ID	Date	TSS	Antimony (Sb)		Arsenic (As)		Barium (Ba)			Beryllium (Be)		Cadmium (Cd)		Chromium (Cr)		Cobalt (Co)		Copper (Cu)		Lead (Pb)		Nickel (Ni)		Selenium (Se)		Silver (Ag)		Thallium (Tl)		Vanadium (Vn)		Zinc (Zn)		
			D	T	D	T	D	T		D	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	
Typical MRL			0.002	0.002	0.005	0.005	0.005	0.005	RPD (%)	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.01	0.01	0.01	0.002	0.002	0.02	0.02	0.005	0.005	0.01	0.01	0.005	0.005	0.01	0.01	0.01	0.01	RPD (%)
WAC 173-200 Criteria			–	–	0.00005	0.00005	–	1.0		–	–	–	0.01	–	0.05	–	–	–	1.0	–	0.05	–	–	–	0.01	–	0.05	–	–	–	–	–	5.0	
Shallow Perched Aquifer																																	
(BG) MW-10S	7/10/2014	*	*	*	*	*	*	0.0022	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
(BG) MW-10S	10/29/2014	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
(BG) MW-10S	1/12/2015	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
(BG) MW-10S	4/20/2015	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
(BG) MW-10S	7/30/2015	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
(BG) MW-10S	10/13/2015	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
(BG) MW-10S	1/13/2016	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
(BG) MW-10S	4/18/2016	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-11S	7/8/2014	*	*	*	*	*	0.0110	0.0100	9.5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.046	0.047	2.2	
MW-11S	10/27/2014	*	*	*	*	*	0.0090	0.0100	10.5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.130	0.120	8.0	
MW-11S	1/14/2015	*	*	*	*	*	0.0094	0.0100	6.2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.017	0.017	0.0	
MW-11S	4/21/2015	*	*	*	*	*	0.0093	0.0110	16.7	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.028	0.031	10.2	
MW-11S	7/29/2015	*	*	*	*	*	0.0100	0.0100	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**	
MW-11S	10/14/2015	*	*	*	*	*	0.0089	0.0110	21.1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**	
MW-11S	1/11/2016	*	*	*	*	*	0.0100	0.0110	9.5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**	
MW-11S	4/19/2016	*	*	*	*	*	0.0078	0.0077	1.3	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**	
MW-12S	July (3Q 2014)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
MW-12S	Oct. (4Q 2014)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
MW-12S	1/15/2015	21	*	*	*	*	0.0170	0.0200	16.2	*	*	*	*	*	*	*	*	*	0.014	*	0.003	*	*	*	*	*	*	*	*	0.022	0.027	20.4	
MW-12S	4/20/2015	4.8	*	*	*	*	0.0140	0.0190	30.3	*	*	*	*	*	*	*	*	*	0.014	*	0.004	*	*	*	*	*	*	*	*	*	0.040	**	
MW-12S	7/31/2015	26	*	*	*	*	0.0180	0.0260	36.4	*	*	*	*	*	*	*	*	*	0.015	*	*	*	*	*	*	*	*	*	*	*	0.012	**	
MW-12S	10/19/2015	99	*	*	*	*	0.0160	0.0270	51.2	*	*	*	*	*	*	*	*	*	0.019	*	*	*	*	*	*	*	*	*	*	0.042	0.180	124.3	
MW-12S	1/14/2016	5.2	*	*	*	*	0.0150	0.0140	6.9	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.230	0.560	83.5	
MW-12S	4/19/2016	4.4	*	*	*	*	0.0220	0.0230	4.4	*	*	*	*	*	*	*	*	*	0.010	*	*	*	*	*	*	*	*	*	*	0.270	0.290	7.1	
MW-13S	7/8/2014	*	*	*	*	*	0.0110	0.0110	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.031	0.026	17.5	
MW-13S	10/29/2014	*	*	*	*	*	0.0063	0.0073	14.7	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.024	*	**	
MW-13S	1/13/2015	*	*	*	*	*	0.0650	0.0650	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.020	0.018	10.5	
MW-13S	4/20/2015	*	*	*	*	*	0.0072	0.0077	6.7	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.018	0.019	5.4	
MW-13S	7/30/2015	*	*	*	*	*	0.0099	0.0097	2.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**	
MW-13S	10/14/2015	*	*	*	*	*	*	0.0110	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**	
MW-13S	1/13/2016	*	*	*	*	*	0.0110	0.0098	11.5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**	
MW-13S	4/19/2016	*	*	*	*	*	0.0120	0.0120	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**	
MW-14S	7/9/2014	*	*	*	*	*	*	0.0039	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**	
MW-14S	10/29/2014	5.2	*	*	*	*	0.0060	0.0068	12.5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**	
MW-14S	1/12/2015	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**	
MW-14S	4/20/2015	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**	
MW-14S	7/27/2015	*	*	*	*	*	0.0065	0.0065	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**	
MW-14S	10/15/2015	*	*	*	*	*	0.0088	0.0089	1.1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**	
MW-14S	1/13/2016	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**	
MW-14S	4/18/2016	*	*	*	*	*	0.0056	0.0065	14.9	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**	
MW-15S	7/9/2014	*	*	*	*	*	0.0100	0.0099	1.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.049	0.044	10.8	
MW-15S	10/28/2014	*	*	*	*	*	0.0140	0.0150	6.9	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.061	0.065	6.3	
MW-15S	1/13/2015	*	*	*	*	*	0.0130	0.0120	8.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.063	0.061	3.2	
MW-15S	4/21/2015	*	*	*	*	*	0.0110	0.0110	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.051	0.049	4.0	
MW-15S	7/27/2015	*	*	*	*	*	0.0120	0.0130	8.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**	
MW-15S	10/13/2015	*	*	*	*	*	0.0160	0.0150	6.5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**	
MW-15S	1/13/2016	*	*	*	*	*	0.0082	0.0098	17.8	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**	
MW-15S	4/18/2016	4.4	*	*	*	*	0.0110	0.0110	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**	
MW-17S	7/8/2014	*	*	*	*	*	0.0190	0.0180	5.4	*	*	*	*	*	*	*	*	*	0.002	*	*	*	0.002	*	*	*	*	*	*	0.043	0.044	2.3	
MW-17S	10/28/2014	*	*	*	*	*	0.0230	0.0220	4.4	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.086	0.086	0.0	
MW-17S	1/13/2015	*	*	*	*	*	0.0220	0.0230	4.4	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.033	0.032	3.1	
MW-17S	4/23/2015	*	*	*	*	*	0.0220	0.0240	8.7	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.050	0.039	24.7	
MW-17S	7/27/2015	*	*	*	*	*	0.0220	0.0230	4.4	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**	
MW-17S	10/15/2015	*	*	*	*	*	0.0230	0.0230	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**	
MW-17S	1/12/2016	*	*	*	*	*	0.0330	0.0300	9.5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**	
MW-17S	4/19/2016	*	*	*	*	*	0.0230	0.0230	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**	

Table A1. Summary of Total and Dissolved Metals Data
Groundwater (mg/L)
Hidden Valley Landfill, Pierce County, Washington

Well ID	Date	TSS	Antimony (Sb)		Arsenic (As)		Barium (Ba)			Beryllium (Be)		Cadmium (Cd)		Chromium (Cr)		Cobalt (Co)		Copper (Cu)		Lead (Pb)		Nickel (Ni)		Selenium (Se)		Silver (Ag)		Thallium (Tl)		Vanadium (Vn)		Zinc (Zn)		
			D	T	D	T	D	T		D	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	
	Typical MRL		0.002	0.002	0.005	0.005	0.005	0.005	RPD (%)	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.01	0.01	0.01	0.002	0.002	0.02	0.02	0.005	0.005	0.01	0.01	0.005	0.005	0.01	0.01	0.01	0.01	RPD (%)
	WAC 173-200 Criteria		–	–	0.00005	0.00005	–	1.0		–	–	–	0.01	–	0.05	–	–	–	1.0	–	0.05	–	–	–	0.01	–	0.05	–	–	–	–	–	5.0	
MW-18S	7/9/2014	*	*	*	*	*	0.0130	0.0120	8.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.019	0.019	0.0
MW-18S	10/27/2014	*	*	*	*	*	0.0120	0.0130	8.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-18S	1/14/2015	*	*	*	*	*	0.0140	0.0140	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-18S	4/23/2015	*	*	*	*	*	0.0130	0.0120	8.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-18S	7/29/2015	*	*	*	*	*	0.0120	0.0110	8.7	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-18S	10/16/2015	*	*	*	*	*	0.0130	0.0120	8.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-18S	1/11/2016	*	*	*	*	*	0.0120	0.0120	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-18S	4/19/2016	*	*	*	*	*	0.0130	0.0120	8.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-23S	7/10/2014	19	*	*	*	*	0.0098	0.0180	59.0	*	*	*	*	*	*	*	*	*	0.005	*	0.049	*	0.003	*	*	*	*	*	*	*	*	0.051	0.100	64.9
MW-23S	Oct. (4Q 2014)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MW-23S	1/15/2015	18	*	*	*	*	0.0072	0.0100	32.6	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.062	0.078	22.9
MW-23S	4/23/2015	180	0.002	0.003	*	*	0.0092	0.0160	54.0	*	*	*	*	*	*	*	*	*	*	*	0.012	*	*	*	*	*	*	*	*	*	*	0.045	0.090	66.7
MW-23S	7/28/2015	2000	*	0.014	*	**0.0290**	0.0068	0.2300	188.5	*	*	*	0.005	*	**0.056**	*	0.019	*	0.200	*	**1.500**	*	0.059	*	*	*	*	*	*	*	*	0.028	2.500	195.6
MW-23S	Oct. (4Q 2015)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MW-23S	1/14/2016	280	*	0.003	*	*	0.0072	0.0330	128.4	*	*	*	*	*	0.006	*	*	*	0.022	*	**0.130**	*	*	*	*	*	*	*	*	*	0.013	0.027	0.370	172.8
MW-23S	4/21/2016	44	*	*	*	*	0.0063	0.0100	45.4	*	*	*	*	*	*	*	*	*	*	*	0.016	*	*	*	*	*	*	*	*	*	*	0.026	0.065	85.7
MW-25S	7/8/2014	*	*	*	*	*	*	0.0027	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.041	0.037	10.3
MW-25S	10/28/2014	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-25S	1/14/2015	*	*	*	*	*	0.0052	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-25S	4/21/2015	8.8	*	*	*	*	*	0.0092	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-25S	7/31/2015	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-25S	10/16/2015	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-25S	1/13/2016	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-25S	4/20/2016	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-28S	July (3Q 2014)	–	–	–	–	–	–	–	**	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MW-28S	Oct. (4Q 2014)	–	–	–	–	–	–	–	**	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MW-28S	Jan. (1Q 2015)	–	–	–	–	–	–	–	**	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MW-28S	4/22/2015	210	*	*	*	*	*	0.0840	**	*	*	*	*	*	0.017	*	0.012	*	0.035	*	0.006	*	0.021	*	*	*	*	*	*	*	0.029	*	0.046	**
MW-28S	July (3Q 2015)	–	–	–	–	–	–	–	**	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MW-28S	Oct. (4Q 2015)	–	–	–	–	–	–	–	**	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MW-28S	1/14/2016	340	*	*	*	*	*	0.0610	**	*	*	*	*	*	0.010	*	*	*	0.021	*	0.005	*	*	*	*	*	*	*	*	*	0.022	*	0.064	**
MW-28S	4/21/2016	140	*	*	*	*	*	0.0210	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.015	0.035	80.0
FMMW-1	7/9/2014	*	*	*	*	*	0.0092	0.0084	9.1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
FMMW-1	10/27/2014	*	*	*	*	*	0.0072	0.0086	17.7	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
FMMW-1	1/14/2015	*	*	*	*	*	0.0067	0.0066	1.5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.038	0.036	5.4
FMMW-1	4/22/2015	*	*	*	*	*	0.0070	0.0073	4.2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
FMMW-1	7/29/2015	*	*	*	*	*	0.0067	0.0067	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
FMMW-1	10/16/2015	*	*	*	*	*	0.0066	0.0069	4.4	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
FMMW-1	1/11/2016	*	*	*	*	*	0.0055	0.0050	9.5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
FMMW-1	4/20/2016	*	*	*	*	*	0.0074	0.0071	4.1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
FMMW-2	7/9/2014	*	*	*	*	*	0.0150	0.0150	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.074	0.100	29.9
FMMW-2	10/28/2014	*	*	*	*	*	0.0180	0.0190	5.4	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.039	0.037	5.3
FMMW-2	1/14/2015	*	*	*	*	*	0.0200	0.0200	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.072	0.041	54.9
FMMW-2	4/22/2015	*	*	*	*	*	0.0150	0.0160	6.5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.085	0.083	2.4
FMMW-2	7/29/2015	*	*	*	*	*	0.0160	0.0190	17.1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
FMMW-2	10/16/2015	*	*	*	*	*	0.0160	0.0170	6.1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
FMMW-2	1/11/2016	*	*	*	*	*	0.0230	0.0230	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
FMMW-2	4/20/2016	*	*	*	*	*	0.0150	0.0150	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**

Table A1. Summary of Total and Dissolved Metals Data
Groundwater (mg/L)
Hidden Valley Landfill, Pierce County, Washington

