Data Validation Package

October 2009
Groundwater and Surface Water Sampling at the Burrell, Pennsylvania, Disposal Site

December 2009

U.S. DEPARTMENT OF ENERGY | Legacy Management

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Sampling Event Summary

Site: Burrell, Pennsylvania, Disposal Site

Sampling Period: October 19-20, 2009

The 2000 *Long-Term Surveillance Plan for the U.S. Department of Energy Burrell Vicinity Property, Blairsville, Pennsylvania*, requires groundwater monitoring as a best management practice to evaluate the performance of the disposal cell. Groundwater is monitored at 5-year intervals and began in 1999. The planned sample locations are listed in Table 1.

Table 1. Ground-Water Monitoring Locations, Burrell, Pennsylvania, Disposal Site

Monitor Wells	Location
0420 & 0520	Up gradient, or background wells
0422 & 0522	Cross gradient, point-of-compliance wells
0423 & 0523	Down gradient, point-of-compliance wells
0424 & 0524	Down gradient, point-of-compliance wells
Seeps	**Location**
0611	Bottom of disposal cell
0612	Bottom of disposal cell

Sampling and analysis was conducted as specified in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites* (LMS/PLN/S04351, continually updated) and the *Environmental Procedures Catalog* (LMS/PRO/S04325, continually updated). Samples were collected from all monitor wells; surface locations 0611 and 0612 (seeps) were not sampled because they were dry. Surface location 0625 was added to the sampling event as a replacement surface location. A duplicate sample was collected from location 0423. An equipment blank was not collected because dedicated sampling equipment was used.

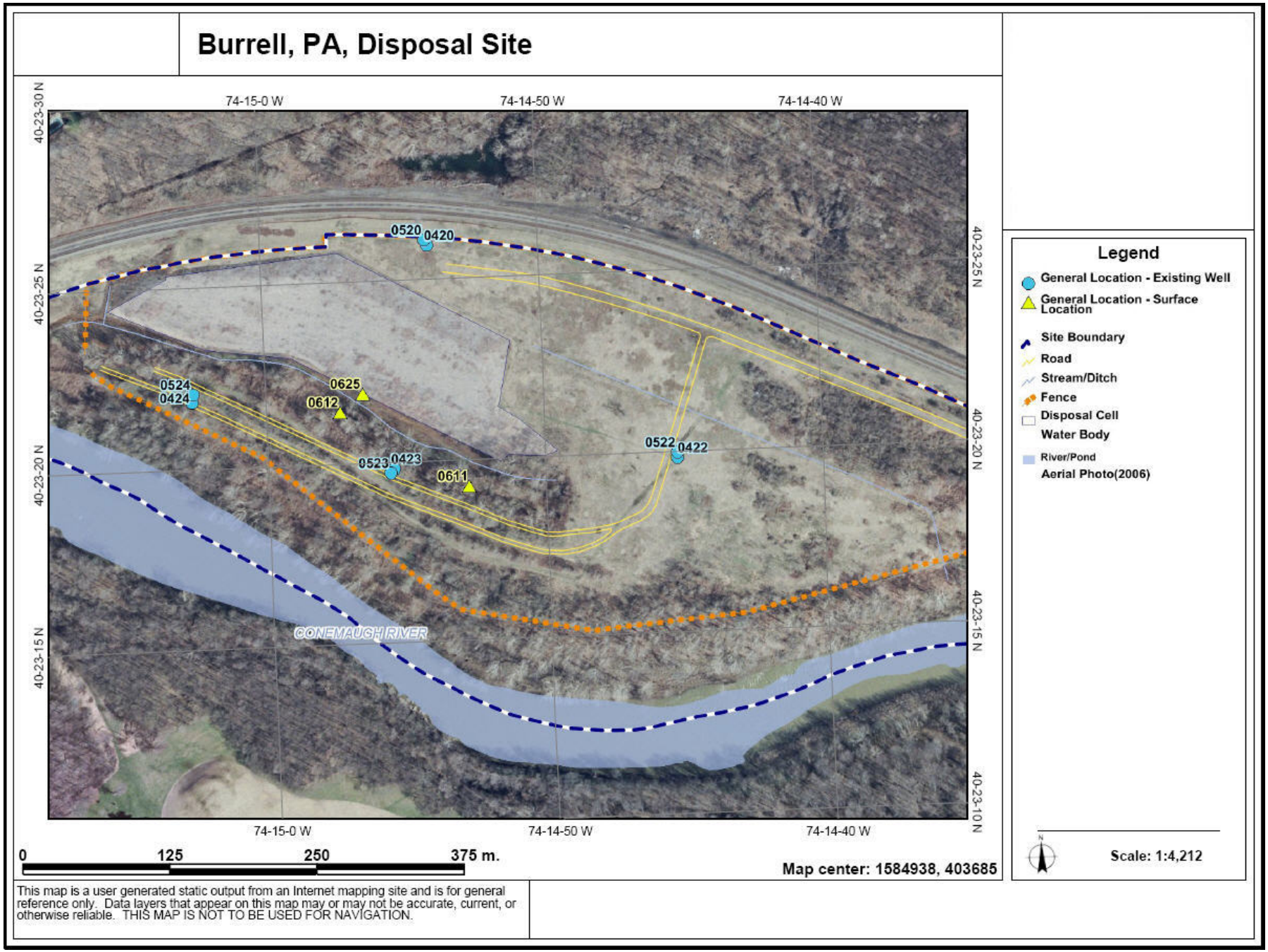
Four of the analytes that are monitored (lead, molybdenum, selenium, and uranium) have maximum contamination levels (MCLs) from 40 CFR 192.02 that are used as indicators for evaluating cell performance. The concentrations of these analytes did not exceed their respective MCLs in any of the samples.

The data are consistent with the historical results and indicate that seepage from the disposal cell has not occurred and groundwater quality relative to background has not degraded, thus demonstrating continuing performance of the disposal cell.

2010.01.07 13:01:32 -05'00'

Michele Miller
Site Lead, SM Stoller

Date



Burrell, Pennsylvania Sample Location Map

Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	Burrell, Pennsylvania	**Date(s) of Water Sampling**	October 19-20, 2009
Date(s) of Verification	December 9, 2009	**Name of Verifier**	Steve Donivan

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures?	Yes	
List other documents, SOPs, instructions.		Work Order Letter dated September 16, 2009.
2. Were the sampling locations specified in the planning documents sampled?	No	Surface water locations 0611 and 0612 were dry.
3. Was a pre-trip calibration conducted as specified in the above-named documents?	Yes	Pre-trip calibration was performed on October 12, 2009.
4. Was an operational check of the field equipment conducted daily?	Yes	Operational checks were performed on October 19 and 20, 2009.
Did the operational checks meet criteria?	Yes	
5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified?	Yes	Alkalinity is no longer included as a standard/routine water quality indicator that is collected in the field.
6. Was the category of the well documented?	Yes	All wells were Category I.
7. Were the following conditions met when purging a Category I well:		
Was one pump/tubing volume purged prior to sampling?	Yes	
Did the water level stabilize prior to sampling?	Yes	
Did pH, specific conductance, and turbidity measurements stabilize prior to sampling?	Yes	Turbidity did not meet the criteria for wells 0422 and 0424. Samples were filtered.
Was the flow rate less than 500 mL/min?	Yes	
If a portable pump was used, was there a 4-hour delay between pump installation and sampling?	NA	

Water Sampling Field Activities Verification Checklist (continued)

	Response (Yes, No, NA)	Comments
8. Were the following conditions met when purging a Category II well:		
Was the flow rate less than 500 mL/min?	NA	
Was one pump/tubing volume removed prior to sampling?	NA	
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	A duplicate sample was collected from location 0423.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment?	NA	
11. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
12. Were QC samples assigned a fictitious site identification number?	Yes	Location ID 2820 was used for the duplicate sample.
Was the true identity of the samples recorded on the Quality Assurance Sample Log or in the Field Data Collection System (FDCS) report?	Yes	
13. Were samples collected in the containers specified?	Yes	
14. Were samples filtered and preserved as specified?	Yes	
15. Were the number and types of samples collected as specified?	Yes	
16. Were chain of custody records completed and was sample custody maintained?	Yes	
17. Are field data sheets signed and dated by both team members (hardcopies) or are dates present for the “Date Signed” fields (FDCS)?	Yes	
18. Was all other pertinent information documented on the field data sheets?	Yes	
19. Was the presence or absence of ice in the cooler documented at every sample location?	Yes	
20. Were water levels measured at the locations specified in the planning documents?	Yes	

Laboratory Performance Assessment

General Information

Report Number (RIN):	09102634
Sample Event:	October 19-20, 2009
Site(s):	Burrell, Pennsylvania
Laboratory:	ALS Laboratory Group, Fort Collins, Colorado
Work Order No.:	0910223
Analysis:	Metals and Wet Chemistry
Validator:	Steve Donivan
Review Date:	December 8, 2009

This validation was performed according to the *Environmental Procedures Catalog* (LMS/PRO/S04325, continually updated) "Standard Practice for Validation of Laboratory Samples." The procedure was applied at Level 3, Data Validation. See attached Data Validation Worksheets for supporting documentation on the data review and validation. All analyses were successfully completed. The samples were prepared and analyzed using accepted procedures based on methods specified by line item code, which are listed in Table 2.

Table 2. Analytes and Methods

Analyte	Line Item Code	Prep Method	Analytical Method
Calcium, Iron, Magnesium, Manganese, Potassium, Sodium	LMM-01	SW-846 3005A	SW-846 6010B
Chloride	MIS-A-039	SW-846 9056	SW-846 9056
Lead, Molybdenum, Selenium, Uranium	LMM-02	SW-846 3005A	SW-846 6020A
Nitrate + Nitrite as N	WCH-A-022	EPA 353.2	EPA 353.2
Sulfate	MIS-A-044	SW-846 9056	SW-846 9056
Total Dissolved Solids (TDS)	WCH-A-033	EPA 16.01	EPA 160.1

Data Qualifier Summary

Analytical results were qualified as listed in Table 3. Refer to the attached validation worksheets and the sections below for an explanation of the data qualifiers applied.

