Department of Energy
Office of Legacy Management

MAY 2 2 2009

Mike Fliegel
U.S. Nuclear Regulatory Commission
Mail Stop T7E18
Washington, DC 20555-0001

Subject: Transmittal of Data Validation Package for the Canonsburg, Pennsylvania, Disposal Site, October 2008

Dear Mr. Fliegel:

Enclosed for your review is the subject document that presents the results of the October 2008 sampling at the U.S. Department of Energy (DOE) Canonsburg, Pennsylvania, disposal site. Six ground water samples and three surface water samples were collected to demonstrate compliance with standards as set forth in the *Ground Water Compliance Action Plan for the Canonsburg, Pennsylvania, UMTRA Project Site*. Water levels were measured at each sampled well. Sampling and analysis was conducted as specified in *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites*.

The DOE monitors ground water and surface water at the Canonsburg site to demonstrate that uranium concentrations do not exceed U.S. Nuclear Regulatory Commission approved alternate concentration limits (ACL) of 1.0 milligram per liter (mg/L) in ground water and 0.01 mg/L at the point of exposure in Chartiers Creek. The ACL for uranium was not exceeded in point-of-compliance wells 0412, 0413, and 0414. The uranium concentration in well 0412 has decreased since the 2007 event when a notable increase was observed. Comparisons of the analytical results from Chartiers Creek downstream locations 0602 and 0603 to the results from the upstream location 0601 indicate negligible site-related impacts to water quality in Chartiers Creek. The uranium concentration did not exceed the ACL at any of the surface locations.

The results from this sampling event indicate that the alternate concentration limit for uranium was not exceeded either in the point-of-compliance wells or the point-of-exposure in Chartiers Creek. Moreover, site-related impacts to water quality in Chartiers Creek were deemed negligible. A detailed evaluation of the sample results is presented in the enclosed data validation package.

Please contact me at 240-252-8506 if you have any questions.

Sincerely,

Jack R Craig 2009.05.22 09:41:42 -04'00'

Jack Craig
Site Manager

Enclosure

cc w/enclosure:
S. Harper, Pennsylvania Dept. of Environmental Protection
D. Shearer, Pennsylvania Dept. of Environmental Protection

cc w/o enclosure:
M. Miller, Stoller (e)
File: CAN 410.02 (Roberts)

LMS/CAN/S01008

Data Validation Package

October 2008 Groundwater and Surface Water Sampling at the Canonsburg, Pennsylvania, Disposal Site

March 2009

U.S. DEPARTMENT OF ENERGY | Office of Legacy Management

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Sampling Event Summary

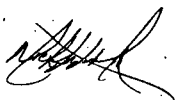
Site: Canonsburg, Pennsylvania, Disposal Site

Sampling Period: October 13, 2008

Six groundwater samples and three surface water samples were collected at the Canonsburg, Pennsylvania, Disposal Site to demonstrate compliance with standards as set forth in the *Ground Water Compliance Action Plan for the Canonsburg, Pennsylvania, UMTRA Project Site*. Water levels were measured at each sampled well. Sampling and analysis was conducted as specified in *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites*. One duplicate sample was collected from location 0424.

The U.S. Department of Energy monitors groundwater and surface water at the Canonsburg site to demonstrate that uranium concentrations do not exceed U.S. Nuclear Regulatory Commission-approved alternate concentration limits (ACL) of 1.0 milligram per liter (mg/L) in groundwater and 0.01 mg/L at the point of exposure in Chartiers Creek.

The ACL for uranium was not exceeded in point-of-compliance wells 0412, 0413, and 0414. The uranium concentration in well 0412 has decreased since the 2007 event when a notable increase was observed. Comparisons of the analytical results from Chartiers Creek downstream locations 0602 and 0603 to the results from the upstream location 0601 indicate negligible site-related impacts to water quality in Chartiers Creek. The uranium concentration did not exceed the ACL at any of the surface locations.

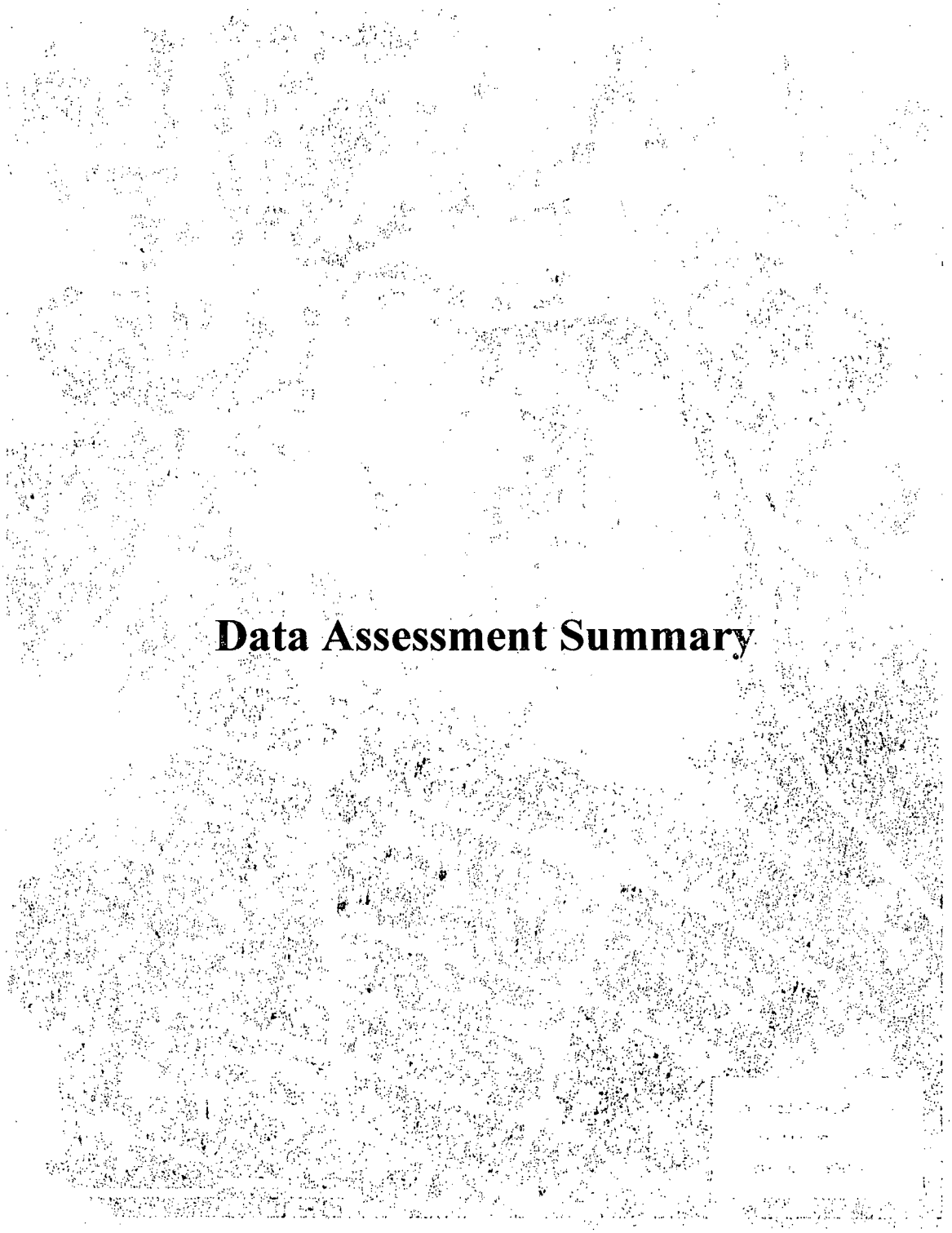


Digitally signed by Michele L. Miller
DN: cn=Michele L. Miller, c=us, o=u.s. government, ou=department of energy, public cas, people
Date: 2009.03.17 14:08:45 -04'00'

Michele Miller
Site Lead, S.M. Stoller

Date

Sample Location Map, Canonsburg, Pennsylvania, Disposal Site



Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	Canonsburg, Pennsylvania	**Date(s) of Water Sampling**	October 13, 2008
Date(s) of Verification	March 3, 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 11, 2008.
2. Were the sampling locations specified in the planning documents sampled?	Yes	
3. Was a pre-trip calibration conducted as specified in the above-named documents?	No	Monthly YSI calibration was performed of September 24, 2008. Quarterly turbidity meter calibration was performed on July 18, 2008.
4. Was an operational check of the field equipment conducted daily?	Yes	A re-calibration was noted at 08:40, October 13, 2008.
Did the operational checks meet criteria?	NA	Operational check data not available.
5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified?	No	DO was measured, but not required.
6. Was the category of the well documented?	Yes	
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	Well 0412 turbidity was > 10 NTU, sample was 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?	Yes	
Was one pump/tubing volume removed prior to sampling?	Yes	
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	A duplicate sample was collected from location 0424.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment?	NA	Dedicated equipment was used to sample all wells.
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 2677 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 Completed" 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): 08091855
Sample Event: October 13, 2008
Site(s): Canonsburg, Pennsylvania
Laboratory: Paragon Analytics, Fort Collins, Colorado
Work Order No.: 0810156
Analysis: Metals, Inorganics, and Radiochemistry
Validator: Steve Donivan
Review Date: November 14, 2008

This validation was performed according to the *Environmental Procedures Catalog*, "Standard Practice for Validation of Laboratory Data," GT-9(P) Rev 1. The procedure was applied at Level 3, Data Validation. See attached Data Validation Worksheets for supporting documentation on the data review and validation. The analysis was successfully completed. The sample was prepared and analyzed using accepted procedures based on methods specified by line item code, which are listed in Table 1.

Table 1. Analytes and Methods

Analyte	Line Item Code	Prep Method	Analytical Method
Alkalinity	WCH-A-002	MCAWW 310.1	MCAWW 310.1
Calcium, Magnesium, Manganese, Potassium, Sodium	LMM-01	SW-846 3005A	SW-846 6010B
Chloride	MIS-A-039	SW-846 9056	SW-846 9056
Gross Alpha/Beta	GPC-A-001	EPA 900.0	EPA 900.0
Molybdenum, Uranium	LMM-02	SW-846 3005A	SW-846 6020
Sulfate	MIS-A-044	SW-846 9056	SW-846 9056

Sample Shipping/Receiving

Paragon Analytics, Fort Collins, Colorado, received 10 water samples on October 17, 2008, accompanied by a Chain of Custody (COC) form. The COC form was checked to confirm that all of the samples were listed on the form and that signatures and dates were present indicating sample relinquishment and receipt. The sample submittal had no errors or omissions. Copies of the air waybill labels were included with the sample receiving documentation.

Preservation and Holding Times

The sample shipments were received cool and intact with the temperature inside the iced coolers at 6.0 °C and 2.9 °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 applicable holding times.

Data Qualifier Summary

The analytical results were qualified as listed in Table 2.

Table 2. Data Qualifier Summary

Sample Number	Location	Analyte	Flag	Reason
0810156-1	0406A	Gross Beta	J	Less than 3 times the MDC
0810156-2	0410	Gross Beta	J	Less than 3 times the MDC
0810156-2	0410	Uranium	U	Less than 5 times the method blank
0810156-5	0414B	Gross Alpha	J	Less than 3 times the MDC
0810156-5	0414B	Gross Beta	J	Less than 3 times the MDC
0810156-5	0414B	Potassium	J	Serial dilution failure
0810156-6	0424	Gross Beta	J	Less than 3 times the MDC
0810156-6	0424	Sulfate	J	Poor field duplicate precision
0810156-6	0424	Uranium	U	Less than 5 times the method blank
0810156-10	0424 Duplicate	Gross Beta	J	Less than 3 times the MDC
0810156-10	0424 Duplicate	Uranium	U	Less than 5 times the method blank

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 SW-846 6010B

Calibrations for calcium, magnesium, molybdenum, potassium, and sodium were performed on October 23, 2008, using one calibration standard. Blank calibration and laboratory spike standards were prepared from independent sources. Initial and continuing calibration verification (CCV) checks were made at the required frequency resulting in six CCVs. All calibration check results met the acceptance criteria. A reporting limit verification check was made at the required frequency to verify the linearity of the calibration curve near the practical quantitation limit. The check results were within the acceptance range.

Method SW-846 6020

Calibrations for molybdenum and uranium were performed October 28, 2008. The initial calibrations were performed using six calibration standards resulting in calibration curves with correlation coefficient (r^2) values greater than 0.995. The absolute values of the curve intercepts were less than 3 times the method detection limit (MDL). Calibration and laboratory spike standards were prepared from independent sources. Initial and CCV checks were made at the required frequency resulting in 12 CCVs. All initial and CCV results were within the acceptance

range with the exception of CCV1 for molybdenum. There were no samples associated with this CCV. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curves near the practical quantitation limit. The check results were within the acceptance range. The mass calibration and resolution was checked at the beginning of each analytical run in accordance with the procedure. Internal standard recoveries were stable and within acceptance ranges.

Method SW-846 9056

Initial calibrations were performed for chloride and sulfate using five calibration standards on October 21, 2008. The resulting calibration curves had r^2 values greater than 0.995 and intercepts less than 3 times the MDL. Initial calibration and calibration check standards were prepared from independent sources. Initial and CCV checks were made at the required frequency resulting in eight CCVs. All initial and CCV results were within the acceptance range.

Radiochemical Analysis

Radiochemical results are qualified with a "J" flag (estimated) when the result is greater than the minimum detectable concentration (MDC), but less than 3 times the MDC. Radiochemical results are qualified with a "U" flag (not detected) when the result is greater than the MDC, but less than the two sigma total propagated uncertainty.

Gross Alpha/Beta

Plateau calibrations were performed on November 6, 2007. Alpha and beta attenuation calibrations were performed on November 8, 2007, covering a range of 0 to 204 milligrams (mg). All standards were counted to a minimum of 10,000 counts. All calibration and background checks met acceptance criteria. The residual mass was less than 100 mg for all samples.

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. All initial and continuing calibration blank results were below the practical quantitation limits for calcium, magnesium, manganese, molybdenum, potassium, sodium, and uranium. In cases where blank concentration exceeds the instrument detection limit, 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. The method blank results for chloride and sulfate were below the method detection limits. The gross alpha and gross beta method blank results were below the MDC.

Inductively Coupled Plasma (ICP) Interference Check Sample (ICS) Analysis

ICP interference check samples ICSA and ICSAB 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 and matrix spike duplicate (MS/MSD) pairs were analyzed for all analytes as a measure of method performance in the sample matrix. Matrix spike data are not evaluated when the concentration of the unspiked sample is greater than 4 times the spike concentration. The MS/MSD recoveries met the acceptance criteria for all analytes evaluated.

Laboratory Replicate Analysis

The relative percent difference values for the laboratory replicate sample and matrix spike duplicate sample results for all non-radiochemical analytes were less than twenty percent and the relative error ratio for gross alpha and gross beta was less than 3.0, indicating acceptable laboratory precision.

Laboratory Control Samples (LCS)

LCS 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 LCS results were acceptable for all analysis categories.

Metals Serial Dilution

Serial dilutions were performed during the metals analysis to monitor physical or chemical interferences that may exist in the sample matrix. Serial dilutions were prepared and analyzed for calcium, magnesium, manganese, potassium, and sodium. The acceptance criteria were met for all analytes with the exception of potassium. The associated potassium result is qualified with a "J" flag (estimated).

Detection Limits/Dilutions

Samples were diluted in a consistent and acceptable manner when required. The required detection limits were met for all analytes with the following exceptions. The required detection limits were not met for gross alpha and gross beta in some cases because of the elevated levels of dissolved solids in the samples. In all cases for these samples the gross alpha and gross beta results were greater than the detection limit. The total alkalinity reported detection limits were greater than the required detection limit. All total alkalinity results were greater than the detection limit.

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.

Anion/Cation Balance

The anion/cation balance is used to determine if major ion concentrations have been quantified correctly. The total anions should balance with the total cations when expressed in milliequivalents per liter (meq/L). Table 3 shows the total anion and cation results from this event and the charge balance, which is a relative percent difference calculation. Typically, a charge balance difference of 10 percent is considered acceptable.

Table 3. Cation/Anion Balance

Site Code	Location	Cations (meq/L)	Anions (meq/L)	Charge Balance (%)
CAN01	0406A	17.85	18.68	2.2
CAN01	0410	11.28	10.07	5.7
CAN01	0412	36.37	32.31	5.9
CAN01	0413	7.49	7.47	0.2
CAN01	0414B	7.60	6.80	5.6
CAN01	0424	8.35	13.02	8.4
CAN01	0601	12.38	11.91	1.9
CAN01	0602	12.38	11.68	2.7
CAN01	0603	12.46	11.68	3.2

The charge balance value for all locations was less than 10 percent indicating acceptable data quality.

Electronic Data Deliverable (EDD) File

The EDD file arrived on November 12, 2008. The Sample Management System EDD validation module was used to verify that the EDD file was complete and in compliance with requirements. The module compares the contents of the file 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: 08091855 Lab Code: PAR Validator: Steve Donivan Validation Date: 11/14/2008

Project: Canonsburg 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	There are 11 detection limit failures.
☐ Field/Trip Blanks	
☑ Field Duplicates	There was 1 duplicate evaluated.

SAMPLE MANAGEMENT SYSTEM

RIN: 08091855 Lab Code: PAR

Non-Compliance Report: Detection Limits

Project: Canonsburg

Validation Date: 11/14/2008

Ticket	Location	Lab Sample ID	Method Code	Lab Method	Analyte Name	Result	Qualifier	Reported Detection Limit	Required Detection Limit	Units
GKS 736	0406A	0810156-1	WCH-A-002	EPA310.1	TOTAL ALKALINITY AS CaCO3	700		50	10	MG/L
GKS 738	0412	0810156-3	GPC-A-001	724R10	GROSS BETA	44.7		5.9	4	pCi/L
GKS 738	0412	0810156-3	GPC-A-001	724R10	GROSS ALPHA	152		2.8	2	pCi/L
GKS 738	0412	0810156-3	WCH-A-002	EPA310.1	TOTAL ALKALINITY AS CaCO3	650		50	10	MG/L
GKS 739	0413	0810156-4	WCH-A-002	EPA310.1	TOTAL ALKALINITY AS CaCO3	500		20	10	MG/L
GKS 740	0414B	0810156-5	WCH-A-002	EPA310.1	TOTAL ALKALINITY AS CaCO3	240		50	10	MG/L
GKS 741	0424	0810156-6	WCH-A-002	EPA310.1	TOTAL ALKALINITY AS CaCO3	430		50	10	MG/L
GKS 742	0601	0810156-7	WCH-A-002	EPA310.1	TOTAL ALKALINITY AS CaCO3	130		20	10	MG/L
GKS 743	0602	0810156-8	WCH-A-002	EPA310.1	TOTAL ALKALINITY AS CaCO3	130		20	10	MG/L
GKS 744	0603	0810156-9	WCH-A-002	EPA310.1	TOTAL ALKALINITY AS CaCO3	120		20	10	MG/L
GKS 745	2677	0810156-10	WCH-A-002	EPA310.1	TOTAL ALKALINITY AS CaCO3	420		50	10	MG/L

SAMPLE MANAGEMENT SYSTEM

Metals Data Validation Worksheet

RIN: 08091855 **Lab Code:** PAR **Date Due:** 11/14/2008

Matrix: Water **Site Code:** CAN01 **Date Completed:** 11/13/2008

Analyte	Date Analyzed	CALIBRATION						Method	LCS	MS	MSD	Dup.	ICSAB	Serial Dil.	CRI
		Int.	R^2	ICV	CCV	ICB	CCB	Blank	%R	%R	%R	RPD	%R	%R	%R
CALCIUM	10/23/2008			OK	OK	OK	OK	OK	102.0	98.0	88.0	3.0	105.0	3.0	111.0
MAGNESIUM	10/23/2008			OK	OK	OK	OK	OK	106.0	104.0	102.0	2.0	107.0	2.0	105.0
MANGANESE	10/23/2008			OK	OK	OK	OK	OK	99.0	56.0	14.0	2.0	96.0	1.0	100.0
MOLYBDENUM	10/28/2008	0.0000	1.0000	OK	OK	OK	OK	OK	96.0	97.0	97.0	0.0	111.0		114.0
POTASSIUM	10/23/2008			OK	OK	OK	OK	OK	96.0	100.0	100.0	0.0		25.0	86.0
SODIUM	10/23/2008			OK	OK	OK	OK	OK	97.0	99.0	99.0	0.0		6.0	87.0
URANIUM	10/28/2008	0.0000	1.0000	OK	OK	OK	OK	OK	97.0	101.0	101.0	1.0	106.0	3.0	94.0

SAMPLE MANAGEMENT SYSTEM
Radiochemistry Data Validation Worksheet

RIN: 08091855 **Lab Code:** PAR **Date Due:** 11/14/2008

Matrix: Water **Site Code:** CAN01 **Date Completed:** 11/13/2008

Sample	Analyte	Date Analyzed	Result	Flag	Tracer %R	LCS %R	MS %R	Duplicate
Blank_Spike	GROSS ALPHA	10/31/2008				97.6		
0410	GROSS ALPHA	11/01/2008						2.60
Blank	GROSS ALPHA	11/01/2008	0.1120	U				
Blank_Spike	GROSS BETA	10/31/2008				93.7		
0410	GROSS BETA	11/01/2008						0.22
Blank	GROSS BETA	11/01/2008	-0.3290	U				

SAMPLE MANAGEMENT SYSTEM

Wet Chemistry Data Validation Worksheet

RIN: 08091855 **Lab Code:** PAR **Date Due:** 11/14/2008

Matrix: Water **Site Code:** CAN01 **Date Completed:** 11/13/2008

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	10/27/2008	0.000	0.9998	OK	OK	OK	OK	OK	100.0				
SULFATE	10/27/2008	0.000	0.9997	OK	OK	OK	OK	OK	102.0				
SULFATE	10/29/2008	0.000	0.9997	OK	OK	OK	OK			107.0	105.0	2.00	
TOTAL ALKALINITY AS CaC	10/23/2008			OK	OK	OK	OK	OK	99.0			1.00	

Sampling Quality Control Assessment

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

Sampling Protocol

All monitor well sample results were qualified with an "F" flag in the database indicating the wells were purged and sampled using the low-flow sampling method. Additionally, sample results for wells 0406A, 0410, 0413, and 0414B were qualified with a "Q" flag indicating the data are qualitative because these wells are Category II based on turbidity and water level drawdown.

Equipment Blank Assessment

An equipment blank was not necessary because new pump-head tubing was used at each location.

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. Duplicate samples were collected from location 0424. The non-radiochemical duplicate results met the U.S. Environmental Protection Agency recommended laboratory duplicate criteria of having a relative percent difference of less than 20 percent for results that are greater than 5 times the practical quantitation limit with the following exception. The sulfate relative percent difference value was greater than 20 percent. There were no errors noted during the review of the laboratory data. The sulfate result for location 0424 is qualified with a "J" flag because of the lower than expected precision. The gross alpha and gross beta duplicate results had relative error ratios less than three, demonstrating acceptable precision.

SAMPLE MANAGEMENT SYSTEM

Validation Report: Field Duplicates

RIN: 08091855 Lab Code: PAR Project: Canonsburg Validation Date: 11/14/2008

Duplicate: 2677 Sample: 0424

Analyte	Sample Result	Sample Flag	Sample Error	Duplicate Result	Duplicate Flag	Duplicate Error	RPD	RER	Units
Bicarbonate	430			420			2.35		MG/L
CALCIUM	110000			110000			0		UG/L
CARBONATE AS CaCO3	50	U		50	U				MG/L
CHLORIDE	190			180			5.41		MG/L
GROSS ALPHA	0.306	U	0.78	-0.282	U	0.902		1.0	pCi/L
GROSS BETA	4.92		1.59	2.73		1.42		2.0	pCi/L
MAGNESIUM	32000			32000			0		UG/L
MANGANESE	4700			5000			6.19		UG/L
MOLYBDENUM	0.8	B		0.44	B				UG/L
POTASSIUM	4300			4300			0		UG/L
SODIUM	110000			110000			0		UG/L
SULFATE	69			93			29.63		MG/L
TOTAL ALKALINITY AS CaCO3	430			420			2.35		MG/L
URANIUM	0.029	B		0.022	B				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 — 3-16-2009 (Date)

Data Validation Lead: Steve Donivan — 3-16-2009 (Date)

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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 following potential outliers were identified. The chloride and magnesium concentrations for well 0410 were higher than the historical maximum. This is a Category II well as noted by the "Q" qualifier and variations in analyte concentrations are excepted. The chloride concentration for location 0602 was higher than the historical maximum. Chloride concentrations at this location have been trending upward since 2003.

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Data Validation Outliers Report - No Field Parameters

Laboratory: PARAGON (Fort Collins, CO)

RIN: 08091855

Comparison: All Historical Data

Report Date: 3/4/2009

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
CAN01	0406A	10/13/2008	Calcium	260		FQ	250		FQ	194		F	6	0	Yes	No
CAN01	0406A	10/13/2008	Chloride	130	N	FQ	110		FQ	51.4		F	6	0	Yes	No
CAN01	0406A	10/13/2008	Magnesium	49		FQ	48		FQ	40.4		F	6	0	Yes	No
CAN01	0406A	10/13/2008	Manganese	1		FQ	4.43		F	1.8		FQ	6	0	Yes	No
CAN01	0406A	10/13/2008	Sodium	35		FQ	51		FQ	37.3		F	6	0	Yes	No
CAN01	0406A	10/13/2008	Sulfate	9.3		FQ	51.9		F	19.2		FQ	6	0	Yes	No
CAN01	0410	10/13/2008	Calcium	66		FQ	56.5		F	24.7		FQ	31	0	No	Yes
CAN01	0410	10/13/2008	Chloride	340		FQ	182		L	22		FQ	31	0	Yes (log)	Yes
CAN01	0410	10/13/2008	Magnesium	33		FQ	25		FQ	11.4		FQ	31	0	Yes	Yes
CAN01	0410	10/13/2008	Sodium	92		FQ	74		FQJ	32.1		F	31	0	No	Yes
CAN01	0410	10/13/2008	Sulfate	66		FQ	171			72		FQ	30	0	No	No
CAN01	0412	10/13/2008	Chloride	17		F	84			20.8		F	37	0	No	No
CAN01	0413	10/13/2008	Sulfate	53		FQ	551		F	55		FQ	43	0	No	No
CAN01	0414B	10/13/2008	Alkalinity, Total (As CaCO3)	240		FQ	223		F	204		F	5	0	Yes	No
CAN01	0424	10/13/2008	Chloride	180		F	160		F	91		F	20	0	Yes	No
CAN01	0424	10/13/2008	Chloride	190		F	160		F	91		F	20	0	Yes	No
CAN01	0424	10/13/2008	Gross Beta	4.92		FJ	4.4			2.67	U	F	7	3	Yes	No
CAN01	0424	10/13/2008	Manganese	4.7		F	6.9			4.86		F	21	0	Yes	No
CAN01	0424	10/13/2008	Sodium	110		F	160	E	J	120		F	20	0	Yes	No
CAN01	0424	10/13/2008	Sulfate	69		FJ	230			89		F	20	0	Yes	No
CAN01	0424	10/13/2008	Uranium	0.000029	B	UF	0.001	U		0.000037	B	F	22	20	No	No
CAN01	0424	10/13/2008	Uranium	0.000022	B	UF	0.001	U		0.000037	B	F	22	20	No	No

Data Validation Outliers Report - No Field Parameters

Laboratory: PARAGON (Fort Collins, CO)

RIN: 08091855

Comparison: All Historical Data

Report Date: 3/4/2009

				Current			Historical Maximum			Historical Minimum			Number of		Normally	Statistical
					Qualifiers			Qualifiers			Qualifiers		Data Points		Distributed	Outlier
Site Code	Location Code	Sample Date	Analyte	Result	Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect		
CAN01	0601	10/13/2008	Chloride	140			134			31		RX	22	0	Yes	No
CAN01	0602	10/13/2008	Chloride	140			133			31		RX	25	0	Yes	Yes
CAN01	0603	10/13/2008	Chloride	150			133			39			18	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.

Attachment 2
Data Presentation

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Groundwater Quality Data

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Groundwater Quality Data by Location (USEE100) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 3/4/2009
Location: 0406A WELL Replacement well for 0406.

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Carbonate (As CaCO3)	mg/L	10/13/2008	0001	5	-	15	50	U	FQ	#	50	
Alkalinity, Total (As CaCO3)	mg/L	10/13/2008	0001	5	-	15	700		FQ	#	50	
Bicarbonate	mg/L	10/13/2008	0001	5	-	15	700		FQ	#	50	
Calcium	mg/L	10/13/2008	0001	5	-	15	260		FQ	#	0.014	
Chloride	mg/L	10/13/2008	0001	5	-	15	130	N	FQ	#	4	
Dissolved Oxygen	mg/L	10/13/2008	N001	5	-	15	0.75		FQ	#		
Gross Alpha	pCi/L	10/13/2008	0001	5	-	15	1.7	U	FQ	#	1.7	0.889
Gross Beta	pCi/L	10/13/2008	0001	5	-	15	5.31		FQJ	#	2.6	1.79
Magnesium	mg/L	10/13/2008	0001	5	-	15	49		FQ	#	0.0089	
Manganese	mg/L	10/13/2008	0001	5	-	15	1		FQ	#	0.0002	
Molybdenum	mg/L	10/13/2008	0001	5	-	15	0.001		FQ	#	0.0001	
Oxidation Reduction Potential	mV	10/13/2008	N001	5	-	15	61.3		FQ	#		
pH	s.u.	10/13/2008	N001	5	-	15	7.95		FQ	#		
Potassium	mg/L	10/13/2008	0001	5	-	15	5.9		FQ	#	0.026	
Sodium	mg/L	10/13/2008	0001	5	-	15	35		FQ	#	0.0018	
Specific Conductance	umhos /cm	10/13/2008	N001	5	-	15	1649		FQ	#		
Sulfate	mg/L	10/13/2008	0001	5	-	15	9.3		FQ	#	1	
Temperature	C	10/13/2008	N001	5	-	15	15.76		FQ	#		
Turbidity	NTU	10/13/2008	N001	5	-	15	22		FQ	#		
Uranium	mg/L	10/13/2008	0001	5	-	15	0.00078		FQ	#	0.0000045	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 3/4/2009
Location: 0410 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Carbonate (As CaCO3)	mg/L	10/13/2008	0001	11.48 - 16.08	5	U	FQ	#	5	
Alkalinity, Total (As CaCO3)	mg/L	10/13/2008	0001	11.48 - 16.08	16		FQ	#	5	
Bicarbonate	mg/L	10/13/2008	0001	11.48 - 16.08	16		FQ	#	5	
Calcium	mg/L	10/13/2008	0001	11.48 - 16.08	66		FQ	#	0.014	
Chloride	mg/L	10/13/2008	0001	11.48 - 16.08	340		FQ	#	10	
Dissolved Oxygen	mg/L	10/13/2008	N001	11.48 - 16.08	2.76		FQ	#		
Gross Alpha	pCi/L	10/13/2008	0001	11.48 - 16.08	1.7	U	FQ	#	1.7	0.862
Gross Beta	pCi/L	10/13/2008	0001	11.48 - 16.08	3.15		FQJ	#	2.2	1.41
Magnesium	mg/L	10/13/2008	0001	11.48 - 16.08	33		FQ	#	0.0089	
Manganese	mg/L	10/13/2008	0001	11.48 - 16.08	3.5		FQ	#	0.0002	
Molybdenum	mg/L	10/13/2008	0001	11.48 - 16.08	0.0001	U	FQ	#	0.0001	
Oxidation Reduction Potential	mV	10/13/2008	N001	11.48 - 16.08	220.6		FQ	#		
pH	s.u.	10/13/2008	N001	11.48 - 16.08	5.7		FQ	#		
Potassium	mg/L	10/13/2008	0001	11.48 - 16.08	2.2		FQ	#	0.026	
Sodium	mg/L	10/13/2008	0001	11.48 - 16.08	92		FQ	#	0.0018	
Specific Conductance	umhos /cm	10/13/2008	N001	11.48 - 16.08	1286		FQ	#		
Sulfate	mg/L	10/13/2008	0001	11.48 - 16.08	66		FQ	#	5	
Temperature	C	10/13/2008	N001	11.48 - 16.08	17.95		FQ	#		
Turbidity	NTU	10/13/2008	N001	11.48 - 16.08	14		FQ	#		
Uranium	mg/L	10/13/2008	0001	11.48 - 16.08	0.000021	B	UFQ	#	0.0000045	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 3/4/2009
Location: 0412 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Carbonate (As CaCO3)	mg/L	10/13/2008	0001	13.21	-	18.21	50	U	F	#	50	
Alkalinity, Total (As CaCO3)	mg/L	10/13/2008	0001	13.21	-	18.21	650		F	#	50	
Bicarbonate	mg/L	10/13/2008	0001	13.21	-	18.21	650		F	#	50	
Calcium	mg/L	10/13/2008	0001	13.21	-	18.21	470		F	#	0.014	
Chloride	mg/L	10/13/2008	0001	13.21	-	18.21	17		F	#	4	
Dissolved Oxygen	mg/L	10/13/2008	N001	13.21	-	18.21	0.84		F	#		
Gross Alpha	pCi/L	10/13/2008	0001	13.21	-	18.21	152		F	#	2.8	25.2
Gross Beta	pCi/L	10/13/2008	0001	13.21	-	18.21	44.7		F	#	5.9	8.26
Magnesium	mg/L	10/13/2008	0001	13.21	-	18.21	81		F	#	0.0089	
Manganese	mg/L	10/13/2008	0001	13.21	-	18.21	26		F	#	0.002	
Molybdenum	mg/L	10/13/2008	0001	13.21	-	18.21	0.00084	B	F	#	0.0001	
Oxidation Reduction Potential	mV	10/13/2008	N001	13.21	-	18.21	-32.1		F	#		
pH	s.u.	10/13/2008	N001	13.21	-	18.21	7.81		F	#		
Potassium	mg/L	10/13/2008	0001	13.21	-	18.21	4.3		F	#	0.026	
Sodium	mg/L	10/13/2008	0001	13.21	-	18.21	48		F	#	0.0018	
Specific Conductance	umhos /cm	10/13/2008	N001	13.21	-	18.21	2742		F	#		
Sulfate	mg/L	10/13/2008	0001	13.21	-	18.21	1100		F	#	10	
Temperature	C	10/13/2008	N001	13.21	-	18.21	18.39		F	#		
Turbidity	NTU	10/13/2008	N001	13.21	-	18.21	25		F	#		
Uranium	mg/L	10/13/2008	0001	13.21	-	18.21	0.17		F	#	0.000009	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 3/4/2009
Location: 0413 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Carbonate (As CaCO3)	mg/L	10/13/2008	0001	6.05	-	11.05	20	U	FQ	#	20	
Alkalinity, Total (As CaCO3)	mg/L	10/13/2008	0001	6.05	-	11.05	300		FQ	#	20	
Bicarbonate	mg/L	10/13/2008	0001	6.05	-	11.05	300		FQ	#	20	
Calcium	mg/L	10/13/2008	0001	6.05	-	11.05	110		FQ	#	0.014	
Chloride	mg/L	10/13/2008	0001	6.05	-	11.05	14		FQ	#	1	
Dissolved Oxygen	mg/L	10/13/2008	N001	6.05	-	11.05	2.54		FQ	#		
Gross Alpha	pCi/L	10/13/2008	0001	6.05	-	11.05	58		FQ	#	1.7	9.87
Gross Beta	pCi/L	10/13/2008	0001	6.05	-	11.05	27.2		FQ	#	2.8	4.79
Magnesium	mg/L	10/13/2008	0001	6.05	-	11.05	15		FQ	#	0.0089	
Manganese	mg/L	10/13/2008	0001	6.05	-	11.05	2.4		FQ	#	0.0002	
Molybdenum	mg/L	10/13/2008	0001	6.05	-	11.05	0.002		FQ	#	0.0001	
Oxidation Reduction Potential	mV	10/13/2008	N001	6.05	-	11.05	60.7		FQ	#		
pH	s.u.	10/13/2008	N001	6.05	-	11.05	7.18		FQ	#		
Potassium	mg/L	10/13/2008	0001	6.05	-	11.05	3.7		FQ	#	0.026	
Sodium	mg/L	10/13/2008	0001	6.05	-	11.05	15		FQ	#	0.0018	
Specific Conductance	umhos /cm	10/13/2008	N001	6.05	-	11.05	704		FQ	#		
Sulfate	mg/L	10/13/2008	0001	6.05	-	11.05	53		FQ	#	2.5	
Temperature	C	10/13/2008	N001	6.05	-	11.05	17.58		FQ	#		
Turbidity	NTU	10/13/2008	N001	6.05	-	11.05	60		FQ	#		
Uranium	mg/L	10/13/2008	0001	6.05	-	11.05	0.12		FQ	#	0.000009	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 3/4/2009
Location: 0414B WELL Replacement well for 0414A.

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Carbonate (As CaCO3)	mg/L	10/13/2008	N001	-	50	U	FQ	#	50	
Alkalinity, Total (As CaCO3)	mg/L	10/13/2008	N001	-	240		FQ	#	50	
Bicarbonate	mg/L	10/13/2008	N001	-	240		FQ	#	50	
Calcium	mg/L	10/13/2008	N001	-	99		FQ	#	0.014	
Chloride	mg/L	10/13/2008	N001	-	11		FQ	#	1	
Dissolved Oxygen	mg/L	10/13/2008	N001	-	3.13		FQ	#		
Gross Alpha	pCi/L	10/13/2008	N001	-	1.68		FQJ	#	1.1	0.821
Gross Beta	pCi/L	10/13/2008	N001	-	2.84		FQJ	#	2.6	1.47
Magnesium	mg/L	10/13/2008	N001	-	18		FQ	#	0.0089	
Manganese	mg/L	10/13/2008	N001	-	8.2		FQ	#	0.0002	
Molybdenum	mg/L	10/13/2008	N001	-	0.0011		FQ	#	0.0001	
Oxidation Reduction Potential	mV	10/13/2008	N001	-	-2.9		FQ	#		
pH	s.u.	10/13/2008	N001	-	7.69		FQ	#		
Potassium	mg/L	10/13/2008	N001	-	1.7	E	FQJ	#	0.026	
Sodium	mg/L	10/13/2008	N001	-	7.8		FQ	#	0.0018	
Specific Conductance	umhos /cm	10/13/2008	N001	-	692		FQ	#		
Sulfate	mg/L	10/13/2008	N001	-	120		FQ	#	2.5	
Temperature	C	10/13/2008	N001	-	15.54		FQ	#		
Turbidity	NTU	10/13/2008	N001	-	3		FQ	#		
Uranium	mg/L	10/13/2008	N001	-	0.0018		FQ	#	0.0000045	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 3/4/2009
Location: 0424 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Carbonate (As CaCO3)	mg/L	10/13/2008	N001	7.58	-	12.58	50	U	F	#	50	
Alkalinity, Carbonate (As CaCO3)	mg/L	10/13/2008	N002	7.58	-	12.58	50	U	F	#	50	
Alkalinity, Total (As CaCO3)	mg/L	10/13/2008	N001	7.58	-	12.58	430		F	#	50	
Alkalinity, Total (As CaCO3)	mg/L	10/13/2008	N002	7.58	-	12.58	420		F	#	50	
Bicarbonate	mg/L	10/13/2008	N001	7.58	-	12.58	430		F	#	50	
Bicarbonate	mg/L	10/13/2008	N002	7.58	-	12.58	420		F	#	50	
Calcium	mg/L	10/13/2008	N001	7.58	-	12.58	110		F	#	0.014	
Calcium	mg/L	10/13/2008	N002	7.58	-	12.58	110		F	#	0.014	
Chloride	mg/L	10/13/2008	N001	7.58	-	12.58	190		F	#	2	
Chloride	mg/L	10/13/2008	N002	7.58	-	12.58	180		F	#	2	
Dissolved Oxygen	mg/L	10/13/2008	N001	7.58	-	12.58	2.23		F	#		
Gross Alpha	pCi/L	10/13/2008	N001	7.58	-	12.58	1.3	U	F	#	1.3	0.78
Gross Alpha	pCi/L	10/13/2008	N002	7.58	-	12.58	1.6	U	F	#	1.6	0.902
Gross Beta	pCi/L	10/13/2008	N001	7.58	-	12.58	4.92		FJ	#	2.2	1.59
Gross Beta	pCi/L	10/13/2008	N002	7.58	-	12.58	2.73		FJ	#	2.2	1.42
Magnesium	mg/L	10/13/2008	N001	7.58	-	12.58	32		F	#	0.0089	
Magnesium	mg/L	10/13/2008	N002	7.58	-	12.58	32		F	#	0.0089	
Manganese	mg/L	10/13/2008	N001	7.58	-	12.58	4.7		F	#	0.0002	
Manganese	mg/L	10/13/2008	N002	7.58	-	12.58	5		F	#	0.0002	
Molybdenum	mg/L	10/13/2008	N001	7.58	-	12.58	0.0008	B	F	#	0.0001	
Molybdenum	mg/L	10/13/2008	N002	7.58	-	12.58	0.00044	B	F	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 3/4/2009
Location: 0424 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Oxidation Reduction Potential	mV	10/13/2008	N001	7.58 - 12.58	-65.4		F	#		
pH	s.u.	10/13/2008	N001	7.58 - 12.58	9.34		F	#		
Potassium	mg/L	10/13/2008	N001	7.58 - 12.58	4.3		F	#	0.026	
Potassium	mg/L	10/13/2008	N002	7.58 - 12.58	4.3		F	#	0.026	
Sodium	mg/L	10/13/2008	N001	7.58 - 12.58	110		F	#	0.0018	
Sodium	mg/L	10/13/2008	N002	7.58 - 12.58	110		F	#	0.0018	
Specific Conductance	umhos /cm	10/13/2008	N001	7.58 - 12.58	1612		F	#		
Sulfate	mg/L	10/13/2008	N001	7.58 - 12.58	69		FJ	#	5	
Sulfate	mg/L	10/13/2008	N002	7.58 - 12.58	93		F	#	5	
Temperature	C	10/13/2008	N001	7.58 - 12.58	14.23		F	#		
Turbidity	NTU	10/13/2008	N001	7.58 - 12.58	8		F	#		
Uranium	mg/L	10/13/2008	N001	7.58 - 12.58	0.000029	B	UF	#	0.0000045	
Uranium	mg/L	10/13/2008	N002	7.58 - 12.58	0.000022	B	UF	#	0.0000045	

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

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 CAN01, Canonsburg Disposal Site
REPORT DATE: 3/4/2009
Location: 0601 SURFACE LOCATION RESERVED MGILBERT, WQD, 4/24/89

Parameter	Units	Sample Date	ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Carbonate (As CaCO3)	mg/L	10/13/2008	N001	20	U		#	20	
Alkalinity, Total (As CaCO3)	mg/L	10/13/2008	N001	130			#	20	
Bicarbonate	mg/L	10/13/2008	N001	120			#	20	
Calcium	mg/L	10/13/2008	N001	95			#	0.014	
Chloride	mg/L	10/13/2008	N001	140			#	2	
Dissolved Oxygen	mg/L	10/13/2008	N001	13.4			#		
Magnesium	mg/L	10/13/2008	N001	25			#	0.0089	
Manganese	mg/L	10/13/2008	N001	0.048			#	0.0002	
Molybdenum	mg/L	10/13/2008	N001	0.061			#	0.0001	
Oxidation Reduction Potential	mV	10/13/2008	N001	105.6			#		
pH	s.u.	10/13/2008	N001	7.46			#		
Potassium	mg/L	10/13/2008	N001	13			#	0.026	
Sodium	mg/L	10/13/2008	N001	110			#	0.0018	
Specific Conductance	umhos/cm	10/13/2008	N001	1270			#		
Sulfate	mg/L	10/13/2008	N001	280			#	5	
Temperature	C	10/13/2008	N001	18			#		
Turbidity	NTU	10/13/2008	N001	7			#		
Uranium	mg/L	10/13/2008	N001	0.00034			#	0.0000045	

Surface Water Quality Data by Location (USEE102) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 3/4/2009
Location: 0602 SURFACE LOCATION RESERVED MGILBERT, WQD, 4/24/89

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Carbonate (As CaCO3)	mg/L	10/13/2008	N001	20	U		#	20	
Alkalinity, Total (As CaCO3)	mg/L	10/13/2008	N001	130			#	20	
Bicarbonate	mg/L	10/13/2008	N001	130			#	20	
Calcium	mg/L	10/13/2008	N001	93			#	0.014	
Chloride	mg/L	10/13/2008	N001	140			#	2	
Dissolved Oxygen	mg/L	10/13/2008	N001	10.8			#		
Magnesium	mg/L	10/13/2008	N001	24			#	0.0089	
Manganese	mg/L	10/13/2008	N001	0.045			#	0.0002	
Molybdenum	mg/L	10/13/2008	N001	0.064			#	0.0001	
Oxidation Reduction Potential	mV	10/13/2008	N001	56.7			#		
pH	s.u.	10/13/2008	N001	7.75			#		
Potassium	mg/L	10/13/2008	N001	13			#	0.026	
Sodium	mg/L	10/13/2008	N001	110			#	0.0018	
Specific Conductance	umhos/cm	10/13/2008	N001	1230			#		
Sulfate	mg/L	10/13/2008	N001	280			#	5	
Temperature	C	10/13/2008	N001	13.3			#		
Turbidity	NTU	10/13/2008	N001	6			#		
Uranium	mg/L	10/13/2008	N001	0.00037			#	0.0000045	

Surface Water Quality Data by Location (USEE102) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 3/4/2009
Location: 0603 SURFACE LOCATION WS CHARTIERS CREEK UDR CONRAIL OVPS

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Carbonate (As CaCO3)	mg/L	10/13/2008	N001	20	U		#	20	
Alkalinity, Total (As CaCO3)	mg/L	10/13/2008	N001	120			#	20	
Bicarbonate	mg/L	10/13/2008	N001	110			#	20	
Calcium	mg/L	10/13/2008	N001	92			#	0.014	
Chloride	mg/L	10/13/2008	N001	150			#	2	
Dissolved Oxygen	mg/L	10/13/2008	N001	14.48			#		
Magnesium	mg/L	10/13/2008	N001	24			#	0.0089	
Manganese	mg/L	10/13/2008	N001	0.041			#	0.0002	
Molybdenum	mg/L	10/13/2008	N001	0.061			#	0.0001	
Oxidation Reduction Potential	mV	10/13/2008	N001	115.6			#		
pH	s.u.	10/13/2008	N001	7.9			#		
Potassium	mg/L	10/13/2008	N001	13			#	0.026	
Sodium	mg/L	10/13/2008	N001	110			#	0.0018	
Specific Conductance	umhos/cm	10/13/2008	N001	1281			#		
Sulfate	mg/L	10/13/2008	N001	280			#	5	
Temperature	C	10/13/2008	N001	17.32			#		
Turbidity	NTU	10/13/2008	N001	5			#		
Uranium	mg/L	10/13/2008	N001	0.00038			#	0.0000045	

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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STATIC WATER LEVELS (USEE700) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 3/4/2009

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
0406A		941.26	10/13/2008		10.85	930.41	
0410	U	969.16	10/13/2008		12.42	956.74	
0412	O	949.7	10/13/2008		15.97	933.73	
0413	O	940.36	10/13/2008		9.41	930.95	
0414B		943.65	10/13/2008		10.83	932.82	
0424	C	942.25	10/13/2008		14.36	927.89	

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

WATER LEVEL FLAGS: D Dry F FLOWING

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Hydrograph

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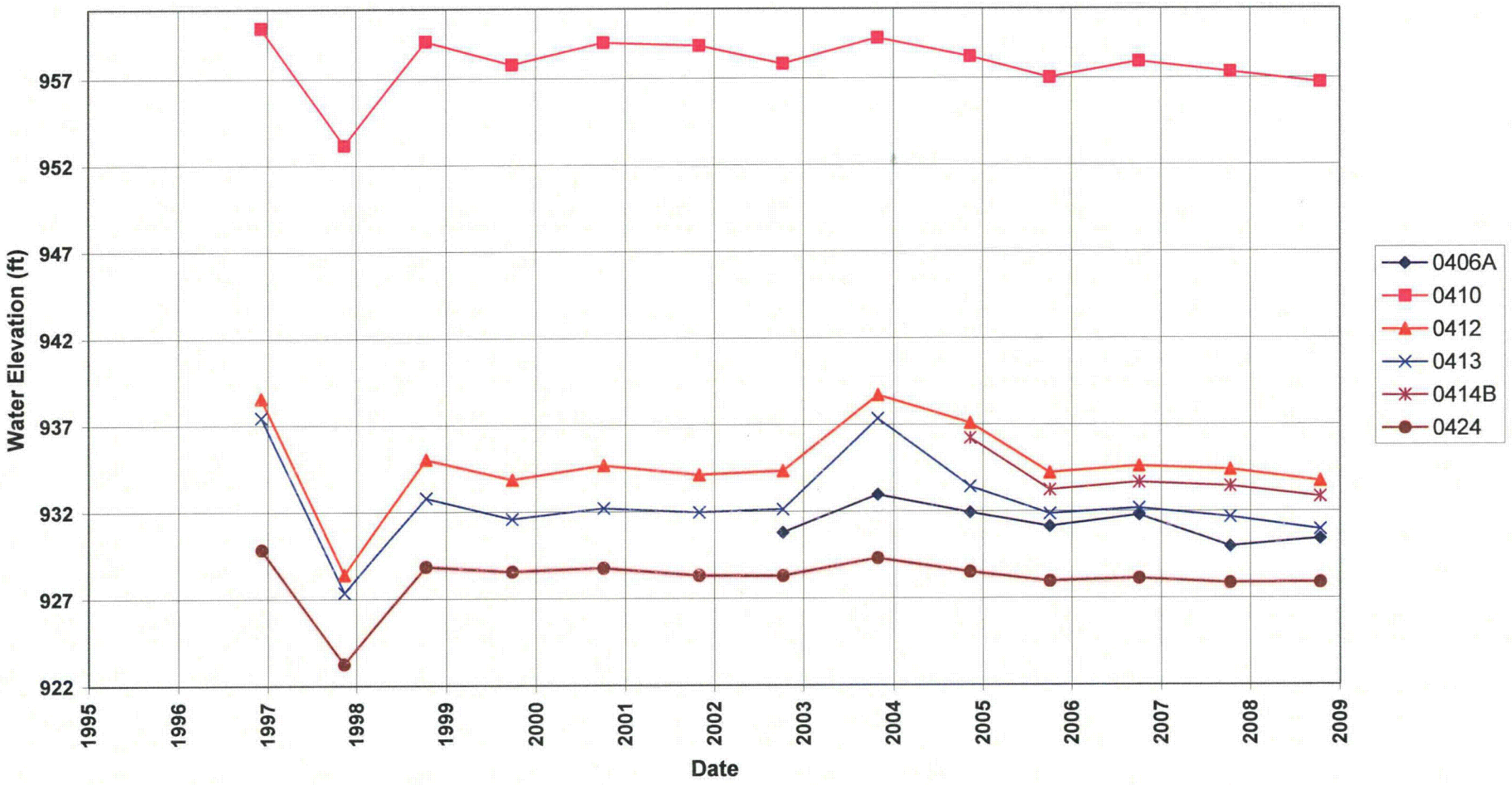
Canonsburg Disposal Site
Hydrograph



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Time-Concentration Graphs

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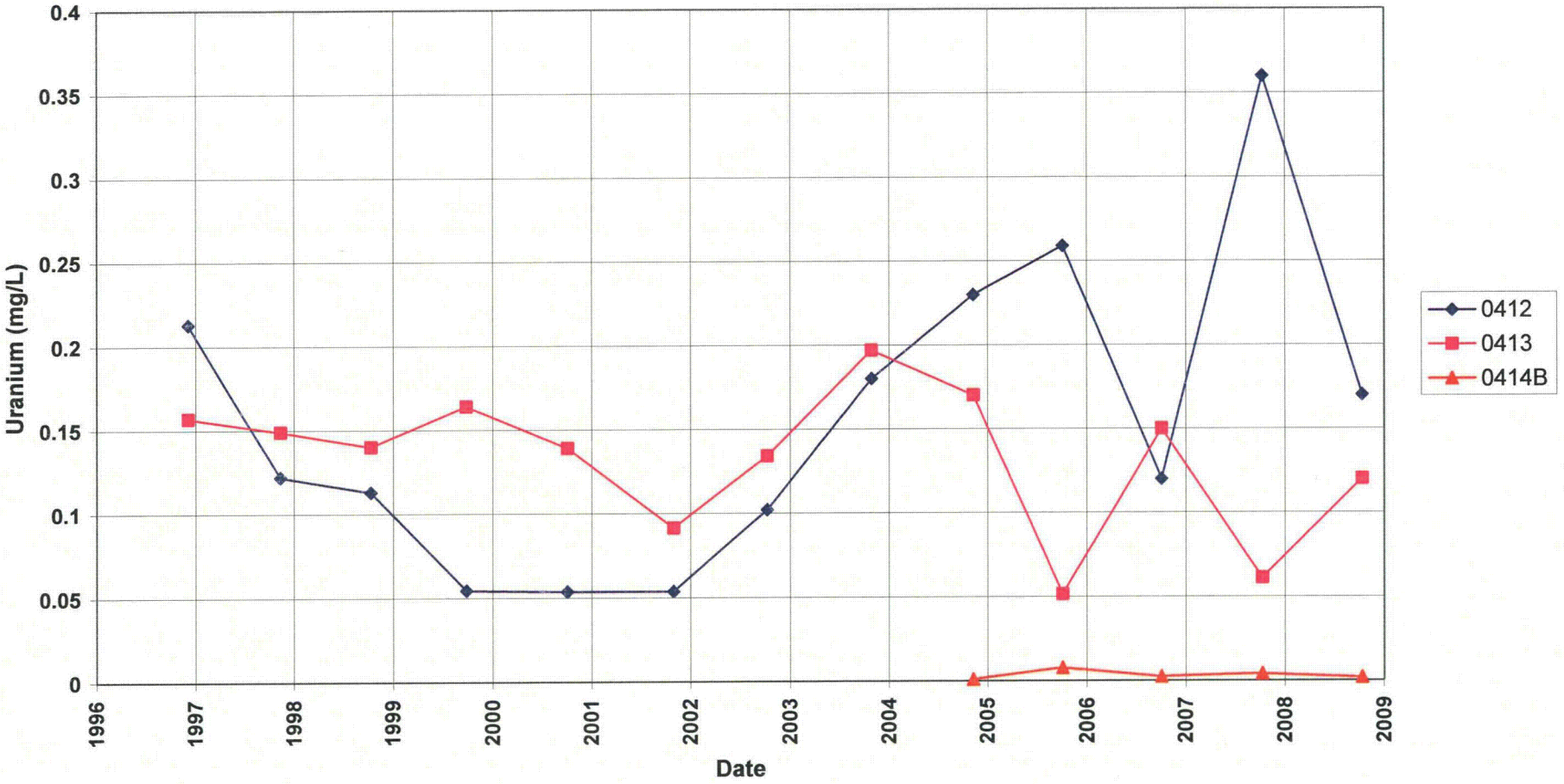
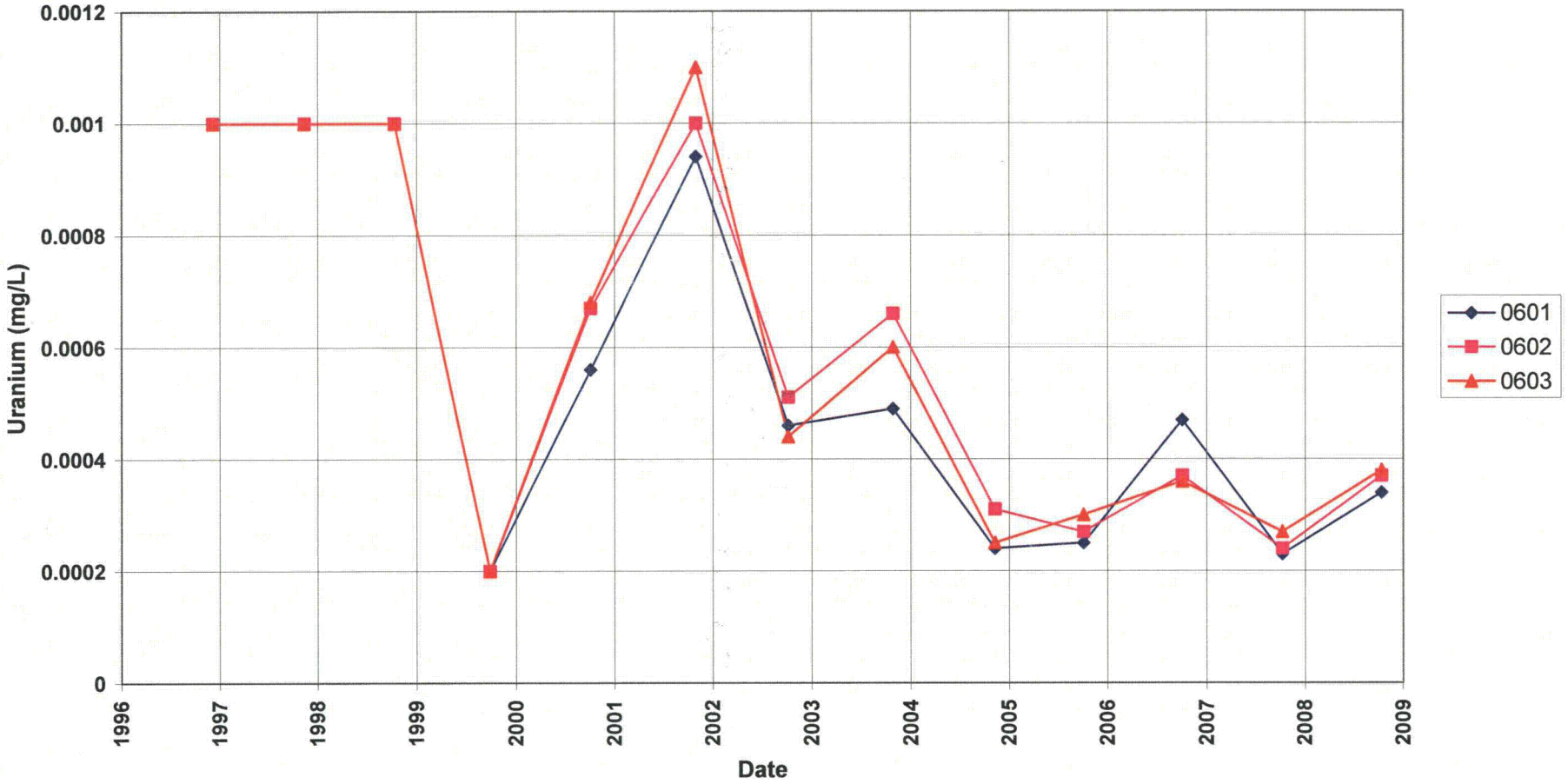
Canonsburg Disposal Site Point of Compliance Wells
Uranium Concentration

Alternate Concentration Limit = 1.0 mg/L



Canonsburg Disposal Site Surface Locations
Uranium Concentration
Alternate Concentration Limit = 0.01 mg/L



Attachment 3
Sampling and Analysis Work Order

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Stoller — established 1959

Task Order LM00-501
Control Number 08-0746

September 11, 2008

U.S. Department of Energy
Office of Legacy Management
ATTN: Jack R. Craig
Site Manager
626 Cochrans Mill Road
Pittsburgh, PA 15236-0940

SUBJECT: Contract No. DE-AM01-07LM00060, Stoller
October 2008 Environmental Sampling at Canonsburg, Pennsylvania

Reference: Task Order LM00-501-02-103-402, Canonsburg Disposal Site

Dear Mr. Craig:

The purpose of this letter is to inform you of the upcoming sampling event at Canonsburg, Pennsylvania. Enclosed are the map and tables specifying sample locations and analytes for routine monitoring. Water quality data will be collected from this site as part of the environmental sampling currently scheduled to begin the week of October 13, 2008.

The following lists show the wells (with zone of completion) and surface locations scheduled to be sampled during this event.

Monitor Wells*

406A Um	410 Um	412 Um	413 Um	414B Nr	424 Um

*NOTE: Um = Unconsolidated material; Nr = No recovery of data for classifying

Surface Locations*

601	602	603

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.

If you have any questions, please call me at 513-738-3281.

Sincerely,

Michele Miller
Project Manager

The S.M. Stoller Corporation 10995 Hamilton Cleves Highway Harrison, OH 45030 (513) 648-3294 Fax: (513) 648-3252

Constituent Sampling Breakdown

Site	Canonsburg				
Analyte	Groundwater	Surface Water	Required Detection Limit (mg/L)	Analytical Method	Line Item Code
Approx. No. Samples/yr	6	3			
Field Measurements					
Alkalinity	X	X			
Dissolved Oxygen					
Redox Potential	X	X			
pH	X	X			
Specific Conductance	X	X			
Turbidity	X				
Temperature	X	X			
Laboratory Measurements					
Aluminum					
Ammonia as N (NH3-N)					
Calcium	X	X	5	SW-846 6010	LMM-01
Chloride	X	X	0.5	SW-846 9056	MIS-A-039
Chromium					
Gross Alpha	X		2	EPA 900.0	GPC-A-001
Gross Beta	X		4	EPA 900.0	GPC-A-001
Iron					
Lead					
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					
Nickel-63					
Nitrate + Nitrite as N (NO3+NO2)-N					
Potassium	X	X	1	SW-846 6010	LMM-01
Radium-226					
Radium-228					
Selenium					
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					
Total Organic Carbon					
Uranium	X	X	0.0001	SW-846 6020	LMM-02
Vanadium					
Zinc					
Total No. of Analytes	11	9			

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.

Attachment 4
Trip Report

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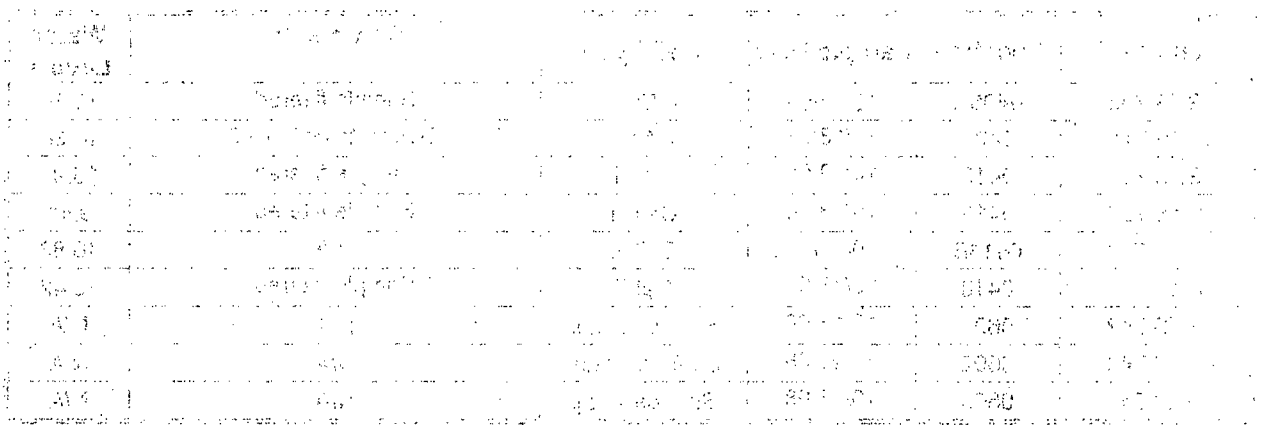

Stoller

established 1959

Memorandum

DATE: November 11, 2008

TO: Michele Miller
Ken Broberg
Steve Donivan
Wanda Sumner
EDD Delivery

FROM: Karen Voisard

SUBJECT: Trip Report for Canonsburg, Pennsylvania October 2008 Annual Sampling

Date of Sampling Event: October 13 and 14th, 2008

Team Members: Jim Gore and Karen Voisard

Number of Locations Sampled: A total of nine locations were sampled (six monitoring wells and three surface water locations). One duplicate sample was collected from monitoring well 0424.

Locations Not Sampled/Reason: None

Location Specific Information: The following table includes the established well type identified for each sampled well location.

Ticket Number	Location	Sample Date	Well Type	Comments	Water Levels
GKS 736	0406A	10/13/08	CAT II	Sample filtered	10.85
GKS 741	0424	10/13/08	CAT I	Duplicate collected	14.36
GKS 738	0412	10/13/08	CAT I	Sample filtered	15.97
GKS 739	0413	10/13/08	CAT II	Sample filtered	9.41
GKS 740	0414B	10/13/08	CAT II	N/A	10.83
GKS 737	0410	10/13/08	Cat II	Sample filtered	12.42
GKS 742	0601	10/13/08	Surface water	N/A	N/A
GKS 743	0602	10/13/08	Surface water	N/A	N/A
GKS 744	0603	10/13/08	Surface water	N/A	N/A

N/A = not applicable

Water Level Measurements: Water levels were measured at all sampled wells. Water level data are provided in the table above and represent depth to water measurements measured from top of well.

Sample Shipment: Samples were shipped overnight by FedEx to Paragon Analytics, Inc., on October 15, 2008.

Field Variance: None

Quality Control Sample Cross Reference: Following is the false identification assigned to the quality control sample:

False ID	True ID	Sample Type	Ticket Number
2677	0424	Duplicate	GKS 745

Requisition Numbers Assigned: All samples were assigned to requisition identification number (RIN) 08091855.

Well Maintenance: Several well maintenance issues were completed during this sampling round. The following table summarizes the well maintenance items completed and several items identified during the sampling event.

Well Number	Maintenance Completed	Maintenance Identified
0406A	• Primed and painted well. • Tried to align holes for security rod.	• Well needs labeled with "A" • Annular seal needs raised above ground surface • No weep hole • Align holes for security rod
0412	• Sample tubing replaced • Primed and painted well • Replaced fence post	• Well not labeled
0413	• Replaced fence post • Primed and painted well • Replaced fence posts	• Annular seal needs raised above ground surface • Well is low to the ground and has no pad
0424	• Painted well	• No well pad • No weep hole • May need bollards if property developed
0414B	• Sample tubing replaced • Well and bollards painted	• Well needs labeled • No weep hole
0410	• No maintenance completed.	• Top of well riser is close to ground surface • Wooden bollards are rotted • Annular seal needs raised above ground surface • No weep hole • Well needs primed and painted

Equipment: All monitoring wells are equipped with dedicated downhole and pumphead tubing. All wells were sampled using a peristaltic pump.

Institutional Controls: All gates were appropriately closed and locked during the sampling event. Construction lock replaced on north side of site near well 0412.