Well ID	Date	TSS	Antimony (Sb)		Arsenic (As)		Barium (Ba)			Beryllium (Be)		Cadmium (Cd)		Chromium (Cr)		Cobalt (Co)		Copper (Cu)		Lead (Pb)		Nickel (Ni)		Selenium (Se)		Silver (Ag)		Thallium (Tl)		Vanadium (Vn)		Zinc (Zn)		
			D	T	D	T	D	T		D	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	
Typical MRL			0.002	0.002	0.005	0.005	0.005	0.005	RPD (%)	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.01	0.01	0.01	0.002	0.002	0.02	0.02	0.005	0.005	0.01	0.01	0.005	0.005	0.01	0.01	0.01	0.01	RPD (%)
WAC 173-200 Criteria			–	–	0.00005	0.00005	–	1.0		–	–	–	0.01	–	0.05	–	–	–	1.0	–	0.05	–	–	–	0.01	–	0.05	–	–	–	–	–	5.0	
Upper Regional Aquifer																																	
(BG) MW-10D	7/10/2014	4.4	*	*	*	*	*	0.0050	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
(BG) MW-10D	10/29/2014	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
(BG) MW-10D	1/12/2015	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
(BG) MW-10D	4/20/2015	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
(BG) MW-10D	7/30/2015	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
(BG) MW-10D	10/13/2015	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
(BG) MW-10D	1/13/2016	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
(BG) MW-10D	4/19/2016	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-11D(2)	7/8/2014	28	*	*	*	*	*	0.0079	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.014	0.015	6.9
MW-11D(2)	10/27/2014	7.6	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.050	0.052	3.9
MW-11D(2)	1/14/2015	30	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.049	0.038	25.3
MW-11D(2)	4/23/2015	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.051	0.065	24.1
MW-11D(2)	7/29/2015	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-11D(2)	10/14/2015	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-11D(2)	1/11/2016	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-11D(2)	4/19/2016	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-12D	7/11/2014	*	*	*	*	*	0.0050	0.0053	5.8	*	*	*	*	*	*	*	*	*	*	*	*	*	0.003	*	*	*	*	*	*	*	*	*	**
MW-12D	10/30/2014	*	*	*	*	*	0.0066	0.0060	9.5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-12D	1/13/2015	*	*	*	*	*	0.0057	0.0061	6.8	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-12D	4/20/2015	*	*	*	*	*	*	0.0050	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-12D	7/31/2015	*	*	*	*	*	0.0056	0.0051	9.3	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-12D	10/19/2015	*	*	*	*	*	0.0054	0.0062	13.8	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-12D	1/14/2016	*	*	*	*	*	0.0051	0.0050	2.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-12D	4/19/2016	*	*	*	*	*	*	0.0050	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-13D	7/8/2014	*	*	*	*	*	0.0078	0.0074	5.3	*	*	*	*	*	*	*	*	*	0.002	*	*	*	0.003	*	*	*	*	*	*	*	*	*	**
MW-13D	10/29/2014	*	*	*	*	*	0.0062	0.0057	8.4	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-13D	1/12/2015	*	*	*	*	*	0.0055	0.0062	12.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-13D	4/20/2015	*	*	*	*	*	0.0050	0.0057	13.1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-13D	7/30/2015	*	*	*	*	*	0.0081	0.0075	7.7	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-13D	10/14/2015	*	*	*	*	*	0.0072	0.0070	2.8	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-13D	1/13/2016	*	*	*	*	*	0.0076	0.0063	18.7	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-13D	4/19/2016	*	*	*	*	*	0.0068	0.0076	11.1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-14D	7/10/2014	*	*	*	*	*	0.0092	0.0092	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-14D	10/29/2014	4.8	*	*	*	**0.0059**	0.0130	0.0140	7.4	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-14D	1/12/2015	*	*	*	*	*	0.0092	0.0100	8.3	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-14D	4/20/2015	*	*	*	*	*	0.0080	0.0087	8.4	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-14D	7/27/2015	*	*	*	**0.0062**	**0.0060**	0.0110	0.0100	9.5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-14D	10/13/2015	*	*	*	**0.0096**	**0.0096**	0.0150	0.0130	14.3	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-14D	1/13/2016	*	*	*	*	*	0.0088	0.0085	3.5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-14D	4/18/2016	5.6	*	*	*	*	0.0092	0.0088	4.4	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-15D	7/9/2014	15	*	*	*	*	0.0059	0.0073	21.2	*	*	*	*	*	*	*	*	*	0.004	*	*	*	0.003	*	*	*	*	*	*	*	0.025	0.026	3.9
MW-15D	10/28/2014	30	*	*	*	*	0.0055	0.0100	58.1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.017	0.018	5.7
MW-15D	1/13/2015	20	*	*	*	*	0.0052	0.0085	48.2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.015	0.017	12.5
MW-15D	4/21/2015	6	*	*	*	*	0.0053	0.0072	30.4	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-15D	7/27/2015	*	*	*	*	*	*	0.0058	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-15D	10/13/2015	*	*	*	*	*	0.0057	0.0058	1.7	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-15D	1/13/2016	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-15D	4/18/2016	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-18D	7/9/2014	*	*	*	*	*	*	0.0055	**	*	*	*	*	*	*	*	*	*	*	*	*	*	0.002	*	*	*	*	*	*	*	*	*	**
MW-18D	10/27/2014	*	*	*	*	*	0.0057	0.0055	3.6	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-18D	1/14/2015	6.8	*	*	*	*	*	0.0054	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.010	*	**
MW-18D	4/23/2015	*	*	*	*	*	0.0056	0.0160	96.3	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.033	0.044	28.6
MW-18D	7/29/2015	*	*	*	*	*	0.0050	0.0053	5.8	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-18D	10/16/2015	*	*	*	*	*	0.0051	0.0054	5.7	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-18D	1/11/2016	*	*	*	*	*	0.0061	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-18D	4/19/2016	*	*	*	*	*	0.0050	0.0052	3.9	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**

Table A1. Summary of Total and Dissolved Metals Data
Groundwater (mg/L)
Hidden Valley Landfill, Pierce County, Washington

Well ID	Date	TSS	Antimony (Sb)		Arsenic (As)		Barium (Ba)			Beryllium (Be)		Cadmium (Cd)		Chromium (Cr)		Cobalt (Co)		Copper (Cu)		Lead (Pb)		Nickel (Ni)		Selenium (Se)		Silver (Ag)		Thallium (Tl)		Vanadium (Vn)		Zinc (Zn)		
			D	T	D	T	D	T		D	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	D	T	
Typical MRL			0.002	0.002	0.005	0.005	0.005	0.005	RPD (%)	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.01	0.01	0.01	0.002	0.002	0.02	0.02	0.005	0.005	0.01	0.01	0.005	0.005	0.01	0.01	0.01	0.01	RPD (%)
WAC 173-200 Criteria			–	–	0.00005	0.00005	–	1.0		–	–	–	0.01	–	0.05	–	–	–	1.0	–	0.05	–	–	–	0.01	–	0.05	–	–	–	–	–	5.0	
Lower Regional Aquifer																																	
MW-14R	7/11/2014	*	*	*	*	*	*	0.0040	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.047	0.043	8.9
MW-14R	10/28/2014	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.023	0.028	19.6
MW-14R	1/13/2015	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.019	0.021	10.0
MW-14R	4/22/2015	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.036	0.063	54.5
MW-14R	7/30/2015	4.4	*	*	*	*	*	0.0052	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-14R	10/13/2015	*	*	*	*	*	0.0051	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-14R	1/12/2016	*	*	*	*	*	0.0058	0.0052	10.9	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-14R	4/18/2016	*	*	*	*	*	*	0.0050	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-20R	7/11/2014	*	*	*	*	*	*	0.0010	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-20R	10/30/2014	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-20R	1/12/2015	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-20R	4/23/2015	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-20R	7/28/2015	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-20R	10/14/2015	*	*	*	*	*	0.0058	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-20R	1/12/2016	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-20R	4/19/2016	*	*	*	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-26R	7/10/2014	*	*	*	*	*	0.0069	0.0074	7.0	*	*	*	*	*	*	*	*	*	0.003	*	*	*	*	*	*	*	*	*	*	*	0.019	**
MW-26R	10/30/2014	*	*	*	*	*	0.0074	0.0074	0.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.011	**
MW-26R	1/12/2015	*	*	*	*	*	0.0073	0.0071	2.8	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-26R	4/23/2015	*	*	*	*	*	0.0086	0.0078	9.8	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0.010	*	**
MW-26R	7/31/2015	*	*	*	*	*	0.0075	0.0072	4.1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-26R	10/14/2015	*	*	*	*	*	0.0015	0.0083	138.8	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-26R	1/12/2016	*	*	*	*	*	0.0072	0.0074	2.7	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
MW-26R	4/19/2016	*	*	*	*	*	0.0081	0.0077	5.1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	**
Number Analyzed		175	175	175	175	175	175	175		175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175	175		
Number Detected		30	1	3	2	4	116	131		0	0	0	1	0	4	0	2	0	14	0	9	0	8	0	0	0	0	0	0	0	3	48	51	
Detection Frequency (%)		17.1%	0.6%	1.7%	1.1%	2.3%	66.3%	74.9%		0.0%	0.0%	0.0%	0.6%	0.0%	2.3%	0.0%	1.1%	0.0%	8.0%	0.0%	5.1%	0.0%	4.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.7%	27.4%	29.1%	
Minimum Reported Concentration		4.4	0.002	0.003	0.006	0.006	0.0015	0.0010		0	0	0	0.005	0	0.006	0	0.012	0	0.002	0	0.003	0	0.002	0	0	0	0	0	0	0	0.013	0.010	0.011	
Maximum Concentration		2000	0.002	0.014	0.010	0.029	0.0650	0.2300		0	0	0	0.005	0	0.056	0	0.019	0	0.200	0	1.50	0	0.059	0	0	0	0	0	0	0	0.029	0.270	2.500	
Average Reported Concentration		NC	NC	NC	NC	NC	0.0109	0.0139		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	

Table A2: Total Metals Data
Groundwater (mg/L)
Hidden Valley Landfill, Pierce County, Washington

	Well ID	Date	Antimony (Sb)		Arsenic (As)		Barium (Ba)		Beryllium (Be)		Cadmium (Cd)		Chromium (Cr)		Cobalt (Co)		Copper (Cu)		Lead (Pb)		Nickel (Ni)		Selenium (Se)		Silver (Ag)		Thallium (Tl)		Vanadium (Vn)		Zinc (Zn)	
		WAC 173-200 Criteria	Result	– Conc.	Result	0.00005 Conc.	Result	1.0 Conc.	Result	– Conc.	Result	0.01 Conc.	Result	0.05 Conc.	Result	– Conc.	Result	1.0 Conc.	Result	0.05 Conc.	Result	– Conc.	Result	0.01 Conc.	Result	0.05 Conc.	Result	– Conc.	Result	– Conc.	Result	5.0 Conc.
Shallow Perched Aquifer																																
(BG)	MW-10S	7/10/2014	0.002	L 0.001	0.005	L 0.0025	0.0022	0.0022	0.001	L 0.0005	0.005	L 0.0025	0.002	L 0.0010	0.01	L 0.005	0.002	L 0.001	0.001	L 0.001	0.002	L 0.001	0.005	L 0.0025	0.01	L 0.005	0.001	L 0.0005	0.01	L 0.005	0.01	L 0.005
(BG)	MW-10S	10/29/2014	0.050	L 0.025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
(BG)	MW-10S	1/12/2015	0.002	L 0.001	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
(BG)	MW-10S	4/20/2015	0.002	L 0.001	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
(BG)	MW-10S	7/30/2015	0.002	L 0.001	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
(BG)	MW-10S	10/13/2015	0.002	L 0.001	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
(BG)	MW-10S	1/13/2016	0.002	L 0.001	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
(BG)	MW-10S	4/18/2016	0.002	L 0.001	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
(BG)	MW-10S	7/5/2016	0.002	L 0.001	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
	MW-11S	7/8/2014	0.002	L 0.001	0.005	L 0.0025	0.0100	0.0100	0.001	L 0.0005	0.005	L 0.0025	0.002	L 0.0010	0.01	L 0.005	0.002	L 0.001	0.001	L 0.001	0.002	L 0.001	0.005	L 0.0025	0.01	L 0.005	0.001	L 0.0005	0.01	L 0.005	0.047	0.047
	MW-11S	10/27/2014	0.050	L 0.025	0.005	L 0.0025	0.0100	0.0100	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.120	0.120
	MW-11S	1/14/2015	0.002	L 0.001	0.005	L 0.0025	0.0100	0.0100	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.017	0.017
	MW-11S	4/21/2015	0.002	L 0.001	0.005	L 0.0025	0.0110	0.0110	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.031	0.031
	MW-11S	7/29/2015	0.002	L 0.001	0.005	L 0.0025	0.0100	0.0100	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
	MW-11S	10/14/2015	0.002	L 0.001	0.005	L 0.0025	0.0110	0.0110	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
	MW-11S	1/11/2016	0.002	L 0.001	0.005	L 0.0025	0.0110	0.0110	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
	MW-11S	4/19/2016	0.002	L 0.001	0.005	L 0.0025	0.0077	0.0077	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
	MW-11S	7/5/2016	0.002	L 0.001	0.005	L 0.0025	0.0091	0.0091	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
	MW-12S	1/15/2015	0.002	L 0.001	0.005	L 0.0025	0.0200	0.0200	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.014	0.014	0.003	0.003	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.027	0.027
	MW-12S	4/20/2015	0.002	L 0.001	0.005	L 0.0025	0.0190	0.0190	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.014	0.014	0.004	0.004	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.040	0.040
	MW-12S	7/31/2015	0.002	L 0.001	0.005	L 0.0025	0.0260	0.0260	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.015	0.015	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.012	0.012
	MW-12S	10/19/2015	0.002	L 0.001	0.005	L 0.0025	0.0270	0.0270	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.019	0.019	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.180	0.180
	MW-12S	1/14/2016	0.002	L 0.001	0.005	L 0.0025	0.0140	0.0140	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.560	0.560
	MW-12S	4/19/2016	0.002	L 0.001	0.005	L 0.0025	0.0230	0.0230	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.010	0.010	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.290	0.290
	MW-12S	7/6/2016	0.002	L 0.001	0.005	L 0.0025	0.0220	0.0220	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.110	
	MW-13S	7/8/2014	0.002	L 0.001	0.005	L 0.0025	0.0110	0.0110	0.001	L 0.0005	0.005	L 0.0025	0.002	L 0.0010	0.01	L 0.005	0.002	L 0.001	0.001	L 0.001	0.002	L 0.001	0.005	L 0.0025	0.01	L 0.005	0.001	L 0.0005	0.01	L 0.005	0.026	0.026
	MW-13S	10/29/2014	0.050	L 0.025	0.005	L 0.0025	0.0073	0.0073	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
	MW-13S	1/13/2015	0.002	L 0.001	0.005	L 0.0025	0.0065	0.0065	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.018	0.018
	MW-13S	4/20/2015	0.002	L 0.001	0.005	L 0.0025	0.0077	0.0077	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.019	0.019
	MW-13S	7/30/2015	0.002	L 0.001	0.005	L 0.0025	0.0097	0.0097	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
	MW-13S	10/14/2015	0.002	L 0.001	0.005	L 0.0025	0.0110	0.0110	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
	MW-13S	1/13/2016	0.002	L 0.001	0.005	L 0.0025	0.0098	0.0098	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
	MW-13S	4/19/2016	0.002	L 0.001	0.005	L 0.0025	0.0120	0.0120	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
	MW-13S	7/6/2016	0.002	L 0.001	0.005	L 0.0025	0.0110	0.0110	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
	MW-14S	7/9/2014	0.002	L 0.001	0.005	L 0.0025	0.0039	0.0039	0.001	L 0.0005	0.005	L 0.0025	0.002	L 0.0010	0.01	L 0.005	0.003	0.003	0.001	L 0.001	0.002	L 0.001	0.005	L 0.0025	0.01	L 0.005	0.001	L 0.0005	0.01	L 0.005	0.01	L 0.005
	MW-14S	10/29/2014	0.050	L 0.025	0.005	L 0.0025	0.0068	0.0068	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
	MW-14S	1/12/2015	0.002	L 0.001	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
	MW-14S	4/20/2015	0.002	L 0.001	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
	MW-14S	7/27/2015	0.002	L 0.001	0.005	L 0.0025	0.0065	0.0065	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
	MW-14S	10/15/2015	0.002	L 0.001	0.005	L 0.0025	0.0089	0.0089	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
	MW-14S	1/13/2016	0.002	L 0.001	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
	MW-14S	4/18/2016	0.002	L 0.001	0.005	L 0.0025	0.0065	0.0065	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
	MW-14S	7/6/2016	0.002	L 0.001	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
	MW-15S	7/9/2014	0.002	L 0.001	0.005	L 0.0025	0.0099	0.0099	0.001	L 0.0005	0.005	L 0.0025	0.002	L 0.0010	0.01	L 0.005	0.002	L 0.001	0.001	L 0.001	0.002	L 0.001	0.005	L 0.0025	0.01	L 0.005	0.001	L 0.0005	0.01	L 0.005	0.044	0.044
	MW-15S	10/28/2014	0.050	L 0.025	0.005	L 0.0025	0.0150	0.0150	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.065	0.065
	MW-15S	1/13/2015	0.002	L 0.001	0.005	L 0.0025	0.0120	0.0120	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.061	0.061
	MW-15S	4/21/2015	0.002	L 0.001	0.005	L 0.0025	0.0110	0.0110	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.049	0.049
	MW-15S	7/27/2015	0.002	L 0.001	0.005	L 0.0025	0.0130	0.0130	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
	MW-15S	10/13/2015	0.002	L 0.001	0.005	L 0.0025	0.0150	0.0150	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
	MW-15S	1/13/2016	0.002	L 0.001	0.005	L 0.0025	0.0098	0.0098	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
	MW-15S	4/18/2016	0.002	L 0.001	0.005	L 0.0025	0.0110	0.0110	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
	MW-15S	7/6/2016	0.002	L 0.001	0.005	L 0.0025	0.0110	0.0110	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
	MW-17S	7/8/2014	0.002	L 0.001	0.005	L 0.0025	0.0180	0.0180	0.001	L 0.0005	0.005	L 0.0025	0.002	L 0.0010	0.01	L 0.005	0.002	0.002	0.001	L 0.001	0.002	0.002	0.005	L 0.0025	0.01	L 0.005	0.001	L 0.0005	0.01	L 0.005	0.044	0.044
	MW-17S	10/28/2014	0.050	L 0.025	0.005	L 0.0025	0.0220	0.0220	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.086	0.086
	MW-17S	1/13/2015	0.002	L 0.001	0.005	L 0.0025	0.0230	0.0230	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.032	0.032
	MW-17S	4/23/2015	0.002	L 0.001	0.005	L 0.0025	0.0240	0.0240	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.039	0.039
	MW-17S	7/27/2015	0.002	L 0.001	0.005	L 0.0025	0.0230	0.0230	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
	MW-17S	10/15/2015	0.002	L 0.001	0.005	L 0.0025	0.0230	0.0230	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
	MW-17S	1/12/2016	0.002	L 0.001	0.005	L 0.0025	0.0300	0.0300	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
	MW-17S	4/19/2016	0.002	L 0.001	0.005	L 0.0025	0.0230	0.0230	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005
	MW-17S	7/6/2016	0.002	L 0.001	0.005	L 0.0025	0.0220	0.0220	0.005	L 0.0025	0.005	L 0.0025	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005	0.002	L 0.001	0.02	L 0.010	0.005	L 0.0025	0.01	L 0.005	0.005	L 0.0025	0.01	L 0.005	0.01	L 0.005

