

Water, Air, Monitoring & Analysis

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Lawrence Livermore National Laboratory (LLNL) Experimental Test Site (Site 300)

Compliance Monitoring Program for Closed Pit 1 Landfill

Annual/Fourth Quarter Report for 2011

Author

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Summary

This combined fourth quarter and annual report for 2011 summarizes compliance activities performed at the Lawrence Livermore National Laboratory (LLNL) Experimental Test Site (Site 300) landfill known as Pit 1. Compliance activities at the pit consist of ground water sampling and analysis, pit cap inspections, and reporting of analytical results. Ground water measurements for the fourth quarter of 2011 are contained in **Appendix A, Tables A-1** to **A-4**.

No evidence of a new release of constituents of concern from Pit 1 is indicated by the fourth quarter ground water measurements and no constituents of concern were detected above statistical limits (SL) at Pit 1. Preliminary results for well K1-09 indicated that barium was above the SL, however the results from resamples taken on two different dates indicated they were below the SL and, therefore were not considered statistical evidence of a release from Pit 1.

The routine fourth quarter visual inspection of the Pit 1 cap was performed on October 12, 2011 by LLNL staff and no deficiencies were noted. No discrepancies were noted and the pit cap and drainage structures continue to function properly.

Introduction

This annual/fourth quarter report for 2011 summarizes compliance monitoring results for a closed landfill known as Pit 1 at LLNL's Site 300. Site 300 is a 28.3 square kilometer (km²) (10.9 square miles [mi²]) site located in the Altamont Hills approximately 10.5 km (6.5 mi) southwest of downtown Tracy, California (**Figure 1**). The landfill is located in the northern portion of the site (**Figure 2**). Closure of this unlined Class I waste management unit was completed with waste in place in December 1992 following a California Department of Health Services (now Department of Toxic Substances Control, or DTSC) approved RCRA Closure and Post-Closure Plan (PCP) using the LLNL Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Federal Facilities Agreement (FFA) process. Site 300 is owned by the U.S. Department of Energy (U.S. DOE) and is operated by Lawrence Livermore National Security, LLC.



Figure 1. Location of LLNL Site 300.



LLNL Site 300 Compliance Monitoring Program for the Closed Pit 1 Landfill Annual/Fourth Quarter Report for 2011

Figure 2. Location of closed landfill Pit 1 at LLNL Site 300.

Pit 1 is located in the Elk Ravine drainage area, about 300 meters (m) or 984 feet (ft) above mean sea level (MSL). Ground water generally flows in an east-northeast direction beneath Pit 1 (Figure 3), following the inclination (dip) of underlying Miocene-age sedimentary rocks (Webster-Scholten, 1994).

The current monitoring network at Pit 1 consists of twelve monitoring wells. These include eight detection monitoring wells and four evaluation monitoring wells (**Figure 3**). The detection monitoring wells that are used to sample the ground water in the vicinity of Pit 1 include: wells K1-01C and K1-07 located hydrologically upgradient from Pit 1; downgradient wells K1-02B, K1-04, K1-05, and W-PIT1-2326; and cross-gradient wells K1-08 and K1-09. The primary objective of the detection monitoring wells is to detect any new release of constituents of concern to ground water. Constituents of concern, as defined by Title 23 of the California Code of Regulations (CCR), Chapter 15, are waste constituents, reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste buried in the Pit 1 Landfill. LLNL collects, analyzes, and statistically evaluates one sample quarterly from each detection monitoring well.

The evaluation monitoring wells are all downgradient of Pit 1 wells and include K1-06, W-PIT1-2620, W-PIT1-2209, and W-865-2005 as required by the Monitoring Reporting Program (MRP). These evaluation monitoring wells were added to Pit 1 monitoring and reporting requirements to track existing plumes of perchlorate and tritium from an upgradient source. LLNL collects and analyzes one sample quarterly from each evaluation monitoring well and annually conducts trend analyses for tritium and perchlorate.

All of these wells are screened in the uppermost water-bearing zone in the Neroly Formation lower blue sandstone unit (Tnbs₁/Tnbs₀). The Neroly Formation contains the main aquifer beneath Site 300. Pit 2, which was closed before RCRA was enacted, is hydrologically upgradient from Pit 1. In 1992, a 2.4 m (8 ft) thick RCRA cap containing an impermeable layer of clay that is 0.6 m (2 ft) thick was constructed over Pit 1. The cap prevents rainwater from percolating through the waste buried in the pit. A water diversion channel was constructed around the pit cap to remove storm water runoff. The diversion channel empties into the adjacent arroyo, the headwater of Elk Ravine.



Figure 3. Locations of Pit 1 compliance monitoring wells.

Compliance Monitoring Program Overview

This report fulfills quarterly requirements set forth in the following two documents: (1) Waste Discharge Requirements (WDR) Order 93-100 and the February 18, 2010, MRP No. 93-100, administered by the California CVRWQCB (CVRWQCB 1993 and 2010) and (2) LLNL Site 300 RCRA Closure and Post-Closure Plans, Landfill Pits 1 and 7 (Rogers/Pacific Corporation 1990). The PCP was approved by the California Department of Health Services (currently the California Department of Toxic Substances Control). The combined requirements include quarterly ground water sampling and analyses to detect potential releases of constituents of concern from the landfill, quarterly and post-rain visual inspections of pit cap integrity, repairs as necessary to maintain the integrity of the landfill and its water-diversion system, annual measurements of cap survey markers to detect subsidence, an annual inspection of the caps by an independent engineer, and quarterly written monitoring reports.

Quality Assurance

To ensure quality data, LLNL works within the established Quality Assurance (QA) program of the LLNL Environmental Functional Area (EFA). LLNL uses protocols and procedures that cover all aspects of ground water sampling, sample tracking, and data management. These written protocols and procedures are contained in the *LLNL Livermore Site and Site 300 Environmental Restoration Project Standard Operating Procedures (SOPs)* (Goodrich and Lorega, 2009), and the *Environmental Monitoring Plan* (Woods, 2009). SOPs are used to minimize inadvertent sample contamination and maintain sample integrity from the well to the analytical laboratory. Data management SOPs ensure that all laboratory measurements are received, accurately recorded, and properly stored both in a computer database and in hardcopy format.

Each quarter, a duplicate (collocated) set of ground water samples is collected from each monitoring network and a set of blank samples is prepared from a randomly chosen well. In addition, equipment blanks are prepared and analyzed to ensure that sampling equipment is properly cleaned before use. Each day, when samples are collected for volatile organic compound (VOC) analysis, a trip blank (prepared at the analytical laboratory) is carried into the field. It is returned unopened to the analytical laboratory for VOC analysis. If VOCs are detected in a trip blank and in any of the routine samples obtained that day, sample results may be discounted and new sampling may be performed.

As required by Executive Order 12770, measurements are reported in *Système Internationale* (SI) units. The SI unit for radioactivity is the becquerel (Bq), equal to 1 nuclear disintegration per second. The more commonly used unit, picocurie (pCi), is equal to 1 nuclear disintegration per 27 seconds. As a convenience, maximum contaminant levels (MCLs) for radioactivity in drinking water are given in both becquerels per liter (Bq/L) and picocuries per liter (pCi/L) in **Table 1** below. Note that MCLs are provided for reference only, because this report does not involve wells used for potable domestic, livestock, or industrial water supply.

	. 8	
Radiological parameter	MCL (Bq/L)	MCL (pCi/L)
Gross alpha	0.555	15
Gross beta	1.85	50
Tritium	740	20,000
Radium (total)	0.185	5
Uranium (total)	0.74	20

Table 1. MCLs for radioactivity in drinking water.

Description of Report Contents

The "Summary of Analytical Results" section reviews any constituents of concern detected in ground water during the fourth quarter of 2011 from detection monitoring and perchlorate and tritium in evaluation monitoring wells. Constituents of concern measurements that exceeded SLs or MCLs in drinking water are discussed in this report.

Appendix A contains the ground water analytical measurements for the fourth quarter of 2011. Pit 1 data are in **Tables A-1**, **A-2**, and **A-3**. **Table A-4** shows the sample dates for Pit 1, and **A-5** shows the reporting limits for the Pit 1 VOC contaminants of concern. Note that the **Appendix A** tables may include some small negative values for radioactivity measurements. These are below the method RLs and are calculated values. They simply indicate that the radioactivity for that ground water sample is less than a low reference standard. **Appendix A** also contains a ground water contour map of water levels from the Tnbs₁/Tnbs₀ Hydrostratigraphic Unit (HSU) at Pit 1.

Appendix B explains the methods used to determine the SL of concentration for a constituent of concern. Requirements for statistical treatment of ground water data are established in the CCR, Title 23, Division 3, Chapter 15, Section 2550.7. LLNL uses a statistical prediction limit method to implement intrawell comparisons. The method uses the average and standard deviation of historical measurements to calculate a SL value. If a routine quarterly constituent of concern measurement exceeds its SL and is confirmed by retesting, it is reported to the CVRWQCB as statistically significant evidence of a release.

Appendix C contains the results for QA sample analyses performed during the fourth quarter of 2011 at Pit 1 (**Table C-1**).

Appendix D consists of **Table D-1** summarizing constituents of concern and the sampling frequencies in the monitoring network for the pit. The regulatory drivers for each constituent of concern are also included in **Table D-1**.

Appendix E consists of **Table E-1** and presents well specification and construction details for detection monitoring and evaluation monitoring wells.

Appendix F consists of **Table F-1** that displays hydrographs for all compliance monitoring wells.

Appendix G consists of Table G-1 and includes field logs for all compliance monitoring wells.

Appendix H consists of **Table H-1** that includes analytical results from 2011 that were omitted from the **Appendix H** plots due to the use of specially reduced Y-axis plot limits. **Table H-2** contains the detection monitoring constituents of concern, monitoring wells, statistical methods, concentration limits, and statistical limits at Pit 1.

Summary of Analytical Results

This section summarizes the analytical results for Pit 1 for the fourth quarter of 2011 and reports on the requirements of the CVRWQCB Pit 1 MRP and post closure plan requirements. During the fourth quarter monitoring period, no new releases of constituents of concern to ground water from the pit are evident in the data. As part of the MRP, statistical limits (SLs) used to monitor ground water constituents of concern are shown on **Table A-1**. The MRP requires that two confirmation samples be collected from wells with constituents of concern exceeding SLs. If either of the two confirmation samples exceeds the statistical limit, a finding of statistically significant evidence of a release is confirmed and a seven-day notification letter must be submitted to the CVRWQCB. The statistical tests used to evaluate this data are those identified in **Appendix B**.

Detection Monitoring Wells

During the fourth quarter, analytical results indicate that no constituents of concern were detected above statistical limit (SL) from Pit 1 detection monitoring wells. Preliminary results for well K1-09 indicated that barium was above the SL (51 μ g/L), with a result of 59 μ g/L; however; resamples, taken on December 8 (48 μ g/L) and December 15, 2011 (46 μ g/L) were below the SL and are therefore not considered statistical evidence of a release from Pit 1.

Although tritium is currently below SL in all detection monitoring wells, and has been during the past two quarters, tritium was detected above the SL in detection monitoring well K1-09 (SL=8.66 Bq/L, [234 pCi/L]) during the second quarter 2011 from a routine sample. As noted in the second quarterly report (**Table A-1**), the well was resampled twice. The first retest sample was below the SL, however, the second resample was slightly above the SL. As noted in the second quarterly report, LLNL does not believe this tritium data is indicative of a statistically significant evidence of a release of tritium from Pit 1, but rather has been attributed to an upgradient source near Pit 7 and the Building 850 area. Tritium activities in well K1-09 have remained below the SL for the past two quarters. In addition to tritium, radium 226 was detected with an unusual result in the upgradient well, K1-07. Because this well is upgradient from Pit 1, the well has no SL and is generally unaffected by Pit 1. However, data from this well will be evaluated over the next few quarters to determine if this was a valid result.

Perchlorate is also identified as a constituent of concern in the MRP and is monitored in samples from the detection monitoring wells (**Table A-2**). This quarter, perchlorate was detected in samples from two downgradient detection monitoring wells: K1-02B ($6.0 \ \mu g/L$, [SL=10 $\mu g/L$]) and W-PIT1-2326 ($5.4 \ \mu g/L$, [SL=7.8 $\mu g/L$]). The detections were above the reporting limit ($4.0 \ \mu g/L$) but were below the SLs for the wells.

The concentrations of selected volatile organic compounds (VOCs) detected in ground water samples from detection monitoring wells are summarized and presented as total VOCs (**Table A-2**). VOCs were detected in the ground water samples from downgradient well K1-05 (19 μ g/L) and cross-gradient wells K1-08 (28 μ g/L) and K1-09 (160 μ g/L). The only VOC observed in these samples was freon-113. Freon-113 arises from a source at Building 865, about 300 m (984 ft) west of Pit 1 (Ferry and Holtzapple, 2006). While Freon-113 is not a constituent of concern for Pit 1, concentrations have generally decreased from historic maxima, and in the past few years the concentrations appear to be relatively stable. However the value at K1-09 (160 μ g/L) this quarter is unusually elevated and therefore will be resampled and reported in the first quarter 2012 report. It seems unlikely that this value represents conditions at this well and may be an analytical error. The highest value that was previously reported for Freon-113 was 150 μ g/L in October 1996.

In addition to the normal reporting on constituents of concern with statistical limits, this report evaluates additional constituents that historically have elevated concentrations and are monitored under the post closure plan or under LLNL's surveillance monitoring program under DOE Order 458.1. For this annual report, Freon-113 results for ground waste samples collected from monitoring wells K1-05, K1-08, and K1-09 are plotted on **Figure 4**.



Date

Figure 4. Freon-113 concentrations in water samples collected from detection ground water monitoring wells around Pit 1.

Evaluation Monitoring Wells

Evaluation monitoring wells are required by the MRP and sample analytical results from these wells are shown on **Table A-3**. The table lists physical parameters as well as the results of perchlorate and tritium analyses. These wells are used to track existing plumes of perchlorate and tritium from an upgradient source. As required by the MRP, annual trend analyses graphs for both perchlorate and tritium evaluation monitoring wells are presented in this annual report.

The fourth quarter 2011 analytical results indicate that perchlorate concentrations in two of the four evaluation monitoring wells, K1-06 ($5.2 \mu g/L$) and W-PIT1-2620 ($4.4 \mu g/L$), exceeded the reporting limit of 4.0 $\mu g/L$, however, neither wells exceeded the 6.0 $\mu g/L$ MCL for perchlorate. For this annual report, perchlorate results for ground waste samples collected from evaluation monitoring wells W-PIT1-2209, W-865-2005, K1-06, and W-PIT1-2620 are plotted on **Figure 5**.



Date

Figure 5. Perchlorate concentrations in water samples collected from detection ground water monitoring wells around Pit 1.

Tritium activities in samples from two of the four evaluation monitoring wells, K1-06 (115 Bq/L, [3108 pCi/L]) and W-PIT1-2620 (38.8 Bq/L [1048 pCi/L]) exceeded the detection limit of 3.7 Bq/L [100 pCi/L]. The tritium activities in wells K1-06 and WPIT1-2209 are similar to last quarter. For this annual report, tritium results for ground waste samples collected from evaluation monitoring wells W-PIT1-02, W-PIT1-2209, W-865-2005, K1-06, and W-PIT1-2620 are plotted on **Figure 6**.