Table 3. Data Qualifier Summary

Sample Number	Location	Analyte	Flag	Reason
0910223-2	0422	Lead	U	Less than 5 times the method blank
0910223-4	0424	Lead	U	Less than 5 times the method blank
0910223-5	0520	Iron	U	Less than 5 times the method blank
0910223-5	0520	Lead	U	Less than 5 times the method blank
0910223-5	0520	Uranium	U	Less than 5 times the method blank
0910223-6	0522	Calcium	U	Less than 5 times the method blank
0910223-6	0522	Iron	U	Less than 5 times the method blank

Table 3 (continued). Data Qualifier Summary

Sample Number	Location	Analyte	Flag	Reason
0910223-6	0522	Lead	U	Less than 5 times the method blank
0910223-6	0522	Magnesium	U	Less than 5 times the method blank
0910223-6	0522	Uranium	U	Less than 5 times the method blank
0910223-7	0523	Calcium	U	Less than 5 times the method blank
0910223-7	0523	Iron	U	Less than 5 times the method blank
0910223-7	0523	Lead	U	Less than 5 times the method blank
0910223-7	0523	Magnesium	U	Less than 5 times the method blank
0910223-8	0524	Iron	U	Less than 5 times the method blank
0910223-8	0524	Lead	U	Less than 5 times the method blank
0910223-8	0524	Magnesium	U	Less than 5 times the method blank
0910223-8	0524	Potassium	J	Negative method blank
0910223-10	0625	Lead	U	Less than 5 times the method blank

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received ten water samples on October 21, 2009, accompanied by Chain of Custody (COC) forms. The COC forms were checked to confirm that all of the samples were listed on the forms and that signatures and dates were present indicating sample relinquishment and receipt. The sample submittal documents including the COC forms had no errors or omissions with the following exceptions. There was no relinquishment time entered on the COC forms. The sample filtration status was not entered on the COC forms. The filtration status was corrected when the data were loaded into the SEEPro database. The receiving documentation included copies of the shipping labels listing the air waybill numbers.

Preservation and Holding Times

The sample shipment was received intact with the temperature inside the iced cooler at 0.2 °C, which complies with requirements. All samples were received in the correct container types and had been preserved correctly for the requested analyses. All samples were analyzed within the required holding time.

Laboratory Instrument Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for all analytes. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear curve. Compliance requirements for continuing calibration checks are established to ensure that the instrument continues to be capable of producing acceptable qualitative and quantitative data. All laboratory instrument calibrations were performed correctly in accordance with the cited methods.

Method MCAWW 353.2
Calibration was performed for nitrate + nitrite as N on October 29, 2009, using seven calibration standards. The calibration curve correlation coefficient values were greater than 0.995 and the

absolute values of the intercepts were less than 3 times the MDL. Initial and continuing calibration verification checks were made at the required frequency resulting in three verification checks. All calibration checks met the acceptance criteria.

Method SW-846 6010B
Calibration for calcium, iron, magnesium, manganese, potassium, and sodium was performed on October 28, 2009, using single point calibrations. Calibration and laboratory spike standards were prepared from independent sources. Initial and continuing calibration verification checks were made at the required frequency resulting in 16 verification checks. All calibration checks met the acceptance criteria. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curve near the practical quantitation limit (PQL) and all results were within the acceptance range.

Method SW-846 6020A
Calibrations were performed for selenium on November 2, 2009, and for lead, molybdenum, and uranium on October 29, 2009, using seven calibration standards. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 3 times the MDL. Calibration and laboratory spike standards were prepared from independent sources. Initial and continuing calibration verification checks were made at the required frequency resulting in three verification checks for selenium and 12 checks for lead, molybdenum, and uranium. All calibration checks met the acceptance criteria. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curve near the PQL and all results were within the acceptance range. Mass calibration and resolution verifications were performed at the beginning of each analytical run in accordance with the analytical procedure. Internal standard recoveries associated with requested analytes were stable and within acceptable ranges.

Method SW-846 9056
Calibrations were performed for chloride and sulfate on October 23, 2009, using five calibration standards. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 3 times the MDL. Calibration and laboratory spike standards were prepared from independent sources. Initial and continuing calibration verification checks were made at the required frequency resulting in six verification checks. All calibration checks met the acceptance criteria.

Method and Calibration Blanks

Method blanks are analyzed to assess any contamination that may have occurred during sample preparation. Calibration blanks are analyzed to assess instrument contamination prior to and during sample analysis. The sodium and potassium method and calibration blanks were negative and the absolute values were greater than the MDL but less than the PQL. The associated sample results that are less than 5 times the MDL are qualified with a “J” flag as estimated values. In cases where a blank concentration exceeds the MDL, the associated sample results are qualified with a “U” flag (not detected) when the sample result is greater than the MDL but less than 5 times the blank concentration. All initial and continuing calibration blank results associated with the samples were below the PQL with the following exceptions.

One sodium calibration blank analyzed on October 28, 2009, had a result that was greater than the PQL. There were no sample results associated with this blank.

Inductively Coupled Plasma (ICP) Interference Check Sample Analysis

Inductively coupled plasma interference check samples were analyzed at the required frequency to verify the instrumental interelement and background correction factors. All check sample results met the acceptance criteria.

Matrix Spike Analysis

Matrix spike (MS) and matrix spike duplicate pairs were analyzed for all analytes as a measure of method performance in the sample matrix. The MS data are not evaluated when the concentration of the unspiked sample is greater than 4 times the spike concentration. The spike recoveries met the recovery criteria for all analytes evaluated with the following exceptions.

The ammonia as N MS recovery for sample 0792 did not meet the acceptance criteria. The sample ammonia result is qualified with a "J" flag as an estimated value.

The chloride and sulfate recoveries for sample 0965 did not meet the acceptance criteria. The sample chloride and sulfate results are qualified with a "J" flag as estimated values.

Laboratory Replicate Analysis

The laboratory replicate sample results demonstrate acceptable laboratory precision. The relative percent difference values for the laboratory replicate sample and matrix spike duplicate sample results for all analytes were less than 20 percent, indicating acceptable laboratory precision.

Laboratory Control Samples

Laboratory control samples were analyzed at the correct frequency to provide information on the accuracy of the analytical method and the overall laboratory performance, including sample preparation. The control sample results were acceptable for all analytes.

Metals Serial Dilution

Serial dilutions were prepared and analyzed for the metals analyses to monitor chemical or physical interferences in the sample matrix. Serial dilution data are evaluated when the concentration of the undiluted sample is greater than 100 times the PQL for ICP-MS or greater than 50 times the PQL for ICP. All evaluated serial dilution data were acceptable with the following exceptions.

The iron and sodium serial dilution results failed to meet the acceptance criteria for sample 0520. The sample sodium result is qualified with a "J" flag as an estimated value. The iron result was qualified on the basis of the method blank.

Detection Limits/Dilutions

Samples were diluted in a consistent and acceptable manner when required. The samples were diluted prior to analysis of uranium to reduce interferences. The required detection limits were achieved for all analytes.

Completeness

Results were reported in the correct units for all analytes requested using contract-required laboratory qualifiers.

Chromatography Peak Integration

The integration of analyte peaks was reviewed for all chloride and sulfate data. There were no manual integrations performed and all peak integrations were satisfactory.

Electronic Data Deliverable (EDD) File

The EDD file arrived on November 16, 2009. The Sample Management System EDD validation module was used to verify that the EDD files were complete and in compliance with requirements. The module compares the contents of the files to the requested analyses to ensure all and only the requested data are delivered. The contents of the EDD were manually examined to verify that the sample results accurately reflect the data contained in the sample data package.

SAMPLE MANAGEMENT SYSTEM

General Data Validation Report

RIN: 09102634 **Lab Code:** PAR **Validator:** Steve Donivan **Validation Date:** 12/4/2009

Project: Burrell **Analysis Type:** ☑ Metals ☑ General Chem ☐ Rad ☐ Organics

# of Samples: 10 **Matrix:** WATER **Requested Analysis Completed:** Yes

Chain of Custody

Present: OK **Signed:** OK **Dated:** OK

Sample

Integrity: OK **Preservation:** OK **Temperature:** OK

Select Quality Parameters

☑ Holding Times	All analyses were completed within the applicable holding times.
☑ Detection Limits	The reported detection limits are equal to or below contract requirements.
☐ Field/Trip Blanks	
☑ Field Duplicates	There was 1 duplicate evaluated.