Table A2: Total Metals Data
Groundwater (mg/L)
Hidden Valley Landfill, Pierce County, Washington

Well ID	Date	Antimony (Sb)		Arsenic (As)		Barium (Ba)		Beryllium (Be)		Cadmium (Cd)		Chromium (Cr)		Cobalt (Co)		Copper (Cu)		Lead (Pb)		Nickel (Ni)		Selenium (Se)		Silver (Ag)		Thallium (Tl)		Vanadium (Vn)		Zinc (Zn)	
	WAC 173-200 Criteria		–		0.00005		1.0		–		0.01		0.05		–		1.0		0.05		–		0.01		0.05		–		–		5.0
		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-18S	7/9/2014	0.002 L	0.001	0.005 L	0.0025	0.0120	0.0120	0.001 L	0.0005	0.005 L	0.0025	0.002 L	0.0010	0.01 L	0.005	0.002 L	0.001	0.001 L	0.001	0.002 L	0.001	0.005 L	0.0025	0.01 L	0.005	0.001 L	0.0005	0.01 L	0.005	0.019	0.019
MW-18S	10/27/2014	0.050 L	0.025	0.005 L	0.0025	0.0130	0.0130	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-18S	1/14/2015	0.002 L	0.001	0.005 L	0.0025	0.0140	0.0140	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-18S	4/23/2015	0.002 L	0.001	0.005 L	0.0025	0.0120	0.0120	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-18S	7/29/2015	0.002 L	0.001	0.005 L	0.0025	0.0110	0.0110	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-18S	10/16/2015	0.002 L	0.001	0.005 L	0.0025	0.0120	0.0120	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-18S	1/11/2016	0.002 L	0.001	0.005 L	0.0025	0.0120	0.0120	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-18S	4/19/2016	0.002 L	0.001	0.005 L	0.0025	0.0120	0.0120	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-18S	7/6/2016	0.002 L	0.001	0.005 L	0.0025	0.0130	0.0130	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-23S	7/10/2014	0.002 L	0.001	0.005 L	0.0025	0.0180	0.0180	0.001 L	0.0005	0.005 L	0.0025	0.002 L	0.0010	0.01 L	0.005	0.005	0.005	0.049	0.049	0.003 L	0.001	0.005 L	0.0025	0.01 L	0.005	0.001 L	0.0005	0.01 L	0.005	0.100	0.100
MW-23S	1/15/2015	0.002 L	0.001	0.005 L	0.0025	0.0100	0.0100	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.078	0.078
MW-23S	4/23/2015	0.0033	0.003	0.005 L	0.0025	0.0160	0.0160	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.012	0.012	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.090	0.090
MW-23S	7/28/2015	0.0140	0.014	0.0290	**0.0290**	0.2300	0.2300	0.005 L	0.0025	0.0050	0.0050	0.0560	**0.0560**	0.019	0.019	0.200	0.200	1.500	**1.500**	0.059	0.059	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.100	0.100	2.500	2.500
MW-23S	1/14/2016	0.0030	0.003	0.005 L	0.0025	0.0330	0.0330	0.005 L	0.0025	0.005 L	0.0025	0.0063	0.0063	0.01 L	0.005	0.022	0.022	0.130	**0.130**	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.013	0.013	0.370	0.370
MW-23S	4/21/2016	0.002 L	0.001	0.005 L	0.0025	0.0100	0.0100	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.016	0.016	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.065	0.065
MW-23S	8/4/2016	0.0025	0.003	0.005 L	0.0025	0.0340	0.0340	0.005 L	0.0025	0.005 L	0.0025	0.0051	0.0051	0.01 L	0.005	0.020	0.020	0.099	0.099	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.012	0.012	0.260	0.260
MW-25S	7/8/2014	0.002 L	0.001	0.005 L	0.0025	0.0027	0.0027	0.001 L	0.0005	0.005 L	0.0025	0.002 L	0.0010	0.01 L	0.005	0.00 L	0.001	0.001 L	0.001	0.002 L	0.001	0.005 L	0.0025	0.01 L	0.005	0.001 L	0.0005	0.01 L	0.005	0.037	0.037
MW-25S	10/28/2014	0.050 L	0.025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-25S	1/14/2015	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-25S	4/21/2015	0.002 L	0.001	0.005 L	0.0025	0.0092	0.0092	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-25S	7/31/2015	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-25S	10/16/2015	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-25S	1/13/2016	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-25S	4/20/2016	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-25S	7/5/2016	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-28S	4/22/2015	0.002 L	0.001	0.005 L	0.0025	0.0840	0.0840	0.005 L	0.0025	0.005 L	0.0025	0.0170	0.0170	0.012	0.012	0.035	0.035	0.006	0.006	0.021	0.021	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.029	0.029	0.046	0.046
MW-28S	1/14/2016	0.002 L	0.001	0.005 L	0.0025	0.0610	0.0610	0.005 L	0.0025	0.005 L	0.0025	0.0099	0.0099	0.01 L	0.005	0.021	0.021	0.005	0.005	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.022	0.022	0.064	0.064
MW-28S	4/21/2016	0.002 L	0.001	0.005 L	0.0025	0.0210	0.0210	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.035	0.035
MW-28S	7/7/2016	0.002 L	0.001	0.0061	**0.0061**	0.1000	0.1000	0.005 L	0.0025	0.005 L	0.0025	0.0190	0.0190	0.015	0.015	0.040	0.040	0.012	0.012	0.023	0.023	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.042	0.042	0.086	0.086
FMMW-1	7/9/2014	0.002 L	0.001	0.005 L	0.0025	0.0084	0.0084	0.001 L	0.0005	0.005 L	0.0025	0.002 L	0.0010	0.01 L	0.005	0.002 L	0.001	0.001 L	0.001	0.002 L	0.001	0.005 L	0.0025	0.01 L	0.005	0.001 L	0.0005	0.01 L	0.005	0.01 L	0.005
FMMW-1	10/27/2014	0.002 L	0.001	0.005 L	0.0025	0.0086	0.0086	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
FMMW-1	1/14/2015	0.002 L	0.001	0.005 L	0.0025	0.0066	0.0066	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.036	0.036
FMMW-1	4/22/2015	0.002 L	0.001	0.005 L	0.0025	0.0073	0.0073	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
FMMW-1	7/29/2015	0.002 L	0.001	0.005 L	0.0025	0.0067	0.0067	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
FMMW-1	10/16/2015	0.002 L	0.001	0.005 L	0.0025	0.0069	0.0069	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
FMMW-1	1/11/2016	0.002 L	0.001	0.005 L	0.0025	0.0050	0.0050	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
FMMW-1	4/20/2016	0.002 L	0.001	0.005 L	0.0025	0.0071	0.0071	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
FMMW-1	7/5/2016	0.002 L	0.001	0.005 L	0.0025	0.0088	0.0088	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
FMMW-2	7/9/2014	0.002 L	0.001	0.005 L	0.0025	0.0150	0.0150	0.001 L	0.0005	0.005 L	0.0025	0.002 L	0.0010	0.01 L	0.005	0.002 L	0.001	0.001 L	0.001	0.002 L	0.001	0.005 L	0.0025	0.01 L	0.005	0.001 L	0.0005	0.01 L	0.005	0.100	0.100
FMMW-2	10/28/2014	0.002 L	0.001	0.005 L	0.0025	0.0190	0.0190	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.037	0.037
FMMW-2	1/14/2015	0.002 L	0.001	0.005 L	0.0025	0.0200	0.0200	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.041	0.041
FMMW-2	4/22/2015	0.002 L	0.001	0.005 L	0.0025	0.0160	0.0160	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.083	0.083
FMMW-2	7/29/2015	0.002 L	0.001	0.005 L	0.0025	0.0190	0.0190	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
FMMW-2	10/16/2015	0.002 L	0.001	0.005 L	0.0025	0.0170	0.0170	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
FMMW-2	1/11/2016	0.002 L	0.001	0.005 L	0.0025	0.0230	0.0230	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
FMMW-2	4/20/2016	0.002 L	0.001	0.005 L	0.0025	0.0150	0.0150	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
FMMW-2	7/5/2016	0.002 L	0.001	0.005 L	0.0025	0.0130	0.0130	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
Upper Regional Aquifer																															
(BG) MW-10D	7/10/2014	0.002 L	0.001	0.005 L	0.0025	0.0050	0.0050	0.001 L	0.0005	0.005 L	0.0025	0.002 L	0.0010	0.01 L	0.005	0.002 L	0.001	0.001 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.001 L	0.0005	0.01 L	0.005	0.01 L	0.005
(BG) MW-10D	10/29/2014	0.050 L	0.025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
(BG) MW-10D	1/12/2015	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
(BG) MW-10D	4/20/2015	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
(BG) MW-10D	7/30/2015	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
(BG) MW-10D	10/13/2015	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
(BG) MW-10D	1/13/2016	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
(BG) MW-10D	4/19/2016	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
(BG) MW-10D	7/5/2016	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-11D(2)	7/8/2014	0.002 L	0.001	0.005 L	0.0025	0.0079	0.0079	0.001 L	0.0005	0.005 L	0.0025	0.002 L	0.0010	0.01 L	0.005	0.002 L	0.001	0.001 L	0.001	0.002 L	0.001	0.005 L	0.0025	0.01 L	0.005	0.001 L	0.0005	0.01 L	0.005	0.015	0.015
MW-11D(2)	10/27/2014	0.050 L	0.025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.052	0.052
MW-11D(2)	1/14/2015	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.038	0.038
MW-11D(2)	4/23/2015	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.065	0.065
MW-11D(2)	7/29/2015	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005