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Figure 6. Tritium activities in water samples collected from detection ground water monitoring wells around Pit 1.

As reported last quarter, we officially replaced detection monitoring well W-PIT1-02 with W-PIT1-2620 because of the continued high pH value detected in well W-PIT1-02, apparently caused by cement grout in the screened casing of the well. The well has been replaced by W-PIT1-2620, which has been added to the Evaluation Monitoring Program as shown on **Figure 3**.

Inspection and Maintenance Summary

The routine fourth quarter visual inspection of the Pit 1 cap was performed on October 12, 2011 by LLNL staff and no deficiencies were noted. No discrepancies were noted and the pit cap and drainage structures continue to function properly.

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Abbreviations and Acronyms

Bq	becquerel (international unit of radioactivity equal to 27 pCi)
CCR	California Code of Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CVRWQCB	Central Valley Regional Water Quality Control Board
DOE	U.S. Department of Energy
DTSC	Department of Toxic Substances Control (California)
EFA	Environmental Functional Area (LLNL)
ERD	Environmental Restoration Department
FFA	Federal Facility Agreement
ft	foot (used as a measure of elevation above MSL)
HSU	Hydrostratigraphic Unit
km	kilometer
km ²	square kilometer
L	liter
LLNL	Lawrence Livermore National Laboratory
m	meter
m^2	square meter
MCL	maximum contaminant level (for drinking water)
mg	milligram
MRP	Monitoring and Reporting Plan
MSL	mean sea level (datum for elevation measurements)
μg	microgram
pCi	picocurie (unit of radioactivity equal to 0.037 Bq)
PCP	post-closure plan
QA	quality assurance
RCRA	Resource Conservation and Recovery Act
RL	reporting limit (contractual concentration near zero)
SI	Système Internationale (units of measurement)
Site 300	Experimental Test Site, LLNL
SL	statistically determined concentration limit
SOP	standard operating procedure
$Tnbs_0$	Neroly Formation basal sandstone
$Tnbs_1$	Neroly Formation lower blue sandstone
VOC	volatile organic compound
WDR	Waste Discharge Requirements (permit)

Appendix A

Tables and Figures of Ground Water Measurements

LLNL Site 300 Compliance Monitoring Program for the Closed Pit 1 Landfill
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Quarter			1	2	3	4
COC (units)	Well	SL	Result	Result	Result	Result
Arsenic (µg/L)	K1-01C	—(a)	12	12	12	12
	K1-07	— (a)	13	13	13	13
	K1-02B	15	11	12	11	12
	K1-04	16	12	12	12	12
	K1-05	18	14	14	15	11
	K1-08	17	14	14	14	13
	K1-09	16	13	14	14	15
	W-PIT1-2326	14	12	12	11	12
Barium (µg/L)	K1-01C	-	<25	25	<25	<25
	K1-07	-	29	30	27	29
	K1-02B	26	25	<25	<25	25
	K1-04	32	27	28	28	29
	K1-05	43	39	37	37	38
	K1-08	49	42	40	43	44
	K1-09	51	45	45	46	59, 48, 46
	W-PIT1-2326	46	35	36	34	34
Beryllium (µg/L)	K1-01C	—	<0.5	<0.2	<0.5	<0.5
	K1-07	2 27	<0.5	<0.2	<0.5	<0.5
	K1-02B	0.5	<0.5	<0.5	<0.5	<0.5
	K1-04	0.5	<0.8	<0.5	<0.5	<0.5
	K1-05	0.5	<0.5	<0.5	<0.5	<0.5
	K1-08	0.5	<0.5	<0.2	<0.5	<0.5
	K1-09	0.5	<0.5	<0.5	<0.5	<0.5
	W-PIT1-2326	0.5	<0.5	<0.2	<0.5	<0.5
Cadmium (µg/L)	K1-01C	—	<0.5	<0.5	<0.5	<0.5
	K1-07		<0.5	<0.5	<0.5	<0.5
	K1-02B	0.52	<0.5	<0.5	<0.5	<0.5
	K1-04	0.5	<1	<0.5	<0.5	<0.5
	K1-05	0.5	<0.5	<0.5	<0.5	<0.5
	K1-08	0.5	<0.5	<0.5	<0.5	<0.5
	K1-09	0.5	<0.5	<0.5	<0.5	<0.5
	W-PIT1-2326	0.5	<0.5	<0.5	< 0.5	<0.5
Cobalt (µg/L)	K1-01C	_	<25	<25	<25	<25
	K1-07	-	<25	<25	<25	<25
	K1-02B	25	<25	<25	<25	<25
	K1-04	25	<1	<25	<25	<25
	K1-05	25	<25	<25	<25	<25
	K1-08	25	<25	<25	<25	<25
	K1-09	25	<25	<25	<25	<25
	W-PIT1-2326	25	<25	<25	<25	<25

Table A.1 Pit 1 detection monitoring	walls constituents of concern SL.	and an anterior and	
Table A-1. The Tuetection monitoring	wens, constituents of concern, SLA	s, and quarterly anal	ytical results for 2011.

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Quarter			1	2	3	4
COC (units)	Well	SL	Result	Result	Result	Result
Copper (µg/L)	K1-01C	-	<10	<10	<10	<10
	K1-07		<10	<10	<10	<10
	K1-02B	60	12	31	10	<10
	K1-04	10	<10	<10	<10	<10
	K1-05	30	<10	<10	<10	<10
	K1-08	10	<10	<10	<10	<10
	K1-09	10	<10	<10	<10	<10
	W-PIT1-2326	10	<10	<10	<10	<10
Lead (µg/L)	K1-01C	-	<2	<2	<2	<2
	K1-07	i = i	<2	<2	<2	<2
	K1-02B	2	<2	<2	<2	<2
	K1-04	2	<2	<2	<2	<2
	K1-05	2	· <2	<2	<2	<2
	K1-08	2	<2	<2	<2	<2
	K1-09	2	<2	<2	<2	<2
	W-PIT1-2326	2	<2	<2	<2	<2
Nickel (µg/L)	K1-01C	-	<5	<5	<5	<5
	K1-07	_	<5	<5	<5	<5
	K1-02B	9	<5	<5	<5	<5
	K1-04	5	2.4	<5	<5	<5
	K1-05	13	<5	<5	<5	<5
	K1-08	5	<5	<5	<5	<5
	K1-09	5	<5	<5	<5	<5
·	W-PIT1-2326	5	<5	<5	<5	<5
Vanadium (µg/L)	K1-01C	3 44	67	64	66	67
	K1-07	1000	65	68	63	63
	K1-02B	59	47	50	48	46
	K1-04	46	32	34	37	32
	K1-05	79	59	66	68	57
	K1-08	78	60	66	62	58
	K1-09	69	57	58	58	59
·····	W-PIT1-2326	63	48	49	49	48
Zinc (µg/L)	K1-01C	-	<20	<20	<20	<20
	K1-07		<20	<20	<20	<20
	K1-02B	98	<20	31	<20	<20
	K1-04	51	3.9	<20	<20	<20
	K1-05	24	<20	<20	<20	<20
	K1-08	20	<20	<20	<20	<20
	K1-09	20	<20	<20	<20	<20
	W-PIT1-2326	48	<20	<20	<20	<20

Table A-1.	Pit 1 detection monitoring wells, constituents of concer-	n, SLs, and quarter	ly analytical results for 2011.
the second s			<u></u>

Quarter			1	2	3	4
COC (units)	Well	SL	Result	Result	Result	Result
Radium 226 (Bq/L)	^(b) K1-01C	8770)	0.004	0.01	0.004	0.006
	K1-07	_	0.008	0.005	0.004	0.000
	K1-02B	0.012	0.005	0.003	0.005	0.025
	K1-04	0.012	0.006	0.008	0.005	0.007
	K1-05	0.012	0.004	0.003	0.002	0.004
	K1-08	0.009	0.003	0.006	0.005	0.007
	K1-09	0.012	0.01	0.004	0.008	0.002
	W-PIT1-2326	0.019	0.002	0.01	0.008	0.004
Tritium (Bq/L)	K1-01C	-	28.6	27.1	31.3	31.7
	K1-07	-	1.7	2.73	0.803	2 78
	K1-02B	158	139	130	127	125
	K1-04	19.2	17.6	14.4	16.9	15.8
	K1-05	11.4	6.07	5.81	6.36	9 32
	K1-08	10.7	6.88	7.73	5 48	9.52
	K1-09	8.66	6.73	8.70, 5.55, 9.88	7.51	6.22
	W-PIT1-2326	133	101	105	96.2	108
Uranium (total, Bq/I	K1-01C		0.139	0.162	0.135	0 142
	K1-07	223	0.115	0.1	0.11	0.13
	K1-02B	0.145	0.128, 0.128	0.160, 0.149, 0.167	0.165	0.143
	K1-04	0.085	0.071, 0.067	0.087, 0.072, 0.074	0.075	0.071
	K1-05	0.115	0.112	0.115	0.105	0.104
	K1-08	0.149	0.114	0.11	0.109	0.087
	K1-09	0.137	0.117	0.114	0.124	0.122
· · · · · · · · · · · · · · · · · · ·	W-PIT1-2326	0.115	0.119	0.119	0.12	0.1
Thorium 228 (Bq/L)	K1-01C	1	0	0	0	0.001
	K1-07	-	0.001	0.001	0	0
	K1-02B	0.003	0	0	0	0.001
	K1-04	0.005	-0.001	-0.001	0.001	0
	K1-05	0.003	0	0	0	0
€<	K1-08	0.004	-0.001	-0.001	0	0
	K1-09	0.008	0	0.001	0	0.002
	W-PIT1-2326	0.005	-0.001	0	0	0.001
Thorium 232 (Bq/L)	K1-01C	1000	0	0	0.001	0
	K1-07	-	0	0	0	0
	K1-02B	0.004	0	0	0	0
	K1-04	0.001	0	0	0	0
	K1-05	0.004	0.001	0	0	0
	K1-08	0.004	0.001	0	0	0.001
	K1-09	0.002	0	0	0	0
	W-PIT1-2326	0.001	0	0	0	0

<u>Autority 1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.</u>
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LLNL Site 300 Compliance Monitoring Program for the Closed Pit 1 Landfill
Annual/Fourth Quarter Report for 2011

Quarter			1	2	3	4
COC (units)	Well	SL	Result	Result	Result	Result
HMX (µg/L)	K1-01C	-	<1	<0.77	<1	<1
	K1-07		<1	<0.8	<0.83	<1
	K1-02B	1	<1.3	<1	<0.89	<0.99
	K1-04	1	<0.77	<1	<1	<1
	K1-05	1	<0.87	<1	<1.3	<1
	K1-08	1	<1	<0.68	<1	<1
	K1-09	1	<1	<1	<0.69	< 0.81
	W-PIT1-2326	1	<1	<1	<1	< 0.83
RDX (µg/L)	K1-01C	=	<1	<0.77	<1	<1
	K1-07	$\sim - 1$	<1	<0.8	<0.83	<1
	K1-02B	1	<1.3	<1	<0.89	<0.99
	K1-04	1	<0.77	<1	<1	<1
	K1-05	1	<0.87	<1	<1.3	<1
	K1-08	1	<1	<0.68	<1	<1
	K1-09	1	<1	<1	<0.69	< 0.81
	W-PIT1-2326	1	<1	<1	<1	< 0.83
Perchlorate (µg/L)	K1-01C	-	<4	<4	<4	<4
	K1-07	-	<4	<4	<4	<4
	K1-02B	10	6.6	6.2	6.4	6
	K1-04	4	<4	<4	<4	<4
	K1-05	4	<4	<4	<4	<4
	K1-08	4	<4	<4	<4	<4
	K1-09	4	<4	<4	<4	<4
	W-PIT1-2326	7.8	5.5	6.6	5.7	5.4

Table A-1.	Pit 1 detection	monitoring wells,	, constituents of concern,	SLs, and quarterly	analytical results for 2011.
				······································	

^(a) Wells K1-01C and K1-07 have no release detection SLs for COCs, because they are upgradient of Pit 1.

^(b) Radioactivity measurements are corrected for the background radioactivity inside the measurement chamber. A negative result for radioactivity indicates that the sample measured lower than the background by the amount shown. Radioactivity values shown as 0.000 measured less than 0.0005 Bq/L.

		Monitoring Well								
	K1-01C	K1-07	K1-02B	<u>K1-04</u>	K1-05	K1-08	K1-09	K1-09	K1-09	W-PIT1-2326
Date Sampled	<u>21-Nov</u>	25-Oct	15-Nov	25-Oct	25-Oct	25-Oct	1-Nov	8-Dec	15-Dec	14-Nov
Depth to water (ft)	108.12	141.74	138.83	157.16	171.81	156.7	161.97	162.02	162.1	179.73
Ground water elevation (ft)	973.82	967.89	968.4	965.51	959.05	966.04	964.71	964.66	964.58	968.06
Field pH (Units)	7.24	7.89	8.11	7,29	7.72	7.9	7.98	7.22	7.13	7.91
Field Specific Conductance (µmhos/cm)	706	610	721	614	6343	646	661	652	660	728
Field Temperature (Degrees C)	19.6	21.3	21.1	21.1	22.1	22.4	21.4	20.5	<u>2</u> 0.1	21
Gross alpha (Bq/L)	0.249	0.104	0.135	0.102	0.089	0.12	0.141	_	_	0.096
Gross beta (Bq/L)	0.11	0.135	0.134	0.136	0.138	0.101	0.097		_	0.098
Nitrate (as NO3) (mg/L)	35	30	33	30	35	33	33	_	_	32
Perchlorate (µg/L)	<4	<4	6	<4	<4	<4	<4	_	I	5.4
Total VOCs (calculated) (µg/L)	ND	ND	ND	ND	19	23	160	=	-	<1,000
Freon 113 (μg/L)	<0.5	<0.5	<0.5	<0.5	19	23	160		-	<0.5

Table A-2. Pit 1 additional PCP constituents for the fourth quarter 2011 analytical results for detection monitoring wells.

Notes:

ND = Not detected above reporting limit. Reporting limits vary with individual VOCs.

(-) Analysis not required.

	Monitoring Well						
	K1-06	W-PIT1-2620	W-PIT1-2209	W-865-2005			
Date Sampled	18-Oct	17-Oct	26-Oct	10-Nov			
Depth to water (ft)	116.05	230.9	215.8	327.15			
Ground water elevation (ft)	973.49	*	950.25	947.72			
Tritium (Bq/L)	115	38.8	2.12	-0.884			
Field pH (Units)	7.81	6.76	7.78	6.23			
Field Specific Conductance (µmhos/cm)	740	706	613	598			
Field Temperature (Degrees C)	24.6	22.4	21.2	20.4			
Perchlorate (µg/L)	5.2	4.4	<4	<4			

Table A-3. Pit 1 evaluation monitoring wells, constituents of concern, physical parameters, and analytical results for the fourth quarter, 2011.

* Surface completion in progress. No ground water elevation available.

Table A-4. Pit 1 ground water well routine sampling dates.