SAMPLE MANAGEMENT SYSTEM

Metals Data Validation Worksheet

RIN: 09102634 **Lab Code:** PAR **Date Due:** 11/18/2009

Matrix: Water **Site Code:** CAN03 **Date Completed:** 11/17/2009

Analyte	Date Analyzed	CALIBRATION						Method Blank	LCS %R	MS %R	MSD %R	Dup. RPD	ICSAB %R	Serial Dil. %R	CRI %R
		Int.	R^2	ICV	CCV	ICB	CCB								
CALCIUM	10/28/2009			OK	OK	OK	OK	OK	103.0	99.0	100.0	1.0	103.0	0.0	106.0
CALCIUM	10/28/2009												104.0		109.0
IRON	10/28/2009			OK	OK	OK	OK	OK	105.0	99.0	100.0	1.0	103.0	16.0	100.0
IRON	10/28/2009												102.0		104.0
LEAD	10/29/2009	0.0000	1.0000	OK	OK	OK	OK	OK	105.0	108.0	113.0	5.0	100.0		106.0
MAGNESIUM	10/28/2009			OK	OK	OK	OK	OK	103.0	102.0	103.0	1.0	106.0	1.0	103.0
MAGNESIUM	10/28/2009												107.0		106.0
MANGANESE	10/28/2009			OK	OK	OK	OK	OK	97.0	96.0	96.0	1.0	95.0	5.0	100.0
MANGANESE	10/28/2009												94.0		101.0
MOLYBDENUM	10/29/2009	0.0000	1.0000	OK	OK	OK	OK	OK	107.0	110.0	118.0	6.0	118.0		99.0
POTASSIUM	10/28/2009			OK	OK	OK	OK	OK	89.0	100.0	100.0	0.0			88.0
POTASSIUM	10/28/2009														82.0
SELENIUM	11/02/2009	0.0000	1.0000	OK	OK	OK	OK	OK	98.0	95.0	94.0	1.0	97.0		74.0
SODIUM	10/28/2009			OK	OK	OK	OK	OK	91.0	102.0	101.0	0.0		11.0	91.0
SODIUM	10/28/2009														87.0
URANIUM	10/29/2009	0.0000	1.0000	OK	OK	OK	OK	OK	109.0	114.0	121.0	6.0	106.0		106.0

SAMPLE MANAGEMENT SYSTEM

Wet Chemistry Data Validation Worksheet

RIN: 09102634 **Lab Code:** PAR **Date Due:** 11/18/2009

Matrix: Water **Site Code:** CAN03 **Date Completed:** 11/17/2009

Analyte	Date Analyzed	CALIBRATION						Method Blank	LCS %R	MS %R	MSD %R	DUP RPD	Serial Dil. %R
		Int.	R^2	ICV	CCV	ICB	CCB						
CHLORIDE	10/24/2009	0.000	0.9999	OK	OK	OK	OK	OK	102.00	104.0	103.0	1.00	
NITRATE/NITRITE AS N	10/29/2009	0.000	1.0000	OK	OK	OK	OK	OK	102.00	104.0	106.0	2.00	
SULFATE	10/24/2009	0.000	0.9999	OK	OK	OK	OK	OK	102.00	107.0	107.0	0	
TOTAL DISSOLVED SOLIDS	10/26/2009							OK	101.00			1.00	

Sampling Quality Control Assessment

The following information summarizes and assesses quality control for this sampling event.

Sampling Protocol

Monitor wells were sampled using dedicated bladder pumps and the low flow purge method. The surface water sample was collected by container immersion.

Sample results for all monitor wells met the Category I low-flow sampling criteria and were qualified with an "F" flag in the database, indicating the wells were purged and sampled using the low-flow sampling method.

Groundwater locations 0422 and 0424 had turbidity values greater than ten nepholometric turbidity units. The samples from these locations were filtered.

Equipment Blank Assessment

An equipment blank was not collected.

Field Duplicate Assessment

Field duplicate samples are collected and analyzed as an indication of overall precision of the measurement process. The precision observed includes both field and laboratory precision and has more variability than laboratory duplicates, which measure only laboratory performance. A duplicate sample was collected from location 0423. The duplicate results met the U.S. Environmental Protection Agency recommended laboratory duplicate criteria of less than 20 percent relative difference for results that are greater than 5 times the PQL, demonstrating acceptable precision.

SAMPLE MANAGEMENT SYSTEM

Validation Report: Field Duplicates

RIN: 09102634 **Lab Code:** PAR **Project:** Burrell **Validation Date:** 12/4/2009

Duplicate: 2820 **Sample:** 0423

Analyte	Sample Result	Sample Flag	Sample Error	Sample Dilution	Duplicate Result	Duplicate Flag	Duplicate Error	Duplicate Dilution	RPD	RER	Units
CALCIUM	130000			1	130000			1	0		UG/L
CHLORIDE	16			10	19			5	17.14		MG/L
IRON	17000			1	16000			1	6.06		UG/L
LEAD	0.68			10	0.69			10	1.46		UG/L
MAGNESIUM	41000			1	40000			1	2.47		UG/L
MANGANESE	1500			1	1500			1	0		UG/L
MOLYBDENUM	13			10	12			10	8.00		UG/L
NITRATE/NITRITE AS N	0.01	U		1	0.01	U		1			MG/L
POTASSIUM	9800			1	9600			1	2.06		UG/L
SELENIUM	0.032	U		1	0.032	U		1			UG/L
SODIUM	21000			1	21000			1	0		UG/L
SULFATE	35			10	32			5	8.96		MG/L
TOTAL DISSOLVED SOLIDS	560			1	560			1	0		MG/L
URANIUM	0.52			10	0.5			10	3.92		UG/L

Certification

All laboratory analytical quality control criteria were met except as qualified in this report. The data qualifiers listed on the SEEPro database reports are defined on the last page of each report. All data in this package are considered validated and available for use.

Laboratory Coordinator: Steve Donivan — Date: 12-28-2009

Data Validation Lead: Steve Donivan — Date: 12-28-2009

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Attachment 1
Assessment of Anomalous Data

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Potential Outliers Report

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Potential Outliers Report

Potential outliers are measurements that are extremely large or small relative to the rest of the data and, therefore, are suspected of misrepresenting the population from which they were collected. Potential outliers may result from transcription errors, data-coding errors, or measurement system problems. However, outliers may also represent true extreme values of a distribution and indicate more variability in the population than was expected.

Statistical outlier tests give probabilistic evidence that an extreme value does not "fit" with the distribution of the remainder of the data and is therefore a statistical outlier. These tests should only be used to identify data points that require further investigation. The tests alone cannot determine whether a statistical outlier should be discarded or corrected within a data set.

There are three steps involved in identifying extreme values or outliers:

1. Identify extreme values that may be potential outliers by generating the Outliers Report using the Sample Management System from data in the SEEPro database. The application compares the new data set with historical data and lists the new data that fall outside the historical data range. A determination is also made if the data are normally distributed using the Shapiro-Wilk Test.
2. Apply the appropriate statistical test. Dixon's Extreme Value test is used to test for statistical outliers when the sample size is less than or equal to 25. This test considers both extreme values that are much smaller than the rest of the data (case 1) and extreme values that are much larger than the rest of the data (case 2). This test is valid only if the data without the suspected outlier are normally distributed. Rosner's Test is a parametric test that is used to detect outliers for sample sizes of 25 or more. This test also assumes that the data without the suspected outliers are normally distributed.
3. Scientifically review statistical outliers and decide on their disposition.

The calcium, chloride, magnesium, pH, sodium, TDS, and turbidity results from well 0422, and the sodium and sulfate results for well 0424 were identified as potential outliers. The data for these parameters point to a general increase or decrease in major anion and cation concentrations and are not indicative of data errors. The data for this event are acceptable as qualified.

Data Validation Outliers Report - No Field Parameters
Laboratory: PARAGON (Fort Collins, CO)
RIN: 09102634
Comparison: All Historical Data
Report Date: 12/9/2009

Site Code	Location Code	Sample Date	Analyte	Current	Qualifiers		Historical Maximum	Qualifiers		Historical Minimum	Qualifiers		Number of Data Points		Normally Distributed	Statistical Outlier
				Result	Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect		
CAN03	0420	10/20/2009	Chloride	27		F	21		F	14		RX	23	0	Yes	Yes
CAN03	0420	10/20/2009	Selenium	0.000032	U	F	0.01	U	RX	0.000038	B	F	23	20	No	No
CAN03	0420	10/20/2009	Sulfate	350		F	344			133		RX	23	0	Yes	No
CAN03	0420	10/20/2009	Total Dissolved Solids	690		F	677			382		RX	23	0	Yes	No
CAN03	0422	10/19/2009	Calcium	150		F	60.9			42.7		RX	25	0	Yes	Yes
CAN03	0422	10/19/2009	Iron	26		F	20.1		RX	0.09		RX	25	1	No	Yes
CAN03	0422	10/19/2009	Magnesium	32		F	18.6			12.8		RX	25	0	Yes	Yes
CAN03	0422	10/19/2009	Manganese	1.7		F	0.838			0.33		RX	25	0	No	Yes
CAN03	0422	10/19/2009	Potassium	6.5		F	3.3		RX	0.71		RX	25	0	No	Yes
CAN03	0422	10/19/2009	Selenium	0.000032	U	F	0.01	U	RX	0.000034	B	F	25	22	No	Yes
CAN03	0422	10/19/2009	Sodium	18		F	82.9		RX	48		F	25	0	Yes	Yes
CAN03	0422	10/19/2009	Sulfate	80		F	139		RX	97		F	25	0	No	Yes
CAN03	0422	10/19/2009	Total Dissolved Solids	630		F	460			350		F	25	0	Yes	Yes
CAN03	0422	10/19/2009	Uranium	0.00024		F	0.003	U	RX	0.00025		F	25	12	No	Yes
CAN03	0423	10/19/2009	Selenium	0.000032	U	F	0.01	U	RX	0.000044	B	F	23	17	No	No
CAN03	0423	10/19/2009	Sodium	21		F	234		RX	24		F	23	0	No	No

Data Validation Outliers Report - No Field Parameters
Laboratory: PARAGON (Fort Collins, CO)
RIN: 09102634
Comparison: All Historical Data
Report Date: 12/9/2009

				Current			Historical Maximum			Historical Minimum			Number of Data Points		Normally Distributed	Statistical Outlier
					Qualifiers			Qualifiers			Qualifiers					
Site Code	Location Code	Sample Date	Analyte	Result	Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect		
CAN03	0424	10/19/2009	Sodium	21		F	94.2		RX	26		F	21	0	Yes (log)	Yes
CAN03	0424	10/19/2009	Sulfate	110		F	393		RX	180		F	21	0	Yes	Yes
CAN03	0424	10/19/2009	Total Dissolved Solids	660		F	1010		RX	696		RX	21	0	Yes	No
CAN03	0520	10/20/2009	Chloride	15		F	14.6			0.51		U	30	1	No	No
CAN03	0520	10/20/2009	Potassium	0.69	B	F	4.4		RX	0.83		RX	30	0	No	No
CAN03	0520	10/20/2009	Sodium	47	E	F	61.8		RX	48		F	30	0	Yes	No
CAN03	0522	10/19/2009	Selenium	0.000032	U	F	0.014		RX	0.000055	B	F	22	19	No	No
CAN03	0523	10/19/2009	Calcium	0.55	B	UF	112		RX	1.1		RX	25	0	No	Yes
CAN03	0523	10/19/2009	Magnesium	0.061	B	UF	58		RX	0.1	B	RX	25	3	No	Yes
CAN03	0523	10/19/2009	Manganese	0.0017	B	F	1.47		RX	0.002		RX	25	16	No	Yes
CAN03	0523	10/19/2009	Potassium	0.092	U	F	16		RX	0.2		RX	25	2	No	Yes
CAN03	0524	10/19/2009	Uranium	0.000079	B	F	0.003	U	RX	0.000093	B	UF	34	31	No	No