Table A2: Total Metals Data
Groundwater (mg/L)
Hidden Valley Landfill, Pierce County, Washington

Well ID	Date	Antimony (Sb)		Arsenic (As)		Barium (Ba)		Beryllium (Be)		Cadmium (Cd)		Chromium (Cr)		Cobalt (Co)		Copper (Cu)		Lead (Pb)		Nickel (Ni)		Selenium (Se)		Silver (Ag)		Thallium (Tl)		Vanadium (Vn)		Zinc (Zn)	
	WAC 173-200 Criteria		–		0.00005		1.0		–		0.01		0.05		–		1.0		0.05		–		0.01		0.05		–		–		5.0
		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-11D(2)	10/14/2015	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-11D(2)	1/11/2016	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-11D(2)	4/19/2016	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-11D(2)	7/5/2016	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-12D	7/11/2014	0.002 L	0.001	0.005 L	0.0025	0.0053	0.0053	0.001 L	0.0005	0.005 L	0.0025	0.002 L	0.0010	0.01 L	0.005	0.002 L	0.001	0.001 L	0.001	0.003	0.003	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-12D	10/30/2014	0.050 L	0.025	0.005 L	0.0025	0.0060	0.0060	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-12D	1/13/2015	0.002 L	0.001	0.005 L	0.0025	0.0061	0.0061	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-12D	4/20/2015	0.002 L	0.001	0.005 L	0.0025	0.0050	0.0050	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-12D	7/31/2015	0.002 L	0.001	0.005 L	0.0025	0.0051	0.0051	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-12D	10/19/2015	0.002 L	0.001	0.005 L	0.0025	0.0062	0.0062	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-12D	1/14/2016	0.002 L	0.001	0.005 L	0.0025	0.0050	0.0050	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-12D	4/19/2016	0.002 L	0.001	0.005 L	0.0025	0.0050	0.0050	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-12D	7/6/2016	0.002 L	0.001	0.005 L	0.0025	0.0050	0.0050	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-13D	7/8/2014	0.002 L	0.001	0.005 L	0.0025	0.0074	0.0074	0.001 L	0.0005	0.005 L	0.0025	0.002 L	0.0010	0.01 L	0.005	0.002	0.002	0.001 L	0.001	0.003	0.003	0.005 L	0.0025	0.01 L	0.005	0.001 L	0.0005	0.01 L	0.005	0.01 L	0.005
MW-13D	10/29/2014	0.050 L	0.025	0.005 L	0.0025	0.0057	0.0057	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-13D	1/12/2015	0.002 L	0.001	0.005 L	0.0025	0.0062	0.0062	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-13D	4/20/2015	0.002 L	0.001	0.005 L	0.0025	0.0057	0.0057	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-13D	7/30/2015	0.002 L	0.001	0.005 L	0.0025	0.0075	0.0075	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-13D	10/14/2015	0.002 L	0.001	0.005 L	0.0025	0.0070	0.0070	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-13D	1/13/2016	0.002 L	0.001	0.005 L	0.0025	0.0063	0.0063	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-13D	4/19/2016	0.002 L	0.001	0.005 L	0.0025	0.0076	0.0076	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-13D	7/6/2016	0.002 L	0.001	0.005 L	0.0025	0.0070	0.0070	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-14D	7/10/2014	0.002 L	0.001	0.005 L	0.0025	0.0092	0.0092	0.001 L	0.0005	0.005 L	0.0025	0.002 L	0.0010	0.01 L	0.005	0.002 L	0.001	0.001 L	0.001	0.002 L	0.001	0.005 L	0.0025	0.01 L	0.005	0.001 L	0.0005	0.01 L	0.005	0.01 L	0.005
MW-14D	10/29/2014	0.050 L	0.025	0.0059	**0.0059**	0.0140	0.0140	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-14D	1/12/2015	0.002 L	0.001	0.005 L	0.0025	0.0100	0.0100	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-14D	4/20/2015	0.002 L	0.001	0.005 L	0.0025	0.0087	0.0087	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-14D	7/27/2015	0.002 L	0.001	0.0060	**0.0060**	0.0100	0.0100	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-14D	10/13/2015	0.002 L	0.001	0.0096	**0.0096**	0.0130	0.0130	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-14D	1/13/2016	0.002 L	0.001	0.005 L	0.0025	0.0085	0.0085	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-14D	4/18/2016	0.002 L	0.001	0.005 L	0.0025	0.0088	0.0088	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-14D	8/4/2016	0.002 L	0.001	0.005 L	0.0025	0.0110	0.0110	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-15D	7/9/2014	0.002 L	0.001	0.005 L	0.0025	0.0073	0.0073	0.001 L	0.0005	0.005 L	0.0025	0.002 L	0.0010	0.01 L	0.005	0.004	0.004	0.001 L	0.001	0.003	0.003	0.005 L	0.0025	0.01 L	0.005	0.001 L	0.0005	0.01 L	0.005	0.026	0.026
MW-15D	10/28/2014	0.050 L	0.025	0.005 L	0.0025	0.0100	0.0100	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.018	0.018
MW-15D	1/13/2015	0.002 L	0.001	0.005 L	0.0025	0.0085	0.0085	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.017	0.017
MW-15D	4/21/2015	0.002 L	0.001	0.005 L	0.0025	0.0072	0.0072	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-15D	7/27/2015	0.002 L	0.001	0.005 L	0.0025	0.0058	0.0058	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-15D	10/13/2015	0.002 L	0.001	0.005 L	0.0025	0.0058	0.0058	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-15D	1/13/2016	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-15D	4/18/2016	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-15D	7/6/2016	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-18D	7/9/2014	0.002 L	0.001	0.005 L	0.0025	0.0055	0.0055	0.001 L	0.0005	0.005 L	0.0025	0.002 L	0.0010	0.01 L	0.005	0.002 L	0.001	0.001 L	0.001	0.002	0.002	0.005 L	0.0025	0.01 L	0.005	0.001 L	0.0005	0.01 L	0.005	0.01 L	0.005
MW-18D	10/27/2014	0.050 L	0.025	0.005 L	0.0025	0.0055	0.0055	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-18D	1/14/2015	0.002 L	0.001	0.005 L	0.0025	0.0054	0.0054	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-18D	4/23/2015	0.002 L	0.001	0.005 L	0.0025	0.0058	0.0058	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.044	0.044
MW-18D	7/29/2015	0.002 L	0.001	0.005 L	0.0025	0.0053	0.0053	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-18D	10/16/2015	0.002 L	0.001	0.005 L	0.0025	0.0054	0.0054	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-18D	1/11/2016	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-18D	4/19/2016	0.002 L	0.001	0.005 L	0.0025	0.0052	0.0052	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-18D	7/6/2016	0.002 L	0.001	0.005 L	0.0025	0.0057	0.0057	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
Lower Regional Aquifer																															
MW-14R	7/11/2014	0.002 L	0.001	0.005 L	0.0025	0.0040	0.0040	0.001 L	0.0005	0.005 L	0.0025	0.002 L	0.0010	0.01 L	0.005	0.002 L	0.001	0.001 L	0.001	0.00 L	0.001	0.005 L	0.0025	0.01 L	0.005	0.001 L	0.0005	0.01 L	0.005	0.043	0.043
MW-14R	10/28/2014	0.050 L	0.025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.028	0.028
MW-14R	1/13/2015	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.021	0.021
MW-14R	4/22/2015	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.063	0.063
MW-14R	7/30/2015	0.002 L	0.001	0.005 L	0.0025	0.0052	0.0052	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-14R	10/13/2015	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-14R	1/12/2016	0.002 L	0.001	0.005 L	0.0025	0.0052	0.0052	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-14R	4/18/2016	0.002 L	0.001	0.005 L	0.0025	0.0050	0.0050	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-14R	7/6/2016	0.002 L	0.001	0.005 L	0.0025	0.0053	0.0053	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-20R	7/11/2014	0.002 L	0.001	0.005 L	0.0025	0.0010	0.0010	0.001 L	0.0005	0.005 L	0.0025	0.002 L	0.0010	0.01 L	0.005	0.002 L	0.001	0.001 L	0.001	0.002 L	0.001	0.005 L	0.0025	0.01 L	0.005	0.001 L	0.0005	0.01 L	0.005	0.01 L	0.005
MW-20R	10/30/2014	0.050 L	0.025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-20R	1/12/2015	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005

Table A2: Total Metals Data
Groundwater (mg/L)
Hidden Valley Landfill, Pierce County, Washington

Well ID	Date	Antimony (Sb)		Arsenic (As)		Barium (Ba)		Beryllium (Be)		Cadmium (Cd)		Chromium (Cr)		Cobalt (Co)		Copper (Cu)		Lead (Pb)		Nickel (Ni)		Selenium (Se)		Silver (Ag)		Thallium (Tl)		Vanadium (Vn)		Zinc (Zn)	
	WAC 173-200 Criteria		–		0.00005		1.0		–		0.01		0.05		–		1.0		0.05		–		0.01		0.05		–		–		5.0
		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
MW-20R	4/23/2015	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-20R	7/28/2015	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-20R	10/14/2015	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-20R	1/12/2016	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-20R	4/19/2016	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-20R	7/6/2016	0.002 L	0.001	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-26R	7/10/2014	0.002 L	0.001	0.005 L	0.0025	0.0074	0.0074	0.001 L	0.0005	0.005 L	0.0025	0.002 L	0.0010	0.01 L	0.005	0.003	0.003	0.001 L	0.001	0.002 L	0.001	0.005 L	0.0025	0.01 L	0.005	0.001 L	0.0005	0.01 L	0.005	0.019	0.019
MW-26R	10/30/2014	0.050 L	0.025	0.005 L	0.0025	0.0074	0.0074	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.011	0.011
MW-26R	1/12/2015	0.002 L	0.001	0.005 L	0.0025	0.0071	0.0071	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-26R	4/23/2015	0.002 L	0.001	0.005 L	0.0025	0.0078	0.0078	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-26R	7/31/2015	0.002 L	0.001	0.005 L	0.0025	0.0072	0.0072	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-26R	10/14/2015	0.002 L	0.001	0.005 L	0.0025	0.0083	0.0083	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-26R	1/12/2016	0.002 L	0.001	0.005 L	0.0025	0.0074	0.0074	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-26R	4/19/2016	0.002 L	0.001	0.005 L	0.0025	0.0077	0.0077	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
MW-26R	7/6/2016	0.002 L	0.001	0.005 L	0.0025	0.0079	0.0079	0.005 L	0.0025	0.005 L	0.0025	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005	0.002 L	0.001	0.02 L	0.010	0.005 L	0.0025	0.01 L	0.005	0.005 L	0.0025	0.01 L	0.005	0.01 L	0.005
	Number analyzed	198		198		198		198		198		198		198		198		198		198		198		198		198		198		198	
	Number detected	4		5		147		0		1		6		3		17		11		8		0		0		0		6		54	
	Number non-detect	194		193		51		198		197		192		195		181		187		190		198		198		198		192		144	
	Detection Frequency	2.0%		2.5%		74.2%		0.0%		0.5%		3.0%		1.5%		8.6%		5.6%		4.0%		0.0%		0.0%		0.0%		3.0%		27.3%	
	Minimum Concentration		0.001		0.003		0.001		0.001		0.003		0.001		0.005		0.001		0.001		0.001		0.003		0.005		0.001		0.005		0.005
	Maximum Concentration		0.025		0.029		0.230		0.003		0.005		0.056		0.019		0.200		1.500		0.059		0.003		0.005		0.003		0.100		2.500
	Average Concentration		0.003		0.003		0.011		0.002		0.003		0.003		0.005		0.006		0.010		0.010		0.003		0.005		0.002		0.006		0.036
	Median Value		0.001		0.003		0.007		0.003		0.003		0.003		0.005		0.005		0.001		0.010		0.003		0.005		0.003		0.005		0.005
	Variance		NC		NC		0.0004		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
	Standard Deviation		NC		NC		0.0193		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
	Coefficient of Variation (%)		NC		NC		176.2		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC
	Standard Error		NC		NC		0.0014		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC		NC

Notes: (mg/L) = milligrams per liter
(BG) = Background
(L) indicates not reported at or above the MRL (Method Reporting Limit)

Attachment B

Parameter Optimization Summary

Table B1. Parameter Optimization Analysis for Appendix I Metals
Hidden Valley Landfill, Pierce County, Washington

Parameter	Number of Samples	Leachate Detection Frequency[a] (%)	Leachate Maximum Detection[b] (mg/L)	Leachate Average Concentration[b] (mg/L)	WAC 173-200 Groundwater Quality Criteria (mg/L)	Groundwater Concentration[c] (mg/L)	Groundwater Detections[f]	Groundwater Detection Frequency[f] (%)	Degree of Contrast[d]	Mobility Constant[e] (K_d)	Retained for Detection Monitoring	Rationale
Antimony	59	66%	0.60	0.14	—	0.002	4	2.0%	69	2.4	No	Low concentration in leachate. Low groundwater detection frequency.
Arsenic	60	18%	0.20	0.08	0.00005	0.005	4	2.0%	16	3.4	No	Very low concentration in leachate.
Barium	57	100%	0.82	0.47	1.0	0.011	147	74.2%	43	0.7 - 3.4	No	Low concentration in leachate (less than WAC 173-200 Groundwater Quality Criteria).
Beryllium	57	0%	NA	NA	—	0.005	3	1.5%	NA	3.1	No	Not present in leachate. Low groundwater detection frequency. Low mobility.
Cadmium	57	0%	NA	NA	0.01	0.005	1	0.5%	NA	2.9	No	Not present in leachate. Low groundwater detection frequency. Low mobility.
Chromium (total)	59	100%	0.32	0.13	0.05	0.005	6	3.0%	25	3.9	No	Low concentration in leachate. Low groundwater detection frequency. Low mobility.
Cobalt	57	89%	0.20	0.06	—	0.010	3	1.5%	6	2.1	No	Very low concentration in leachate. Low groundwater detection frequency. Low degree of contrast.
Copper	59	85%	1.83	0.30	1.0	0.010	17	8.6%	30	2.7	No	Low concentration in leachate (less than WAC 173-200 Groundwater Quality Criteria). Low groundwater detection frequency and mobility.
Lead	59	86%	0.26	0.03	0.05	0.002	10	5.1%	14	4.2	No	Very low concentration in leachate (less than WAC 173-200 Groundwater Quality Criteria). Low groundwater detection frequency and mobility.
Nickel	58	100%	0.76	0.51	—	0.020	8	4.0%	26	3.1	No	Low concentration in leachate. Low groundwater detection frequency. Low mobility.
Selenium	57	9%	0.061	0.01	0.01	0.005	0	0.0%	2	1.0	No	Low leachate detection frequency. Very low concentration in leachate (equal to WAC 173-200 Groundwater Quality Criteria). Not present in groundwater. Low degree of contrast.
Silver	57	0%	NA	NA	0.05	0.010	0	0.0%	NA	2.6	No	Not present in leachate or groundwater. Low mobility.
Thallium	57	0%	NA	NA	—	0.005	3	1.5%	NA	—	No	Not present in leachate. Low groundwater detection frequency.
Vanadium	57	95%	0.41	0.20	—	0.010	6	3.0%	20	1.1 - 2.7	No	Low concentration in leachate. Low groundwater detecvtion frequency.
Zinc	60	93%	1.10	0.23	5.0	0.036	54	27.3%	6	3.1	No	Low concentration in leachate (less than WAC 173-200 Groundwater Quality Criteria). Low degree of contrast. Low mobility.