Location	Quarter	Sample Date
K1-01C	1	26-Jan-2011
	2	11-May-2011
	3	18-Aug-2011
	4	21-Nov-2011
K1-02B	1	11-Jan-2011
	2	26-Apr-2011
	3	18-Aug-2011
	4	15-Nov-2011
K1-04	1	5-Jan-2011
	2	28-Apr-2011
	3	19-Jul-2011
	4	25-Oct-2011
K1-05	1	11-Jan-2011
	2	26-Apr-2011
	3	11-Jul-2011
	4	25-Oct-2011
K1-07	1	19-Jan-2011
	2	10-May-2011
	3	13-Jul-2011
	4	25-Oct-2011
K1-08	1	20-Jan-2011
	2	9-May-2011
	3	17-Aug-2011
	4	25-Oct-2011
K1-09	1	24-Jan-2011
	2	28-Apr-2011
	3	15-Aug-2011
	4	1-Nov-2011
W-PIT1-2326	1	25-Jan-2011
	2	12-May-2011
	3	18-Aug-2011
	4	14-Nov-2011
K1-06	1	24-Jan-2011
	2	26-Apr-2011
	3	11-Jul-2011
	4	18-Oct-2011
W-PIT1-2209	1	24-Jan-2011
	2	14-Apr-2011
	3	14-Jul-2011
	4	26-Oct-2011
W-PIT1-02	1	18-Jan-2011
	2	13-Apr-2011
	3	*
	4	*
W-865-2005	1	18-Jan-2011
	2	14-Apr-2011
	3	25-Jul-2011
	4	10-Nov-2011
W-PIT1-2620	1	*
··· 1111-2020	2	*
	3	25-Jul-2011
	4	17-Oct-2011

* W-PIT1-02 replaced by W-PIT1-2620 in 3rd Quarter 2011.

Table A-5.	Pit 1	VOC	Reporting	Limits	(µg/L).
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Accoantik 100 100 100 100 100 100 100 Arendein 50 </th <th>VOC/Location</th> <th>K1-04</th> <th>K1-05</th> <th>K1-07</th> <th>K1-02B</th> <th>K1-09</th> <th>K1-08</th> <th>K1-01C</th> <th>W-PIT1-2326</th>	VOC/Location	K1-04	K1-05	K1-07	K1-02B	K1-09	K1-08	K1-01C	W-PIT1-2326
Acciona 10 10 10 10 10 10 10 Arginatria 50 50 50 50 50 50 50 50 Branadich/normaline 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 Branadich/normaline 0.5 <td>Acetonitrile</td> <td>100</td> <td>100</td> <td>100</td> <td>100</td> <td>100</td> <td>100</td> <td>100</td> <td>100</td>	Acetonitrile	100	100	100	100	100	100	100	100
Academin5050505050505050Acylonitile500.50.50.50.50.50.50.50.50.5Innomotiniboremelhane0.50.50.50.50.50.50.50.50.5Bromotorin0.50.50.50.50.50.50.50.50.5Bromotorin0.50.50.50.50.50.50.50.5Bromotorin0.00.01.001.001.001.000.0Caloba dialifac53555555Caloba dialifac0.50.50.50.50.50.50.50.5Caloba dialifac0.50.50.50.50.50.50.50.50.5Caloba dialifac0.50.50.50.50.50.50.50.50.50.5Caloba dialifac0.50.50.50.50.50.50.50.50.50.50.50.5Caloba dialifac0.5	Acetone	10	10	10	10	10	10	10	10
Acybonicin5050505050505050Brownel-bluromethum0.50.50.50.50.50.50.50.50.5Brownel-bluromethum0.50.50.50.50.50.50.50.50.5Brownel-bluromethum0.50.50.50.50.50.50.50.50.5Brownel-bluromethum0.50.50.50.50.50.50.50.50.5Cabon distilide0.50.50.50.50.50.50.50.50.50.5Cabon distilide55.555 <td>Acrolein</td> <td>50</td> <td>50</td> <td>50</td> <td>50</td> <td>50</td> <td>50</td> <td>50</td> <td>50</td>	Acrolein	50	50	50	50	50	50	50	50
Baxane 0.5<	Acrylonitrile	50	50	50	50	50	50	50	50
neurodicklowenchane 0.5	Benzene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Beennemme 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 Lownnenhame 10 <	Bromodichloromethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Breenenhane 0.5 0.5 0.5 0.5 0.5 0.5 0.5 2Huanone 10 10 10 10 10 10 10 10 Carbon disaffak S	Bromoform	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2-Banane 10 10 10 10 10 10 10 10 Carbon etrachhoride 0.5	Bromomethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Carbon disalidie 5 5 5 5 5 5 5 5 5 Carbon texnohioide 0.5 <td< td=""><td>2-Butanone</td><td>10</td><td>10</td><td>10</td><td>10</td><td>10</td><td>10</td><td>10</td><td>10</td></td<>	2-Butanone	10	10	10	10	10	10	10	10
Carbon temachloride 0.5	Carbon disulfide	5	5	5	5	5	5	5	5
Chlorokenzene 0.5 <	Carbon tetrachloride	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2.Chloro-1.3-bundlene 5 5 5 5 5 5 5 5 5 Chlorochane 0.5 0	Chlorobenzene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Chloroethane 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 2Choroomtykinjelter 10 10 10 10 10 10 10 10 Chloroomtykinjelter 0.5 <td< td=""><td>2-Chloro-1,3-butadiene</td><td>5</td><td>5</td><td>5</td><td>5</td><td>5</td><td>5</td><td>5</td><td>5</td></td<>	2-Chloro-1,3-butadiene	5	5	5	5	5	5	5	5
2-Chloroethylvinylether 10 10 10 10 10 10 10 10 10 Chloroofram 0.5	Chloroethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Chlorom 0.5	2-Chloroethylvinylether	10	10	10	10	10	10	10	10
Chloromethane 0.5 <	Chloroform	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1.2-Dibrono-3-chloropropane 1<	Chloromethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Diromochloromethane 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 1.4-Dichloro-2-butene 5	1,2-Dibromo-3-chloropropane	1	1	1	1	1	1	1	1
1.4-Dichloro-2-butene 5 6 5 0.5<	Dibromochloromethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Dichlorodifluoromethane 0.5	1,4-Dichloro-2-butene	5	5	5	5	5	5	5	5
1.1-Dichloroethane 0.5	Dichlorodifluoromethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1.2-bichloroethane 0.5	1,1-Dichloroethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1.1-bichloroethene 0.5	1.2-Dichloroethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
cis-1,2-Dichloroethene 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 trans-1,2-Dichloroethene 0.5	1,1-Dichloroethene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
trans-1,2-Dichloroethene 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 1.2-Dichloropropane 0.5	cis-1.2-Dichloroethene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1,2-Dichloroethene (total) 1 </td <td>trans-1,2-Dichloroethene</td> <td>0.5</td> <td>0.5</td> <td>0.5</td> <td>0.5</td> <td>0.5</td> <td>0.5</td> <td>0.5</td> <td>0.5</td>	trans-1,2-Dichloroethene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1.2-Dichloropropane 0.5	1,2-Dichloroethene (total)	1	1	1	1	1	1	1	1
cis-1,3-Dichloropropene 0.5	1,2-Dichloropropane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
trans-1,3-Dichloropropene 0.5 <td>cis-1,3-Dichloropropene</td> <td>0.5</td> <td>0.5</td> <td>0.5</td> <td>0.5</td> <td>0.5</td> <td>0.5</td> <td>0.5</td> <td>0.5</td>	cis-1,3-Dichloropropene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1.4-Dioxane 100 10 </td <td>trans-1,3-Dichloropropene</td> <td>0.5</td> <td>0.5</td> <td>0.5</td> <td>0.5</td> <td>0.5</td> <td>0.5</td> <td>0.5</td> <td>0.5</td>	trans-1,3-Dichloropropene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Ethanol 1000 100 10 <td>1,4-Dioxane</td> <td>100</td> <td>100</td> <td>100</td> <td>100</td> <td>100</td> <td>100</td> <td>100</td> <td>100</td>	1,4-Dioxane	100	100	100	100	100	100	100	100
Ethylbenzene 0.5 <t< td=""><td>Ethanol</td><td>1000</td><td>1000</td><td>1000</td><td>1000</td><td>1000</td><td>1000</td><td>1000</td><td>1000</td></t<>	Ethanol	1000	1000	1000	1000	1000	1000	1000	1000
Fron 113 0.5 0.	Ethylbenzene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2-Hexanone 10	Freon 113	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
4-Methyl-2-pentanone 10 <td>2-Hexanone</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td>	2-Hexanone	10	10	10	10	10	10	10	10
Methylene chloride 1	4-Methyl-2-pentanone	10	10	10	10	10	10	10	10
Styrene 0.5	Methylene chloride	1	1	1	1	1	1	1	1
1,1,2-Tetrachloroethane 0.5	Styrene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1,1,2,2-Tetrachloroethane 0.5 <td>1,1,1,2-Tetrachloroethane</td> <td>0.5</td> <td>0.5</td> <td>0.5</td> <td>0.5</td> <td>0.5</td> <td>0.5</td> <td>0.5</td> <td>0.5</td>	1,1,1,2-Tetrachloroethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Tetrachloroethene 0.5	1,1,2,2-Tetrachloroethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Trichloroethene 0.5	Tetrachloroethene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Toluene 0.5	Trichloroethene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1,1,1-Trichloroethane 0.5	Toluene	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1,1,2-Trichloroethane 0.5	1,1,1-Trichloroethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Trichlorofluoromethane 0.5	1,1,2-Trichloroethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Vinyl acetate 20	Trichlorofluoromethane	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Vinyl chloride 0.5	Vinyl acetate	20	20	20	20	20	20	20	20
Total xylene isomers 1 1 1 1 1 1 1 1	Vinyl chloride	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Total xylene isomers	1	1	1	1	1	1	1	1

ESH-EFA-WQ-12-2276 - BS/RB:rtd



Figure A-1. Ground water elevation contour map for the Tnbs₁/Tnbs₀ HSU at Pit 1.

Appendix B

Statistical Methods for Release Detection

Appendix B

Statistical Methods for Release Detection

Statistical monitoring of the RCRA closure and PCP for the Pit 1 landfill is described in the Revised MRP No. 93-100 (February 18, 2010) to satisfy the provisions of CCR Title 23, Chapter 15, Section 2550.7.

LLNL uses an intrawell comparison for each analyte at each down-gradient and cross-gradient well to detect potential releases of constituents of concern to ground water. Intrawell tests compare each measurement at a well to past measurements at that well in order to detect increases in concentration that statistically exceed the variation historically seen at that well.

Where sufficient detections are available, LLNL uses a statistical prediction limit method to implement intrawell comparisons. The method uses the average and standard deviation of historical measurements to calculate a SL value. The SL is calculated so that it will be exceeded by approximately one percent of individual measurements when there has not been a release. When too few detections are available, either the analytical reporting limit or maximum recent detection is used as an SL. The SLs currently in use are documented in the MRP.

Each quarter, each measurement is compared with its associated SL. The SL comparison is augmented by a verification procedure containing two discreet retests, in accordance with CCR Title 23, Chapter 15, Section 2550.7. This protects against false positives due to other causes, such as analytical error in the laboratory. Retests are used when the original measurement exceeds the SL. If either or both of the retests also exceed the SL, the result is considered to be a "statistically significant evidence of a release."

Based on the MRP, monitoring is conducted to evaluate SL detections for all constituents of concern in **Table A-1** detection monitoring wells. In addition, sampling is performed to evaluate whether tritium and perchlorate results for ground water samples collected from evaluation monitoring wells near Pit 1 indicate a release from Pit 1 or another source.

A change of the SL for total uranium at well W-PIT1-2326 was sent to the CVRWQCB in a letter request on June 13, 2011 because the total uranium values at the well had been elevated for several quarters. However, the value was below the closed upgradient well. LLNL has not received a response from the CVRWQCB and is still operating under the old SL. In 2011, the SL was slightly elevated during the first, second, and third quarters. The fourth quarter sampling showed results below the SL for this well. LLNL has previously communicated with the CVRWQCB in past letters and quarterly reports that we do not believe that the total uranium activities in this monitoring well represent statistical evidence of a release from Pit 1. LLNL's conclusion is based on samples collected from upgradient wells, as well as the natural uranium-235/238 ratio at the well.

B-1

Appendix C

Quality Assurance Samples

ESH-EFA-WQ-12-2276-BS/RB:rtd

LLNL Site 300 Compliance Monitoring Program for the Closed Pit 1 L	andfill
Annual/Fourth Quarter Report for 2011	

Constituent*	K1-01C Routine (Nov 21)	K1-01C Dunlicate (Nov 21)	PIT1FB Field blank (Nov 15)	Units
Arsenic	12	12	<2	ug/L
Barium	<25	<25	<25	μg/L
Beryllium	<0.5	<0.5	<0.5	μg/L
Cadmium	<0.5	<0.5	<0.5	μg/L
Cobalt	<25	<25	<25	μg/L
Copper	<10	<10	<10	μg/L
Lead	<2	<2	<2	μg/L
Nickel	<5	<5	<5	μg/L
Vanadium	67	66	<25	μg/L
Zinc	<20	<20	<20	μg/L
Nitrate (as NO3)	35	33	<0.5	mg/I
Perchlorate	<4	<4	<4	μg/L
He compounds				
НМХ	<1	<1	<1	μg/L
RDX	<1	<1	<1	μg/L
Radioactivity				
Radium 226 ^(a)	0.006 ± 0.005	0.012 ± 0.006	0.000 ± 0.004	Bq/L
Tritium	31.7 ± 7.58	28.5 ± 6.99	7.51 ± 4.00	Bq/L
Uranium (total)	0.142 ± 0.018	0.134 ± 0.018	-0.001 ± 0.002	Bq/L
Thorium 228	0.001 ± 0.002	-0.001 ± 0.001	0.002 ± 0.003	Bq/L
Thorium 232	0.000 ± 0.001	0.000 ± 0.001	0.001 ± 0.001	Bq/L
Gross alpha	0.249 ± 0.108	0.194 ± 0.092	0.006 ± 0.022	Bq/L
Gross beta	0.110 ± 0.046	0.130 ± 0.052	0.037 ± 0.061	Bq/L

Table C-1. Pit 1 quality assurance for routine, duplicate, and field blank samples for the fourth quarter 2011.

^(a) Radioactivity is corrected for the background radioactivity inside the measurement apparatus. Negative activity indicates that the sample contained less than the background activity by the amount shown. Radioactivity equal to or less than the 2-sigma uncertainty shown is considered to be a nondetection.

* As standard QA protocol, trip blanks were submitted with all samples in Table C-1. This quarter, all trip blank analyses were non-detects.

Appendix D

Constituents of Concern and Monitoring Frequencies

Constituent	WDR ^(b)	PCP ^(c)	Pit 1
Arsenic	Х		Q
Barium	X		Q
Beryllium	X		Q
Cadmium	Х		Q
Chloride		Х	А
Chromium		Х	SA
Cobalt	Х		Q
Copper	Х		Q
Iron		Х	SA
Lead	Х		Q
Manganese		Х	SA
Mercury		Х	SA
Nickel	Х		Q
Nitrate		Х	SA
Selenium		Х	SA
Silver		Х	SA
Sodium		Х	SA
Sulfate		Х	А
Vanadium	Х		0
Zinc	Х		ò
Total organic carbon (TOC)		Х	Â
Total organic halides (TOX)		Х	A
EPA Method 601		Х	
EPA Method 624		Х	А
EPA Method 625		Х	А
EPA Method 608		Х	А
Gross alpha and gross beta	28	Х	SA
Radium 226	Х		Q
Thorium 228	Х		Q
Thorium 232	Х	2	Q
Tritium	Х		Q
Perchlorate	Х		Q
Uranium (total)	Х		Q
HMX	Х		Q
RDX	Х		Q
Ground water elevation		Х	SA
Ground water temperature		Х	SA
pH		Х	SA
Specific conductance	2	Х	SA

Tahla D_1	Dit 1	constituents	٨f	concorn and	mon	itoring	from	uonaias ⁽ⁱ	I)
Table D-1.	TIFT	constituents	U1	concern anu	mon	litor mg	ΠÇΥ	uchtics.	