Data Validation Outliers Report - Field Parameters Only
Laboratory: Field Measurements
RIN: 09102634
Comparison: All Historical Data
Report Date: 12/9/2009

Site Code	Location Code	Sample Date	Analyte	Current Result	Current Qualifiers Lab	Current Qualifiers Data	Historical Maximum Result	Historical Maximum Qualifiers Lab	Historical Maximum Qualifiers Data	Historical Minimum Result	Historical Minimum Qualifiers Lab	Historical Minimum Qualifiers Data	Number of Data Points N	Number of Data Points N Below Detect	Normally Distributed	Statistical Outlier
CAN03	0420	10/20/2009	Specific Conductance	977		F	916			400		RX	20	0	Yes	No
CAN03	0422	10/19/2009	pH	6.86		F	6.82			6.25		RX	25	0	Yes	Yes
CAN03	0422	10/19/2009	Specific Conductance	1047		F	712			420		RX	25	0	No	Yes
CAN03	0422	10/19/2009	Turbidity	34.5		F	15			2.82			7	0	Yes	Yes
CAN03	0423	10/19/2009	pH	6.97		F	6.93		RX	6.51		RX	21	0	Yes	No
CAN03	0520	10/20/2009	pH	7.97		F	7.91			6.39		F	29	0	No	No
CAN03	0522	10/19/2009	Turbidity	1.51		F	56.6		G	3.67		F	7	0	Yes (log)	No
CAN03	0523	10/19/2009	pH	9.64		F	9.36		G	6.69		F	25	0	No	Yes
CAN03	0523	10/19/2009	Turbidity	2.51		F	240		G	5.27		F	6	0	Yes (log)	No
CAN03	0524	10/19/2009	pH	8.99		F	8.44			6.25		F	32	0	No	Yes
CAN03	0524	10/19/2009	Specific Conductance	923		F	914			430		RX	33	0	Yes	No

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

LAB QUALIFIERS:

*	Replicate analysis not within control limits.
>	Result above upper detection limit.
A	TIC is a suspected aldol-condensation product.
B	Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
C	Pesticide result confirmed by GC-MS.
D	Analyte determined in diluted sample.
E	Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
H	Holding time expired, value suspect.
I	Increased detection limit due to required dilution.
J	Estimated
N	Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
P	> 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
U	Analytical result below detection limit.

W	Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
X,Y,Z	Laboratory defined qualifier, see case narrative.

DATA QUALIFIERS:

F	Low flow sampling method used.	G	Possible grout contamination, pH > 9.	J	Estimated value.
L	Less than 3 bore volumes purged prior to sampling.	Q	Qualitative result due to sampling technique.	R	Unusable result.
U	Parameter analyzed for but was not detected.	X	Location is undefined.		

STATISTICAL TESTS:

The distribution of the data is tested for normality or lognormality using the Shapiro-Wilk Test
Outliers are identified using Dixon's Test when there are 25 or fewer data points.
Outliers are identified using Rosner's Test when there are 26 or more data points.
See Data Quality Assessment: Statistical Methods for Practitioners, EPA QC/G-9S, February 2006.

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Attachment 2
Data Presentation

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Groundwater Quality Data

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Groundwater Quality Data by Location (USEE100) FOR SITE CAN03, Burrell Disposal Site
REPORT DATE: 12/9/2009
Location: 0420 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Data	QA	Detection Limit	Uncertainty
Calcium	mg/L	10/20/2009	N001	35.4	-	55.4	120		F	#	0.0021	
Chloride	mg/L	10/20/2009	N001	35.4	-	55.4	27		F	#	2	
Iron	mg/L	10/20/2009	N001	35.4	-	55.4	36		F	#	0.0016	
Lead	mg/L	10/20/2009	N001	35.4	-	55.4	0.0013		F	#	0.000014	
Magnesium	mg/L	10/20/2009	N001	35.4	-	55.4	33		F	#	0.0066	
Manganese	mg/L	10/20/2009	N001	35.4	-	55.4	1.9		F	#	0.0001	
Molybdenum	mg/L	10/20/2009	N001	35.4	-	55.4	0.00089	B	F	#	0.000067	
Nitrate + Nitrite as Nitrogen	mg/L	10/20/2009	N001	35.4	-	55.4	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	10/20/2009	N001	35.4	-	55.4	-86.4		F	#		
pH	s.u.	10/20/2009	N001	35.4	-	55.4	6.68		F	#		
Potassium	mg/L	10/20/2009	N001	35.4	-	55.4	1		F	#	0.092	
Selenium	mg/L	10/20/2009	N001	35.4	-	55.4	0.000032	U	F	#	0.000032	
Sodium	mg/L	10/20/2009	N001	35.4	-	55.4	19		F	#	0.0044	
Specific Conductance	umhos /cm	10/20/2009	N001	35.4	-	55.4	977		F	#		
Sulfate	mg/L	10/20/2009	N001	35.4	-	55.4	350		F	#	5	
Temperature	C	10/20/2009	N001	35.4	-	55.4	11.49		F	#		
Total Dissolved Solids	mg/L	10/20/2009	N001	35.4	-	55.4	690		F	#	20	
Turbidity	NTU	10/20/2009	N001	35.4	-	55.4	6.19		F	#		
Uranium	mg/L	10/20/2009	N001	35.4	-	55.4	0.000078	B	F	#	0.0000017	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN03, Burrell Disposal Site
REPORT DATE: 12/9/2009
Location: 0422 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Calcium	mg/L	10/19/2009	0001	37	-	52	150		F	#	0.0021	
Chloride	mg/L	10/19/2009	0001	37	-	52	15		F	#	2	
Iron	mg/L	10/19/2009	0001	37	-	52	26		F	#	0.0016	
Lead	mg/L	10/19/2009	0001	37	-	52	0.00014	B	UF	#	0.000014	
Magnesium	mg/L	10/19/2009	0001	37	-	52	32		F	#	0.0066	
Manganese	mg/L	10/19/2009	0001	37	-	52	1.7		F	#	0.0001	
Molybdenum	mg/L	10/19/2009	0001	37	-	52	0.01		F	#	0.000067	
Nitrate + Nitrite as Nitrogen	mg/L	10/19/2009	0001	37	-	52	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	10/19/2009	N001	37	-	52	-84.1		F	#		
pH	s.u.	10/19/2009	N001	37	-	52	6.86		F	#		
Potassium	mg/L	10/19/2009	0001	37	-	52	6.5		F	#	0.092	
Selenium	mg/L	10/19/2009	0001	37	-	52	0.000032	U	F	#	0.000032	
Sodium	mg/L	10/19/2009	0001	37	-	52	18		F	#	0.0044	
Specific Conductance	umhos /cm	10/19/2009	N001	37	-	52	1047		F	#		
Sulfate	mg/L	10/19/2009	0001	37	-	52	80		F	#	5	
Temperature	C	10/19/2009	N001	37	-	52	11.22		F	#		
Total Dissolved Solids	mg/L	10/19/2009	0001	37	-	52	630		F	#	20	
Turbidity	NTU	10/19/2009	N001	37	-	52	34.5		F	#		
Uranium	mg/L	10/19/2009	0001	37	-	52	0.00024		F	#	0.0000017	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN03, Burrell Disposal Site
REPORT DATE: 12/9/2009
Location: 0423 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Calcium	mg/L	10/19/2009	N001	34.7	-	49.7	130		F	#	0.0021	
Calcium	mg/L	10/19/2009	N002	34.7	-	49.7	130		F	#	0.0021	
Chloride	mg/L	10/19/2009	N001	34.7	-	49.7	16		F	#	2	
Chloride	mg/L	10/19/2009	N002	34.7	-	49.7	19		F	#	1	
Iron	mg/L	10/19/2009	N001	34.7	-	49.7	17		F	#	0.0016	
Iron	mg/L	10/19/2009	N002	34.7	-	49.7	16		F	#	0.0016	
Lead	mg/L	10/19/2009	N001	34.7	-	49.7	0.00068		F	#	0.000014	
Lead	mg/L	10/19/2009	N002	34.7	-	49.7	0.00069		F	#	0.000014	
Magnesium	mg/L	10/19/2009	N001	34.7	-	49.7	41		F	#	0.0066	
Magnesium	mg/L	10/19/2009	N002	34.7	-	49.7	40		F	#	0.0066	
Manganese	mg/L	10/19/2009	N001	34.7	-	49.7	1.5		F	#	0.0001	
Manganese	mg/L	10/19/2009	N002	34.7	-	49.7	1.5		F	#	0.0001	
Molybdenum	mg/L	10/19/2009	N001	34.7	-	49.7	0.013		F	#	0.000067	
Molybdenum	mg/L	10/19/2009	N002	34.7	-	49.7	0.012		F	#	0.000067	
Nitrate + Nitrite as Nitrogen	mg/L	10/19/2009	N001	34.7	-	49.7	0.01	U	F	#	0.01	
Nitrate + Nitrite as Nitrogen	mg/L	10/19/2009	N002	34.7	-	49.7	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	10/19/2009	N001	34.7	-	49.7	-128.2		F	#		
pH	s.u.	10/19/2009	N001	34.7	-	49.7	6.97		F	#		
Potassium	mg/L	10/19/2009	N001	34.7	-	49.7	9.8		F	#	0.092	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN03, Burrell Disposal Site
REPORT DATE: 12/9/2009
Location: 0423 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Data	QA	Detection Limit	Uncertainty
Potassium	mg/L	10/19/2009	N002	34.7	-	49.7	9.6		F	#	0.092	
Selenium	mg/L	10/19/2009	N001	34.7	-	49.7	0.000032	U	F	#	0.000032	
Selenium	mg/L	10/19/2009	N002	34.7	-	49.7	0.000032	U	F	#	0.000032	
Sodium	mg/L	10/19/2009	N001	34.7	-	49.7	21		F	#	0.0044	
Sodium	mg/L	10/19/2009	N002	34.7	-	49.7	21		F	#	0.0044	
Specific Conductance	umhos /cm	10/19/2009	N001	34.7	-	49.7	977		F	#		
Sulfate	mg/L	10/19/2009	N001	34.7	-	49.7	35		F	#	5	
Sulfate	mg/L	10/19/2009	N002	34.7	-	49.7	32		F	#	2.5	
Temperature	C	10/19/2009	N001	34.7	-	49.7	13.26		F	#		
Total Dissolved Solids	mg/L	10/19/2009	N001	34.7	-	49.7	560		F	#	20	
Total Dissolved Solids	mg/L	10/19/2009	N002	34.7	-	49.7	560		F	#	20	
Turbidity	NTU	10/19/2009	N001	34.7	-	49.7	1.94		F	#		
Uranium	mg/L	10/19/2009	N001	34.7	-	49.7	0.00052		F	#	0.0000017	
Uranium	mg/L	10/19/2009	N002	34.7	-	49.7	0.0005		F	#	0.0000017	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN03, Burrell Disposal Site
REPORT DATE: 12/9/2009
Location: 0424 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Calcium	mg/L	10/19/2009	0001	34.2	-	44.2	150		F	#	0.0021	
Chloride	mg/L	10/19/2009	0001	34.2	-	44.2	20		F	#	2	
Iron	mg/L	10/19/2009	0001	34.2	-	44.2	0.48		F	#	0.0016	
Lead	mg/L	10/19/2009	0001	34.2	-	44.2	0.00005	B	UF	#	0.000014	
Magnesium	mg/L	10/19/2009	0001	34.2	-	44.2	39		F	#	0.0066	
Manganese	mg/L	10/19/2009	0001	34.2	-	44.2	4.2		F	#	0.0001	
Molybdenum	mg/L	10/19/2009	0001	34.2	-	44.2	0.013		F	#	0.000067	
Nitrate + Nitrite as Nitrogen	mg/L	10/19/2009	0001	34.2	-	44.2	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	10/19/2009	N001	34.2	-	44.2	33.2		F	#		
pH	s.u.	10/19/2009	N001	34.2	-	44.2	6.55		F	#		
Potassium	mg/L	10/19/2009	0001	34.2	-	44.2	7.5		F	#	0.092	
Selenium	mg/L	10/19/2009	0001	34.2	-	44.2	0.000032	U	F	#	0.000032	
Sodium	mg/L	10/19/2009	0001	34.2	-	44.2	21		F	#	0.0044	
Specific Conductance	umhos /cm	10/19/2009	N001	34.2	-	44.2	1016		F	#		
Sulfate	mg/L	10/19/2009	0001	34.2	-	44.2	110		F	#	5	
Temperature	C	10/19/2009	N001	34.2	-	44.2	12.76		F	#		
Total Dissolved Solids	mg/L	10/19/2009	0001	34.2	-	44.2	660		F	#	20	
Turbidity	NTU	10/19/2009	N001	34.2	-	44.2	36.2		F	#		
Uranium	mg/L	10/19/2009	0001	34.2	-	44.2	0.00072		F	#	0.0000017	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN03, Burrell Disposal Site
REPORT DATE: 12/9/2009
Location: 0520 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Calcium	mg/L	10/20/2009	N001	103.8	-	158.8	25		F	#	0.0021	
Chloride	mg/L	10/20/2009	N001	103.8	-	158.8	15		F	#	0.4	
Iron	mg/L	10/20/2009	N001	103.8	-	158.8	0.15	E	UF	#	0.0016	
Lead	mg/L	10/20/2009	N001	103.8	-	158.8	0.000047	B	UF	#	0.000014	
Magnesium	mg/L	10/20/2009	N001	103.8	-	158.8	9.9		F	#	0.0066	
Manganese	mg/L	10/20/2009	N001	103.8	-	158.8	0.032		F	#	0.0001	
Molybdenum	mg/L	10/20/2009	N001	103.8	-	158.8	0.0016		F	#	0.000067	
Nitrate + Nitrite as Nitrogen	mg/L	10/20/2009	N001	103.8	-	158.8	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	10/20/2009	N001	103.8	-	158.8	-150.8		F	#		
pH	s.u.	10/20/2009	N001	103.8	-	158.8	7.97		F	#		
Potassium	mg/L	10/20/2009	N001	103.8	-	158.8	0.69	B	F	#	0.092	
Selenium	mg/L	10/20/2009	N001	103.8	-	158.8	0.000032	U	F	#	0.000032	
Sodium	mg/L	10/20/2009	N001	103.8	-	158.8	47	E	F	#	0.0044	
Specific Conductance	umhos /cm	10/20/2009	N001	103.8	-	158.8	427		F	#		
Sulfate	mg/L	10/20/2009	N001	103.8	-	158.8	19		F	#	1	
Temperature	C	10/20/2009	N001	103.8	-	158.8	11.98		F	#		
Total Dissolved Solids	mg/L	10/20/2009	N001	103.8	-	158.8	240		F	#	20	
Turbidity	NTU	10/20/2009	N001	103.8	-	158.8	1.27		F	#		
Uranium	mg/L	10/20/2009	N001	103.8	-	158.8	0.000019	B	UF	#	0.0000017	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN03, Burrell Disposal Site
REPORT DATE: 12/9/2009
Location: 0522 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Data	QA	Detection Limit	Uncertainty
Calcium	mg/L	10/19/2009	N001	103.5	-	156.7	0.73	B	UF	#	0.0021	
Chloride	mg/L	10/19/2009	N001	103.5	-	156.7	6.3		F	#	0.2	
Iron	mg/L	10/19/2009	N001	103.5	-	156.7	0.069	B	UF	#	0.0016	
Lead	mg/L	10/19/2009	N001	103.5	-	156.7	0.00011	B	UF	#	0.000014	
Magnesium	mg/L	10/19/2009	N001	103.5	-	156.7	0.15	B	UF	#	0.0066	
Manganese	mg/L	10/19/2009	N001	103.5	-	156.7	0.0018	B	F	#	0.0001	
Molybdenum	mg/L	10/19/2009	N001	103.5	-	156.7	0.00087	B	F	#	0.000067	
Nitrate + Nitrite as Nitrogen	mg/L	10/19/2009	N001	103.5	-	156.7	0.22		F	#	0.01	
Oxidation Reduction Potential	mV	10/19/2009	N001	103.5	-	156.7	-175.9		F	#		
pH	s.u.	10/19/2009	N001	103.5	-	156.7	9.64		F	#		
Potassium	mg/L	10/19/2009	N001	103.5	-	156.7	1.6		F	#	0.092	
Selenium	mg/L	10/19/2009	N001	103.5	-	156.7	0.000032	U	F	#	0.000032	
Sodium	mg/L	10/19/2009	N001	103.5	-	156.7	140		F	#	0.0044	
Specific Conductance	umhos /cm	10/19/2009	N001	103.5	-	156.7	665		F	#		
Sulfate	mg/L	10/19/2009	N001	103.5	-	156.7	6.2		F	#	0.5	
Temperature	C	10/19/2009	N001	103.5	-	156.7	14		F	#		
Total Dissolved Solids	mg/L	10/19/2009	N001	103.5	-	156.7	380		F	#	20	
Turbidity	NTU	10/19/2009	N001	103.5	-	156.7	1.51		F	#		
Uranium	mg/L	10/19/2009	N001	103.5	-	156.7	0.000022	B	UF	#	0.0000017	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN03, Burrell Disposal Site
REPORT DATE: 12/9/2009
Location: 0523 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Calcium	mg/L	10/19/2009	N001	107.5	-	156	0.55	B	UF	#	0.0021	
Chloride	mg/L	10/19/2009	N001	107.5	-	156	7.9		F	#	0.2	
Iron	mg/L	10/19/2009	N001	107.5	-	156	0.043	B	UF	#	0.0016	
Lead	mg/L	10/19/2009	N001	107.5	-	156	0.00009	B	UF	#	0.000014	
Magnesium	mg/L	10/19/2009	N001	107.5	-	156	0.061	B	UF	#	0.0066	
Manganese	mg/L	10/19/2009	N001	107.5	-	156	0.0017	B	F	#	0.0001	
Molybdenum	mg/L	10/19/2009	N001	107.5	-	156	0.0016		F	#	0.000067	
Nitrate + Nitrite as Nitrogen	mg/L	10/19/2009	N001	107.5	-	156	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	10/19/2009	N001	107.5	-	156	-129.9		F	#		
pH	s.u.	10/19/2009	N001	107.5	-	156	9.64		F	#		
Potassium	mg/L	10/19/2009	N001	107.5	-	156	0.092	U	F	#	0.092	
Selenium	mg/L	10/19/2009	N001	107.5	-	156	0.000032	U	F	#	0.000032	
Sodium	mg/L	10/19/2009	N001	107.5	-	156	120		F	#	0.0044	
Specific Conductance	umhos /cm	10/19/2009	N001	107.5	-	156	651		F	#		
Sulfate	mg/L	10/19/2009	N001	107.5	-	156	7.9		F	#	0.5	
Temperature	C	10/19/2009	N001	107.5	-	156	13.64		F	#		
Total Dissolved Solids	mg/L	10/19/2009	N001	107.5	-	156	340		F	#	20	
Turbidity	NTU	10/19/2009	N001	107.5	-	156	2.51		F	#		
Uranium	mg/L	10/19/2009	N001	107.5	-	156	0.00023		F	#	0.0000017	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN03, Burrell Disposal Site
REPORT DATE: 12/9/2009
Location: 0524 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Calcium	mg/L	10/19/2009	N001	103.7	-	152.2	1.9		F	#	0.0021	
Chloride	mg/L	10/19/2009	N001	103.7	-	152.2	17		F	#	1	
Iron	mg/L	10/19/2009	N001	103.7	-	152.2	0.029	B	UF	#	0.0016	
Lead	mg/L	10/19/2009	N001	103.7	-	152.2	0.00035	B	UF	#	0.000014	
Magnesium	mg/L	10/19/2009	N001	103.7	-	152.2	0.31	B	UF	#	0.0066	
Manganese	mg/L	10/19/2009	N001	103.7	-	152.2	0.011		F	#	0.0001	
Molybdenum	mg/L	10/19/2009	N001	103.7	-	152.2	0.0014		F	#	0.000067	
Nitrate + Nitrite as Nitrogen	mg/L	10/19/2009	N001	103.7	-	152.2	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	10/19/2009	N001	103.7	-	152.2	-114.1		F	#		
pH	s.u.	10/19/2009	N001	103.7	-	152.2	8.99		F	#		
Potassium	mg/L	10/19/2009	N001	103.7	-	152.2	0.2	B	UF	#	0.092	
Selenium	mg/L	10/19/2009	N001	103.7	-	152.2	0.000032	U	F	#	0.000032	
Sodium	mg/L	10/19/2009	N001	103.7	-	152.2	190		F	#	0.0044	
Specific Conductance	umhos /cm	10/19/2009	N001	103.7	-	152.2	923		F	#		
Sulfate	mg/L	10/19/2009	N001	103.7	-	152.2	140		F	#	2.5	
Temperature	C	10/19/2009	N001	103.7	-	152.2	12.66		F	#		
Total Dissolved Solids	mg/L	10/19/2009	N001	103.7	-	152.2	570		F	#	20	
Turbidity	NTU	10/19/2009	N001	103.7	-	152.2	2.18		F	#		
Uranium	mg/L	10/19/2009	N001	103.7	-	152.2	0.000079	B	F	#	0.0000017	

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

LAB QUALIFIERS:

*	Replicate analysis not within control limits.
>	Result above upper detection limit.
A	TIC is a suspected aldol-condensation product.
B	Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
C	Pesticide result confirmed by GC-MS.
D	Analyte determined in diluted sample.
E	Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
H	Holding time expired, value suspect.
I	Increased detection limit due to required dilution.
J	Estimated
N	Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
P	> 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
U	Analytical result below detection limit.
W	Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
X,Y,Z	Laboratory defined qualifier, see case narrative.

DATA QUALIFIERS:

F	Low flow sampling method used.	G	Possible grout contamination, pH > 9.	J	Estimated value.
L	Less than 3 bore volumes purged prior to sampling.	Q	Qualitative result due to sampling technique.	R	Unusable result.
U	Parameter analyzed for but was not detected.	X	Location is undefined.		

QA QUALIFIER:

#	Validated according to quality assurance guidelines.

Surface Water Quality Data

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Surface Water Quality Data by Location (USEE102) FOR SITE CAN03, Burrell Disposal Site
REPORT DATE: 12/9/2009
Location: 0625 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Calcium	mg/L	10/20/2009	N001	59			#	0.0021	
Chloride	mg/L	10/20/2009	N001	2			#	0.2	
Iron	mg/L	10/20/2009	N001	1.6			#	0.0016	
Lead	mg/L	10/20/2009	N001	0.000046	B	U	#	0.000014	
Magnesium	mg/L	10/20/2009	N001	11			#	0.0066	
Manganese	mg/L	10/20/2009	N001	0.28			#	0.0001	
Molybdenum	mg/L	10/20/2009	N001	0.00081	B		#	0.000067	
Nitrate + Nitrite as Nitrogen	mg/L	10/20/2009	N001	0.015			#	0.01	
Oxidation Reduction Potential	mV	10/20/2009	N001	71.4			#		
pH	s.u.	10/20/2009	N001	6.91			#		
Potassium	mg/L	10/20/2009	N001	1.3			#	0.092	
Selenium	mg/L	10/20/2009	N001	0.000032	U		#	0.000032	
Sodium	mg/L	10/20/2009	N001	1.7			#	0.0044	
Specific Conductance	umhos/cm	10/20/2009	N001	405			#		
Sulfate	mg/L	10/20/2009	N001	19			#	0.5	
Temperature	C	10/20/2009	N001	11.86			#		
Total Dissolved Solids	mg/L	10/20/2009	N001	200			#	20	
Turbidity	NTU	10/20/2009	N001	8.5			#		
Uranium	mg/L	10/20/2009	N001	0.000091	B		#	0.0000017	

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

LAB QUALIFIERS:

*	Replicate analysis not within control limits.
>	Result above upper detection limit.
A	TIC is a suspected aldol-condensation product.
B	Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
C	Pesticide result confirmed by GC-MS.
D	Analyte determined in diluted sample.
E	Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
H	Holding time expired, value suspect.
I	Increased detection limit due to required dilution.
J	Estimated
N	Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
P	> 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
U	Analytical result below detection limit.
W	Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
X,Y,Z	Laboratory defined qualifier, see case narrative.

DATA QUALIFIERS:

F	Low flow sampling method used.	G	Possible grout contamination, pH > 9.	J	Estimated value.
L	Less than 3 bore volumes purged prior to sampling.	Q	Qualitative result due to sampling technique.	R	Unusable result.
U	Parameter analyzed for but was not detected.	X	Location is undefined.		

QA QUALIFIER:

#	Validated according to quality assurance guidelines.

Static Water Level Data

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Location Code	Flow Code	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)
0420	U	10/20/2009	09:17:33	34.72
0422	C	10/19/2009	10:10:57	34.39
0423	D	10/19/2009	12:58:30	35.94
0424	D	10/19/2009	16:42:34	35.45
0520	U	10/20/2009	09:44:10	38.55
0522	C	10/19/2009	10:46:43	46.9
0523	D	10/19/2009	13:33:11	42.03
0524	D	10/19/2009	17:26:28	41.46

FLOW CODES: B BACKGROUND C CROSS GRADIENT D DOWN GRADIENT F OFF SITE
N UNKNOWN O ON SITE U UPGRADIENT

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Time-Concentration Graphs

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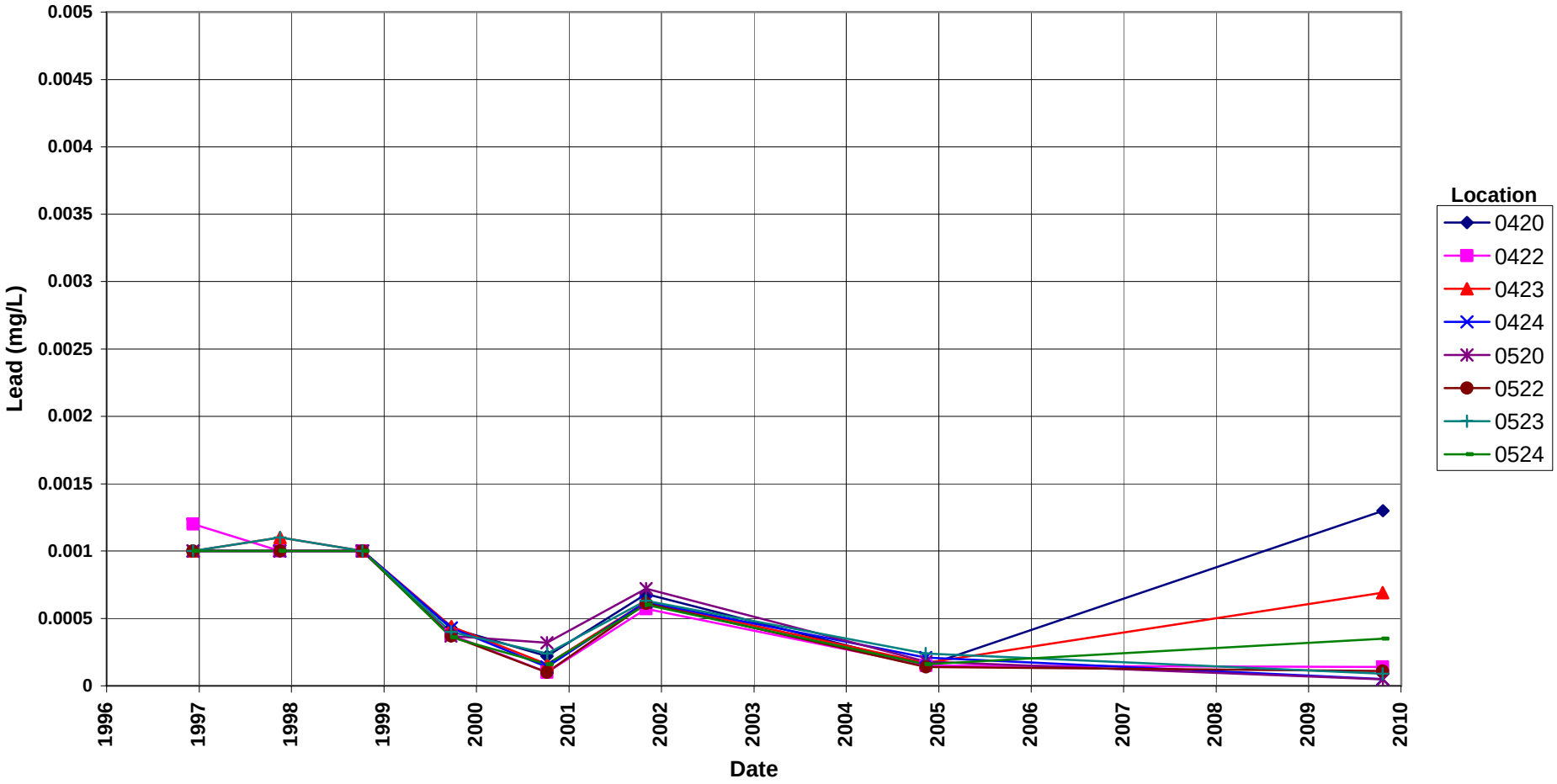
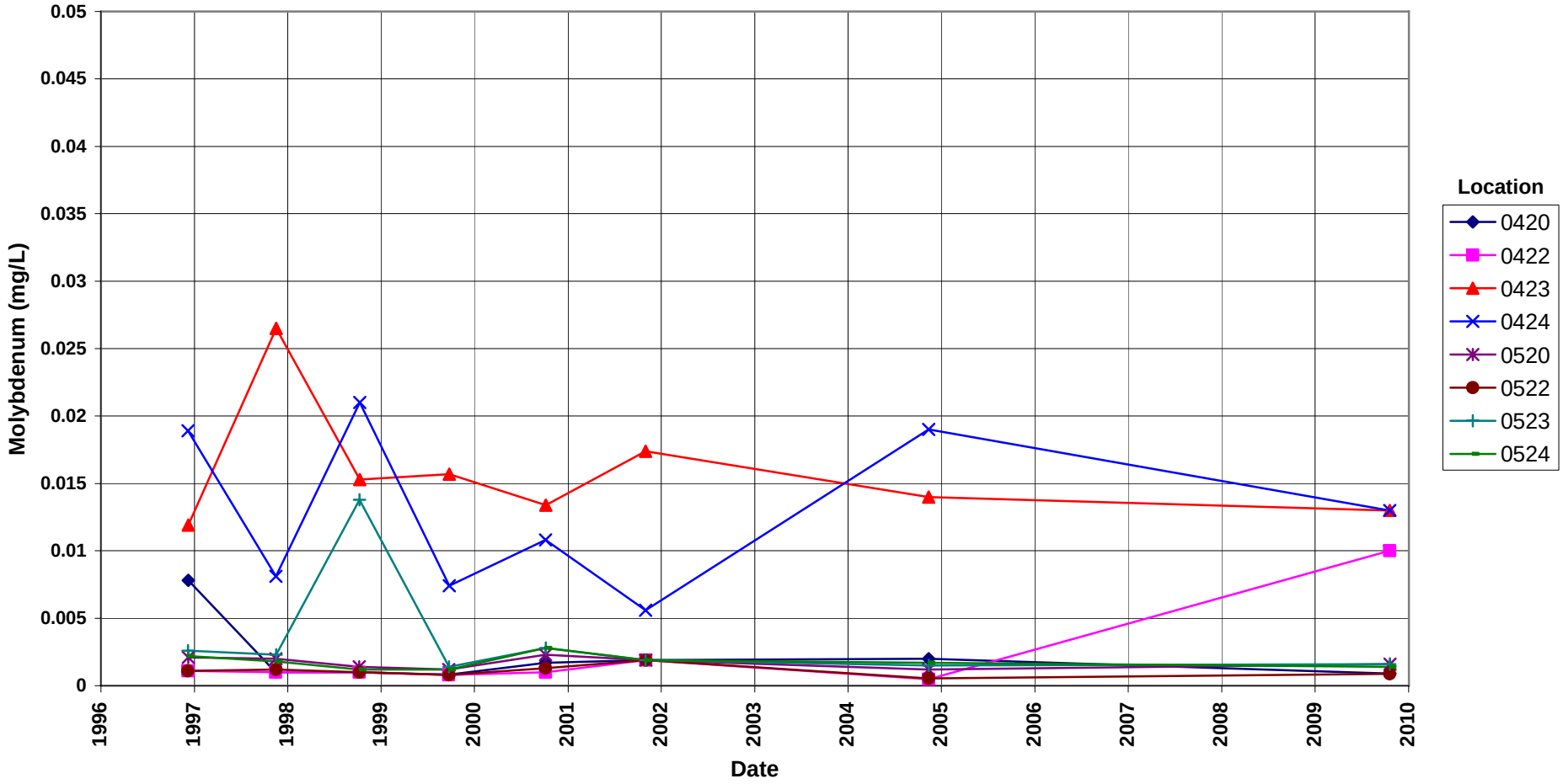
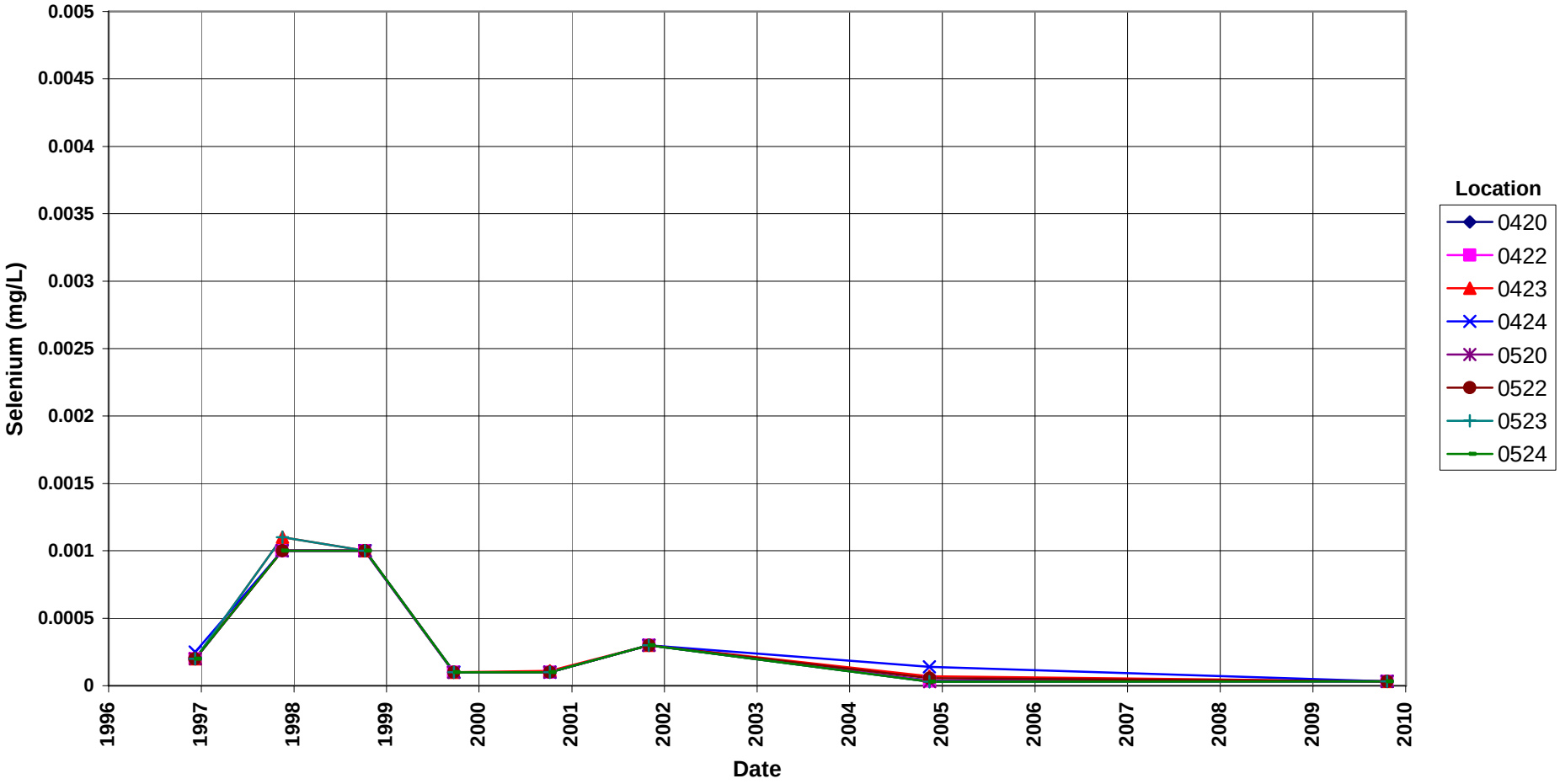
Burrell Disposal Site
Lead Concentration
40 CFR 192.02 Maximum Concentration Limit (MCL) = 0.05 mg/L



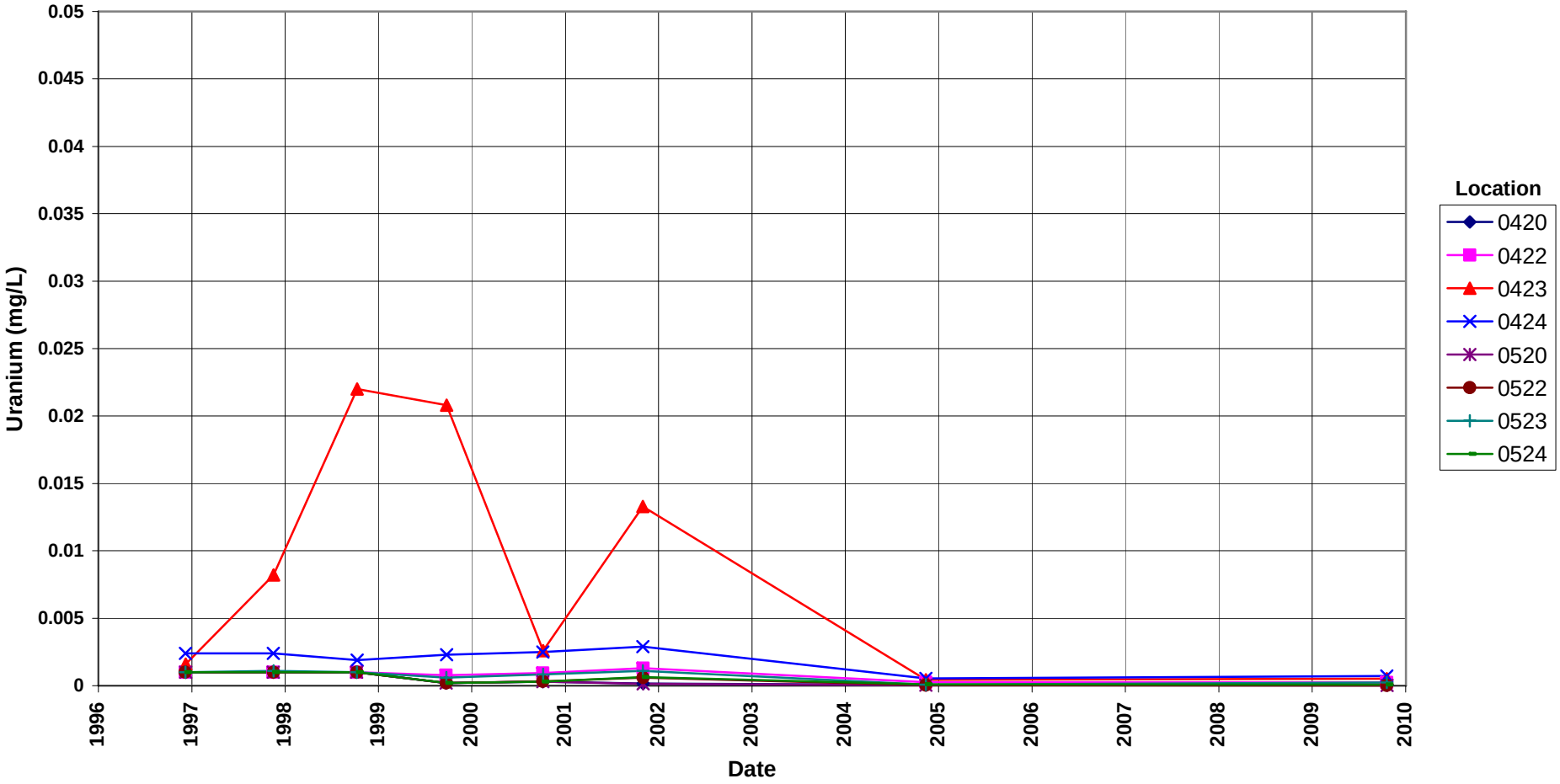
Burrell Disposal Site
Molybdenum Concentration
40 CFR 192.02 Maximum Concentration Limit (MCL) = 0.10 mg/L



Burrell Disposal Site
Selenium Concentration
40 CFR 192.02 Maximum Concentration Limit (MCL) = 0.01 mg/L



Burrell Disposal Site
Uranium Concentration
40 CFR 192.02 Maximum Concentration Limit (MCL) = 0.044 mg/L



Attachment 3
Sampling and Analysis Work Order

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Stoller established 1959

Task Order LM00-501
Control Number 09-1071

September 16, 2009

U.S. Department of Energy
Office of Legacy Management
ATTN: Jack Craig
Site Manager
3600 Collins Ferry Rd.
Morgantown, WV 26505

SUBJECT: Contract No. DE-AM01-07LM00060, Stoller
October 2009 Environmental Sampling at the Burrell, Pennsylvania, Disposal Site

REFERENCE: Task Order LM00-501-02-102-402, Burrell, PA, Site

Dear Mr. Craig:

The purpose of this letter is to inform you of the upcoming sampling event at Burrell, Pennsylvania. Enclosed are the map and tables specifying sample locations and analytes for routine monitoring at the Burrell site. Water quality data will be collected from monitor wells and surface locations at this site as part of the routine environmental sampling currently scheduled to begin the week of October 19, 2009.

The following lists show the locations scheduled to be sampled during this event.

Monitor Wells*

420 Al	423 Al	424 Al	520 Cs	522 Cs	523 Cs	524 Cs
422 Al						

*NOTE: Al = Alluvium; Cs = Castleman Formation

Surface Locations

611	612

All samples will be collected as directed in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites*. Access agreements are being reviewed and are expected to be complete by the beginning of fieldwork.

The S.M. Stoller Corporation 2597 B ¾ Road Grand Junction, CO 81503 (970) 248–6000 Fax: (970) 248–6040

Please contact me at (412) 818-7015 if you have any questions.

Sincerely,

Digitally signed by Michele L. Miller
DN: cn=Michele L. Miller, c=us, o=u.
s. government, ou=department of
energy, public cas, people
Date: 2009.09.15 14:54:14 -04'00'

Michele Miller
Project Manager

MM/lcg/lb

Enclosures (3)

cc: (electronic)
Cheri Bahrke, Stoller
Steve Donivan, Stoller
Bev Gallagher, Stoller
Lauren Goodknight, Stoller
Michele Miller, Stoller
EDD Delivery
rc-grand.junction

Constituent Sampling Breakdown

Site	Burrell				
Analyte	Groundwater	Surface Water	Required Detection Limit (mg/L)	Analytical Method	Line Item Code
Approx. No. Samples/yr	8	2			
Field Measurements					
Alkalinity	X	X			
Dissolved Oxygen					
Redox Potential	X	X			
pH	X	X			
Specific Conductance	X	X			
Turbidity	X	X			
Temperature	X	X			
Laboratory Measurements					
Aluminum					
Ammonia as N (NH3-N)					
Calcium	X	X	5	SW-846 6010	LMM-02
Chloride	X	X	0.5	SW-846 9056	MIS-A-039
Chromium					
Iron	X	X	0.05	SW-846 6020	LMM-02
Lead	X	X	0.002	SW-846 6020	LMM-02
Magnesium	X	X	5	SW-846 6010	LMM-01
Manganese	X	X	0.005	SW-846 6010	LMM-01
Molybdenum	X	X	0.003	SW-846 6020	LMM-02
Nickel					
Nitrate + Nitrite as N (NO3+NO2)-N	X	X	0.05	EPA 353.1	WCH-A-022
Potassium	X	X	1	SW-846 6010	LMM-01
Selenium	X	X	0.0001	SW-846 6020	LMM-02
Silica					
Sodium	X	X	1	SW-846 6010	LMM-01
Strontium					
Sulfate	X	X	0.5	SW-846 9056	MIS-A-044
Sulfide					
Total Dissolved Solids	X	X	10	SM2540 C	WCH-A-033
Total Organic Carbon					
Uranium	X	X	0.0001	SW-846 6020	LMM-02
Vanadium					
Zinc					
Total No. of Analytes	14	14			

Note: All analyte samples are considered unfiltered unless stated otherwise. All private well samples are to be unfiltered. The total number of analytes does not include field parameters.

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Attachment 4
Trip Report

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Stoller established 1959
Grand Junction Office

Memorandum

Control Number N/A

DATE: November 16, 2009

TO: Michele Miller

FROM: Jeff Walters

SUBJECT: Trip Report

Site: Burrell, PA

Dates of Sampling Event: October 19 and 20, 2009

Team Members: Mike Stott and Jeff Walters

Number of Locations Sampled: 8 monitor wells, 1 surface water sample, and one duplicate sample. Samples were collected for the following analysis: Ca, Fe, Pb, Mg, Mn, Mo, K, Se, Na, U, Cl, SO4, TDS, (NO3+NO2)-N. They are listed in Table 1 below.

Table 1. Locations Sampled

Location	Date	Time	Notes
0420	10/20/09	0917	
0422	10/19/09	1010	Filtered due to high turbidity
0423	10/19/09	1258	
0424	10/19/09	1642	Filtered due to high turbidity
0520	10/20/09	0944	
0522	10/19/09	1046	
0523	10/19/09	1333	
0524	10/19/09	1726	
Surface Water	10/20/09	1145	This location was added by Ken Broberg and Jack Craig
2820	10/19/09	1200	Duplicate of 423

RIN Number Assigned: 09102634

Locations Not Sampled/Reason: Surface water locations 0611 and 0612. Both are seeps that are currently not producing water.

Field Variance: None.

Quality Control Sample Cross Reference: One duplicate sample was collected for this event. Table 2 lists the false identification number assigned to the sample collected for quality control.

Table 2. QC Sample Cross-Reference

False ID	True ID	Sample Type	Analytes	Date Sampled
2820	0423	Duplicate	Ca, Fe, Pb, Mg, Mn, Mo, K, Se, Na, U, Cl, SO4, TDS, (NO3+NO2)-N	10/19/09

Water Level Measurements: Water levels were collected from all sampled monitor wells.

Sampling Method: Monitor wells were sampled using dedicated bladder pumps and the low flow purge method. The surface water sample was collected by container immersion.

Well Inspection Summary: Well inspections were performed at all sampled wells. Well 0423 has a cracked pad and the pin holding the lid in place is bent. The lock was cleaned, lubricated, and reinstalled but will need a replacement during the next site visit. All sampled wells have lids in good condition but need to be wire brushed and painted. All other wells are in good condition.

Equipment: The Pinellas laptop computer with the Field Data Collection System, a Grand Junction YSI meter, and a Fernald turbidity meter were used. All other equipment and supplies were from Fernald.

Site Issues: Surface water location did not have the coordinates recorded. The coordinates in the GPS shipped to us from Grand Junction and the aerial map in the 3 ring binder show the two seep locations south of the cell by about 200 feet. This information is suspect. According to other maps Michelle Miller had, the seep locations are on the South side of the cell.

Notes for the Next Trip: Although the sampled wells were inspected during purging, a more thorough inspection of these and all site wells should be performed during the next visit. Also recommended is installing new aluminum or brass identification tags on all wells.

(JW/lcg)

cc: (electronic)
Jack Craig, DOE–LM
Cheri Bahrke, Stoller
Ken Broberg, Stoller
Steve Donivan, Stoller
EDD Delivery