Notes:

Red highlight = Average leachate concentrations less than 0.1 mg/L or less than WAC 173-200 Groundwater Quality Criteria.

Yellow highlight = Average leachate concentrations less than 1.0 mg/L, leachate detection frequencies less than 10%, groundwater detection frequencies less than 10%, degrees of contrast less than 10%, and/or high contaminant retardation factors (mobility constants).

(a) Leachate Detection Frequency is the number of reported detections in leachate divided by the total number of samples. Detection frequencies of 10% or less are considered low.

(b) Leachate Concentrations are based on data collected from March 2000 through January 2016, plus leachate well data from 1989. Average concentrations of less than 1.0 mg/L are considered low, and less than 0.1 are considered very low.

(c) Groundwater concentrations are set equal to the laboratory method reporting limits, except barium and zinc which were detected in 74.2% and 27.3% of groundwater samples, respectively, and are set equal to the average groundwater concentration.

(d) Degree of Contrast is a comparison between the groundwater concentration and the average leachate concentration. Degrees of contrast of 10x or less are considered low.

(e) Mobility Constants are from Partition Coefficients for Metals in Surface Water, Soil and Waste, USEPA 600/R-05/074, July 2005. Mobility constants greater than 2.5 are considered indicative of low mobility.

(f) Number of times anaylte was detected in groundwater samples over the last nine sampling events (July 2014 through August 2016).

(NA) indicates not applicable due to no detections reported in leachate.

(—) indicates not available.

Attachment C

Leachate Quality Database

Table C1. Leachate Database, Total Metals (mg/L)
Hidden Valley Landfill, Pierce County, Washington