^(a) Monitoring frequencies are: Q (quarterly); SA (semiannually); A (annually).

^(b) Constituents of concern required to be monitored by WDR 93-100 (CVRWQCB, 2010).

(e) Additional constituents of concern required to be monitored by the post-closure plan (Rogers/Pacific Corporation, 1990).

Appendix E

Well Specification and Construction Details for Detection Monitoring and Evaluation Monitoring Wells

Table E-1. Well specification and construction details of the Pit 1 monitoring network.

Elevation of Casing Rottom	965.42	938.73	919	944.86	972.54	956.63	952.72	932.68	921.87	918.3	898.05	910.67
Elevation of Filter Pack Bottom	955.92	932.73	616	941.86	971.54	956.63	952.72	932.68	919.87	911.3	896.05	905.79
Elevation of Filter Pack Ton	986.92	982.13	968	972.86	995.54	983.93	985.72	975.68	950.87	934.3	929.05	949.79
Elevation of Bentonite Rottom	986.92	982.13	968	None	None	983.93	985.72	975.68	950.87	934.3	929.05	949.79
Elevation of Rentonite Ton	998.92	985.23	978	None	None	985.63	991.22	978.18	954.87	942.3	939.05	960.79
Elevation of Screen Rottom	965.42	938.73	920	944.86	972.54	958.63	954.72	934.68	922.87	919.3	899.05	911.09
Elevation of Screen Ton	975.42	958.73	937	965.86	982.54	978.63	979.72	969.68	942.87	929.3	919.05	930.79
Reference Evaluation	1081.94	1107.23	1122.67	1130.86	1089.54	1109.63	1122.74	1126.68	1274.87	1181.3	1166.05	1147.79
Ground Surface Evaluation	1078.92	1105.23	1120	1128.86	1087.54	1106.63	1120.72	1124.68	1272.87	1179.3	1164.05	1145.79
Easting	1699062.3	1699452.58	1699231.7	1699057.58	1699627.38	1698965.54	1698848.94	1698880.26	1699555.36	1699912.16	1700615.69	1699717.26
Northing	427774.28	427893.78	428315.51	428485.47	427736.68	428199.97	428373.1	428488.09	428990.64	428494.39	428221.94	428240.21
NSH	Tnbs ₁ /Tnbs ₀											
Well	K1-01C	K1-02B	K1-04	K1-05	K1-06	K1-07	K1-08	K1-09	W-865-2005	W-PIT1-02	W-PIT1-2209	W-PIT1-2326

Appendix F

Hydrographs for All Compliance Monitoring Wells
























Appendix G

Field Logs for Compliance Monitoring and Evaluation Monitoring Wells

	All Gr	ound Water Sa	ampling Data			e in
Target Sample	Date: 21-Nov-2011		Month: 1	Norm Otr: 4	Norm Vears	MUM
WELL ID:	K1-01C		AREA INFO:		9200/FMF3/D	
DATE: 21-No	v-2011 LOG H	BOOK (DOCUMEN	T CONTROL #		BAGRAND	m
PURGE METHOD/SAMPLE	METHOD: RF / GRVS	•	CONTRACTOR		AA23012	
SCREENED INTERVAL;	106.82 - 116 8	· · · · · · · · · · · · · · · · · · ·	_ CONTANINANT	PRESENT:	<u>NO3-37/3H</u>	<1000 pCi/L
CASING DEPTH(calc)/(fbrel: 116 en (1)	<u> </u>	_ PUMP INTAKE	DEPTH:		112.30
DEPTH TO WATER (Share)	110.82 / II.	3.5	CASING DIAME	TER/TCASING	HT(in): 3	.5 / 3.02
DEFIN 10 WATER(IDmp):	<u>107.64 on 18-AUG</u>	-11 /08.1	1	VOLUME	FACTOR: 0.1	500
WATER IN CASING (ft):	8.88	6. 70	CASING VOL (Gal/Time):	4.44	4.35 Gal
TIME PUMP ON:	0950		INITIAL FLOW	RATE (Q=GPM):	
TIME PUMP OFF:	10/3		MEASURED BY:	FLOW METER/ (GRAD CYL./ BU	JCKET/ OTHER
TIME Q GAL PUI	RGED VOLUMES P	H TEMP C	SC	mV	OG	DTE
0953 -	- 7.1	24 196	798.5	70	1	112.14
			-			
33						
		-				
					14	
METER SER	IAL # CALIBRA	TED	SAMPLER/EMPLO	YER:	eilme00	
SC :	JSD YES	NO 1	PROJECT:		3EMG	
mV :	TES	NO	SAMPLE PRESER	VATION/AMT O	f REAGENT:	NA
H2O:	YES	/NO	PRICE VOLVEXC	ESS H20 DEST	: 0.00 / Nor	e
QC SAMPLE ID:K1-78Y	OC LAB	(S) : RREPT.TNP	BCIABC nav		or ound	110.7
SAMPLE ID (VERIFY):	KI-OIC/ RAUS	(-).	/ BCLADS-BAK,	GEL QC SAMP	LE TIME:	(125
PROTECT			TIME COLLECTER		1013	
3EMG	ANALYTICAL LAB	/ REQUESTED	ANALYSIS /	QUANTITY	/ TYPI	OF CONTAINERS
3EMG	GEL	AS:F1	LTER	0	11.	Polyethylene
3EMG	GEL	AS:U	1130	·· 2	1L	Polyethylene
3EMG	BCLABS-BAK	E300.0	:NO3	2	1L	Polyethylene
3EMG	BCLABS-BAK	E300.0	PERC	1	250	ml Polyethylene
3EMG	BCLABS-BAK	E82	50	3 T	250	mi Polyethylene
3EMG	BCLABS-BAK	E8330	R+H	3	40 mi	A GLASS VOA VIAL
JEMG	GEL	E90	0	1	11	Polyethyler
3EMG	GEL	E900:F]	LTER	õ	16	Polyethylene
JEMG	GEL	E90	6	1	250	m] GLASS_AMPED
SENG	EBERLINE	RA22	26	1	250	1L PLASTIC
32mg	EBERLINE	RA226:F	ILTER	0		1L PLASTIC
3EMG	BCLABS-BAK	WGMGM	ET1	1	1L	Polyethylene
- 6/A # 6	DY UNDS-BAK	WGMGMET1:	FILTER	0	1L	Polyethylene

Page: 1 of 1

)

All Ground Water Sampling Data

									-	
I	farget S	ample Date:	15-Nov-2	011		Month:	Norm Qtr: 4	Norm Year:	2011	
WELL ID	12		K1~02B			AREA INFO:		\$300/RWRb/	WW	
DATE:		15-Nov-201	1	LOG BOOK	(DOCUMENT	r control) #	:	BB23009		
PURGE M	ETHOD/S	AMPLE METHO	D: ST /	3VES		CONTAMINANT	PRESENT.	103 22 /nand /		
SCREENE	D INTER	VAL:	148.80 -	168.80		PUMP TNTAVP	DEDBIT.	03-33/PERC-0	5.4/83>1000 PCi/L	
CASING I	DEPTH(ca	alc)/(fbgs);	168.80	/ 166.5		CACTNO DESK	DEPIN:	N.	147.30	
DEPTH TO	O WATER	(fbmp): 1	36.03 on	16-81/0-13	1760	CASING UIAMI	ETER/TCASING	HT(in):	3.5 / 2.00	
WATER IN	I CASING	; (ft): 3	2 47	7992	[] 0.0	>>	VOLUMI	S FACTOR: 0.	.500	
		1	770	29.14		CASING VOL ((Gal/Time):	16.23	5 + 300 = 45 FR	
	1F ON:	· · · · · · · · · · · · · · · · · · ·	3.20			INITIAL PLOW	RATE (Q=GPM	1): <u> </u>	6	
TIME PUM	1P OFF:					MEASURED BY:	FLOW METER/	GRAD CYL./ E	BUCKET/ OTHER	
TIME		GAL PURGED	VOLUMES	рн	TEMP C	sc	mV	OG	DTW	
1340	┝╌┥╴	15	(8.19	23.1	7169	210	(138.89	
1349	<u> </u>	30	2	807	2.1	7219	215	١	(39.70)	
1359		45	3 :	8,12	21,0	720.8	212	1	140.15	
1401				\$ 12	21.1	7212	210		190.18	
1403				8.11	211	774.9	211			
					0.111	1011				
METER	La	CEDTAL #	l							
рН :			883	ALIBRATED XES/NO	S	AMPLER/EMPLO	OYER:	silva90		
SC :				ES/NO	S	AMPLE PRESER	WATION/AMT	JENG	AVS	
120;				VES/NO	P	URGE VOL/EXC	ESS H20 DEST	: 48.69 / F	PIT7-SRC	
				YES/NO	T	F LOCATION:		PIT7-SRC		
C SAMPLE	ID:PIT	1FB	(QC LAB(S):	EBERLINE,	BCLABS-BAK	, GEL QC SAME	LE TIME:	1415	
AMPLE ID	(VERIF	Y): (C	1-028/	sues	T	IME COLLECTE	:D:		1415	
PR	OJECT	/ AN	ALYTICAL	LAB / RE	OUESTED	ANALVSTS /	OUDVERT	9.		
	3EMG		GEL		AS:FIL	TER	QUANTIT	Y / TYI	PE OF CONTAINERS	
	3EMG		GEL		AS:TH	ISO	2	1	L Polyethylene	
	JEMG		GEL		AS:UI	so	2	1	L Polyethylene	
	JEMG		BCLABS-BAI	ς	E300.0:	NO3	1	250	m] Polvethules-	
	JEMG		BCLABS-BAH	< .	E300.0:	PERC	1	250	mi roryechytene	
	JEMG		BCLABS-BAH	\$	E826	0	3	40 -	M. Glass VOl	
	SEMG		BCLABS-BAR	K C	E8330:	R+H	3	±V U 1	L Ambor Cl	
	JEMG		GEL		E900)	1	1	L Dolwothulass	
	3EMG GEL					LTER	ō	11	- Forvethylene	
	3EMG GEL				E906			1 250 ml GIAGA AUGUST		
	3EMG EBERLINE					RA226 1			LOU ML GLASS-AMBER	
	JEMG		EBERLINE		RA226:FI	LTER	0		IL PLASTIC	
	JEMG	1	BCLABS-BAK	18	WGMGME	T1	ĩ	1.	LL PLASTIC	
	3EMG	I	BCLABS-BAK	W	GMGMET1:	FILTER	ō	11	5 Folyethylene	

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All Ground Water Sampling Data

			1	All Ground	Water San	mpling Data				
т	arge	t Sample Date:	25-0ct-20	011		Month:	Norm Qtr: 4	Norm Year	: 2011	Cum
WELL ID	:		K1-04			AREA INFO:		S300/EWFA		
DATE :		25-0ct-201	1	LOG BOOK	(DOCUMENI	CONTROL) #		Z1023		~
PURGE MI	ethoe	SAMPLE METHO): <u>ST /</u>	3VES		CONTAMINANT	PRESENT :	1	NO3-28	10.000
SCREENEI	D INT	ERVAL:	185.97 -	202.97		PUMP INTAKE	DEPTH:		186.00	
CASING [DEPTH	(calc)/(fbgs):	203.97	1 / 201 +	57.16	CASING DIAME	TER/TCASING	HT(in):	3.5 / 2.67	
DEPTH TO	D WAT	ER(fbmp):	57.00 on	16-AUG-11	157-10	2	VOLUME	FACTOR: 0	.500	
WATER IN	CAS	ING (ft): 4	6.67	46.61		CASING VOL (Gal/Time):	23.33	23.4 +30= 7	5,0
TIME PUM	LP ON	•	0944			INITIAL FLOW	RATE (Q=GPM):2	8 Q	
TIME PUM	IP OF	F:				MEASURED BY:	FLOW METER/	GRAD CYL./	BUCKET/ OTHER	
TIME	<u>Q</u>	GAL PURGED	VOLUMES	рн	TEMP C	sc	mV	OG	DTW	
0954	ļ	23.4	1	6.20	20.9	596.3	11	÷	178.02	7
1002		.46.8	2	6.94	21.2	605.1	-15	1	178.55	
1012		70.2	3	7.23	21.1	613.2	-21	1	Probe Stickie. NO WL	5
1014				7.27	21.3	613.4	10"	(
1016				7-29	21.1	614.3	12			
										8 3
METER pH :		SERIAL #	nc~2	ALIBRATED	S	AMPLER/EMPLO	OYER:	silva9	0	
SC :		U/N	2002	WES/NO	1 C	ROJECT:		3EM0	1	
mV :				TESTNO	2 10	MAPLE PRESE	AVATION/AMT C	f REAGENT:	NA	
H2O:				ES/NO	Ţ	F LOCATION:	LESS HZO DEST	* <u>69.98 /</u>	S300-DRUM	
QC SAMPLE	: 1D:			QC LAB(S):			OC SAMP	LE TIME:	(ž.	
SAMPLE ID	(VE	RIFY):	1-04/2	UES	Т	IME COLLECTE	D:	10	23	•
PR	OJEC	т / Ан	NALYTICAL	LAB / RE	QUESTED	ANALYSIS /	OILANTTT	v / m		
	3E)	1G	GEL		AS:FII	TER	0	. / 1	IPE OF CONTAINERS	
	3EN	IG	GEL		AS:TH	ISO	2		11. Polyethylene	
	3EN	íG	GEL		AS:U1	so	2		1L Polyethylene	
	JEN	lG IC	BCLABS-BA	K	E300.0	:NO3	1	25	0 ml Polvethvlene	
	JEN	lG	BCLABS-BA	ĸ	E300.0:	PERC	1	25	0 ml Polyethylene	
	JEN	G	BCLABS-BA	ĸ	E826	0	3	40	ML Glass VOA vial	26
	315M วษม		BCLABS-BA	к	E8330:	R+H	3		1L Amber Glass	
	3.EM 2.EM	G	GEL		E90	0	1		1L Polyethylene	
	JEH JEH	G	GEL		E900:FI	LTER	0		1L Polyethylene	
	3 DM 3 DM	G	GEL		E900	5	1	25	0 ml GLASS-AMBER	
	JEM	G	EBERLINE		RA22	б	1		1L PLASTIC	
	3EM	G	BCLARS PN	× ~	KA226:F	LLTER	0		1L PLASTIC	
	3EM	G	BCLABS_BA	n	WGMGMI	ST1 ETT MEE	1		lL Polyethylene	
				n	Gridpits 1 1	CILTER	0		1L Polyethylene	

