LMS/CAN/S01010

Data Validation Package

October 2010
Groundwater and Surface Water Sampling at the Canonsburg, Pennsylvania, Disposal Site

January 2011

U.S. DEPARTMENT OF ENERGY | Legacy Management

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Contents

Sampling Event Summary 1
Sample Location Map, Canonsburg, Pennsylvania, Disposal Site 3
Data Assessment Summary 5
Water Sampling Field Activities Verification Checklist 7
Laboratory Performance Assessment 9
Sampling Quality Control Assessment 14
Certification 16

Attachment 1—Assessment of Anomalous Data

Potential Outliers Report

Attachment 2—Data Presentation

Groundwater Quality Data
Surface Water Quality Data
Static Water Level Data
Hydrograph
Time-Concentration Graphs

Attachment 3—Sampling and Analysis Work Order

Attachment 4—Trip Report

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Sampling Event Summary

Site: Canonsburg, Pennsylvania, Disposal Site

Sampling Period: October 20, 2010

Five groundwater samples and one surface water sample were collected at the Canonsburg, Pennsylvania, Disposal Site to demonstrate compliance with standards as set forth in the 2000 *Ground Water Compliance Action Plan for the Canonsburg, Pennsylvania, UMTRA Project Site.* Water levels were measured at each sampled well. Sampling and analysis were conducted as specified in *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites* (LMS/PLN/S04351, continually updated). One duplicate sample was collected from location 0412.

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 the point-of-compliance wells 0412, 0413, and 0414B, nor was the ACL exceeded at surface location 0602.

Michele L. Miller
2011.01.05 10:13:36 -05'00'

Michele Miller
Site Lead, S.M. Stoller Corporation

Date

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Legend

- WELL TO BE SAMPLED
- SURFACE LOCATION TO BE SAMPLED
- EXISTING WELL
- SITE BOUNDARY

N

0 250 500 Feet

U.S. DEPARTMENT OF ENERGY GRAND JUNCTION, COLORADO	Work Performed by S.M. Stoller Corporation Under DOE Contract No. DE-AM01-07LM00060
Planned Sampling Map Canonsburg, PA, Disposal Site October 2010	
DATE PREPARED: January 4, 2011	FILENAME: S0700700

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Sample Location Map, Canonsburg, Pennsylvania, Disposal Site

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Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	Canonsburg, Pennsylvania	**Date(s) of Water Sampling**	October 20, 2010
Date(s) of Verification	December 15, 2010	**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 14, 2010.
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?	NA	Calibration data were not available for review.
4. Was an operational check of the field equipment conducted daily?	NA	
Did the operational checks meet criteria?	NA	
5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified?	Yes	
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?	No	Well 0414B did not meet water level criteria, data are qualified as Category II.
Did pH, specific conductance, and turbidity measurements stabilize prior to sampling?	Yes	
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 0412.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with non-dedicated equipment?	NA	All samples were collected with new, or dedicated, tubing.
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 2817 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?	NA	Sample cooling was not required.
20. Were water levels measured at the locations specified in the planning documents?	Yes	

Laboratory Performance Assessment

General Information

Report Number (RIN): 10103380
Sample Event: October 20, 2010
Site(s): Canonsburg, Pennsylvania
Laboratory: ALS Laboratory Group, Fort Collins, Colorado
Work Order No.: 1010332
Analysis: Metals
Validator: Steve Donivan
Review Date: December 15, 2010

This validation was performed according to the *Environmental Procedures Catalog* (LMS/PRO/S04325, continually updated), "Standard Practice for Validation of Laboratory Data." 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 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
Manganese, Uranium	LMM-02	SW-846 3005A	SW-846 6020

Sample Shipping/Receiving

ALS Laboratory Group, Fort Collins, Colorado, received seven water samples on October 22, 2010, accompanied by a Chain of Custody form. The Chain of Custody 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 at ambient temperature 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

None of the analytical results required qualification.

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 6020
Calibrations for manganese and uranium were performed November 11, 2010. The initial calibrations were performed using six calibration standards resulting in calibration curves with correlation coefficient 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 continuing calibration verification checks were made at the required frequency resulting in five verification checks. All initial and continuing calibration verification results were within the acceptance range. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curves near the practical quantitation limit (PQL). 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 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 method detection limits.