Well ID	Date	Antimony (Sb)		Arsenic (As)		Barium (Ba)		Beryllium (Be)		Cadmium (Cd)		Chromium (Cr)		Cobalt (Co)		Copper (Cu)		Lead (Pb)		Nickel (Ni)		Selenium (Se)		Silver (Ag)		Thallium (Tl)		Vanadium (Vn)		Zinc (Zn)	
		Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.	Result	Conc.
Leachate, East Area	3/27/2000	0.050	L 0.025	0.010	0.010	0.02	0.023	0.005	L 0.003	0.004	L 0.002	0.039	0.039	0.018	L 0.009	0.010	L 0.005	0.002	L 0.001	0.230	0.230	0.005	L 0.003	0.01	L 0.005	0.005	L 0.003	0.033	0.033	0.010	L 0.005
Leachate, East Area	4/18/2001	0.050	L 0.025	0.050	0.050	0.49	0.486	0.010	L 0.005	0.002	L 0.001	0.174	0.174	0.020	L 0.010	0.020	L 0.010	0.021	0.021	0.319	0.319	0.080	L 0.040	0.02	L 0.010	0.010	L 0.005	0.123	0.123	0.080	0.080
Leachate, East Area	7/12/2001	0.050	L 0.025	0.113	0.113	0.82	0.818	0.005	L 0.003	0.005	L 0.003	0.273	0.273	0.020	0.020	0.128	0.128	0.074	0.074	0.604	0.604	0.010	L 0.005	0.01	L 0.005	0.005	L 0.003	0.180	0.180	0.088	0.088
Leachate, East Area	10/26/2001	0.050	L 0.025	0.057	0.057	0.74	0.742	0.005	L 0.003	0.005	L 0.003	0.220	0.220	0.020	0.020	1.500	1.500	0.100	0.100	0.488	0.488	0.010	L 0.005	0.01	L 0.005	0.005	L 0.003	0.160	0.160	0.525	0.525
Leachate, East Area	1/24/2002	0.050	L 0.025	0.200	0.200	0.77	0.766	0.005	L 0.003	0.005	L 0.003	0.316	0.316	0.030	0.030	0.030	0.030	0.045	0.045	0.697	0.697	0.010	L 0.005	0.01	L 0.005	0.025	L 0.013	0.219	L 0.110	0.165	0.165
Leachate, East Area	4/24/2002	0.050	L 0.025	0.046	0.046	0.57	0.566	–	–	–	–	0.216	0.216	0.018	0.018	0.010	L 0.005	0.010	0.010	0.363	0.363	–	–	–	–	–	–	0.162	0.162	0.041	0.041
Leachate, East Area	7/30/2002	0.385	0.385	0.092	0.092	0.42	0.418	0.010	L 0.005	0.010	L 0.005	0.191	0.191	0.128	0.128	0.158	0.158	0.042	0.042	0.571	0.571	0.020	L 0.010	0.02	L 0.010	0.010	L 0.005	0.333	0.333	0.675	0.675
Leachate, East Area	10/24/2002	0.010	L 0.005	0.039	0.039	0.69	0.687	0.010	L 0.005	0.010	L 0.005	0.187	0.187	0.020	L 0.010	0.053	0.053	0.018	0.018	0.598	0.598	0.010	L 0.005	0.02	L 0.010	0.010	L 0.005	0.171	0.171	0.155	0.155
Leachate, East Area	2/3/2003	0.100	L 0.050	0.052	0.052	0.68	0.676	0.010	L 0.005	0.010	L 0.005	0.195	0.195	0.030	0.030	0.060	0.060	0.028	0.028	0.643	0.643	0.020	L 0.010	0.02	L 0.010	0.020	L 0.010	0.183	0.183	0.119	0.119
Leachate, East Area	1/29/2004	0.100	L 0.050	0.044	0.044	0.71	0.706	0.010	L 0.005	0.010	L 0.005	0.152	0.152	0.022	0.022	0.039	0.039	0.017	0.017	0.548	0.548	0.010	L 0.005	0.01	L 0.005	0.010	L 0.005	0.118	0.118	0.056	0.056
Leachate, East Area	1/27/2005	0.050	L 0.025	0.021	0.021	0.39	0.385	0.005	L 0.003	0.005	L 0.003	0.082	0.082	0.025	0.025	0.015	0.015	0.014	0.014	0.246	0.246	0.005	L 0.003	0.01	L 0.005	0.005	L 0.003	0.072	0.072	0.514	0.514
Leachate, East Area	1/25/2006	0.100	L 0.050	0.057	0.057	0.69	0.692	0.010	L 0.005	0.010	L 0.005	0.139	0.139	0.020	L 0.010	0.020	L 0.010	0.023	0.023	0.503	0.503	0.010	L 0.005	0.02	L 0.010	0.010	L 0.005	0.197	0.197	0.065	0.065
Leachate, East Area	1/23/2007	0.100	L 0.050	0.040	0.040	0.55	0.549	0.010	L 0.005	0.010	L 0.005	0.102	0.102	0.035	0.035	0.031	0.031	0.016	0.016	0.276	0.276	0.005	L 0.003	0.02	L 0.010	0.010	L 0.005	0.081	0.081	0.562	0.562
Leachate, East Area	1/30/2008	0.100	L 0.050	0.056	0.056	0.58	0.584	0.010	L 0.005	0.010	L 0.005	0.219	0.219	0.023	0.023	0.020	L 0.010	0.007	0.007	0.432	0.432	0.005	L 0.003	0.02	L 0.010	0.010	L 0.005	0.148	0.148	0.060	0.060
Leachate, East Area	1/23/2009	0.500	L 0.250	0.065	0.065	0.72	0.716	0.050	L 0.025	0.050	L 0.025	0.212	0.212	0.100	L 0.050	0.100	L 0.050	0.020	L 0.010	0.459	0.459	0.050	L 0.025	0.10	L 0.050	0.002	L 0.001	0.157	0.157	0.100	L 0.050
Leachate, East Area	1/27/2010	0.015	0.015	0.084	0.084	0.55	0.550	0.005	L 0.003	0.005	L 0.003	0.190	0.190	0.018	0.018	0.050	L 0.025	0.010	L 0.005	0.480	0.480	0.025	L 0.013	0.01	L 0.005	0.025	L 0.013	0.130	0.130	0.050	L 0.025
Leachate, East Area	1/5/2011	0.004	L 0.002	0.018	0.018	0.45	0.450	0.001	L 0.001	0.005	L 0.003	0.100	0.100	0.016	0.016	0.004	L 0.002	0.002	L 0.001	0.270	0.270	0.010	L 0.005	0.01	L 0.005	0.020	L 0.010	0.090	0.090	0.028	0.028
Leachate, East Area	1/24/2012	0.080	L 0.040	0.120	0.120	0.57	0.570	0.001	L 0.001	0.005	L 0.003	0.079	0.079	0.020	L 0.010	0.096	0.096	0.009	0.009	0.460	0.460	0.005	L 0.003	0.01	L 0.005	0.001	L 0.001	0.180	L 0.090	0.140	0.140
Leachate, East Area	1/16/2013	0.011	0.011	0.069	0.069	0.69	0.690	0.001	L 0.001	0.005	L 0.003	0.210	0.210	0.019	0.019	0.009	0.009	0.003	0.003	0.520	0.520	0.005	L 0.003	0.01	L 0.005	0.001	L 0.001	0.170	0.170	0.120	0.120
Leachate, East Area	1/10/2014	0.012	0.012	0.078	0.078	0.70	0.700	0.001	L 0.001	0.005	L 0.003	0.200	0.200	0.016	0.016	0.077	0.077	0.022	0.022	0.520	0.520	0.005	L 0.003	0.01	L 0.005	0.001	L 0.001	0.120	0.120	0.310	0.310
Leachate, East Area	1/15/2015	0.004	0.004	0.035	0.035	0.39	0.390	0.005	L 0.003	0.005	L 0.003	0.120	0.120	0.013	0.013	0.026	0.026	0.008	0.008	0.300	0.300	0.037	0.037	0.01	L 0.005	0.005	L 0.003	0.091	0.091	0.100	0.100
Leachate, East Area	1/12/2016	0.007	0.007	0.051	0.051	0.48	0.480	0.005	L 0.003	0.005	L 0.003	0.130	0.130	0.012	0.012	0.260	0.260	0.013	0.013	0.360	0.360	0.005	L 0.003	0.01	L 0.005	0.005	L 0.003	0.100	0.100	0.230	0.230
Leak Detection, Side Slope	10/26/2001	0.312	0.312	0.061	0.061	0.44	0.437	0.005	L 0.003	0.005	L 0.003	0.154	0.154	0.123	0.123	0.089	0.089	0.040	L 0.020	0.466	0.466	0.010	L 0.005	0.01	L 0.005	0.005	L 0.003	0.241	0.241	0.081	0.081
Leak Detection, Side Slope	1/17/2002	0.221	0.221	0.020	0.020	0.38	0.384	0.005	L 0.003	0.005	L 0.003	0.138	0.138	0.070	0.070	0.387	0.387	0.039	0.039	0.497	0.497	0.010	L 0.005	0.01	L 0.005	0.005	L 0.003	0.311	0.311	0.127	0.127
Leak Detection, Side Slope	4/24/2002	0.038	0.038	0.086	0.086	0.37	0.370	–	–	–	–	0.135	0.135	0.082	0.082	0.249	0.249	0.017	0.017	0.471	0.471	–	–	–	–	–	–	0.265	0.265	0.154	0.154
Leak Detection, Side Slope	10/24/2002	0.362	0.362	0.078	0.078	0.35	0.353	0.010	L 0.005	0.010	L 0.005	0.153	0.153	0.087	0.087	0.160	0.160	0.025	0.025	0.519	0.519	0.010	L 0.005	0.02	L 0.010	0.010	L 0.005	0.266	0.266	0.053	0.053
Leak Detection, Side Slope	2/3/2003	0.443	0.443	0.101	0.101	0.47	0.472	0.010	L 0.005	0.010	L 0.005	0.172	0.172	0.154	0.154	0.548	0.548	0.038	0.038	0.653	0.653	0.020	L 0.010	0.02	L 0.010	0.020	L 0.010	0.347	0.347	0.162	0.162
Leak Detection, Side Slope	4/25/2003	0.595	0.595	0.089	0.089	0.35	0.353	0.010	L 0.005	0.010	L 0.005	0.182	0.182	0.202	0.202	1.010	1.010	0.069	0.069	–	–	0.020	L 0.010	0.02	L 0.010	0.010	L 0.005	0.246	0.246	0.519	0.519
Leak Detection, Side Slope	7/24/2003	0.332	0.332	0.070	0.070	0.31	0.313	0.010	L 0.005	0.010	L 0.005	0.133	0.133	0.169	0.169	0.538	0.538	0.049	0.049	0.554	0.554	0.020	L 0.010	0.02	L 0.010	0.020	L 0.010	0.241	0.241	0.168	0.168
Leak Detection, Side Slope	10/28/2003	0.375	0.375	0.013	0.013	0.40	0.397	0.005	L 0.003	0.005	L 0.003	0.132	0.132	0.201	0.201	1.830	1.830	0.040	0.040	0.642	0.642	0.010	L 0.005	0.01	L 0.005	0.005	L 0.003	0.207	0.207	0.533	0.533
Leak Detection, Side Slope	1/29/2004	0.175	0.175	0.078	0.078	0.48	0.478	0.010	L 0.005	0.010	L 0.005	0.113	0.113	0.158	0.158	0.575	0.575	0.028	0.028	0.708	0.708	0.010	L 0.005	0.01	L 0.005	0.010	L 0.005	0.226	0.226	0.242	0.242
Leak Detection, Side Slope	4/13/2004	0.136	0.136	0.099	0.099	0.45	0.450	0.010	L 0.005	0.010	L 0.005	0.121	0.121	0.067	0.067	0.278	0.278	0.019	0.019	0.671	0.671	0.010	L 0.005	0.01	L 0.005	0.010	L 0.005	0.322	0.322	0.117	0.117
Leak Detection, Side Slope	7/29/2004	0.191	0.191	0.087	0.087	0.45	0.451	0.010	L 0.005	0.010	L 0.005	0.129	0.129	0.098	0.098	0.304	0.304	0.040	L 0.020	0.672	0.672	0.008	L 0.004	0.02	L 0.010	0.010	L 0.005	0.322	0.322	0.115	0.115
Leak Detection, Side Slope	10/20/2004	0.201	0.201	0.059	0.059	0.43	0.426	0.005	L 0.003	0.005	L 0.003	0.121	0.121	0.113	0.113	0.546	0.546	0.021	0.021	0.715	0.715	0.020	L 0.010	0.01	L 0.005	0.020	L 0.010	0.412	0.412	0.185	0.185
Leak Detection, Side Slope	1/27/2005	0.190	0.190	0.027	0.027	0.54	0.539	0.010	L 0.005	0.010	L 0.005	0.136	0.136	0.106	0.106	0.334	0.334	0.027	0.027	0.761	0.761	0.050	L 0.025	0.02	L 0.010	0.010	L 0.005	0.344	0.344	0.181	0.181
Leak Detection, Side Slope	4/20/2005	0.086	0.086	0.029	0.029	0.45	0.452	0.010	L 0.005	0.010	L 0.005	0.111	0.111	0.098	0.098	0.495	0.495	0.010	0.010	0.756	0.756	0.020	L 0.010	0.02	L 0.010	0.008	L 0.004	0.362	0.362	0.181	0.181
Leak Detection, Side Slope	7/27/2005	0.100	L 0.050	0.059	0.059	0.50	0.504	0.001	L 0.001	0.006	L 0.003	0.108	0.108	0.076	0.076	0.465	0.465	0.043	0.043	0.700	0.700	0.002	L 0.001	0.01	L 0.004	0.020	L 0.010	0.292	0.292	0.212	0.212
Leak Detection, Side Slope	10/13/2005	0.136	0.136	0.058	0.058	0.56	0.557	0.005	L 0.003	0.005	L 0.003	0.094	0.094	0.082	0.082	0.453	0.453	0.040	L 0.020	0.650	0.650	0.040	L 0.020	0.01	L 0.005	0.040	L 0.020	0.233	0.233	0.204	0.204
Leak Detection, Side Slope	1/25/2006	0.132	0.132	0.071	0.071	0.47	0.474	0.010	L 0.005	0.010	L 0.005	0.105	0.105	0.058	0.058	0.388	0.388	0.023	0.023	0.636	0.636	0.010	L 0.005	0.02	L 0.010	0.010	L 0.005	0.289	0.289	0.211	0.211
Leak Detection, Side Slope	4/11/2006	0.125	0.125	0.071	0.071	0.54	0.538	0.005	L 0.003	0.005	L 0.003	0.088	0.088	0.066	0.066	0.227	0.227	0.016	0.016	0.581	0.581	0.020	L 0.010	0.01	L 0.005	0.005	L 0.003	0.230	0.230	0.630	0.630
Leak Detection, Side Slope	8/11/2006	0.153	0.153	0.071	0.071	0.50	0.502	0.005	L 0.003	0.005	L 0.003	0.099	0.099	0.056	0.056	0.351	0.351	0.055	0.055	0.596	0.596	0.010	L 0.005	0.01	L 0.005	0.005	L 0.003	0.010	L 0.005	0.630	0.630
Leak Detection, Side Slope	10/26/2006	0.135	0.135	0.076	0.076	0.55	0.546	0.010	L 0.005	0.010	L 0.005	0.117	0.117	0.049	0.049	0.446	0.446	0.038	0.038	0.663	0.663	0.004	L 0.002	0.02	L 0.010	0.004	L 0.002	0.304	0.304	0.343	0.343
Leak Detection, Side Slope	1/22/2007	0.168	0.168	0.082	0.082	0.52	0.522	0.010	L 0.005	0.010	L 0.005	0.115	0.115	0.054	0.054	0.215	0.215	0.021	0.021	0.674	0.674	0.019	0.019	0.02	L 0.010	0.005	L 0.003	0.293	0.293	0.188	0.188
Leak Detection, Side Slope	4/25/2007	0.281	0.281	0.052	0.052	0.18	0.182	0.005	L 0.003	0.005	L 0.003	0.071	0.071	0.086	0.086	0.623	0.623	0.050	L 0.025	0.590	0.590	0.100	L 0.050	0.01	L 0.005	0.100	L 0.050	0.338	0.338	0.207	0.207
Leak Detection, Side Slope	7/20/2007	0.179	0.179	0.148	0.148	0.21	0.211	0.005	L 0.003	0.005	L 0.003	0.078	0.078	0.055	0.055	0.325	0.325	0.033	0.033	0.535	0.535	0.010	L 0.005	0.01	L 0.005	0.005	L 0.003	0.307	0.307	0.125	0.125
Leak Detection, Side Slope	10/15/2007	0.076	0.076	0.138	0.138	0.25	0.253	0.005	L 0.003	0.005	L 0.003	0.058	0.058	0.033	0.033	0.276	0.276	0.029	0.029	0.501	0.501	0.005	L 0.003	0.01	L 0.005	0.005	L 0.003	0.272	0.272	0.187	0.187
Leak Detection, Side Slope	1/30/2008	0.235	0.235	0.095	0.095	0.38	0.375	0.010	L 0.005	0.010	L 0.005	0.092	0.092	0.044	0.044	0.123	0.123	0.013	0.013	0.534	0.534	0.010	L 0.005	0.02	L 0.010	0.010	L 0.005	0.202	0.202	0.130	0.130
Leak Detection, Side Slope	4/18/2008	–	–	0.089	0.089	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.121	0.121
Leak Detection, Side Slope	7/24/2008	0.160	0.160	0.115	0.115	0.27	0.267	0.005	L 0.003	0.005	L 0.003	0.058	0.058	0.056	0.056	0.205	0.205	0.015	0.015	0.472	0.472	0.025	L 0.013	0.01	L 0.005	0.010	L 0.005	0.212	0.212	0.070	0.070
Leak Detection, Side Slope	10/22/2008	0.410	0.410	0.087	0.087	0.31	0.308	0.010	L 0.005	0.010	L 0.005	0.063	0.063	0.142	0.142	0.807	0.807	0.017	0.017	0.628	0.628	0.005	L 0.003	0.02	L 0.010	0.005	L 0.003	0.147	0.147	0.266	0.266
Leak Detection, Side Slope	1/23/2009	0.500	L 0.250	0.105	0.105	0.41	0.408	0.050	L 0.025	0.050	L 0.025	0.076	0.076	0.113	0.113	0.301	0.301	0.026	0.026	0.537	0.537	0.050	L 0.025	0.10	L 0.050	0.002	L 0.001	0.157	0.157	0.103	0.103
Leak Detection, Side Slope	4/16/2009	0.089	0.089	0.078	0.078	0.36	0.356	0.005	L 0.003	0.005	L 0.003	0.053	0.053	0.059	0.059	0.457	0.457	0.035	0.035	0.540	0.540	0.025	L 0.013	0.01	L 0.005	0.025	L 0.013	0.183	0.183	0.292	0.292
Leak Detection, Side Slope	1/27/2010	0.200	0.200	0.130	0.130	0.31	0.310	0.005	L 0.003	0.005	L 0.003	0.078	0.078	0.029	0.029	0.230	0.230	0.017	0.017	0.490	0.490	0.025	L 0.013	0.01	L 0.005	0.025	L 0.013	0.130	0.130	0.120	0.120
Leak Detection, Side Slope	1/7/2011	0.097	0.097	0.160	0.160	0.39	0.390	0.001	L 0.001	0.005	L 0.003	0.052	0.052	0.015	0.015	0.024	0.024	0.006	0.006	0.350	0.350	0.010	L 0.005	0.01	L 0.005	0.002	L 0.001	0.120	0.120	0.039	0.039
Leak Detection, Side Slope	1/24/2012	0.150	0.150	0.200	0.200	0.48	0.480	0.001	L 0.001	0.005	L 0.003	0.075	0.075	0.040	0.040	0.062	0.062	0.008	0.008	0.500	0.500	0.025	L 0.013	0.01	L 0.005	0.005	L 0.003	0.150	0.150	0.050	L 0.025
Leak Detection, Side Slope	1/10/2014	0.130	0.130	0.190	0.190	0.53	0.530	0.001	L 0.001	0.005	L 0.003	0.065	0.065	0.026	0.026	0.580	0.580	0.020	0.020	0.550	0.550	0.005	0.005	0.01	L 0.005	0.001	L 0.001	0.140	0.140	0.510	0.510
Leak Detection, Side Slope	1/15/2015	0.080	0.080	0.130	0.130	0.37	0.370	0.005	L 0.003	0.005	L 0.003	0.044	0.044	0.041	0.041	0.740	0.740	0.035	0.035	0.460	0.460	0.061	0.061	0.01	L 0.005	0.005	L 0.003	0.160	0.160	1.100	1.100
Leak Detection, Side Slope	1/12/2016	0.072	0.072	0.120	0.120	0.38	0.380	0.005	L 0.003	0.005	L 0.003	0.048	0.048	0.021	0.021	0.320	0.320	0.022	0.022	0.410	0.410	0.009	0.009	0.01	L 0.005	0.005	L 0.003	0.150	0.150	0.500	0.500
LEACHATE, LH-1	2/22/1989	0.050	L 0.025	0.036	0.036	–	–	0.005	L 0.003	0.002	L 0.001	0.130	0.130	–	–	0.150	0.150	0.260	0.260	0.120	0.120	0.010	L 0.005	0.01	L 0.005	0.005	L 0.003	–	–	0.700	0.700
LEACHATE, LH-2	4/29/1988	0.050	L 0.025	0.050	0.050	–	–	0.005	L 0.003	0.005	L 0.003	0.030	0.030	–	–	0.010	L 0.005	0.006	0.006	0.100	0.100	0.005	L 0.003	0.01	L 0.005	0.005	L 0.003	–	–	0.020	0.020
Number analyzed		59		60		57		57		57		59		57		59		59		58		57		57		57		57		60	
Number detected		39		11		57		0		0		59		51		50		51		58		5		0		0		54		56	
Number non-detect		20		49		0		57		57		0		6		9		8		0		52		57		57		3		4	
Detection Frequency		66%		18%		100%		0%		0%		100%		89%		85%		86%		100%		9%		0%		0%		95%		93%	
Minimum Concentration			0.002		0.010		0.023		0.001		0.001		0.030		0.009		0.002		0.001		0.100		0.001		0.004		0.001		0.005		0.005
Maximum Concentration			0.595		0.200		0.818		0.025		0.025		0.316		0.202		1.830		0.260		0.761		0.061		0.050		0.050		0.412		1.100
Average Concentration			0.138		0.078		0.473		0.004		0.004		0.127		0.061		0.300		0.029		0.514		0.010		0.008		0.006		0.201		0.231
Median Value			0.097		0.071		0.472		0.003		0.003		0.120		0.049		0.227		0.021		0.527		0.005		0.005		0.004		0.183		0.159

Notes: (mg/L) = milligrams per liter
(L) indicates not reported at or above the MRL (Method Reporting Limit)

Appendix I

QUARTERLY SITE INSPECTION REPORTS

Facility Inspection Checklist

Hidden Valley Landfill, Pierce County, Washington

Name: SAM ARLINGTON Date: 2/18/2016

Signature: [signature] Weather: Lt. clouds

Items	Yes	No	Comments
Cover System			
Settlement Depressions (sinkholes)		X	
Cracking of Cover Soils		X	
Inadequate Cover Soil or Rock		X	
Standing Water	X		NORTH of N35 ON COVER ROAD
Vegetation			
Bare or Sparsely Vegetated Areas		X	
Areas of Dying Vegetation		X	
Large Root Vegetation (ex. Bushes)		X	
Stormwater Conveyance System			
Ditch Obstructions or Flat Areas	X		PERIODIC FLAT SPOTS DUE TO SETTLEMENT
Culvert Obstructions		X	
Catch Basin Debris or Silt Accumulation		X	
Stormwater Basin Debris or Silt	X		SILT ? FINES OBSERVED IN CONCRETE BASIN
Cover Erosion			
Gullies and/or Erosion Scars		X	
Presence of Seeps		X	
Vector Control			
Evidence of Ground Burrows		X	
Leachate Collection & Leak Detection Systems			
Piping or Valve Issues		X	
Pump or Meter Issues		X	
Foaming at Pump		X	

Other Remarks:

Facility Inspection Checklist

Hidden Valley Landfill, Pierce County, Washington

Name: SAM ARLINGTON Date: 5/24/2016

Signature: [signature] Weather: CLOUDY

Items	Yes	No	Comments
Cover System			
Settlement Depressions (sinkholes)		X	
Cracking of Cover Soils		X	
Inadequate Cover Soil or Rock		X	
Standing Water		X	NO SIGNIFICANT MEASURABLE RAIN PRIOR TO MONITORING
Vegetation			
Bare or Sparsely Vegetated Areas		N/A	MOWING COVER AT TIME OF INSPECTION, GRASS ~ 2FT TALL ON MOST OF COVER
Areas of Dying Vegetation		N/A	
Large Root Vegetation (ex. Bushes)		N/A	
Stormwater Conveyance System			
Ditch Obstructions or Flat Areas	X		
Culvert Obstructions		X	
Catch Basin Debris or Silt Accumulation		X	
Stormwater Basin Debris or Silt	X		
Cover Erosion			
Gullies and/or Erosion Scars		X	
Presence of Seeps		X	
Vector Control			
Evidence of Ground Burrows		X	
Leachate Collection & Leak Detection Systems			
Piping or Valve Issues		X	
Pump or Meter Issues		X	
Foaming at Pump		X	

Other Remarks:

0421600202

Facility Inspection Checklist

Hidden Valley Landfill, Pierce County, Washington

Name: SAM ARLINGTON Date: 8/25/2016

Signature: Sam A Weather: CLEAR

Items	Yes	No	Comments
Cover System			
Settlement Depressions (sinkholes)		X	
Cracking of Cover Soils		X	
Inadequate Cover Soil or Rock		X	
Standing Water		N/A	NO RAIN FOR ~1 WEEK PRIOR
Vegetation			
Bare or Sparsely Vegetated Areas		X	
Areas of Dying Vegetation	X		VERY HOT RECENTLY, SOME DEAD GRASS
Large Root Vegetation (ex. Bushes)		X	
Stormwater Conveyance System			
Ditch Obstructions or Flat Areas	X		SOME FLAT SPOTS ON COVER DITCHES
Culvert Obstructions		X	
Catch Basin Debris or Silt Accumulation		X	
Stormwater Basin Debris or Silt		X	
Cover Erosion			
Gullies and/or Erosion Scars		X	
Presence of Seeps		X	
Vector Control			
Evidence of Ground Burrows		X	
Leachate Collection & Leak Detection Systems			
Piping or Valve Issues		X	
Pump or Meter Issues		X	
Foaming at Pump		X	

Other Remarks:

Facility Inspection Checklist

Hidden Valley Landfill, Pierce County, Washington

Name: SAM ADLINGTON Date: 11/17/2016

Signature: Sam A Weather: OVERCAST

Items	Yes	No	Comments
Cover System			
Settlement Depressions (sinkholes)		X	
Cracking of Cover Soils		X	
Inadequate Cover Soil or Rock		X	
Standing Water	X		SMALL SPOT OF STANDING WATER BETWEEN N33 & N35 ON COVER ROAD. NO RAIN 24-hr PRIOR
Vegetation			
Bare or Sparsely Vegetated Areas		X	
Areas of Dying Vegetation		X	
Large Root Vegetation (ex. Bushes)	X		SMALL TREES UPSLOPE of GP-10 IN DITCH
Stormwater Conveyance System			
Ditch Obstructions or Flat Areas	X		FLAT OR REVERSE GRADES IN COVER & PERIMETER DITCHES
Culvert Obstructions		X	
Catch Basin Debris or Silt Accumulation		X	
Stormwater Basin Debris or Silt		X	
Cover Erosion			
Gullies and/or Erosion Scars		X	
Presence of Seeps		X	
Vector Control			
Evidence of Ground Burrows		X	
Leachate Collection & Leak Detection Systems			
Piping or Valve Issues		X	
Pump or Meter Issues		X	
Foaming at Pump		X	

Other Remarks:

Appendix J

LANDFILL GAS SYSTEM O&M REPORTS

Hidden Valley Landfill
LFG System Monitoring & Maintenance
January 26, 2016

MAINTENANCE ITEMS COMPLETED THIS MONTH:

- Performed monthly LFG extraction well monitoring and repairs on January 26, 2016.
- Repaired piping at extraction well N-14.

LANDFILL FLARE STATION

Before system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
01/26/2016 06:53	31.5	22.0	3.0	43.5	257	257	29.64

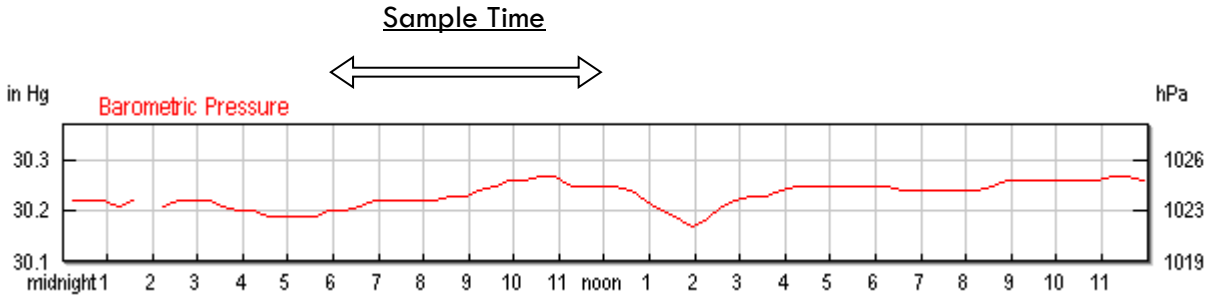
PHOTO LOG

Repair of extraction well N-14

Barometric Pressure Trend – January 2016
Hidden Valley Landfill, Pierce County, Washington

Barometric Pressure Trend for January 2016

Barometric Pressure Trend for January 26, 2016



Source : KPLU
https://www.wunderground.com/history/airport/KPLU/2016/1/26/DailyHistory.html?req_city=Puyallup&req_state=WA&reqdb.zip=98371&reqdb.magic=1&reqdb.wmo=99999

Hidden Valley Landfill
LFG System Monitoring & Maintenance
February 19, 24, & 29, 2016

MAINTENANCE ITEMS COMPLETED THIS MONTH:

- Performed monthly LFG extraction well monitoring and repairs on February 24 and 29, 2016.
- Repaired piping at condensate sump CS-2, and extraction wells N-15 and N-60.

LANDFILL FLARE STATION

Before system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
02/19/2016 09:20	38.7	25.0	2.1	34.2	237	237	29.02

After system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
02/24/2016 14:46	41.0	28.3	1.7	29.0	210	210	29.60

PHOTO LOG

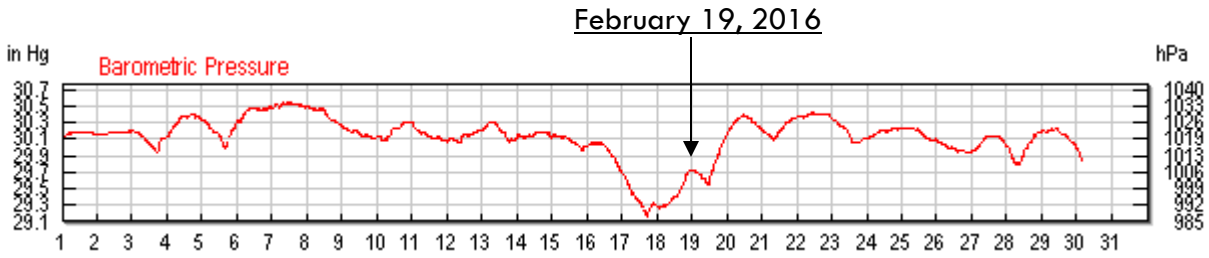
Repair of piping at condensate sump CS-2

Repair of Extraction Well N-15

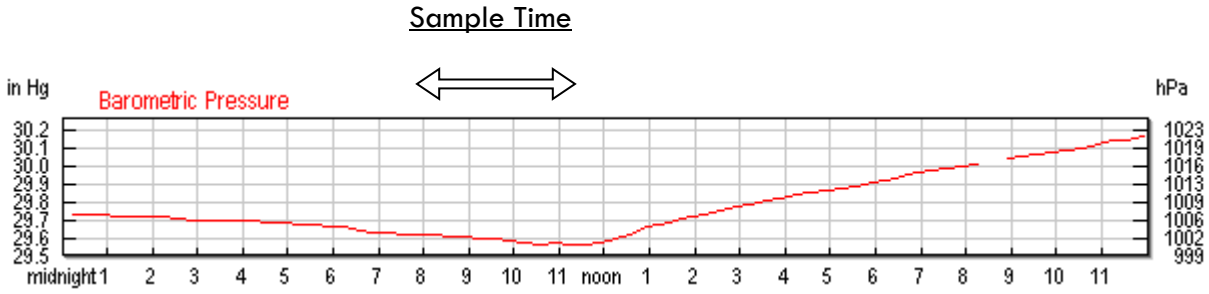
Repair of Extraction Well N-60

Barometric Pressure Trend – February 2016
Hidden Valley Landfill, Pierce County, Washington

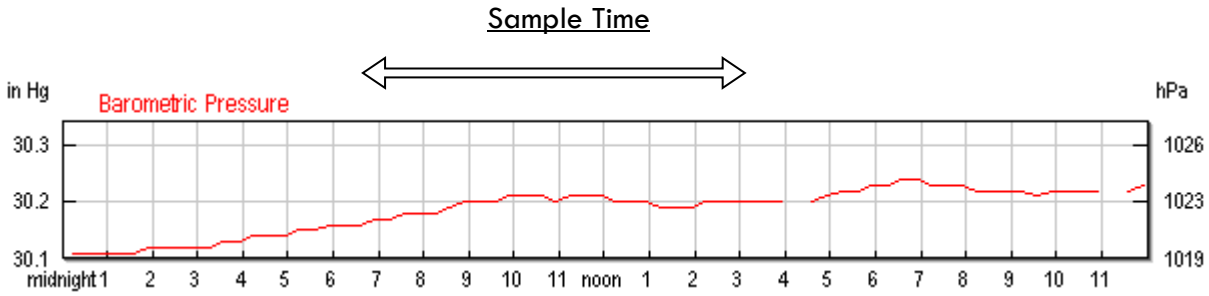
Barometric Pressure Trend for February 2016



Barometric Pressure Trend for February 19, 2016



Barometric Pressure Trend for February 24, 2016



Source : KPLU
https://www.wunderground.com/history/airport/KPLU/2016/2/19/DailyHistory.html?req_city=Puyallup&req_state=WA&reqdb.zip=98371&reqdb.magic=1&reqdb.wmo=99999

Hidden Valley Landfill
LFG System Monitoring & Maintenance
March 9 & 11, 2016

MAINTENANCE ITEMS COMPLETED THIS MONTH:

- Performed monthly LFG extraction well monitoring and repairs on March 9 and 11, 2016.
- Repaired piping at condensate sump CS-6 and extraction well N-6.

LANDFILL FLARE STATION

Before system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
03/09/2016 08:53	37.1	23.8	3.5	35.6	230	230	29.18

After system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
03/09/2016 12:51	42.3	27.3	1.6	28.8	263	263	28.99

PHOTO LOG

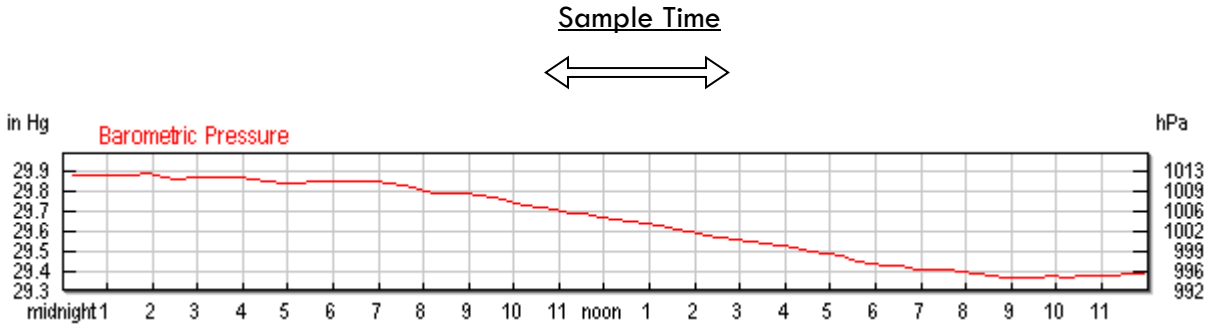
Repair of condensate sump CS-6

Repair of Extraction Well N-6

Barometric Pressure Trend – March 2016
Hidden Valley Landfill, Pierce County, Washington

Barometric Pressure Trend for March 2016

Barometric Pressure Trend for March 9, 2016



Source : KPLU
https://www.wunderground.com/history/airport/KPLU/2016/3/9/DailyHistory.html?req_city=Puyallup&req_state=WA&req_statename=&reqdb.zip=98371&reqdb.magic=1&reqdb.wmo=99999

Hidden Valley Landfill
LFG System Monitoring & Maintenance
April 19 & 26, 2016

MAINTENANCE ITEMS COMPLETED THIS MONTH:

- Performed monthly LFG extraction well monitoring and repairs on April 19, 2016.
- Performed maintenance on the flare station on April 26.

LANDFILL FLARE STATION

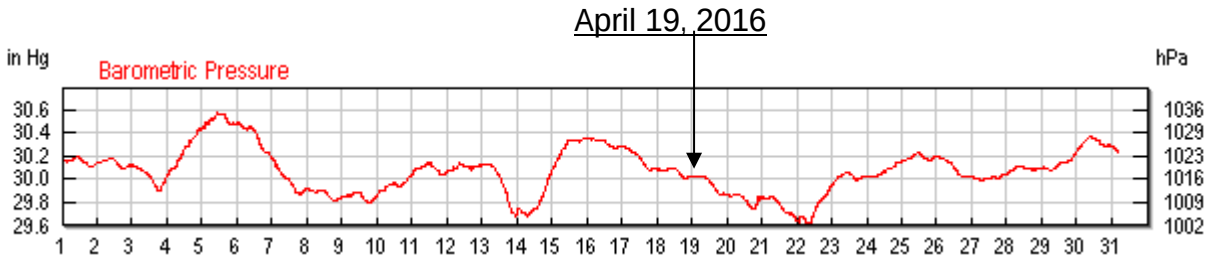
Before system maintenance

Date & Time	CH_4 %	CO_2 %	O_2 %	Balance %	Init. Flow SCFM	Adj. Flow SCFM	Baro. Press. inches Hg
04/19/2016 06:37	28.0	20.1	4.6	47.3	310	`	29.45

After system maintenance

Date & Time	CH_4 %	CO_2 %	O_2 %	Balance %	Init. Flow SCFM	Adj. Flow SCFM	Baro. Press. inches Hg
04/19/2016 09:30	36.7	23.5	2.4	`	245	245	29.50

Barometric Pressure Trend for April 19, 2016



Source : KPLU
https://www.wunderground.com/history/airport/

Hidden Valley Landfill
LFG System Monitoring & Maintenance
May 5 & 6, 2016

MAINTENANCE ITEMS COMPLETED THIS MONTH:

- Performed monthly LFG extraction well monitoring and repairs on May 5 & 6, 2016.