			l	All Ground	Water Sa	mpling Data				and
r	large	t Sample Date	: 25-Oct-2	011		Nonth:	Norm Qtr: 4	Norm Yea	r: 2011	What /
WELL ID	·		K1-05			AREA INFO:		\$300/EWEA	/97/01	
DATE:		25-0ct-20	11	LOG BOOK	(DOCUMENT	r Control) #	:	21023		
PURGE M	ETHOI)/SAMPLE METHO	D: GF /	3VES		CONTAMINANT	PRESENT:	FREAK 1	12 10 0/200 00	<u></u>
SCREENE	D IN	ERVAL:	165.30 -	186.30		INTAKE DEPTH	На			
CASING I	DEPTH	l(calc)/(fbgs)	:186.3	0 / 184		CASING DIAM	ETER / TO A STAR		0.00	
DEPTH TO	PAW C	ER(fbmp):	172.02 on	16-AUG-11	171	. 81	UOLUM	nr(10);	572.00	
WATER IN	N CAS	ING (ft):	13.98	14.44		CASING VOL ((Gal/Wime)	FACTOR:	1.020	
TIME PUM	IP ON	:10	યપ		//	INITIAL PLOY	(Gal/Time):	14.26	19.8 × 500-	<u>49,9</u> cm (
TIME PUM	IP OF	F:	13			MPAGUDED DV	RATE (Q=GPF	1):	1,0 2	te de aller en de la comp
TIME	Q	GAL PURGED	VOLUMES	n¥	MEND C	MEASORED BY	FLOW METER/	GRAD CYL./	BUCKET/ OTHER	
1100		14.8		7.75	20.5	<u>sc</u>	mV	OG	DTW	
1116		29.6	2	7.72	116	(727	63	4	Probe Stic.	hing
1132		44.4	3	268	17.0	636-6	110	<u> </u>	Prose Sta	chay
11-34				7.00	120	630.6	1/2	1	Probe Stic	has
1136				7 71	121	657.0	11 6	1		
		<u>0</u>			26,1	6 27.5	115	/		
		······								
METER	<u></u>	SERIAL A	t					Ϋ́.		
рН :		610	2883	KES NO	S	AMPLER/EMPLO ROJECT:	DYER:	silvas	0	
mV :				YESANO	S	AMPLE PRESER	RVATION/AMT (of REAGENT:	NA	New York Control of Co
H2O:				TES/NO	P T	URGE VOL/EXC F LOCATION:	CESS H20 DEST	C: 42.78 / \$300	S300-DRUM	
QC SAMPLE	ID:			QC LAB(S):_			QC SAME	LE TIME:		
SAMPLE ID	(VE	RIFY): h	-1-05/	3UES	T	IME COLLECTE	D:	//*	13	
PR	OJEC	т / а	NALYTICAL	LAB / RE	QUESTED	ANALYSIS /	OUANTIT	v / m	VDP OF COMPANY	
	JER	iG IG	GEL		AS:FIL	TER	0		1L Polvethvlene	
	3EM	IG ·	GEL		AS:TH	ISO	2		1L Polyethylene	£
	3EM	IG	BCLABS-BA	к	E300 0	- 50 • 103	2		1L Polyethylene	l.
	3EM	G	BCLABS-BA	к	E300.0:	PERC	1	25	0 ml Polyethyle	ne
	3EM	G	BCLABS-BA	к	E826	0	3 T	25	0 ml Polyethyle	ne
	3EM	G	BCLABS-BA	К	E8330:	R+H	3	40	ML GLASS VOA VI	ial
	JEMG GEL)	1	1L Amber Glass		
	3EMG GEL E900					LTER	0		15 Folyethylene	
	3EMG GEL E9					5	1	21	in convernytene	an a
	3EMG EBERLINE RA2					6	1	4.	11. DIASS-AMBE	216
JEMG EBERLINE RA226:FI					LTER	ō		IL PLASTIC		
	3 D M	2	BCLABS-BAI	(WGMGME	T1	1		IL Polvethuleno	
	9 E E	J	BCLABS-BAI	K W	GMGMET1:	FILTER	0		1L Polyethylene	

MAX GPM 15 1.0

Have to turn off purge water in order to obtain a Sample from the Sampling port. Page: 1 of 1

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				All Ground	Water Sa	ampling Data				
Та	rget i	Sample Dat	e: 18-0ct-2	011		Month:	Norm Qtr: 4	Norm Yea	r: 2011	M
WELL ID:			K1-06			AREA INFO:		8200/		
DATE :		18-0ct-2	011	LOG BOOK	(DOCUMEN	T CONTROL +		3300/ EWFA	/PITI	
PURGE MET	THOD/S	AMPLE METH	OD: PB /	GRBA	•		· •	AA21159		
SCREENED	INTER	JAT .	100.00	GILLER	<u>0</u>	CONTAMINAN	PRESENT:	3H>	1000pCi/L	
		· AD .	107.30 -	117.30		INTAKE DEPT	H:		0.00	
CASING DE	PTH(Ca	alc)/(fbgs): 117.3	0 / 115		CASING DIAM	ETER/TCASING	HT(in);	5 / 2 00	
DEPTH TO	WATER	fbmp):	115.97 on	16-AUG-11	116.	05	VOLUM	2 23.000.		****
WATER IN (CASING	(ft):	1.03			CASTNG HOT		FACTOR:	1.020	
TIME PUMP	ON:					CADING AOL	(Gal/Time):	1.05		
TIME PUMP	OFF					INITIAL FLOW	RATE (Q=GPM	l):		
	OFF:				······································	MEASURED BY:	FLOW METER/	GRAD CYL./	BUCKET/ OTHER	
TIME	0 0	AL PURGED	VOLUMES	рН	TEMP C	sc	mV	0G	Dom: x	
1339				7-81	24-6	740.4	52	1	DTW]
										-
					1					-
		······]
			++							
			<u> </u>							1
	·									
IETER		SERIAL A	#		L					
ж.:		Gios	583	YESYNO	S. Pl	AMPLER/EMPLO ROJECT:	YER:	silva9	0	
V :				YES NO	S	AMPLE PRESER	VATION/AMT O	JEMG f REAGENT:	ALTA	
20:				YES NO	Pl Tr	JRGE VOL/EXC	ESS H2O DEST	: 0.00 / N	one	
C SAMPLE I	D:	-	- 0			DOCATION:		Ground		
AMPLE TO A	VEDIEN	1.	hind	с шыр (S):			QC SAMP	LE TIME:	¢	
	A PULTE A) ¹	11-06/1	MARY	TI	ME COLLECTE):	/3	47	
PROJ) 3 3	ECT BEMG BEMG	/ A	NALYTICAL L CALTEST GEL	AB / RE	QUESTED A E300.0:1	NALYSIS / PERC	QUANTITY 1	/ тү 250	PE OF CONTAINERS	
					E300		1	25	0 ml GLASS-AMBER	

NOTE: Purge rate/time: N/A since est_sus_flow = 0 Purge Volume: 0 gal. Revision: 07/08/2011

Page: 1 of 1.

Target :		A	11 Ground	Water Sam	pling Data				
	Sample Date:	25-0ct-20	11		Month: H	Norm Qtr: 4	Norm Year:	2011 WGM	
WELL ID:		K1-07			AREA INFO:		S300/EWFA/E	ITI	
DATE:	25-0ct-201	1	LOG BOOK	(DOCUMENT	CONTROL) #:		Z1023	2.0	
PURGE METHOD/S	AMPLE METHON	D: GF / :	SVES		CONTAMINANT	PRESENT :	N)3-34	
SCREENED INTER	VAL I	131.30 -	151.30		INTAKE DEPTH	l:	0.	.00	
CASING DEPTH(c	alc)/(fbgs):	153.30	/ 150		CASING DIAME	TER/TCASING	HT(in):	4.5 / 3.00	
DEPTH TO WATER	(fbmp):	141.71 on :	16-AUG-11	141,3	14	VOLUME	FACTOR: 0.	826	
WATER IN CASIN	G (ft):1	1.29	11.56		CASING VOL (Gal/Time):	9.33	1,5 × 300=28,5 G	
TIME PUMP ON:_		1312			INITIAL FLOW	RATE (Q=GPM):2.0	00	
TIME PUMP OFF:				I	MEASURED BY	FLOW METER	GRAD CYL./ E	BUCKET/ OTHER	
TIME Q	GAL PURGED	VOLUMES	рн	TEMP C	sc	mV	OG	DTW	
1317	9.5	1	8.10	20.8	608,5	-15	(145.40	
1322	196al	2	194	21.1	610.7	-15		145.93	
1327	28.5	3	7.91	21.3	6 11.7	-7	1	14604	
1329			7.88	21.4	611.8	13	l		
1331			7.89	21.3	610.3	14	1		
	······						,		
								: (6)	
IETER	SERIAL #	ian c	ALIPRATED	S	AMPLER/EMPLO	OYER:	silva9()	
с:	0102	203	YES/NO	F	ROJECT:		3 EMG		
v :			YES/NO	F	URGE VOL/EX	TESS HOO DES	DI REAGENT:		
20:			CES/NO	I	F LOCATION:		\$300	5300-DROA	
C SAMPLE ID:			QC LAB(S):		********	QC SAMI	PLE TIME:	- Martinetter	
AMPLE ID (VERI	(FY):	21-07/	3025	1	IME COLLECTI	SD:	1346		
PROJECT	/ A	NALYTICAL	LAB / RI	EOUESTED	ANALYSTS /	ሰህአህጥተው	V / mu		
3EMG		GEL		AS:FI	TER	0	- / 11	FE OF CONTAINERS	
3EMG		GEL		AS:TH	ISO	2		L Polvethylene	
3EMG		GEL		AS:U	ISO	2	. 1	L Polyethylene	
JEMG		BCLABS-BA	ĸ	E300.0	:NO3	1	250) ml Polyethylene	
2549		BULABS-BA	r. V	E300.0:	PERC	1	250) ml Polyethylene	
33840		BCLARC-PA	r r	E82(00	3	40	mL Glass VOA vial	
JEMG JEMG		GRI.	4	E0330:	к+н 0	3	1L Amber Glass		
JEMG JEMG JEMG		GEI.		E000.51		1	1L Polyethylene		
3EMG 3EMG 3EMG 3EMG		~~~		ROU		0	1	L Polyethylene	
JEMG JEMG JEMG JEMG JEMG		GEL		v , u	E906 1		25	H THE CTASS ANDED	
3 EMG 3 EMG 3 EMG 3 EMG 3 EMG 3 EMG		GEL EBERLINE		RATO	6	1	2.9	V MI GLASS-AABER	
JEMG JEMG JEMG JEMG JEMG JEMG JEMG		GEL EBERLINE EBERLINE		RA22 RA226:F	16 ILTER	1	2.3	IL PLASTIC	
3EMG 3EMG 3EMG 3EMG 3EMG 3EMG 3EMG 3EMG		GEL EBERLINE EBERLINE BCLABS-BA	к	RA22 RA226:F WGMGM	26 Ilter Et1	1 0 1	2.3	1L PLASTIC 1L PLASTIC	

_								
Targe	et Sample Date:	25-0ct-20	911		Month: N	form Qtr: 4	Norm Year	: 2011
DAME -	AB 4 4 844	R1-00		·······	AREA INFO:	***	S300/EWFA	PIT1
DATE:	25-0ct-201	1	LOG BOOK (DOCUMENT	CONTROL) #:		21023	
PURGE METHO	D/SAMPLE METHOD	0: GF /	3VES		CONTAMINANT	PRESENT :	FREON 1	13-37/N03-36
SCREENED IN	TERVAL :	143.32 -	168.32		INTAKE DEPTH	:		0.00
CASING DEPT	H(calc)/(fbgs):	170.32	/ 168		CASING DIAME	TER/TCASING	HT(in):	4.5 / 2.02
DEPTH TO WA	TER(fbmp):1	155.48 on	17-AUG-11	156.	10	VOLUME	PACTOR:	.826
WATER IN CA	SING (ft): 1	4.54	13.62		CASING VOL (Gal/Time) :	12 01	11.7 13. 222
TIME PUMP O	N :	1127		· · ·	NIDIAL PLOY			VE D
THE DIND O	D D -	1110	·	······································	INITIAL FLOW	RATE (Q=GPM	[]: <u> </u>	15 12
TTHE FORP O	СС	5			IEASURED BY:	BLOW METER	GRAD CYL./	BUCKET/ OTHER
TIME Q	GAL PURGED	VOLUMES	рН	TEMP C	SC	mV	OG	DTW
1230	11.2	to!	8.01	20.9	638.9	17	(157.59
1238	22.4	2	7.94	21.7	648.9	24		157,72
1246	33.6	3	7.91	222	644.7	31	8	Probe Sticking
1248			2.91	22.4	644.1	8	1	1 100.00
1250			7.90	22.4	6457	15	1	
Contractor and the second s		+			0,317			
					·······			
IETER)H :	SERIAL #	e co	ALIBRATED	S	AMPLER/EMPLO	DYER :	silva	20
ETER H : C :	SERIAL #	* c 2868 3	ALISRATED YES/NO YES/NO	s P S	AMPLER/EMPLO ROJECT: AMPLE PRESEN	DYER:	silva 3EM of REAGENT:	30 3 WA
IETER)H : ;C : ;W : ;20:	SERIAL #	4 c 2588 3	ALIBRATED YBS/NO YBS/NO YES/NO YES/NO	S P S P	AMPLER/EMPLC ROJECT: AMPLE PRESEF URGE VOL/EXC F. LOCATION-	DYER: RVATION/AMT CESS H20 DES	silva 3EM of REAGENT: T: <u>36.04</u> /	00 3 3 8300-DRUM
IETER IETER <t< td=""><td>SERIAL #</td><td>e co</td><td>ALIBRATED YIS/NO YES/NO YES/NO YES/NO YES/NO</td><td>S P S P T</td><td>AMPLER/EMPLO ROJECT: AMPLE PRESER URGE VOL/EXC F LOCATION:</td><td>DYER: RVATION/AMT CESS H20 DES</td><td>silva 3EM of REAGENT: T:36.04 / \$300</td><td>90 3 8300-DRUM</td></t<>	SERIAL #	e co	ALIBRATED YIS/NO YES/NO YES/NO YES/NO YES/NO	S P S P T	AMPLER/EMPLO ROJECT: AMPLE PRESER URGE VOL/EXC F LOCATION:	DYER: RVATION/AMT CESS H20 DES	silva 3EM of REAGENT: T:36.04 / \$300	90 3 8300-DRUM
IETER HE : IC : IV : I20: C SAMPLE ID AMPLE ID (V	SERIAL #	2583	ALIBRATED YES/NO YES/NO YES/NO YES/NO QC LAB(S):	S P S P T	AMPLER/EMPLO ROJECT: AMPLE PRESENURGE VOL/EXC F LOCATION:	DYER: RVATION/AMT CESS H20 DES QC SAM	silva 3em of REAGENT: T: 36.04 / 8300 PLE TIME:	20 3 20 3 3 8300-DRUM
IETER JH : IC : IV : I20: C SAMPLE ID AMPLE ID (V PDO IE	SERIAL # 6(2 	k 1-0%	ALIBRATED YES/NO YES/NO YES/NO QC LAB(S): 3025	S P S P T T	AMPLER/EMPLO ROJECT: AMPLE PRESE URGE VOL/EXC F LOCATION: IME COLLECTE	DYER: RVATION/AMT CESS H20 DES QC SAM ED:	silva 3EM of REAGENT: 7:36.04 / 8300 PLE TIME: /2 \$	80 3 20 3 8300-DRUM 8
ETTER H : C : V : ZO: C SAMPLE ID AMPLE ID (V PROJE 31	SERIAL # 6 (< 	k c 25853 ki-os / NALYTICAL GRI	ALIJERATED YES/NO YES/NO YES/NO YES/NO QC LAB(S): 3025 LAB / RE	S P T T T SQUESTED	AMPLER/EMPLO ROJECT: AMPLE PRESE URGE VOL/EXC F LOCATION: IME COLLECTE ANALYSIS /	DYER: RVATION/AMT DESS H20 DES QC SAM ED: QUANTIT	silva 3EM of REAGENT: T: 36.04 / 8300 PLE TIME: /2 \$	BO BO BO BO BO BO BO BO BO BO BO BO BO B
ETER H : C : 20: C SAMPLE ID AMPLE ID (V PROJE 33 31	SERIAL # 612 612 612 612 612 612 612 612 612 612	k co 2583 KI-05 / NALYTICAL GEL GEL	ALIBRATED YES/NO YES/NO YES/NO YES/NO QC LAB(S): 302 LAB / RE	S P T T SQUESTED AS:FII AS:TH	AMPLER/EMPLO ROJECT: AMPLE PRESEN URGE VOL/EXC F LOCATION: IME COLLECTE ANALYSIS / JTER ISO	DYER: RVATION/AMT CESS H20 DES QC SAM ED: QUANTIT 0 2	silva 3em of REAGENT: T: 36.04 / 8300 PLE TIME: /2 \$	BO BO BO BO BO BO BO BO BO BO BO BO BO B
ETER H : C : 20: C SAMPLE ID AMPLE ID (V PROJE 31 31 31 31 31	SERIAL # G (< G (< C (< C (<)))) () () () () () () () () () () () ()	k c 2583 KI-08 NALYTICAL GEL GEL GEL	ALIJERATED YES/NO YES/NO YES/NO YES/NO QC LAB(S): 302 S LAB / RE	S P T T SQUESTED AS:FII AS:TH AS:UI	AMPLER/EMPLO ROJECT: AMPLE PRESENURGE VOL/EXC F LOCATION: IME COLLECTE ANALYSIS / JTER ISO	DYER: RVATION/AMT CESS H20 DES QC SAM ED: QUANTIT 0 2 2	silva 3em of REAGENT: T: 36.04 / 8300 PLE TIME: /2 \$	BO BO BO BO BO BO BO BO BO BO BO BO BO B
ETER H : C : 20: C SAMPLE ID AMPLE ID (V PROJE 31 31 31 31 31 31 31	SERIAL # Gld Cld Cld Cld Cld Cld Cld Cld C	LI-OS MALYTICAL GEL GEL BCLABS-BA	ALIJARATED YES/NO YES/NO YES/NO QC LAB(S): 302 S LAB / RE	S P T T SQUESTED AS:FII AS:TH AS:UI E300.0	AMPLER/EMPLO ROJECT: AMPLE PRESENURGE VOL/EXC F LOCATION: IME COLLECTN ANALYSIS / TER ISO :SO :NO3	DYER: RVATION/AMT CESS H20 DES QC SAM ED: QUANTIT 0 2 2 1	silva 3EM of REAGENT: T: 36.04 / 8300 PLE TIME: /2 \$ YY / T	AD AD BO BO BO BO BO BO BO BO BO BO
ETER H : C : 20: C SAMPLE ID MPLE ID (V PROJE 31 31 31 31 31 31 31 31 31 31 31 31 31	SERIAL # Gld Cld Cld Cld Cld Cld Cld Cld C	KI-OS MALYTICAL GEL GEL BCLABS-BA BCLABS-BA	ALIJSRATED YES/NO YES/NO YES/NO QC LAB(S): 302 S LAB / RE	S P T T SQUESTED AS:FII AS:TH AS:UI E300.0 E300.0	AMPLER/EMPLO ROJECT: AMPLE PRESE URGE VOL/EXC F LOCATION: IME COLLECTE ANALYSIS / /TER ISO :SO :NO3 PERC	DYER: RVATION/AMT CESS H20 DES QC SAM ED: QUANTIT 0 2 2 1 1	silva 3em of REAGENT: T: 36.04 / 8300 PLE TIME: /2 \$ YY / T 2 2	ACA B300-DRUM B300-DRUM S300-DRUM S
ETER H : C : 20: C SAMPLE ID AMPLE ID (V PROJE 33 31 31 31 31 31 31 31 31 31	SERIAL # Gld Gld Cld Cld Cld Cld Cld Cld Cld C	KI-OS MALYTICAL GEL GEL BCLABS-BA BCLABS-BA BCLABS-BA	ALIJSRATED YES/NO YES/NO YES/NO QC LAB(S): 302 S LAB / RE	S P T T RQUESTED AS:FII AS:FII AS:UJ E300.0 E300.0 E826	AMPLER/EMPLO ROJECT: AMPLE PRESE URGE VOL/EXC F LOCATION: IME COLLECTE ANALYSIS / JTER ISO SO :NO3 PERC 0	DYER: RVATION/AMT CESS H20 DES QC SAM ED: QUANTIT 0 2 1 1 3	silva 3em of REAGENT: T: 36.04 / 8300 PLE TIME: /2 \$ YY / T 2 2 40	SOO-DRUM SOO-DR
ETER H : C : 20: C SAMPLE ID AMPLE ID (V PROJE 33 31 31 31 31 31 31 31 31 31 31 31 31	SERIAL # Gla Control Control	KI-OS MALYTICAL GEL GEL BCLABS-BA BCLABS-BA BCLABS-BA BCLABS-BA	ALIBRATED YES/NO YES/NO YES/NO YES/NO QC LAB(S): 302 LAB / RE LAB / RE	S P S P T SQUESTED AS:FII AS:FII AS:UJ E300.0 E300.0 E826 E8330:	AMPLER/EMPLO ROJECT: AMPLE PRESE URGE VOL/EXC F LOCATION: IME COLLECTE ANALYSIS / TER ISO SSO :NO3 PERC 0 R+H	DYER: RVATION/AMT CESS H20 DES QC SAM ED: QUANTIT 0 2 1 1 3 3	silva 3em of REAGENT: T: 36.04 / 8300 PLE TIME: /2 \$ YY / T 2 2 40	20 3 20 3 20 3 300-DRUM 300-DRUM 300-DRUM 300-DRUM 500-D
ETTER HETER HE : C : C SAMPLE ID AMPLE ID (V PROJE 31 31 31 31 31 31 31 31 31 31	SERIAL # G(< SERIAL # G(< C(C): ERIFY): ERIFY): CCT / A EMG EMG EMG EMG EMG EMG EMG EMG	A CONSTRUCTION ALYTICAL GEL GEL BCLABS-BA BCLABS-BA BCLABS-BA BCLABS-BA CONSTRUCTION	ALIBRATED YES/NO YES/NO YES/NO YES/NO QC LAB(S): 302 LAB / RE LAB / RE	S P S P T T SQUESTED AS:FII AS:FII AS:FII E300.0 E300.0 E300.0 E826 E8330: E90	AMPLER/EMPLO ROJECT: AMPLE PRESE URGE VOL/EXC F LOCATION: IME COLLECTE ANALYSIS / TER ISO :SO :NO3 PPERC 0 R+H 0	DYER: RVATION/AMT CESS H20 DES QC SAM ED: QUANTIT 0 2 1 1 3 3 1	silva 3EM of REAGENT: T:36.04 / \$300 PLE TIME: /2 ≶ Y / T 2 Y / T 2 2 40	20 3 20 3 20 3 3 5 5 5 5 5 5 5 5 5 5 5 5 5
METER JH : JC : JV : J20:	SERIAL # G(c C(c) C(c	KI-OS CLABS-BA BCLABS-BA BCLABS-BA BCLABS-BA BCLABS-BA BCLABS-BA BCLABS-BA BCLABS-BA CEL CEL	ALIBRATED YES/NO YES/NO YES/NO YES/NO QC LAB(S): 302 LAB / RE LAB / RE	S P S P T T EQUESTED AS:FII AS:FII AS:TH AS:U1 E300.0 E300.0 E300.0 E300.0 E300.0 E826 E8330: E900:FI	AMPLER/EMPLO ROJECT: AMPLE PRESE URGE VOL/EXC F LOCATION: IME COLLECTE ANALYSIS / TER ISO :SO :NO3 PERC 0 R+H 0 LTER	DYER: RVATION/AMT CESS H20 DES QC SAM 2D: QUANTIT 0 2 1 1 3 3 1 0	silva 3EM of REAGENT: T:36.04 / \$300 PLE TIME: /2 ≶ Y / T 2 Y / T 2 2 40	20 3 20 3 3 3 5 300-DRUM 5 5 5 5 5 5 5 5 5 5 5 5 5
AETER JH : JC : JC : JV : I20: JC SAMPLE ID AMPLE ID (V PROJE J1 J2 J3 J3 J1 J1 J2 J3 J3 J3 J3 J3 <td< td=""><td>SERIAL # G(2 CCT / A ERIFY):/ CCT / A EMG EMG EMG EMG EMG EMG EMG EMG</td><td>A COSS 3</td><td>ALIBRATED YES/NO YES/NO YES/NO YES/NO QC LAB(S): 302 LAB / RE LAB / RE</td><td>S P S P T T EQUESTED AS:FII AS:TH AS:UI E300.0 E30.</td><td>AMPLER/EMPLO ROJECT: AMPLE PRESE URGE VOL/EXC F LOCATION: IME COLLECTE ANALYSIS / TER ISO :SO :NO3 PERC 0 R+H 0 LTER 5</td><td>DYER: RVATION/AMT CESS H20 DES QC SAM 2D: QUANTIT 0 2 1 1 3 3 1 0 1</td><td>silva 3EM of REAGENT: T: 36.04 / 8300 PLE TIME: /2 \$ YY / T 2 YY / T 2 2 40</td><td>20 3 20 3 20 3 3 5 5 5 5 5 5 5 5 5 5 5 5 5</td></td<>	SERIAL # G(2 CCT / A ERIFY):/ CCT / A EMG EMG EMG EMG EMG EMG EMG EMG	A COSS 3	ALIBRATED YES/NO YES/NO YES/NO YES/NO QC LAB(S): 302 LAB / RE LAB / RE	S P S P T T EQUESTED AS:FII AS:TH AS:UI E300.0 E30.	AMPLER/EMPLO ROJECT: AMPLE PRESE URGE VOL/EXC F LOCATION: IME COLLECTE ANALYSIS / TER ISO :SO :NO3 PERC 0 R+H 0 LTER 5	DYER: RVATION/AMT CESS H20 DES QC SAM 2D: QUANTIT 0 2 1 1 3 3 1 0 1	silva 3EM of REAGENT: T: 36.04 / 8300 PLE TIME: /2 \$ YY / T 2 YY / T 2 2 40	20 3 20 3 20 3 3 5 5 5 5 5 5 5 5 5 5 5 5 5
AETER HH : SC : IZO : <td>SERIAL # G(c C C C C C C C C C C C C C</td> <td>KI-OS ALYTICAL GEL GEL GEL BCLABS-BA BCLABS-BA BCLABS-BA GEL GEL GEL GEL GEL</td> <td>ALIBRATED YIS/NO YES/NO YES/NO YES/NO QC LAB(S): 302 S LAB / RH</td> <td>S P S P T T SQUESTED AS:FII AS:TH AS:UJ E300.0 E30.</td> <td>AMPLER/EMPLO ROJECT: AMPLE PRESEN URGE VOL/EXC F LOCATION: IME COLLECTE ANALYSIS / TER ISO SOO :NO3 PERC 00 R+H 0 LTER 5 6</td> <td>DYER: QC SAM: QC SAM: QC</td> <td>silva 3EM of REAGENT: T: 36.04 / \$300 PLE TIME: /2 \$ YY / T 2 2 40 2</td> <td>20 3 20 3 3 3 3 3 3 3 3 3 3 3 3 3</td>	SERIAL # G(c C C C C C C C C C C C C C	KI-OS ALYTICAL GEL GEL GEL BCLABS-BA BCLABS-BA BCLABS-BA GEL GEL GEL GEL GEL	ALIBRATED YIS/NO YES/NO YES/NO YES/NO QC LAB(S): 302 S LAB / RH	S P S P T T SQUESTED AS:FII AS:TH AS:UJ E300.0 E30.	AMPLER/EMPLO ROJECT: AMPLE PRESEN URGE VOL/EXC F LOCATION: IME COLLECTE ANALYSIS / TER ISO SOO :NO3 PERC 00 R+H 0 LTER 5 6	DYER: QC SAM: QC	silva 3EM of REAGENT: T: 36.04 / \$300 PLE TIME: /2 \$ YY / T 2 2 40 2	20 3 20 3 3 3 3 3 3 3 3 3 3 3 3 3
AETER HETER HE : IC : IC SAMPLE ID AMPLE ID (V PROJE 31 31 31 31 31 31 31 31 31 31	SERIAL # G(c C(c) C(c	KI-OS MALYTICAL GEL GEL GEL BCLABS-BA BCLABS-BA BCLABS-BA GEL GEL GEL GEL GEL GEL CABS-BA	ALIJARATED YIS/NO YES/NO YES/NO YES/NO QC LAB(S): 302 S LAB / RH LAB / RH	S P S P T T EQUESTED AS:FII AS:UJ E300.0 E300.0 E300.0 E826 E8330: E900 E900:FI E900 RA22 RA226:F	AMPLER/EMPLO ROJECT: AMPLE PRESEN URGE VOL/EXC F LOCATION: IME COLLECTE ANALYSIS / JTER ISO SO :NO3 PERC 0 R+H 0 LTER 5 6 6 LTER	DYER: RVATION/AMT CESS H20 DES QC SAM ED: QUANTIT 0 2 2 1 1 3 3 1 0 1 1 0	silva 3EM of REAGENT: T: 36.04 / 8300 PLE TIME: /2 \$ YY / 7 2 2 40 2	ACA B300-DRUM B300-DRUM B300-DRUM B300-DRUM C C C C C C C C C C C C C
ETER H : C : 20: C SAMPLE ID AMPLE ID (V PROJE 31 31 31 31 31 31 31 31 31 31 31 31 31	SERIAL # C(< C(< C(< C(C(C(C(C(C(C(C(C(C(KI-OS VI-OS KI	XALIARATED YAS/NO YES/NO YES/NO YES/NO QC LAB(S): 302 S LAB / RH	S P T S S S S S S S S S S S S S	AMPLER/EMPLO ROJECT: AMPLE PRESEN URGE VOL/EXC F LOCATION: IME COLLECTE ANALYSIS / /TER ISO SO :NO3 PERC 0 R+H 0 LTER 5 6 LITER 5 6	DYER: 	silva 3EM of REAGENT: T: 36.04 / 8300 PLE TIME: /2 \$ YY / T 2 2 40 2	ACA B300-DRUM B300-DRUM B300-DRUM B300-DRUM C C C C C C C C C C C C C

8.97 ·**

All Ground Water Sampling Data

Targ	et Sample Date:	01-Nov-20)11		Month:	Norm Qtr: 4	Norm Year	: 2011	
WELL ID:		K1-09			AREA INFO:		S300/ENFA/		
DATE:	01-Nov-201	1	LOG BOOK	(DOCUMENT	CONTROL) #	:	AA23003		
PURGE METHO	DD/SAMPLE METHO	D:GF / :	3VES		CONTAMINANT	PRESENT	PPEON	112 120 0	
SCREENED IN	TERVAL :	157.30 -	192 20				FREQU	113-120.0	
0.07.00			*74.30	*****	INTAKE DEPT	H:	0		
CASING DEPI	H(Calc)/(fbgs)	: 194.30	/ 192		CASING DIAM	eter/tcasing	HT(in):	4.5 / 2.00	
DEPTH TO WA	TER(fbmp):	161.93 on :	16-AUG-11	161.9	1-	VOLUMI	FACTOR: 0	.826	
WATER IN CA	SING (ft): 3	2.07	32.33		CASING VOL	(Gal/Time):	26.50	26.7 × 300 2. Se	
TIME PUMP O	N :	1314			INITIAL FLOR	RATE (O-CD		20	
TIME PUMP O	FF:	1.409			MPACUPED DW	ALLE (Q-GF			
ጥ ተ እም ር	CAL DUDGED			······································	MEASURED BY	FLOW METERY	GRAD CYL./	BUCKET/ OTHER	
	GAL PORGED	VOLUMES	Hq	TEMP C	SC	mV	OG	DTW	
1528	26.7	1	4.0	21.2	656.7	25	1	166.88	
1341	63,4	2	7.99	21.5	660,9	18	l l	166,90	
1354	80.1	3	7.99	21.7	660.1	21)	1/1 03	
1356			7.97	21.5	660.8	.20	1	167.02	
1358			2.98	21.4	C/17	20			
	1	10. 10			001.0	20			
	1		·····						
	1								
IETER	SERIAL #	Lacer C	ALIBRATED	s	AMPLER/EMPL	OYER:	silva9	0	
C :	Q	10002	YES/NO	F	ROJECT:		3 EMG		
v :			YES/NO	p	URGE VOL/FX	TRSS NOO DEC	of REAGENT:	NA-	
20:	8		YES/NO	T	F LOCATION:		8300	8300-DRUM	
C SAMPLE ID		¢	C LAB(S):			QC SAM	PLE TIME:		
AMPLE ID (V	ERIFY): <u> (-</u>	09 301	è S	т	IME COLLECTI	SD:	100	î	
PROJE	CT / A	I NALYTICAL 1	LAB / RF	OURSTRD	ANALVETE /			1	
31	EMG	GEL		AS:FII	TER	QUANTIT	Y TY	PE OF CONTAINERS	
31	emg	GEL		AS:TH	ISO	2		IL Polyethylene	
31	IMG	GEL		AS:UI	SO	~ 2 ·		L Polyetnylene	
38	SMG	BCLABS-BAN	ĸ	E300.0	:NO3	1	วะ.	h ml Bolucthylene	
31	MG	BCLABS-BAR	κ	E300.0:	PERC	1	250) ml Polyethylene	
3E	MG	BCLABS-BAH	<	E826	0	- 3	40	mL Glass VON min	
3E	MG	BCLABS-BAR	<	E8330:	R+H	3	*0	IT Ambor Class	
3E	MG	GEL		E900	0	1	1	L Polvethules-	
38	MG	GEL		E900:FI	LTER	ō	1	L Polyethelene	
38	MG	GEL		E906	5	ĩ		0 ml CINCC FROM	
3E	MG	EBERLINE		RA22	6	1	250 ml GLASS-AMBER 1L PLASTIC		
JEMG EBERLINE RA22					LTER	ň	1L PLASTIC		
3E	MG	BCLABS-BAK	ζ	WGMGME	ST1	ĩ	1	IL PLASTIC	
3E	MG	BCLABS-BAK	: W	GMGMET1:	FILTER	ō	1	L Polvethylene	
						-	1	~ rorlerulteue	

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		A	ll Ground W	ater Sam	pling Data	154	Hetes-	+ /
rget Samp	ole Date:	08-Dec-20	11	1	Month: N	orm Qtr: 4	Norm Year:	2011 NouMD
15		K1-09		i	AREA INFO:		S300/EWFA/F	
08	3-Dec-2011	L	LOG BOOK (DOCUMENT	CONTROL) #:		AA23018	
HOD/SAMP	LE METHOD	: GF / 3	VES		CONTAMINANT	PRESENT:	FREON	113-120.0
INTERVAL		157.30 -	192.30		INTAKE DEPTH	: 	0	.00
PTH(calc)/(fbgs):	194.30	/ 192	(CASING DIAME	TER/TCASING	HT(in):	4.5 / 2.00
WATER(fb	mp): <u>1</u>	61.93 on 1	6-AUG-11	162.0	52	VOLUMI	FACTOR: 0	. 826
CASING (ft): <u>3</u>	2.07	37.28		CASING VOL (Sal/Time):	26.50	26.6 × 3cu = 80.0
ON:	115	^c 6			INITIAL FLOW	RATE (Q=GPI	<pre>f):</pre>	
OFF:	124	4		1	MEASURED PY	FLOW METER	GRAD CYL./ I	BUCKET/ OTHER
Q GAI	PURGED	VOLUMES	рН	TEMP C	sc	mV	OG	DTW
2	6.6	١	6.91	20.9	657.0	66	1	171.41
57	5.2	2	7.21	20.6	660.2	61	1	173.94
450	0,0	.3	7 -14	20.10	659.3	60	1	Nm
			7.12	20.0	654.8	57	1	
			7.22	20.5	651.7-	57	\	<u>.</u>
								72
	SERIAL #	\$** \$**	ALIBRATED	ی ا	SAMPLER/EMPL	OYER:	silva9 3EMG	0
			YES/NO	1	SAMPLE PRESE	RVATION/AMT	of REAGENT:	NA
·····	-		YES/NO	1	PURGE VOL/EX	CESS H2O DES	ST: 79.49 / S300	S300-DRUM
ID:	Mar -		QC LAB(S):			QC SAN	APLE TIME:	• • •
(VERIFY): <u> </u>	1-139 30	<u> </u>		TIME COLLECTI	ED:	1247	
OJECT	/ A	NALYTICAL	LAB / R	EQUESTED	ANALYSIS /	OUANTT	<u>ተ</u> ሃ / ጥ	YFE OF CONTAINERS
3EMG		BCLABS-BA	K	E200.	7:BA	1		1L Polyethylene
	OPENDESSAME	OB-Dec-2011 08-Dec-2011 PHOD/SAMPLE METHOD INTERVAL: PTH(calc)/(fbgs): WATER(fbmp): 1 CASING (ft): 3: ON: 1\S OFF: 2 6.6 \$3.2 %c.0 SERIAL # C(c ID: COJECT 3EMG	$\begin{array}{c} \text{All}\\ \text{rget Sample Date: 03-Dec-201}\\ \hline \text{K1-09}\\ \hline 08-Dec-2011\\ \hline \text{HOD/SAMPLE METHOD: } GF / 3\\ \hline \text{INTERVAL: } 157.30 - \\ \text{IPTH(calc)/(fbgs): } 194.30\\ \hline \text{WATER(fbmp): } 161.93 \text{ on } 1\\ \text{CASING (ft): } 32.07 & \\ \text{CASING (ft): } 32.07 & \\ \text{ON: } 1/5\% & \\ \text{OFF: } 1794 & \\ \hline Q & \text{GAL PURGED } \text{VOLUMES} & \\ \hline 2 (6.6 & 1 & \\ \hline 3 3.2 & 2 & \\ \hline 2 (6.6 & 1 & \\ \hline 3 3.2 & 2 & \\ \hline 2 (6.6 & 1 & \\ \hline 3 3.2 & 2 & \\ \hline 0 \text{JECT } & \text{ANALYTICAL} \\ \text{SEMG } & \text{ECLABS-BR} \end{array}$	All Ground # rget Sample Date: 08-Dec-2011 LOG BOOK (OB-Dec-2011 LOG BOOK (HOD/SAMPLE METHOD: GF / 3VES INTERVAL: 157.30 - 192.30 INTERVAL: 1756 ON: 10: 1744 Q GAL PURGED VOLUMES PH INTERVAL: 2 INTERVAL: 2 INTERVAL: 2 Q GAL PURGED VOLUMES PH INTERVAL: 3 SERIAL # CALIBRATED YES/NO YES/NO INTERVIE: 10	All Ground Water Sam rget Sample Date: 08-Dec-2011 K1-09 08-Dec-2011 LOG BOOK (DOCUMENT 'HOD/SAMPLE METHOD: GF / 3VES INTERVAL:	All Ground Water Sampling Data riget Sample Date: 08-Dec-2011 Month: N NI-09 AREA INFO: OB-Dec-2011 LOG BOOK (DOCUMENT CONTROL) #: NOD/SAMPLE METHOD: GF / 3VES CONTAMINANT INTERVAL: 157.30 - 192.30 INTAKE DEPTH PTH(calc)/(fbgs): 194.30 / 192 CASING DIAME WATER(fbmp): 161.93 on 16-AUG-11 (& { ((((((((((((((((((Jft cget Sample Date: 08-Dec-2011 Nonth: Norm Qtr: 4 K1-09 AREA INFO: Q8-Dec-2011 LOG BOOK (DOCUMENT CONTROL) #: NONTANINANT PRESENT: INTERVAL: 157.30 - 192.30 INTAKE DEPTH: INTERVAL: 157.30 - 192.30 INTAKE DEPTH: CONTAMINANT PRESENT: INTERVAL: 157.30 - 192.30 INTAKE DEPTH: CONTAMINANT PRESENT: INTERVAL: 161.93 on 16-AUG-11 161.02.1 VOLUME CASING VOL (Gal/Time): ON: 11512 CASING VOL (Gal/Time): OFF: 1244 MEASURED PI:FLOW METER/ Q GAL PURGED VOLUMES PH TEMP C mov Q CASI Q. Q CASI CAL BCS Colspan="2">SAMPLER/EMPLOYER: PROJECT: PROJECT: <tr< td=""><td>All Ground Water Sampling Data Set Sample Date: 08-Dec-2011 Month: Norm Qcr: 4 Norm Year: NI-09 AREA INFO: S300/EWFA/3 08-Dec-2011 LOG BOOK (DOCUMENT CONTROL) #: AA23018 NOD/SAMPLE METHOD: GF / 3VES CONTAMINANT PRESENT: PREON NOD/SAMPLE METHOD: GF / 3VES CONTAMINANT PRESENT: PREON INTERVAL: 157.30 - 192.30 INTAKE DEPTH: 0 PFTH(calc)/(fbgs): 194.30 / 192 CASING DIAMETER/TCASING HT(in): 0 PFTH(calc)/(fbgs): 194.30 / 192 CASING DIAMETER/TCASING HT(in): 0 PFTH(calc)/(fbgs): 194.30 / 192 CASING VOL (Gal/Time): 26.50 C CASING (ft): 32.07 32.2 Y CASING VOL (Gal/Time): 26.50 C ON: 1\5% INITIAL FLOW RATE (O-GPM): 0 OFF: 1294 MEASURED PT: FLOW METER/ GRAD CYL. / 1 0 GAL PURCED VOLUMES PH TEMP C SC mV OG 2(C.G 1 G. 91 20.9 GS 1.7 GC 1 \$3.7.7.7.7.7.7.7.7.7.7.6.57.7.6.7.7.7.6.7.7.7.7</td></tr<>	All Ground Water Sampling Data Set Sample Date: 08-Dec-2011 Month: Norm Qcr: 4 Norm Year: NI-09 AREA INFO: S300/EWFA/3 08-Dec-2011 LOG BOOK (DOCUMENT CONTROL) #: AA23018 NOD/SAMPLE METHOD: GF / 3VES CONTAMINANT PRESENT: PREON NOD/SAMPLE METHOD: GF / 3VES CONTAMINANT PRESENT: PREON INTERVAL: 157.30 - 192.30 INTAKE DEPTH: 0 PFTH(calc)/(fbgs): 194.30 / 192 CASING DIAMETER/TCASING HT(in): 0 PFTH(calc)/(fbgs): 194.30 / 192 CASING DIAMETER/TCASING HT(in): 0 PFTH(calc)/(fbgs): 194.30 / 192 CASING VOL (Gal/Time): 26.50 C CASING (ft): 32.07 32.2 Y CASING VOL (Gal/Time): 26.50 C ON: 1\5% INITIAL FLOW RATE (O-GPM): 0 OFF: 1294 MEASURED PT: FLOW METER/ GRAD CYL. / 1 0 GAL PURCED VOLUMES PH TEMP C SC mV OG 2(C.G 1 G. 91 20.9 GS 1.7 GC 1 \$3.7.7.7.7.7.7.7.7.7.7.6.57.7.6.7.7.7.6.7.7.7.7

RE-SAMPLE

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					(!	and Re	tert)		\bigcap
رەر	Met Cample Del		ALL Groun	d Water S	ampling Data	an - an	and the second se		AWA
NELL TO	.get sample pat	e: 15-Dec-	2011		Month:	Norm Qtr: 4	Norm Year	: 2011	wi. /
WELD ID:		K1-09			_AREA INFO:_		S300/EWFA/	PITI (A	· / _
DATE:	15-Dec-20	011	LOG BOOK	(DOCUME)	NT CONTROL) #	:	AA23021		/
PURGE MET	HOD/SAMPLE METH	OD: GF /	3VES		_ CONTAMINANT	PRESENT	PPPAN	110 444	
SCREENED	INTERVAL:	157.30	- 192.30		INTAKE DEPT	Li .	FREON	113-120.0	
CASING DEP	PTH(calc)/(fbgs);194.3	0 / 192				0	- 00	
DEPTH TO W	ATER(fbmp):	161.93 00	16-100-11		_ CASING DIAM	ETER/TCASING	HT(in):	4.5 / 2.00	
WATER IN C	ASING (f+).	22.07	20 -	162	.10	VOLUM	E FACTOR: 0	. 826	
THE DIND		32.07	36- 6-		CASING VOL (Gal/Time):	26.50	26.6 × 300 7.	9.86e.1
TTUR BULL		4			INITIAL FLOW	RATE (Q=GP	M):	2.4 C	
TIME PUMP	OFF: (\)	53			MEASURED BY	FLOW METER	GRAD CYL./ I	BUCKET/ OTHER	
TIME	2 GAL PURGED	VOLUMES	рн	TEMP C	SC	mV	0G	DOM	
1125	26.6	1	6.83	17.8	653.8	65	1	171117	7
1136	53.2	2	7.11	14.3	659.3	t:1	1	111,7.5	-
1147	80.0	3	7,09	20.1	1.67 %	1 1	1	pm	-
1149			7 12	200	1000 - 2 11 - 2		,	Nin	4
1151			713		62.)	60		and the second	
r			1	1-20,1	660.5	60			
	-								
MEMED	1					3			
pH :	SERIAL #	5835 C	ALIBRATED	. S	AMPLER/EMPLO ROJECT:	YER:	silva90		
mV :			YES/NO	S	AMPLE PRESER	VATION/AMT C	3EMG of REAGENT:	NA	
820:	** (YES/NO	T.	F LOCATION:	ESS H20 DEST	5300	300-DRUM	
QC SAMPLE ID	**************************************	(C LAB(S):		8-9-60	QC SAMP	LE TIME	na n	
SAMPLE ID (V	ERIFY):	1210	304	(T.	TME COLLECTER) +	ere rritti :		
PROJE	CT / AI	ALYTICAL 1	I LAB / RE	OUESTED 7	NAI VOTO		1 /	<u>>)</u>	
31 31	EMG EMG	BCLABS-BAL	х 	E200.7	BA	QUANTITY 1	/ TYP 11	E OF CONTAINERS	
			x	E200.7:F	ILTER	0	11	Polyethylene	

RE-Sample

			A	ll Ground	Water Sam	mpling Data				
T	arget Sampl	e Date:	26- 0ct -20	11 2		Month:	Norm Qtr: 4	Norm Year	: 2011	· / الملن
WELL ID:	I		N-PIT1-22	09		ARBA INFO:		8300/EWFA/	PITI V	
DATE:	26-	Oct-2011		LOG BOOK	(DOCUMENT	CONTROL) #	:	AA23001		
PURGE ME	THOD/SAMPL	E METHOD:	GF / 3	IVES		CONTAMINANT	PRESENT:			**
SCREENED	INTERVAL:		247.30 -	267.30		PUMP INTAKE	DEPTH:		265 20	-
CASING D	EPTH(calc)	(fbgs):_	268.20	/ 266		CASING DIAME	TER /POASTNG	UTT/int.	E (2 00	
DEPTH TO	WATER (fbmj): 21	5.49 on 3	0-AUG-11	215	. 80	NOT 101		5 7 2.00	-
WATER IN	CASING (ft	:): 52	. 51	57.00	<u>}</u>		VOLOME	FACTOR: 1		
TIME PUM	P ON:		Im	6		CASING VUL (Gal/Time):	53.56	<u> <u>s</u> <u>s</u> <u>y</u> <u>y</u> <u>y</u> <u>z</u> <u>s</u> <u>s</u> <u>s</u> <u>y</u> <u>y</u> <u>y</u> <u>s</u> <u>s</u> <u>s</u> <u>y</u> <u>y</u> <u>s</u> <u>s</u> <u>s</u> <u>s</u> <u>s</u> <u>s</u> <u>s</u> <u>s</u> <u>s</u> <u>s</u></u>	160.324
	D OFF.		101	3		INITIAL FLOW	RATE (Q=GPM) 1		-
TTMD FOR	- OFF.					MEASURED BY:	PLOW METERY	GRAD CYL./	BUCKET/ OTHER	
TIME 1112	Q GAL	PURGED	VOLUMES	pH	TEMP C	sc	mV	OG	DTW	1
mic		5		1.45	21.6	608.3	52	1	230,19	
1125	104	.0	2	7.81	20.7	615.3	47	١	233.53	
1138	160	2.5	3	779	21.	613.5	38		NM Protect	
140				7.82	21.1	612.8	39	1		
1142				7.78	Z1. 2	612.7	33			
			v.							
METER	s	ERIAL #	C	LIBRATED		AMDI ED / PMDI		~	I	ļ
рН : SC :	4	10883		YES/NO	F	PROJECT:	JIBK;	BIIVA9 3EMG	O 3CMP 3GIV	
mV :				YES NO	S	SAMPLE PRESEN	RVATION/AMT (of REAGENT:	NA	
H2O:		·		YES/NO	л	F LOCATION:		Ground	NONE	
QC SAMPLE	ID:		ç	C LAB(S):			QC SAME	LE TIME:	الموجو	
SAMPLE ID	(VERIFY):	<u>(1-D)</u>	1-2200	3085	т	IME COLLECTE	D:	1149		
PR	OJECT	/ AN#	LYTICAL I	l LAB / R	EQUESTED	ANALYSTS /	()TIAN/07/0	v /		
	3CMP		GEL		AS:FII	LTER	0	• / T	IL Polvethylene	<i>K</i> .
	3CMP	-	GEL		AS:UI	ISO	2		1L Polyethylene	
	3EMG	E F	CLABS-BAL	ς. (E300.0	:NO3	1	25	0 ml Polyethylene	
	3GIV	E	CLABS-BAI	ζ.	E300.01	TERC 1	1	25	0 ml Polyethylene	
	3EMG		GEL		E90	6	3	40 25	mL Glass VOA vial 50 ml GLASS-AMBER	

			A	1 Ground W	ater Samp	oling Data			
Ta	irget	Sample Date:	14-Nov-201	11	м	ionth: N	orm Qtr: 4	Norm Year:	2011 NAW
WELL ID:		-	W-PIT1-232	26	A	REA INFO:		S300/ENFA/E	
DATE:		14-Nov-2011	L	LOG BOOK (DOCUMENT	CONTROL) #:		AA23008	
PURGE ME	THOD/	SAMPLE METHOD	1: 25 / 3VB	S		CONTAMINANT	PRESENT :		
SCREENED	INTE	RVAL:	217.30 -	237.02	1	NTAKE DEPTH	:	0	.00
CASING D	EPTH (calc)/(fbgs):	237.42	/ 235.12	C	ASING DIAME	TER/TCASING	HT(in):	5 / 2.00
DEPTH TO	WATE	R(fbmp):1	79.81 on 1	8-AUG-11	179.7	3	VOLUM	FACTOR: 1	. 020
WATER IN	CASI	NG (ft): 5	7.31	57.65	C	CASING VOL (Gal/Time):	58.46	59 + 300 = 1776
TIME PUM	P ON:		1258		1	INITIAL FLOW	RATE (Q=GP)	a): <u>3.0</u>	Q
TIME PUM	P OFF	*	1412		P	EASURED BY :	plow meter/	GRAD CYL./	BUCKET/ OTHER
TIME	<u>, e</u> ,	GAL PURGED	VOLUMES	рн	TEMP C	sc	mV	OG	DTW
1319		59		7.97	21.5	717.2	81	1	183.57
1339		118	2	7.89	20,8	723.6	78	1	187,30
1358		177	3	7.90	20,9	7283	77	1	159.92
1400				7.91	20.8	728.1	70	۱	
1402	ļļ	· · · · · · · · · · · · · · · · · · ·		7.91	21.0	728,3	73	l	
								L	
METER		SERIAL #	¥ C	ALIBRATED	S	AMPLER/EMPL	OYER:	silva9	0
SC :		<u> </u>	085	YES NO	E E	AMPLE PRESE	RVATION/AMT	of REAGENT:	NA
mV :				YES NO	F	PURGE VOL/EX	CESS H2O DES	ST: 175.37	/ PIT7-SRC
H2O:		······		YES/NO	1	F LOCATION:		PIT7-SRC	
QC SAMPLI	E ID:		A 1. 22	QC LAB(S):			QC SAM	APLE TIME:	2 1
SAMPLE I	D (VE	RIFY):	-p++1- 6 5	26/3423	7	TIME COLLECT	ED:		<u>'41L</u>
P	ROJEC	T / P	ANALYTICAL GFL	LAB / R	EQUESTED	ANALYSIS /	QUANTI	TY / T	YPE OF CONTAINERS
	3E	MG	GEL		AS:TH	HISO	2		1L Polyethylene
	3E	MG	GEL		AS:U	ISO	2		1L Polyethylene
	3E)	MG	BCLABS-B	AK	E300.0	:NO3	1	2	50 ml Polyethylene
	3E)	MG	BCLABS-B	AK	E300.0	: PERC	1	25	50 ml Polyethylene
	3E	MG	BCLABS-B	3.K A.K	E82	10U	3	40	mL Glass VOA vial
	3EMG GEL					• K • n	3		IL Amber Glass
3EMG GEL E9						ILTER	0		1L Polyethylene
3EMG GEL					E90)6	1	2	50 ml GLASS-AMBER
	3E	MG	EBERLIN	E	RA2	26	1		1L PLASTIC
	3E)	MG	EBERLIN	E	RA226: H	ILTER	0		1L PLASTIC
	3E	MG	BCLABS-B	AK	WGMGN	HET1	1		1L Polyethylene
	35	ng.	BCLABS~B	4N	WGMGMETI	TELLTER	0		il Polyethylene

All Cround Mak ~

	All Ground	l Water Sa	mpling Data			Cinic
Target Sample Dat	e: 10-Nov-2011		Month: N	Norm Qtr: 4	Norm Year:	2011
WELL ID:	W-865-2005		AREA INFO:		S300/EWPA/	865
DATE: 10-Nov-2	011 LOG BOOK	(DOCUMEN	T CONTROL) #:		AA23007	
PURGE METHOD/SAMPLE METH	HOD: PB / GRBA		CONTAMINANT	PRESENT:		
SCREENED INTERVAL:	332.30 - 352.30		INTAKE DEPTH	i:	0	.00
CASING DEPTH(calc)/(fbg:	a): <u>353.20/351</u>		CASING DIAME	TER/TCASING	HT(in):	5 / 2.00
DEPTH TO WATER(fbmp):	326.89 on 16-AUG-11	327.	15	VOLUM	E FACTOR: 1	.020
WATER IN CASING (ft):	26.11		CASING VOL (Gel (Time) .	26.62	
TIME PUMP ON:			INITIAL PLON	Dame (or ch	20,03	аран жана алан алан алан алан алан алан ал
TIME DIMD OFF.			WELGUERE EUW	KATE (Q=GP	M):	
			MEASURED BY:	FLOW METER/	GRAD CYL./	BUCKET/ OTHER
TIME Q GAL PORGE	VOLUMES PH	TEMP C	sc sc	mV	OG	DTW
	- 6.2 9	20.0	1 598.3	64	<u> </u>	
	£1					a)
METER SERIAI	CALIBRATE	l >	SAMPLER/EMPL	OYER:	j silva9	o
SC :	VES/NO))	PROJECT: SAMPLE PRESE	RVATTON/ANT	SEMG	
mV :	YES/NO	, ,	PURGE VOL/EX	CESS H20 DE	ST: 0.00 / S	1300-DRUM
H20:	YES/NO)	TF LOCATION:		\$300	
QC SAMPLE ID: W-865-64Y 8	65FB QC LAB(S)	:0	BEL, CALTEST	QC SAL	MPLE TIME:	1497
SAMPLE ID (VERIFY):	-865-2005 GM	nA	TIME COLLECT	ED:	13	49
PROJECT /	ANALYTICAL LAB /	REQUESTEI	ANALYSIS /	OUANTT	TY / TY	YPE OF CONTAINERS
3EMG 3EMG	CALTEST GEL	E300.	0:PERC	1	25	0 ml Polyethylene
		E5		1	2:	DU MI GLASS-AMBER

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	All Ground	Water Sa	mpling Data				
Target Sample Date: 17	-0ct-2011		Nonth	_			R.
WELL ID:W-	9 PTT1-2620		Month:]	Norm Qtr: 4	Norm Year:	2011 ())()	`/
DATE: 17-00+ 2011			AREA INFO:	······	S300/EWFA/P	ITI	
	LOG BOOK	(DOCUMENT	CONTROL) #:		AA21158		
FORGE METHOD/SAMPLE METHOD:	BI wes GRA	<u>H</u>	CONTAMINANT	PRESENT :			
SCREENED INTERVAL: 24	7.30 - 262.20		INTAKE DEPTH	:	0	00	
CASING DEPTH(calc)/(fbgs):	262.62 / 260.32		CASING DIAME	TEP/TCACTNO		3	
DEPTH TO WATER(fbmp): 231.	32 on 25-JUL-11	220.91	0	THIC ICASING	HT(1n):	5 / 2.00	
WATER IN CASING (ft): 31.00	1137	<i>a</i>		VOLUM	E FACTOR: 1.	020	
TIME PUMP ON:	- 51.10		CASING VOL (Gal/Time):	31.62		
MTME 2007		i	INITIAL FLOW	RATE (Q=GPN	():		
TIME POMP OFF:		N	EASURED BY:	LOW METER/	GRAD CYL./ BI	UCKET/ OTHER	
TIME Q GAL PURGED VO	LUMES pH	TEMP C	SC	mV	OG	Dimit	
1309	- 6.76	22.4	705.9	47		DIW	
<u>.</u>			1			<u> </u>	
		2				0	
				· []			
							8
METER SERIAL # 7	CALIFRATED	SA	MPLES / FNDI OL	(PD .	l		
sc :	TES NO	PR	OJECT:		Silva90 		
mV :	YES NO	sa Pu	MPLE PRESERV RGE VOL/EXCE	ATION/AMT C	f REAGENT:	NA	
	YES/NO	TF	LOCATION:		PIT7-SRC	TT/-SRC	
QC SAMPLE ID:	QC LAB(S):		**************************************	QC SAMP	LE TIME:		
SAMPLE ID (VERIFY):)-Pit	1-263 262	<u>о</u> ти	ME COLLECTED	:	1317	· · · · · · · · · · · · · · · · · · ·	
PROJECT / ANALYI	ICAL LAB / REC	UESTED AN	NALYSIS /	OllaNET	· · · · · ·		
3EMG CA	LTEST SEL	E300.0:P	ERC	20441113	250 J	OF CONTAINERS	
		0063		1	250	m1 GLASS-AMBER	

PB/GRBA 200 pump vas nostalled.

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Appendix H

Statistical Limits and Graphs of Ground Water Measurements

Pit Area	Constituent	Monitoring Well	Date Sampled	Result	Units ^a
Pit 1	Arsenic	W-PIT1-2326	7/29/2008	<50	ug/L
Pit 1	Barium	K1-04	4/18/2003	<100	ug/L
Pit 1	Barium	K1-05	4/18/2003	<100	ug/L
Pit 1	Cobalt	K1-04	4/18/2003	<50	ug/L
Pit 1	Cobalt	K1-05	4/18/2003	<50	ug/L
Pit 1	Nickel	W-PIT1-2326	7/29/2008	<100	ug/L
Pit 1	Lead	K1-04	4/18/2003	<5	ug/L
Pit 1	Lead	K1-05	4/18/2003	<5	ug/L
Pit 1	Lead	W-PIT1-2326	7/29/2008	<5	ug/L

Table H-1. Analytical results from 2011 that were omitted from the Appendix H plots due to the use of specially reduced Y-axis plot limits.

^a Results labled as "<" had high reporting limits (RLs) for that particular analytical result. These values were not included in the plots. These results if plotted would have significantly altered the y-axis scale.

Pit 1 Area GW Elevation (Feet)









GW Elevation (Feet)

GW Elevation (Feet)

GW Elevation (Feet)

GW Elevation (Feet)

Pit 1 Area GW Elevation (Feet)

Detection Monitoring Point K1-05







Field Temperature (Degrees C)

Field Temperature (Degrees C)

Pit 1 Area Field Temperature (Degrees C)

Background Monitoring Point K1-01C







Pit 1 Area Field Temperature (Degrees C)

Detection Monitoring Point K1-05



Crossgradient Monitoring Point K1-08



s.

- LO





Sample quarter

1 3 1 3

3 1

LLNL Site 300 Pit 1 Monitoring Program



Barium (ug/L)





Sample quarter


Beryllium (ug/L)







ampie qua



Cadmium (ug/L)









Cobalt (ug/L)









Copper (ug/L)







Sample quarter



Lead (ug/L)









Sample quarter

Nickel (ug/L)











Sample quarter



Sample quarter

Zinc (ug/L)







LLNL SITE 300 PIT 1 Monitoring Program



Radium 226 (Bq/L)









LENE ONE OUT IN FIGHTING PROVIDE



Thorium 228 (Bq/L)















Background Monitoring Point K1-07



Thorium 232 (Bq/L)



U234+U233 (Bq/L)







LENE ONO OOO EN EMORINO ING E IOGIAN







U234+U233 (Bq/L)







Sample quarter

U235+U236 (Bq/L)



Sample quarter

3 1

3 1







U238 (Bq/L)

U238 (Bq/L)

1.11.1

....

U238 (Bq/L)













Total U (Bq/L)











HMX (ug/L)

LETTE ONC SOOT ALL MONITORING FLOGRAM



RDX (ug/L)





Sample quarter




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