Inductively Coupled Plasma Interference Check Sample Analysis

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 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

Laboratory replicate analyses are used to determine laboratory precision for each sample matrix. The relative percent difference for replicate results that are greater than 5 times the PQL should be less than 20 percent. For results less than 5 times the PQL, the range should be no greater than the PQL. The replicate results met these criteria demonstrating 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 laboratory control sample results were acceptable.

Metals Serial Dilution

Serial dilutions were performed during the metals analysis to monitor physical or chemical interferences that may exist in the sample matrix. A serial dilution was prepared and analyzed for manganese and uranium with acceptable results.

Detection Limits/Dilutions

Samples were diluted in a consistent and acceptable manner when required. The required detection limits were achieved.

Completeness

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

Electronic Data Deliverable (EDD) File

The EDD file arrived on November 24, 2010. 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: 10103380 Lab Code: PAR Validator: Steve Donivan Validation Date: 12/15/2010

Project: Canonsburg Analysis Type: ☑ Metals ☐ General Chem ☐ Rad ☐ Organics

# of Samples: 7 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: 10103380 **Lab Code:** PAR **Date Due:** 11/19/2010

Matrix: Water **Site Code:** CAN01 **Date Completed:** 11/29/2010

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								
Manganese	11/11/2010	0.0000	1.0000	OK	OK	OK	OK	OK	99.0	104.0	97.0	5.0	103.0	10.0	113.0
Manganese	11/11/2010											4.0			106.0
Uranium	11/11/2010	0.0000	1.0000	OK	OK	OK	OK	OK	96.0	103.0	95.0	8.0	99.0		110.0
Uranium	11/11/2010														105.0

Sampling Quality Control Assessment

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

Sampling Protocol

All monitoring 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, 0412, 0413, and 0414B were qualified with a "Q" flag indicating the data are qualitative because these wells are Category II based on water level drawdown.

Equipment Blank Assessment

An equipment blank was not necessary because dedicated or 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. The relative percent difference for duplicate results that are greater than 5 times the PQL should be less than 20 percent. For results less than 5 times the PQL, the range should be no greater than the PQL. A duplicate sample was collected from location 0412. The duplicate results met these criteria, demonstrating acceptable overall precision.

SAMPLE MANAGEMENT SYSTEM

Validation Report: Field Duplicates

RIN: 10103380 Lab Code: PAR Project: Canonsburg Validation Date: 12/15/2010

Duplicate: 2817 Sample: 0412

Analyte	Sample Result	Sample Flag	Sample Error	Sample Dilution	Duplicate Result	Duplicate Flag	Duplicate Error	Duplicate Dilution	RPD	RER	Units
Manganese	23000			1000	22000			1000	4.44		UG/L
Uranium	240			10	220			10	8.70		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 2011.01.05 07:49:53 -07'00'

Steve Donivan — Date

Data Validation Lead: Steve Donivan 2011.01.05 07:50:13 -07'00'

Steve Donivan — Date

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.

Two of the measured pH values were identified as potential outliers. Further review indicated that all of the pH values were suspect, erroneously high or low. The pH probe used during this sampling event was determined to be non-functional prior to the next upcoming event, and taken out of service. The pH values from this sampling event are qualified with an “R” flag as rejected.

Data Validation Outliers Report - Field Parameters Only
Comparison: All Historical Data
Laboratory: Field Measurements
RIN: 10103380
Report Date: 12/16/2010

Site Code	Location Code	Sample ID	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	Statistical Outlier
CAN01	0406A	N001	10/20/2010	Turbidity	6.69		FQ	22		FQ	7.29		FQ	8	0	No
CAN01	0412	N001	10/20/2010	pH	5.4		RFQ	7.81		F	5.91			35	0	No
CAN01	0413	N001	10/20/2010	pH	5.48		RFQ	7.18		FQ	6.42		F	43	0	Yes
CAN01	0414B	N001	10/20/2010	pH	8.76		RFQ	7.69		FQ	6.42		F	6	0	No
CAN01	0602	N001	10/20/2010	pH	10.21		R	8.3		RX	7.14		RX	24	0	Yes

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: 12/16/2010
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
Dissolved Oxygen	mg/L	10/20/2010	N001	5	-	15	1.63		FQ	#		
Oxidation Reduction Potential	mV	10/20/2010	N001	5	-	15	-117.6		FQ	#		
pH	s.u.	10/20/2010	N001	5	-	15	7.4		RFQ	#		
Specific Conductance	umhos /cm	10/20/2010	N001	5	-	15	1643		FQ	#		
Temperature	C	10/20/2010	N001	5	-	15	17.42		FQ	#		
Turbidity	NTU	10/20/2010	N001	5	-	15	6.69		FQ	#		
Uranium	mg/L	10/20/2010	N001	5	-	15	0.0016		FQ	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 12/16/2010
Location: 0412 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Dissolved Oxygen	mg/L	10/20/2010	N001	13.21	-	18.21	2.92		FQ	#		
Manganese	mg/L	10/20/2010	N001	13.21	-	18.21	23		FQ	#	0.018	
Manganese	mg/L	10/20/2010	N002	13.21	-	18.21	22		FQ	#	0.018	
Oxidation Reduction Potential	mV	10/20/2010	N001	13.21	-	18.21	-65.6		FQ	#		
pH	s.u.	10/20/2010	N001	13.21	-	18.21	5.4		RFQ	#		
Specific Conductance	umhos /cm	10/20/2010	N001	13.21	-	18.21	2815		FQ	#		
Temperature	C	10/20/2010	N001	13.21	-	18.21	11.4		FQ	#		
Turbidity	NTU	10/20/2010	N001	13.21	-	18.21	4.16		FQ	#		
Uranium	mg/L	10/20/2010	N001	13.21	-	18.21	0.24		FQ	#	0.000029	
Uranium	mg/L	10/20/2010	N002	13.21	-	18.21	0.22		FQ	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 12/16/2010
Location: 0413 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Dissolved Oxygen	mg/L	10/20/2010	N001	6.05	-	11.05	2.45		FQ	#		
Oxidation Reduction Potential	mV	10/20/2010	N001	6.05	-	11.05	47.4		FQ	#		
pH	s.u.	10/20/2010	N001	6.05	-	11.05	5.48		RFQ	#		
Specific Conductance	umhos /cm	10/20/2010	N001	6.05	-	11.05	770		FQ	#		
Temperature	C	10/20/2010	N001	6.05	-	11.05	11.95		FQ	#		
Turbidity	NTU	10/20/2010	N001	6.05	-	11.05	9.66		FQ	#		
Uranium	mg/L	10/20/2010	N001	6.05	-	11.05	0.2		FQ	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 12/16/2010
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
Dissolved Oxygen	mg/L	10/20/2010	N001	-	2.27		FQ	#		
Oxidation Reduction Potential	mV	10/20/2010	N001	-	20		FQ	#		
pH	s.u.	10/20/2010	N001	-	8.76		RFQ	#		
Specific Conductance	umhos /cm	10/20/2010	N001	-	623		FQ	#		
Temperature	C	10/20/2010	N001	-	13.79		FQ	#		
Turbidity	NTU	10/20/2010	N001	-	9.6		FQ	#		
Uranium	mg/L	10/20/2010	N001	-	0.0028		FQ	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 12/16/2010
Location: 0424 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Dissolved Oxygen	mg/L	10/20/2010	N001	7.58	-	12.58	1.11		F	#		
Oxidation Reduction Potential	mV	10/20/2010	N001	7.58	-	12.58	-29.2		F	#		
pH	s.u.	10/20/2010	N001	7.58	-	12.58	8.02		RF	#		
Specific Conductance	umhos /cm	10/20/2010	N001	7.58	-	12.58	1592		F	#		
Temperature	C	10/20/2010	N001	7.58	-	12.58	15.53		F	#		
Turbidity	NTU	10/20/2010	N001	7.58	-	12.58	7.55		F	#		
Uranium	mg/L	10/20/2010	N001	7.58	-	12.58	0.00005	B	F	#	0.000029	

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.

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.

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Surface Water Quality Data

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Surface Water Quality Data by Location (USEE102) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 12/16/2010
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
Dissolved Oxygen	mg/L	10/20/2010	N001	13.49			#		
Manganese	mg/L	10/20/2010	N001	0.054			#	0.00018	
Oxidation Reduction Potential	mV	10/20/2010	N001	3.2			#		
pH	s.u.	10/20/2010	N001	10.21		R	#		
Specific Conductance	umhos/cm	10/20/2010	N001	867			#		
Temperature	C	10/20/2010	N001	12			#		
Turbidity	NTU	10/20/2010	N001	5.25			#		
Uranium	mg/L	10/20/2010	N001	0.00034			#	0.000029	

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.

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Static Water Level Data

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STATIC WATER LEVELS (USEE700) FOR SITE CAN01, Canonsburg Disposal Site
REPORT DATE: 12/16/2010

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)
0406A		941.26	10/20/2010	10:45:24	9.96	931.3
0412	O	949.7	10/20/2010	09:50:21	15.9	933.8
0413	O	940.36	10/20/2010	09:10:07	9.04	931.32
0414B		943.65	10/20/2010	11:28:43	10.99	932.66
0424	C	942.25	10/20/2010	13:06:44	14.46	927.79

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

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Hydrograph

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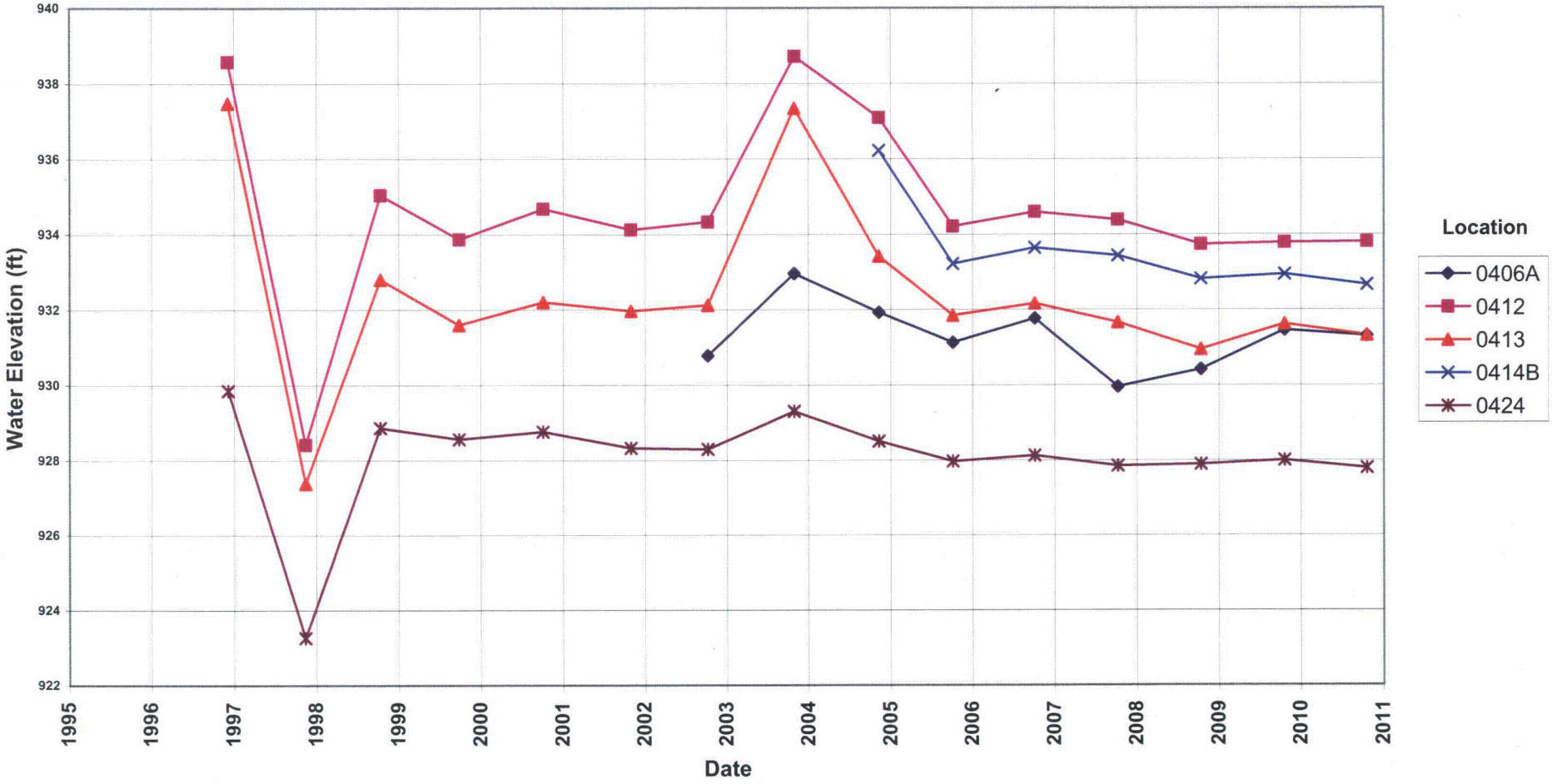
Canonsburg Disposal Site
Hydrograph



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Time-Concentration Graphs

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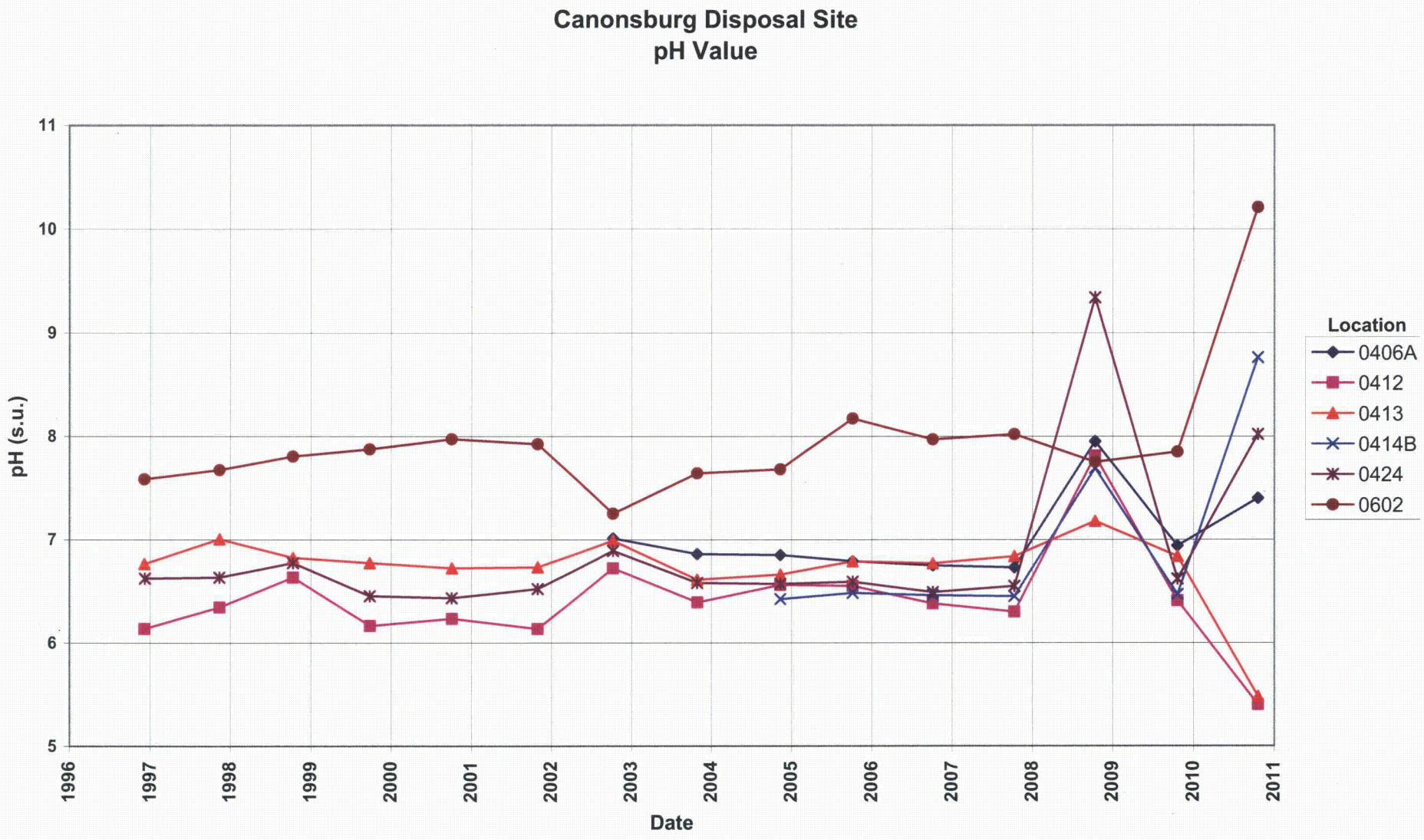
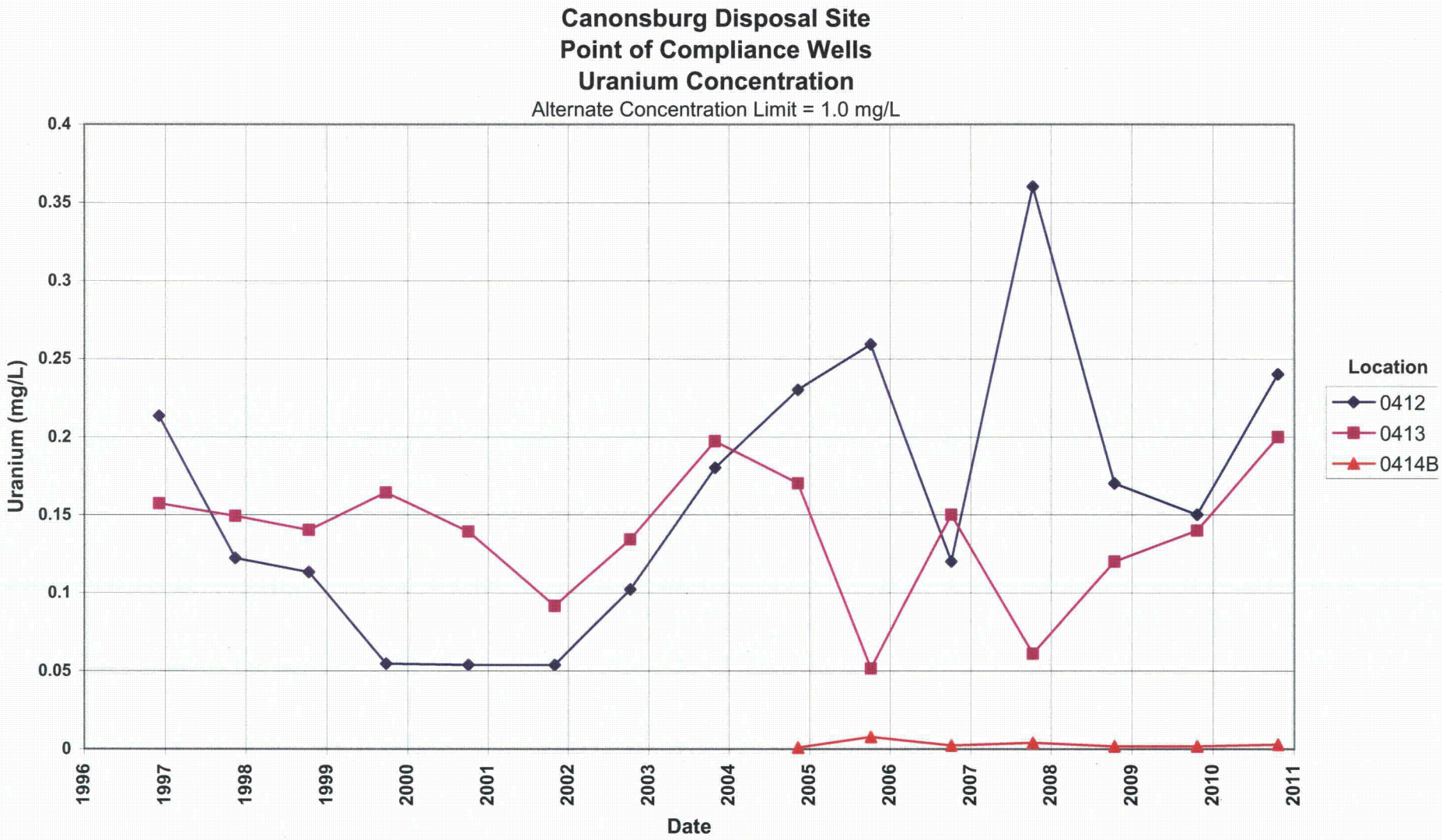
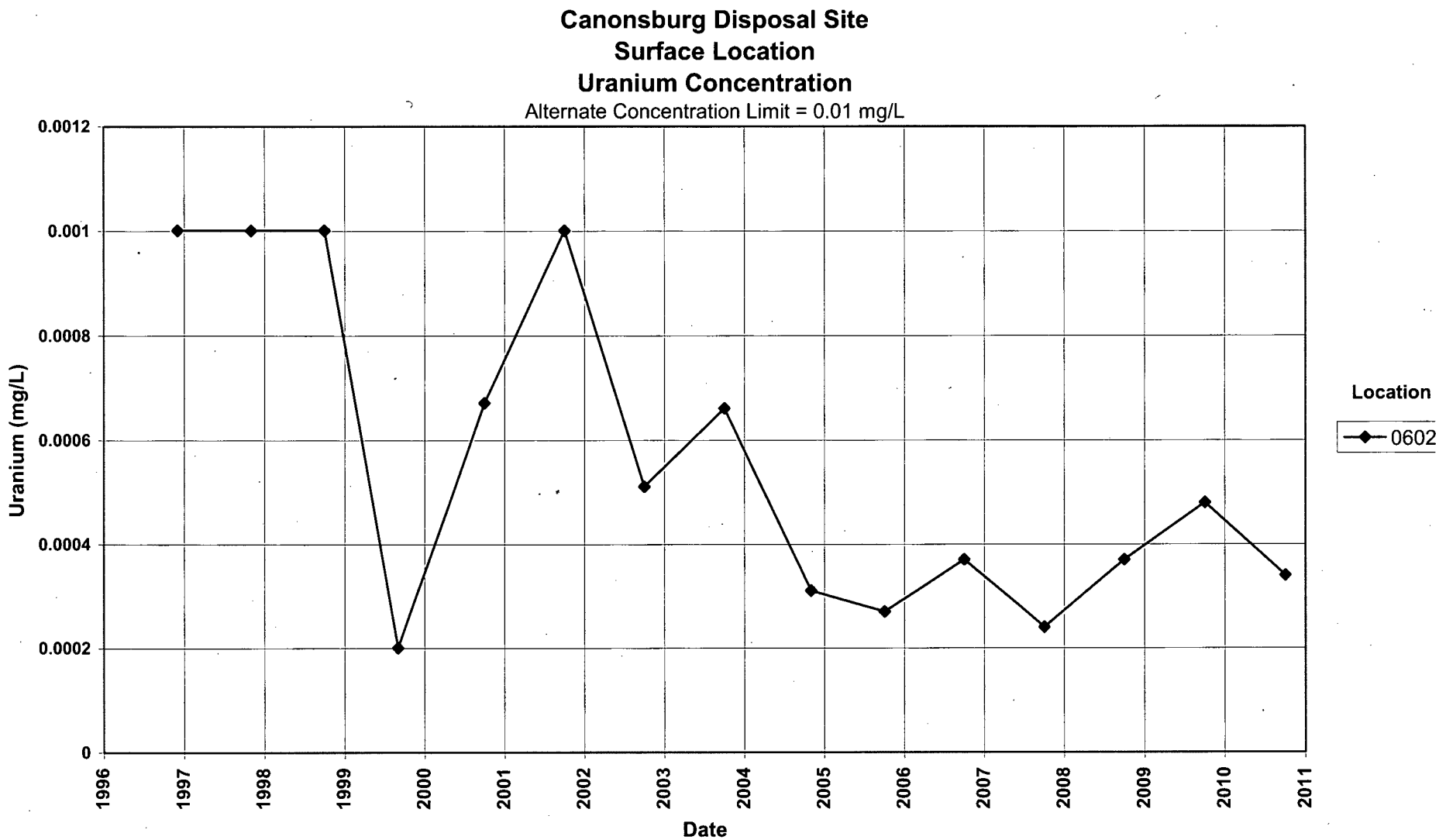

Canonsburg Disposal Site
pH Value
pH (s.u.)
11
10
9
8
7
6
5
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Date
Location
0406A
0412
0413
0414B
0424
0602


Canonsburg Disposal Site
Point of Compliance Wells
Uranium Concentration
Alternate Concentration Limit = 1.0 mg/L
Uranium (mg/L)
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Date
Location
0412
0413
0414B


Canonsburg Disposal Site
Surface Location
Uranium Concentration
Alternate Concentration Limit = 0.01 mg/L
Uranium (mg/L)
0.0012
0.001
0.0008
0.0006
0.0004
0.0002
0
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Date
Location
0602

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Attachment 3
Sampling and Analysis Work Order

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Task Order LM00-501
Control Number 10-0930

September 14, 2010

U.S. Department of Energy
Office of Legacy Management
ATTN: Cliff Carpenter
Site Manager
99 Research Park Rd.
Morgantown, WV 26505

SUBJECT: Contract No. DE-AM01-07LM00060, S.M. Stoller Corporation (Stoller) October 2010 Environmental Sampling at Canonsburg, Pennsylvania

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

Dear Mr. Carpenter:

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 at the Canonsburg Disposal site. Water quality data will be collected from this site as part of the environmental sampling currently scheduled to begin the week of October 18, 2010.

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

Monitoring Wells*
406A Um 412 Um 413 Um 414B Nr 424 Um

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

Surface Locations*
602

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 B¾ Road Grand Junction, CO 81503 (970) 248-6000 Fax: (970) 248-6040

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

Sincerely,

Michele L. Miller
2010.09.13 20:34:25
-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

Sampling Frequencies for Locations at Canonsburg, Pennsylvania

Location ID	Quarterly	Semiannually	Annually	Biennially	Not Sampled	Notes
Monitoring Wells						
0406A			X			
0412			X			
0413			X			
0414B			X			
0424			X			
Surface Locations						
0602			X			

Sampling conducted in October
Based on LTSP dated 2008

Constituent Sampling Breakdown

Site	Canonsburg				
Analyte	**Groundwater**	**Surface Water**	**Required Detection Limit (mg/L)**	**Analytical Method**	**Line Item Code**
Approx. No. Samples/yr	5	1			
Field Measurements					
Alkalinity	X	X			
Dissolved Oxygen	X	X			
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					
Chloride					
Chromium					
Gross Alpha					
Gross Beta					
Iron					
Lead					
Magnesium					
Manganese					
Molybdenum					
Nickel					
Nickel-63					
Nitrate + Nitrite as N (NO3+NO2)-N					
Potassium					
Radium-226					
Radium-228					
Selenium					
Silica					
Sodium					
Strontium					
Sulfate					
Sulfide					
Total Dissolved Solids					
Total Organic Carbon					
Uranium	X	X	0.0001	SW-846 6020	LMM-02
Vanadium					
Zinc					
Total No. of Analytes	1	1			

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

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Memorandum

DATE: December 2, 2010

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

FROM: Karen Voisard

SUBJECT: Trip Report for Canonsburg, Pennsylvania October 2010 Annual Sampling

Date of Sampling Event: October 20, 2010

Team Members: Mike Stott, Henry Becker

Number of Locations Sampled: A total of six locations were sampled (five monitoring wells and one surface water location). One duplicate sample was collected from monitoring well 0412.

Locations Not Sampled/Reason: Well 0410; not scheduled for sampling.

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
ILU 651	0406A	10/20/10	CAT II	N/A	9.96
ILU 655	0424	10/20/10	CAT I	N/A	12.51
ILU 652	0412	10/20/10	CAT II	Duplicate Collected	15.90
ILU 653	0413	10/20/10	CAT II	N/A	9.04
ILU654	0414B	10/20/10	CAT I	N/A	10.99
ILU 657	0602	10/20/10	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 ALS Laboratory Group, Fort Collins, CO, on October 21st, 2010.

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

False ID	True ID	Sample Type	Ticket Number
2817	0412	Duplicate	ILU 656

Requisition Numbers Assigned: All samples were assigned to requisition identification number (RIN) 10103380.

Well Maintenance: An inspection of all existing wells and their surroundings was conducted on October 19th, 2010. Several well maintenance issues were noted during this sampling round. None of these maintenance items were resolved during this sampling round. The following table summarizes the well maintenance items noted during this trip.

Well Number	Maintenance Concern
0406A	No drain hole observed in protective casing above ground surface Annular seal is not flush with surface One bollard has been struck and knocked off plumb 20-25 degrees
0410	Concrete pad is NOT present/visible Well is not painted (orange, or other bright color) No drain hole observed in protective casing above ground surface Annular seal is not flush with surface Guards are wooden and deteriorated
0412	No drain hole observed in protective casing above ground surface Annular seal is not flush with surface
0413	Ground surface near well is sunken No concrete pad No well number installed on protective casing No drain hole observed in protective casing above ground surface Annular seal is not flush with surface
0414B	Ground has settled under pad and it is floating Well casing is movable, compromising surface seal Guard posts are loose in wet soil
0424	No concrete pad No guard posts

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 and after the sampling event. A site inspection was being conducted by the client, site manager, and ecological restoration personnel simultaneous with sampling activities. Loose (wind blown) litter was collected in garbage bags. No evidence of vandalism or tampering was noted by sampling personnel.