LANDFILL FLARE STATION

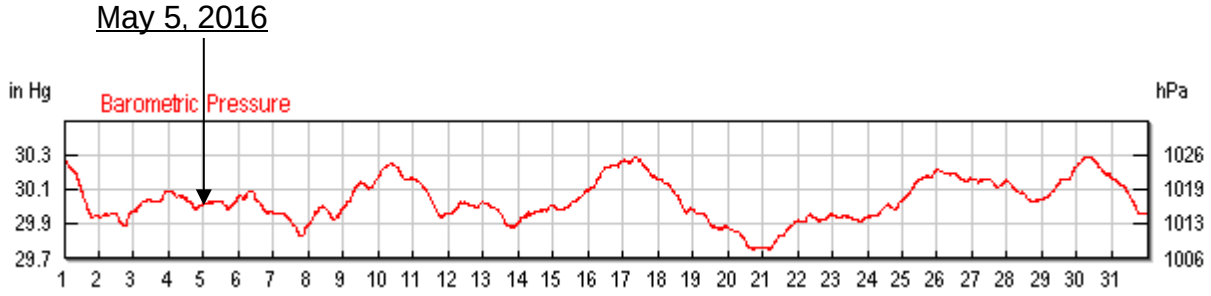
Before system maintenance

Date & Time	CH_4 %	CO_2 %	O_2 %	Balance %	Init. Flow SCFM	Adj. Flow SCFM	Baro. Press. inches Hg
05/05/2016 11:20	24.9	16.9	8.2	50.0	276	2760	29.40

After system maintenance

Date & Time	CH_4 %	CO_2 %	O_2 %	Balance %	Init. Flow SCFM	Adj. Flow SCFM	Baro. Press. inches Hg
05/06/2016 12:51	43.3	26.5	1.5	28.7	215	215	29.47

Barometric Pressure Trend for May 2016



Source : KPLU
https://www.wunderground.com/history/airport/

Hidden Valley Landfill
LFG System Monitoring & Maintenance
June 9, 26 & 30, 2016

MAINTENANCE ITEMS COMPLETED THIS MONTH:

- Performed monthly LFG extraction well monitoring and repairs on June 9, 26 & 30, 2016.
- Replaced 10"x18" LFG Hose South of E-12
- Replaced 12"x18" LFG Hose East of E-25
- Repaired separated 4" PVC Line East of E-39
- Repaired separated 3" PVC Line at N-27
- Replaced 2" Valve, reconnect lateral at N-29
- Replaced damaged 3" LFG hose, Replaced 2" valve at N-17

LANDFILL FLARE STATION

Before system maintenance

Date & Time	CH_4 %	CO_2 %	O_2 %	Balance %	Init. Flow SCFM	Adj. Flow SCFM	Baro. Press. inches Hg
06/09/2016 08:53	29.6	22.6	4.5	43.3	261	261	29.33

After system maintenance

Date & Time	CH_4 %	CO_2 %	O_2 %	Balance %	Init. Flow SCFM	Adj. Flow SCFM	Baro. Press. inches Hg
06/30/2016 10.16	44.1	27.4	0.3	28.2	281	281	29.62

PHOTO LOG

Flex-hose repair south of well E-12

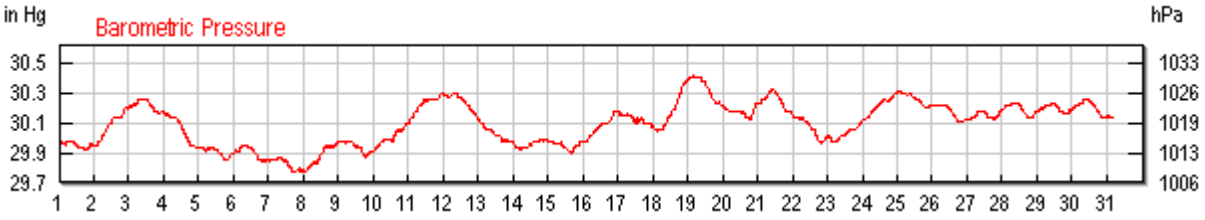
Flex-hose repair east of well E-25

Flex-hose repair at N-17

Flex-hose repair at N-29

Barometric Pressure Trend – June 2016
Hidden Valley Landfill, Pierce County, Washington

Barometric Pressure Trend for June 2016



Source : KPLU
https://www.wunderground.com/history/airport/

Hidden Valley Landfill
LFG System Monitoring & Maintenance
July 21 and 22, 2016

MAINTENANCE ITEMS COMPLETED THIS MONTH:

- Performed monthly LFG extraction well monitoring and repairs on July 21 and 22, 2016.

LANDFILL FLARE STATION

Before system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
07/21/2016 12:30	38.2	26.4	0.0	35.4	233	233	29.40

After system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
07/22/2016 11:47	43.7	26.3	1.3	28.7	155	155	29.60

Barometric Pressure Trend for July 2016

Source : KPLU
https://www.wunderground.com/history/airport/KPLU/2016/7/21/MonthlyHistory.html?req_city=KPLU&req_state=WA&req_statename=Washington&reqdb.zip=98375&reqdb.magic=5&reqdb.wmo=99999

Hidden Valley Landfill
LFG System Monitoring & Maintenance
August 12, 2016

MAINTENANCE ITEMS COMPLETED THIS MONTH:

- Performed monthly LFG extraction well monitoring and repairs on August 12, 2016.

LANDFILL FLARE STATION

Before system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
08/12/2016 09:08	38.2	26.1	2.2	33.5	155	155	29.48

After system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
08/12/2016 16:43	45.6	23.3	0.0	28.1	283	283	29.33

Barometric Pressure Trend for August 2016

Source : KPLU
https://www.wunderground.com/history/airport/KPLU/2016/8/12/MonthlyHistory.html?req_city=KPLU&req_state=WA&req_statename=Washington&reqdb.zip=98375&reqdb.magic=5&reqdb.wmo=99999

Hidden Valley Landfill
LFG System Monitoring & Maintenance
September 29 and 30, 2016

MAINTENANCE ITEMS COMPLETED THIS MONTH:

- Performed monthly LFG extraction well monitoring and repairs on September 29 and 30, 2016.

LANDFILL FLARE STATION

Before system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
09/29/2016 11:44	35.6	26.1	1.6	36.7	260	260	29.52

After system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
09/30/2016 10:15	47.2	28.1	1.6	23.1	230	230	29.47

Barometric Pressure Trend for September 2016

Source : KPLU
https://www.wunderground.com/history/airport/KPLU/2016/9/29/MonthlyHistory.html?req_city=KPLU&req_state=WA&req_statename=Washington&reqdb.zip=98375&reqdb.magic=5&reqdb.wmo=99999

Hidden Valley Landfill
LFG System Monitoring & Maintenance
October 21 and 27, 2016

MAINTENANCE ITEMS COMPLETED THIS MONTH:

- Performed monthly LFG extraction well monitoring and repairs on October 21 and 27, 2016.

LANDFILL FLARE STATION

Before system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
10/21/2016 07:21	37.9	26	1.7	34.4	214	214	29.46

After system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
10/27/2016 11:23	43.3	29.2	0.6	23.7	200	200	29.30

Barometric Pressure Trend for October 2016

Source : KPLU
https://www.wunderground.com/history/airport/KPLU/2016/10/21/MonthlyHistory.html?req_city=Puyallup&req_state=WA&reqdb.zip=98375&reqdb.magic=5&reqdb.wmo=99999

Hidden Valley Landfill
LFG System Monitoring & Maintenance
November 29 and 30, 2016

MAINTENANCE ITEMS COMPLETED THIS MONTH:

- Performed monthly LFG extraction well monitoring and repairs on November 29 and 30, 2016.
- Replaced valve and flex hose at well N-58

LANDFILL FLARE STATION

Before system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
11/29/2016 10:50	40.9	26.7	2.1	30.3	192	192	29.63

After system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
11/30/2016 09:27	41.5	26.6	2.8	29.1	202	202	29.46

PHOTO LOG

Flex-hose repair at well N-58

Barometric Pressure Trend for November 2016

Source : KPLU
https://www.wunderground.com/history/airport/KPLU/2016/11/29/MonthlyHistory.html?req_city=Puyallup&req_state=WA&req_statename=&reqdb.zip=98375&reqdb.magic=5&reqdb.wmo=99999

Hidden Valley Landfill
LFG System Monitoring & Maintenance
December 6, 7, and 8, 2016

MAINTENANCE ITEMS COMPLETED THIS MONTH:

- Performed monthly LFG extraction well monitoring and repairs on December 6, 7, and 8, 2016.
- Restarted flare following high oxygen shutdown.
- Removed 10 inch wye from header near well N-12.
- Reroute and connect lateral for well E-12 to the 10 inch header.
- Replaced 10 inch flex-hose at well E-2.
- Replaced the 2 inch valve ate Well N-66.
- Replaced the 3 inch flex-hose at well E-18.
- Temporarily sealed oxygen leak at well N-24.
- Repaired the lateral connecting well N-44 to the header.
- Temporarily sealed oxygen leak at well N-24.

LANDFILL FLARE STATION

Before system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg
12/7/2016 16:43	16.6	11.1	13.5	58.8	418	418	29.81

After system maintenance

Date & Time	CH_4	CO_2	O_2	Balance	Init. Flow	Adj. Flow	Baro. Press.
	%	%	%	%	SCFM	SCFM	inches Hg

Not performed

PHOTO LOG

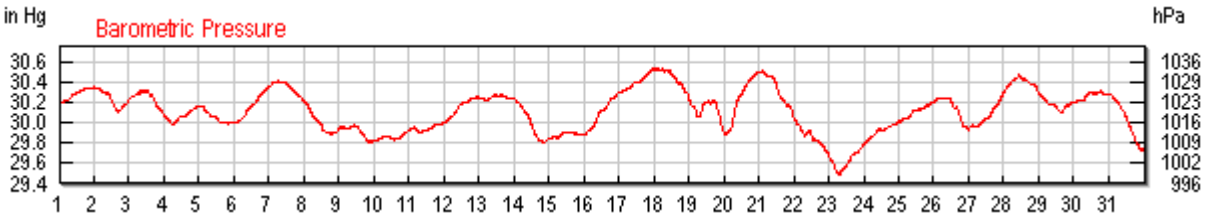
Replaced flex-hose at well E-2

Removed 10 inch wye and rerouted lateral at well E-2

Repaired lateral at well N-44

Removed wye from header near well N-12

Barometric Pressure Trend for December 2016



Source : KPLU
https://www.wunderground.com/history/airport/KPLU/2016/12/6/MonthlyHistory.html?req_city=Puyallup&req_state=WA&req_statename=&reqdb.zip=98375&reqdb.magic=5&reqdb.wmo=99999

Condensate Recirculation Inspection Checklist

Hidden Valley Landfill, Pierce County, Washington

Name: SAM ADLINGTON Date: 2/18/2016

Signature: [signature] Weather: Lt. clouds

Instructions: Inspect each sump for pump operation and condensate fluid level, which should be below the overflow drainage pipe. Note any unusual observations such as soil staining or air leaks in the comments section.

Sump	Operation per Design (Y or N)	Comments
Sump No. 1	Y	
Sump No. 2	Y	
Sump No. 3	Y	
Sump No. 4	Y	
Sump No. 5	Y	STRONG ODOR WHEN OPENED
Sump No. 6	N	AIR LEAK OBSERVED, LID NOT OPENED SITE 3 SCS FS NOTIFIED.
Sump No. 7	Y	
Sump No. 8	Y	
Sump No. 9	Y	
Sump No. 10	Y	
~~Other Remarks:~~ Sump No. 11	N	PUMP REMOVED, STRONG VACUUM

Condensate Recirculation Inspection Checklist

Hidden Valley Landfill, Pierce County, Washington

Name: SAM ADLINGTON Date: 5/24/2016

Signature: [signature] Weather: CLOUDY

Instructions: Inspect each sump for pump operation and condensate fluid level, which should be below the overflow drainage pipe. Note any unusual observations such as soil staining or air leaks in the comments section.

Sump	Operation per Design (Y or N)	Comments
Sump No. 1	NM	SEE NOTE 1.
Sump No. 2	↓	↓
Sump No. 3		
Sump No. 4		
Sump No. 5		
Sump No. 6		
Sump No. 7		
Sump No. 8		
Sump No. 9		
Sump No. 10		

Other Remarks:

1. HIGH O_2 AT FLARE (11% VOL.), DID NOT WANT TO RISK SHUTDOWN BY OPENING SUMP LIDS. INSTRUCTED INSTEAD TO TRY TO FIND SOURCE(S) OF LEAK.

04216002-02

Condensate Recirculation Inspection Checklist

Hidden Valley Landfill, Pierce County, Washington

Name: SAM ADDINGTON Date: 9/25/2016

Signature: [signature] Weather: CLEAR

Instructions: Inspect each sump for pump operation and condensate fluid level, which should be below the overflow drainage pipe. Note any unusual observations such as soil staining or air leaks in the comments section.

Sump	Operation per Design (Y or N)	Comments
Sump No. 1	Y	
Sump No. 2	Y	AUDIABLE AIR LEAK FROM AIR SUPPLY
Sump No. 3	Y	"
Sump No. 4	N/A	BOLTS ON LID RUSTED SHUT
Sump No. 5	Y	
Sump No. 6	N	UNDER VACUUM
Sump No. 7	Y	
Sump No. 8	Y	
Sump No. 9	Y	
Sump No. 10	N	UNDER VACUUM.

Other Remarks: