

Data Validation Package

May 2012
Groundwater Sampling at the
Sherwood, Washington, Disposal Site

July 2012



U.S. DEPARTMENT OF
ENERGY

Legacy
Management

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Sampling Event Summary

Site: Sherwood, Washington, Disposal Site

Sampling Period: May 18, 2012

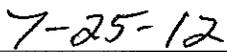
The 2001 *Long-Term Surveillance Plan (LTSP) for the U.S. Department of Energy Sherwood Project (UMTRCA Title II) Reclamation Cell, Wellpinit, Washington*, does not require groundwater compliance monitoring at the Sherwood site. However, the LTSP stipulates limited groundwater monitoring for chloride and sulfate (designated indicator parameters) and total dissolved solids (TDS) as a best management practice.

Samples were collected from the background well, MW-2B, and the two downgradient wells, MW-4 and MW-10, in accordance with the LTSP. Sampling and analysis were conducted as specified in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites (LMS/PLN/S04351, continually updated)*. Water levels were measured in the wells and in four piezometers completed in the tailings dam.

Review of time-concentration graphs included in this report indicate that the chloride, sulfate, and TDS concentrations are consistent with historical measurements. The concentrations in well MW-4, which were high in 2011, have returned to historical levels. The concentrations of chloride and sulfate are well below the State of Washington water quality criteria value of 250 milligrams per liter for both parameters.



David Traub
Site Lead, S.M. Stoller Corporation



Date



Sherwood, Washington, Disposal Site Sample Location Map

Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	<u>Sherwood, Washington</u>	Date(s) of Water Sampling	<u>May 18, 2012</u>
Date(s) of Verification	<u>July 10, 2012</u>	Name of Verifier	<u>Gretchen Baer</u>

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures? List other documents, SOPs, instructions.	<u>Yes</u>	<u>Work Order letter dated May 1, 2012.</u>
2. Were the sampling locations specified in the planning documents sampled?	<u>Yes</u>	<u>Pre-trip calibration was performed on May 14, 2012.</u>
3. Was a pre-trip calibration conducted as specified in the above-named documents?	<u>Yes</u>	<u>Operational checks were performed on May 18, 2012.</u>
4. Was an operational check of the field equipment conducted daily? Did the operational checks meet criteria?	<u>Yes</u> <u>Yes</u>	
5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified?	<u>Yes</u>	
6. Was the category of the well documented?	<u>Yes</u>	
7. Were the following conditions met when purging a Category I well: Was one pump/tubing volume purged prior to sampling? Did the water level stabilize prior to sampling? Did pH, specific conductance, and turbidity measurements stabilize prior to sampling? Was the flow rate less than 500 mL/min? If a portable pump was used, was there a 4-hour delay between pump installation and sampling?	<u>Yes</u> <u>Yes</u> <u>Yes</u> <u>Yes</u> <u>NA</u>	

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 well MW-4.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment?	NA	All samples were collected with dedicated equipment.
11. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
12. Were QC samples assigned a fictitious site identification number? Was the true identity of the samples recorded on the Quality Assurance Sample Log or in the Field Data Collection System (FDCS) report?	Yes	Location ID 2100 was used for the duplicate sample.
Was the true identity of the samples recorded on the Quality Assurance Sample Log or in the Field Data Collection System (FDCS) report?	Yes	
13. Were samples collected in the containers specified?	Yes	
14. Were samples filtered and preserved as specified?	Yes	
15. Were the number and types of samples collected as specified?	Yes	
16. Were chain of custody records completed and was sample custody maintained?	Yes	
17. Are field data sheets signed and dated by both team members (hardcopies) or are dates present for the "Date Signed" fields (FDCS)?	Yes	
18. Was all other pertinent information documented on the field data sheets?	Yes	
19. Was the presence or absence of ice in the cooler documented at every sample location?	Yes	
20. Were water levels measured at the locations specified in the planning documents?	Yes	

Laboratory Performance Assessment

General Information

Requisition No. (RIN): 12054531
Sample Event: May 18, 2012
Site(s): Sherwood, Washington
Laboratory: ALS Laboratory Group, Fort Collins, Colorado
Work Order No.: 1205313
Analysis: Inorganics
Validator: Gretchen Baer
Review Date: July 10, 2012

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 samples were 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
Chloride, Cl	MIS-A-039	SW-846 9056	SW-846 9056
Sulfate, SO ₄	MIS-A-044	SW-846 9056	SW-846 9056
Total Dissolved Solids, TDS	WCH-A-033	MCAWW 160.1	MCAWW 160.1

Data Qualifier Summary

None of the analytical results required qualification.

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received four samples on May 19, 2012, accompanied by a Chain of Custody form. The Chain of Custody was checked to confirm that all of the samples were listed with sample collection dates and times, and that signatures and dates were present indicating sample relinquishment and receipt. The Chain of Custody was complete with no errors or omissions. A copy of the air bill was included in the receiving documentation.

Preservation and Holding Times

The sample shipment was received intact with the temperature inside the iced cooler at 1.2 °C, which complies with requirements. All samples were received in the correct container types and had been preserved correctly for the requested analyses. All samples were analyzed within the applicable holding times.

Detection and Quantitation Limits

The method detection limit (MDL) was reported for all analytes as required. The MDL, as defined in 40 CFR 136, is the minimum concentration of an analyte that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero. The practical quantitation limit (PQL) for these analytes is the lowest concentration that can be reliably measured, and is defined as 5 times the MDL. The reported MDLs for all analytes demonstrate compliance with contractual requirements.

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. 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. All calibration and laboratory spike standards were prepared from independent sources.

Method MCAWW 160.1, Total Dissolved Solids

There are no initial or continuing calibration requirements associated with the determination of TDS.

Method SW-846 9056, Chloride and Sulfate

Initial calibrations were performed using five calibration standards on April 12 and May 30, 2012. The correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 3 times the MDL. Initial and continuing calibration checks were made at the required frequency resulting in 11 calibration checks. The calibration checks met the acceptance criteria.

Method and Calibration Blanks

Method blanks are analyzed to assess any contamination that may have occurred during sample preparation. Calibration blanks are analyzed to assess instrument contamination prior to and during sample analysis. All method blank and calibration blank results were below the MDL for all analytes.

Matrix Spike Analysis

Matrix spike (MS) samples are used to measure method performance in the sample matrix. The spike 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 that are 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 Sample

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. All control sample results were acceptable.

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 ion chromatography data. There were no manual integrations performed and all peak integrations were satisfactory.

Electronic Data Deliverable File

The electronic data deliverable (EDD) file arrived on June 18, 2012. 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: 12054531 Lab Code: PAR Validator: Gretchen Baer Validation Date: 7/10/2012
Project: Sherwood Analysis Type: Metals General Chem Rad Organics
of Samples: 4 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
- Detection Limits
- Field/Trip Blanks
- Field Duplicates

All analyses were completed within the applicable holding times.

The reported detection limits are equal to or below contract requirements.

There was 1 duplicate evaluated.

SAMPLE MANAGEMENT SYSTEM

Wet Chemistry Data Validation Worksheet

RIN: 12054531

Lab Code: PARDate Due: 6/16/2012Matrix: WaterSite Code: SHEDate Completed: 6/18/2012

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	04/12/2012	-0.089	1.0000	OK		OK							
CHLORIDE	05/24/2012						OK	91.00					
CHLORIDE	05/25/2012				OK		OK		98.0				
CHLORIDE	05/30/2012	-0.033	1.0000	OK		OK							
SULFATE	04/12/2012	0.316	1.0000	OK		OK							
SULFATE	05/24/2012						OK	94.00					
SULFATE	05/25/2012				OK		OK		98.0				
SULFATE	05/30/2012	0.448	0.9999	OK		OK							
TOTAL DISSOLVED SOLIDS	05/23/2012						OK	104.00			1.00		

Sampling Quality Control Assessment

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

Sampling Protocol

Sample results for all monitoring wells met the Category I or II low-flow sampling criteria and were qualified with an “F” flag in the database, indicating the wells were purged and sampled using the low-flow sampling method. The groundwater sample results for wells MW-2B and MW-4 were further qualified with a “Q” flag in the database indicating the data are considered qualitative because these are Category II wells.

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 that are less than 5 times the PQL, the range should be no greater than the PQL. A duplicate sample was collected from location MW-4. The duplicate results met the criteria, demonstrating acceptable overall precision.

SAMPLE MANAGEMENT SYSTEM
Validation Report: Field Duplicates

Page 1 of 1

RIN: 12054531 Lab Code: PAR Project: Sherwood Validation Date: 7/10/2012

Duplicate: 2100

Sample: MW-4

Analyte	Sample				Duplicate				RPD	RER	Units
	Result	Flag	Error	Dilution	Result	Flag	Error	Dilution			
CHLORIDE	1.3			1	1.1			1	16.67		MG/L
SULFATE	18			1	17			1	5.71		MG/L
TOTAL DISSOLVED SOLIDS	300			1	310			1	3.28		MG/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 7-25-2012
Steve Donivan Date

Data Validation Lead: Gretchen Baer 7/24/12
Gretchen Baer 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.

No values from this sampling event were identified as potential outliers.

Data Validation Outliers Report - No Field Parameters

Comparison: All Historical Data

Laboratory: ALS Laboratory Group

RIN: 12054531

Report Date: 7/10/2012

Site Code	Location Code	Sample ID	Sample Date	Analyte	Current			Historical Maximum			Historical Minimum			Number of Data Points		Statistical Outlier
					Result	Qualifiers		Result	Qualifiers		Result	Qualifiers		N	N Below Detect	
						Lab	Data		Lab	Data		Lab	Data			
SHE01	MW-2B	N001	05/18/2012	Chloride	2.6		FQ	2.3		FQ	0.56		FQ	18	0	No
SHE01	MW-4	N001	05/18/2012	Total Dissolved Solids	300		FQ	990		FQ	330		FQ	12	0	No
SHE01	MW-4	N002	05/18/2012	Total Dissolved Solids	310		FQ	990		FQ	330		FQ	12	0	No

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 SHE01, Sherwood Disposal Site

REPORT DATE: 7/11/2012

Location: MW-10 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Chloride	mg/L	05/18/2012	N001	224 - 234	2.1		F	#	0.2	
Oxidation Reduction Potential	mV	05/18/2012	N001	224 - 234	93		F	#		
pH	s.u.	05/18/2012	N001	224 - 234	7.14		F	#		
Specific Conductance	umhos/cm	05/18/2012	N001	224 - 234	1031		F	#		
Sulfate	mg/L	05/18/2012	N001	224 - 234	27		F	#	0.5	
Temperature	C	05/18/2012	N001	224 - 234	14.19		F	#		
Total Dissolved Solids	mg/L	05/18/2012	N001	224 - 234	590		F	#	40	
Turbidity	NTU	05/18/2012	N001	224 - 234	1.4		F	#		

Groundwater Quality Data by Location (USEE100) FOR SITE SHE01, Sherwood Disposal Site

REPORT DATE: 7/11/2012

Location: MW-2B WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID			Lab	Data QA		
Chloride	mg/L	05/18/2012	N001	47.4 - 57.4	2.6		FQ #	0.2	
Oxidation Reduction Potential	mV	05/18/2012	N001	47.4 - 57.4	188		FQ #		
pH	s.u.	05/18/2012	N001	47.4 - 57.4	6.59		FQ #		
Specific Conductance	umhos/cm	05/18/2012	N001	47.4 - 57.4	211		FQ #		
Sulfate	mg/L	05/18/2012	N001	47.4 - 57.4	4		FQ #	0.5	
Temperature	C	05/18/2012	N001	47.4 - 57.4	11.54		FQ #		
Total Dissolved Solids	mg/L	05/18/2012	N001	47.4 - 57.4	180		FQ #	20	
Turbidity	NTU	05/18/2012	N001	47.4 - 57.4	0.71		FQ #		

Groundwater Quality Data by Location (USEE100) FOR SITE SHE01, Sherwood Disposal Site

REPORT DATE: 7/11/2012

Location: MW-4 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Lab	Qualifiers		Detection Limit	Uncertainty
		Date	ID				Data	QA		
Chloride	mg/L	05/18/2012	N001	184 - 197.5	1.3		FQ	#	0.2	
Chloride	mg/L	05/18/2012	N002	184 - 197.5	1.1		FQ	#	0.2	
Oxidation Reduction Potential	mV	05/18/2012	N001	184 - 197.5	-33		FQ	#		
pH	s.u.	05/18/2012	N001	184 - 197.5	7.27		FQ	#		
Specific Conductance	umhos/cm	05/18/2012	N001	184 - 197.5	636		FQ	#		
Sulfate	mg/L	05/18/2012	N001	184 - 197.5	18		FQ	#	0.5	
Sulfate	mg/L	05/18/2012	N002	184 - 197.5	17		FQ	#	0.5	
Temperature	C	05/18/2012	N001	184 - 197.5	13.3		FQ	#		
Total Dissolved Solids	mg/L	05/18/2012	N001	184 - 197.5	300		FQ	#	20	
Total Dissolved Solids	mg/L	05/18/2012	N002	184 - 197.5	310		FQ	#	20	
Turbidity	NTU	05/18/2012	N001	184 - 197.5	8.15		FQ	#		

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 SHE01, Sherwood Disposal Site
REPORT DATE: 7/11/2012

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
MW-10		2008.93	05/18/2012	12:30:59	228.65	1780.28	
MW-2B		2116.04	05/18/2012	09:20:50	52.20	2063.84	
MW-4		NA	05/18/2012	11:30:32	238.12	NA	
P1		NA	05/18/2012	11:45:00	22.37	NA	
P2		NA	05/18/2012	11:55:00	61.41	NA	
P3		NA	05/18/2012	12:05:00			D
P4		NA	05/18/2012	12:15:00	22.34	NA	

NA: Not Available

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

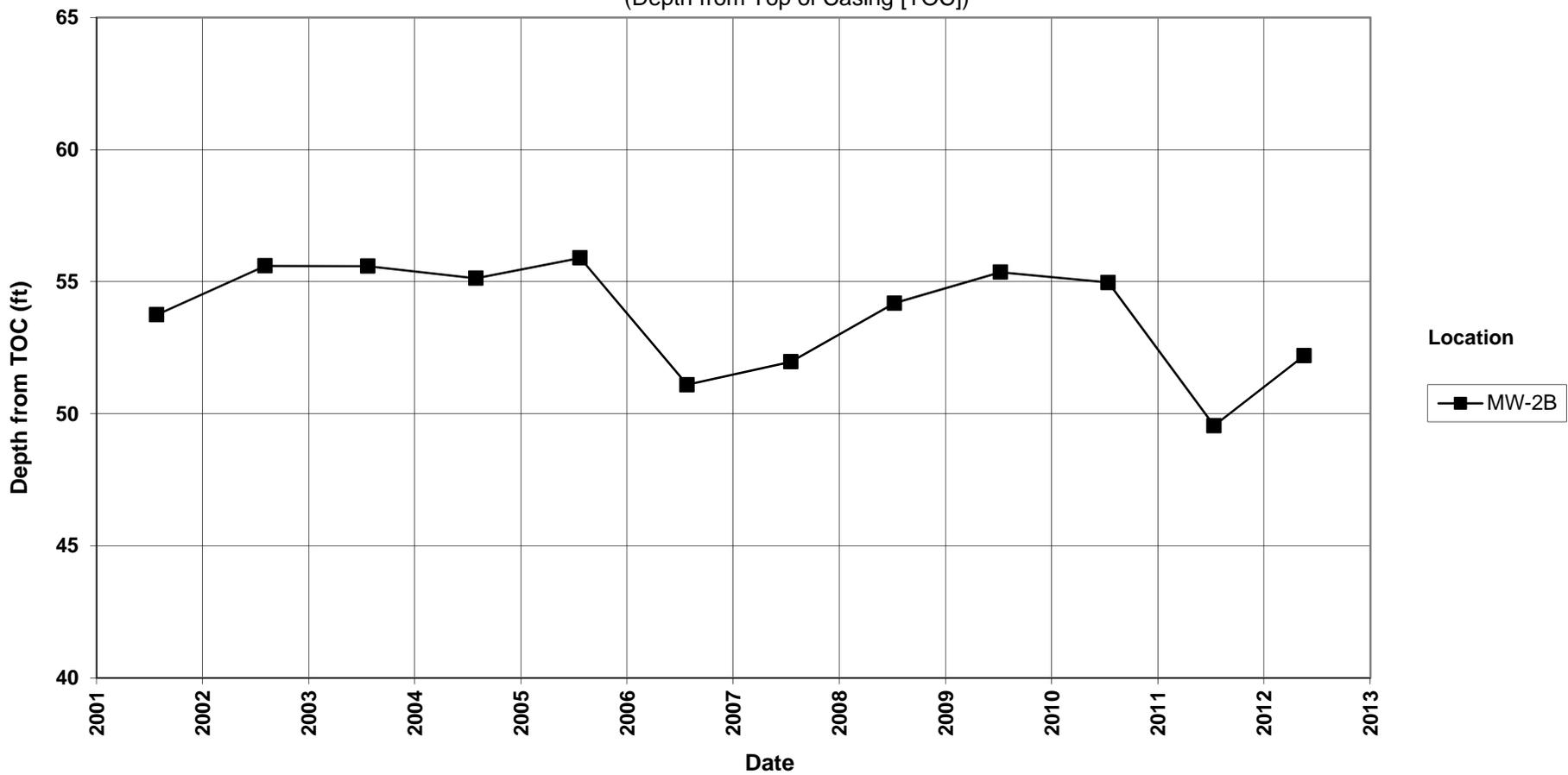
WATER LEVEL FLAGS: D Dry F Flowing B Below top of pump

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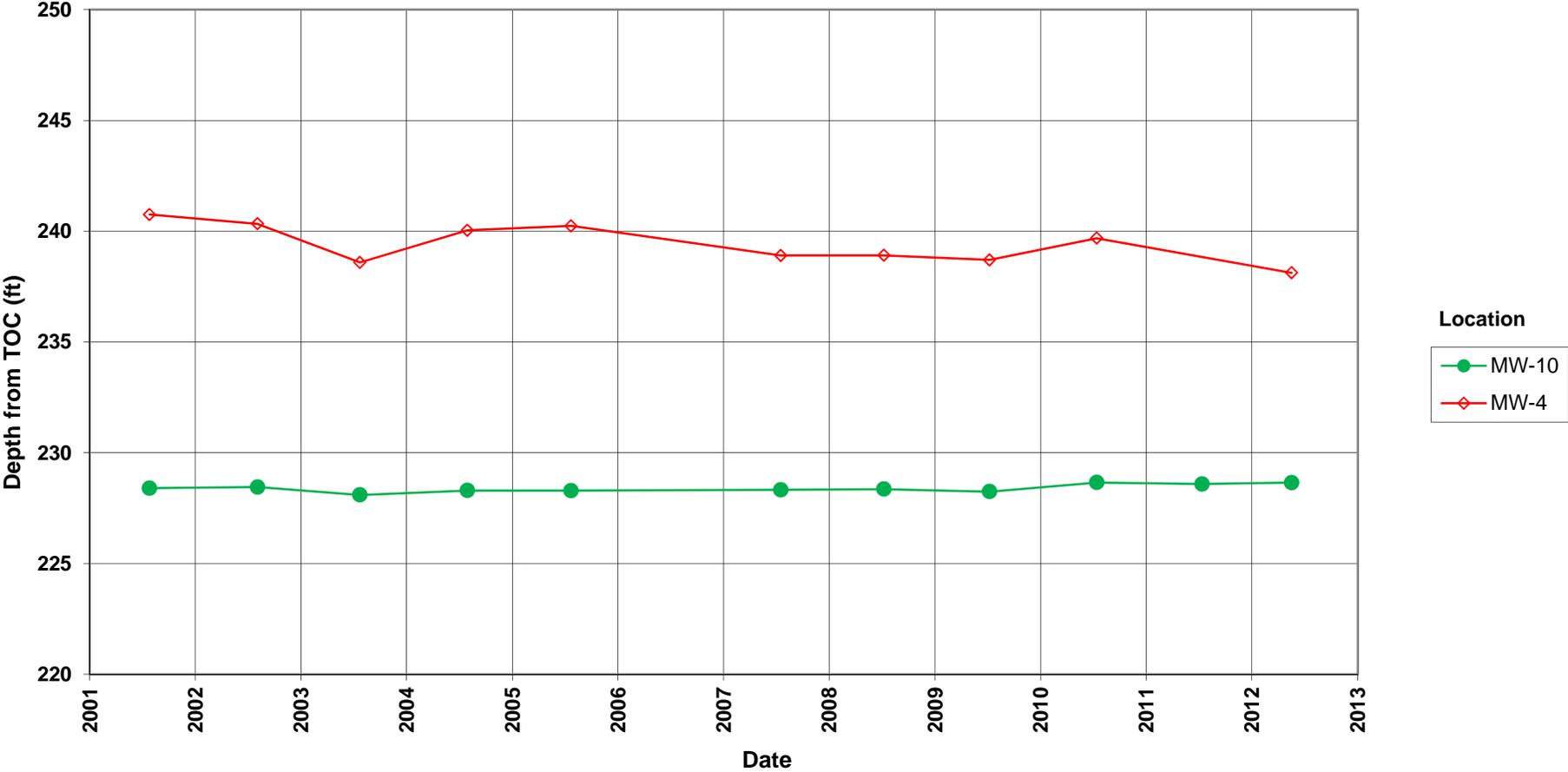
Hydrographs

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Sherwood Disposal Site
Hydrograph
Background Well
(Depth from Top of Casing [TOC])



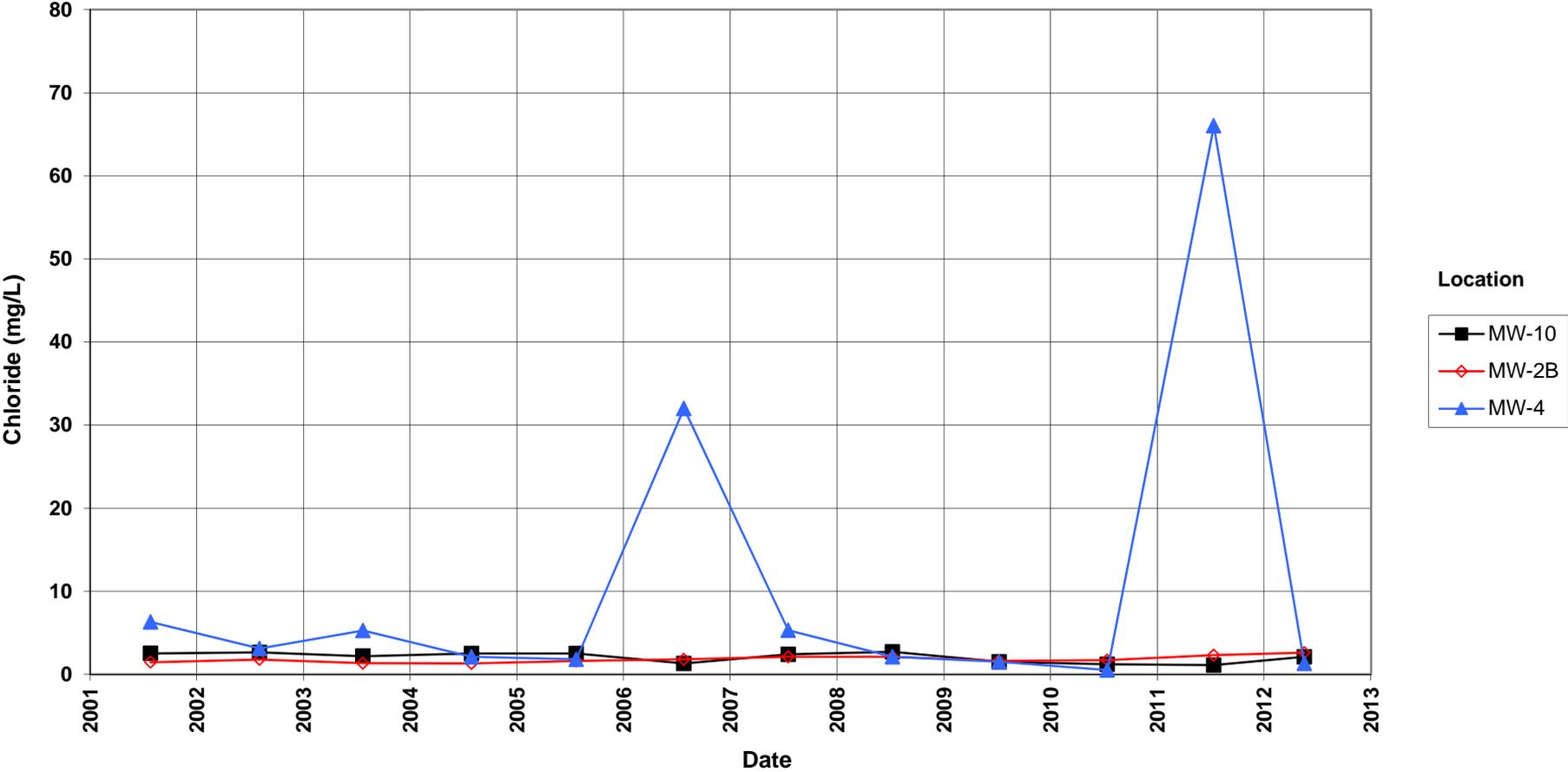
Sherwood Disposal Site
Hydrograph
(Depth from Top of Casing [TOC])



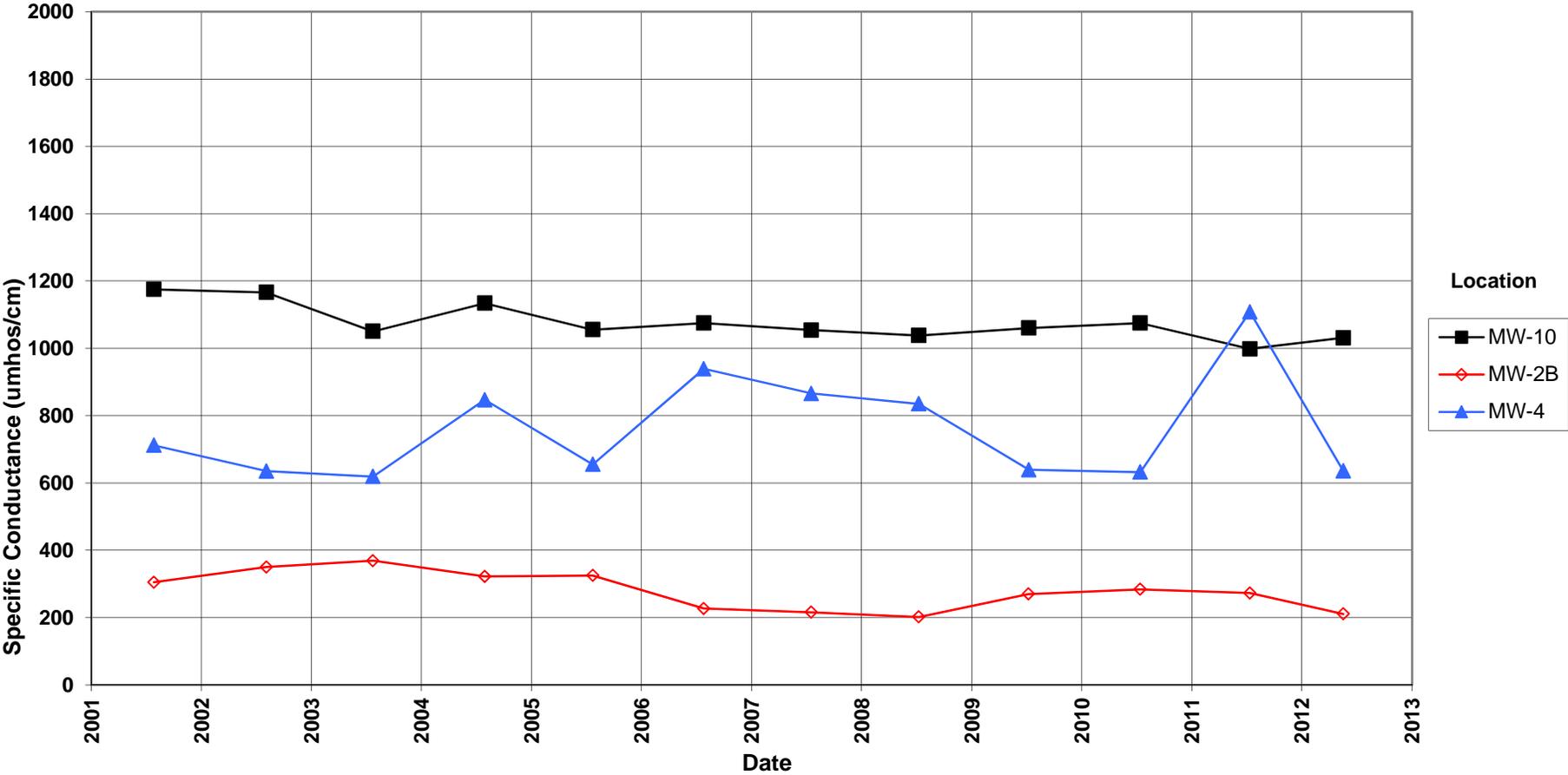
Time-Concentration Graphs

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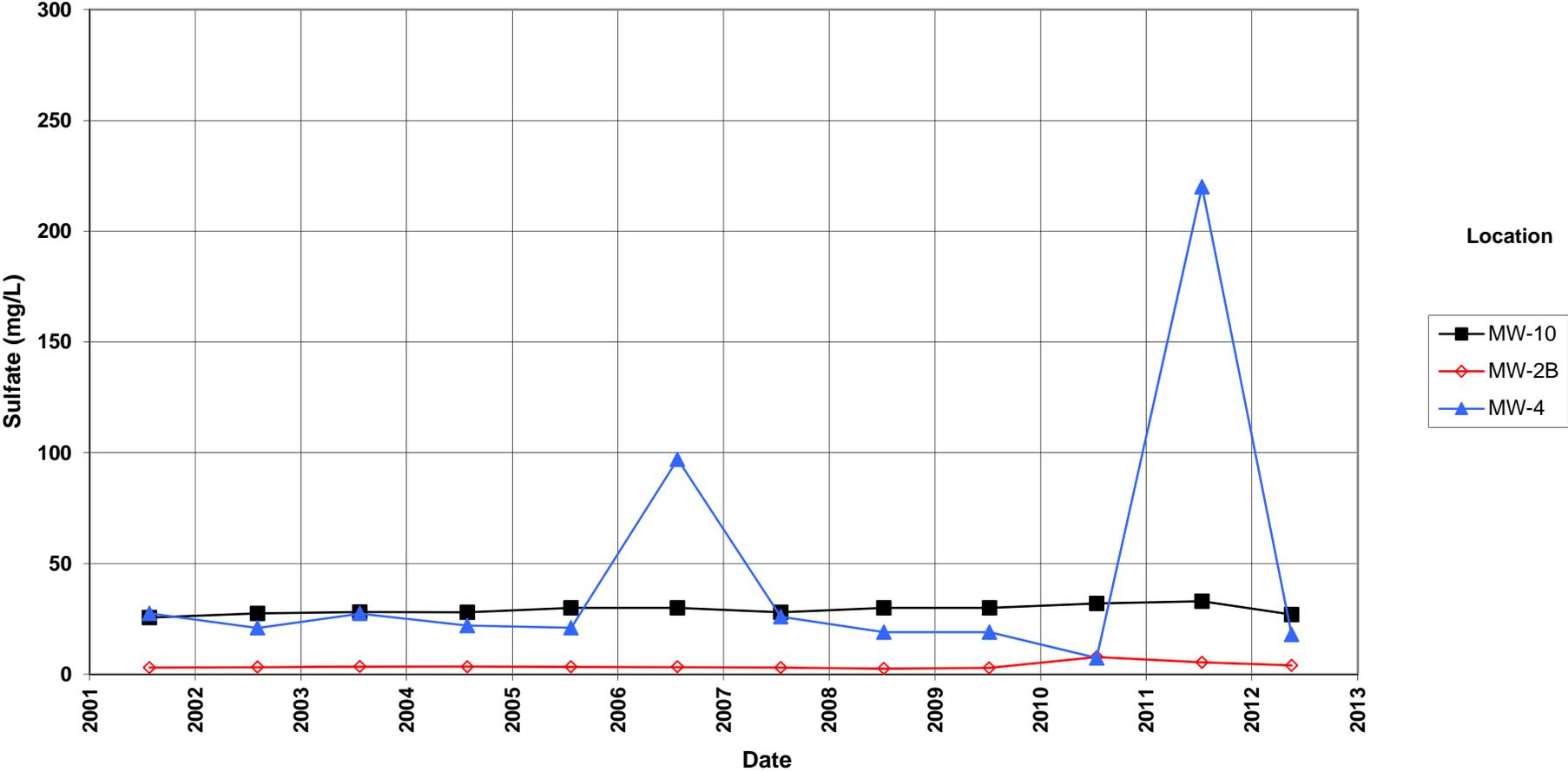
Sherwood Disposal Site Chloride Concentration



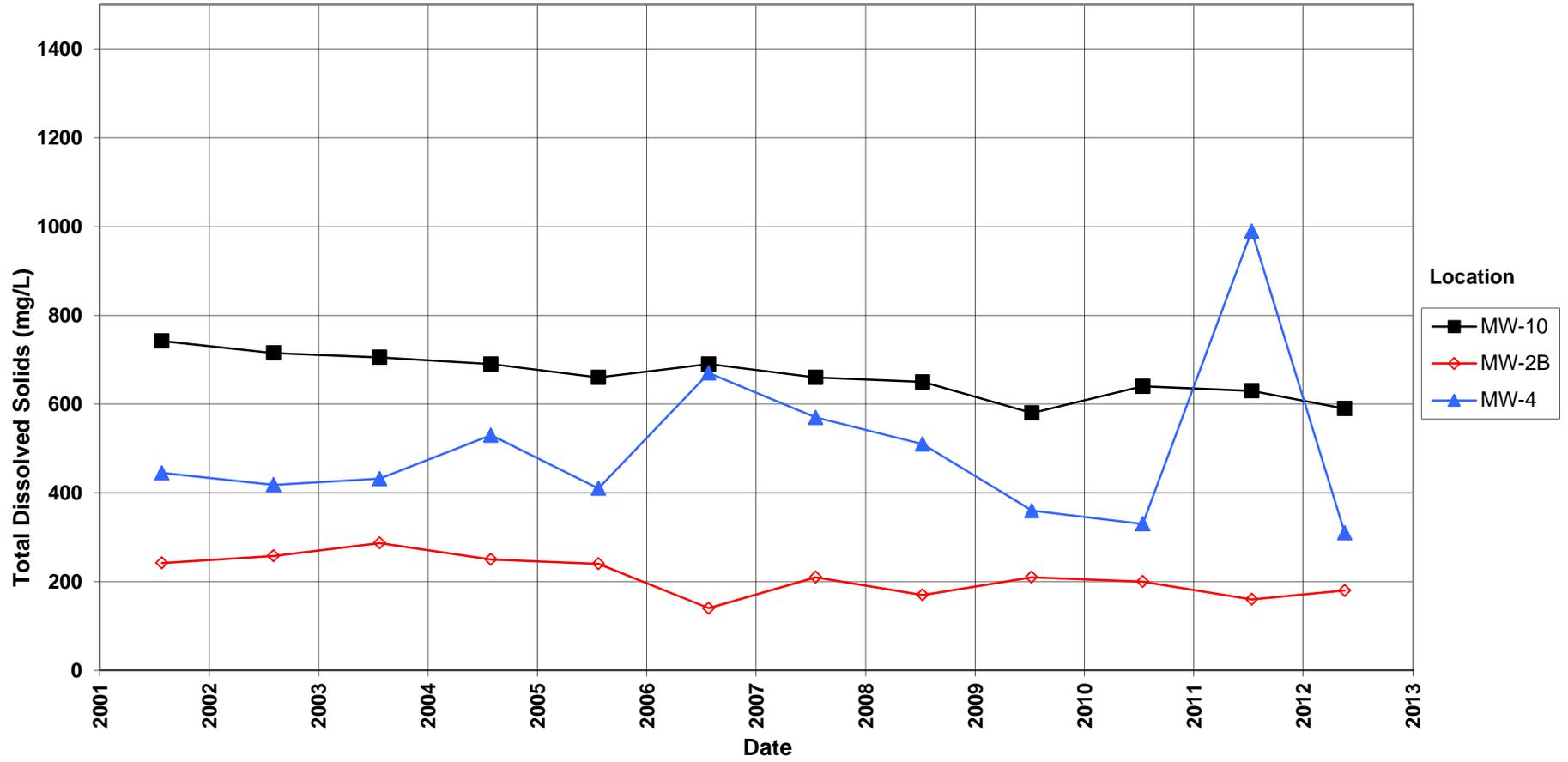
Sherwood Disposal Site Specific Conductance



Sherwood Disposal Site Sulfate Concentration



Sherwood Disposal Site Total Dissolved Solids Concentration



Attachment 3
Sampling and Analysis Work Order

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established 1959

Task Order LM00-501
Control Number 12-0597

May 1, 2012

U.S. Department of Energy
Office of Legacy Management
ATTN: Rich Bush
Site Manager
2597 Legacy Way
Grand Junction, CO 81503

SUBJECT: Contract No. DE-AM01-07LM00060, S.M. Stoller Corporation (Stoller)
May 2012 Environmental Sampling at the Sherwood, Washington, Disposal Site

REFERENCE: Task Order LM00-501-03-221-402, Sherwood, Washington, Disposal Site

Dear Mr. Bush:

The purpose of this letter is to inform you of the upcoming sampling event at the Sherwood, Washington, Disposal Site. Enclosed are the map and tables specifying sample locations and analytes for monitoring at the Sherwood site. Water quality data will be collected at this site as part of the routine environmental sampling currently scheduled to begin the week of May 14, 2012.

The following list shows the locations scheduled to be sampled during this event.

Monitoring Wells

MW-2B MW-4 MW-10

Water levels will be obtained from piezometers P1, P2, P3, and P4.

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.

Please contact me at (970) 248-6557 if you have any questions or concerns.

Sincerely,

David Traub
Site lead

DT/dko

The S.M. Stoller Corporation 2597 Legacy Way Grand Junction, CO 81503 (970) 248-6000 Fax (970) 248-6040

Rich Bush
Control Number 12-0597
Page 2

Enclosures (3)

cc: (electronic)

Karl Stoeckle, DOE
Steve Donovan, Stoller
Bev Gallagher, Stoller
Lauren Goodknight, Stoller
David Traub, Stoller
EDD Delivery
rc-grand.junction
File: SHE 410.02(A)

**Sampling Frequencies for Locations at
Sherwood, Washington**

Location ID	Quarterly	Semiannually	Annually	Biennially	Not Sampled	Notes
Monitoring Wells						
MW-2B			X			
MW-4			X			
MW-10			X			
P1					X	Water level only
P2					X	Water level only
P3					X	Water level only
P4					X	Water level only

Sampling conducted in July

Constituent Sampling Breakdown

Site	Sherwood		Required Detection Limit (mg/L)	Analytical Method	Line Item Code
	Groundwater	Surface Water			
Analyte					
Approx. No. Samples/yr	3	0			
Field Measurements					
Alkalinity					
Dissolved Oxygen					
Redox Potential	X				
pH	X				
Specific Conductance	X				
Turbidity	X				
Temperature	X				
Laboratory Measurements					
Aluminum					
Ammonia as N (NH3-N)					
Calcium					
Chloride	X		0.5	SW-846 9056	MIS-A-039
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	X		0.5	SW-846 9056	MIS-A-044
Sulfide					
Total Dissolved Solids	X		10	SM2540 C	WCH-A-033
Total Organic Carbon					
Uranium					
Vanadium					
Zinc					
Total No. of Analytes	3	0			

Note: 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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Memorandum

DATE: May 23, 2012
 TO: David Traub
 FROM: Gretchen Baer
 SUBJECT: Trip Report

Site: Sherwood, WA

Dates of Sampling Event: May 18, 2012

Team Members: Gretchen Baer and Craig Goodknight

Number of Locations Sampled: Three monitoring wells were sampled for total dissolved solids, chloride, and sulfate. Water levels at the four piezometers on top of the tailings dam were also collected.

Locations Not Sampled/Reason: All scheduled locations were sampled.

Location Specific Information:

Location IDs	Comments
MW-10	Cat I for this event but close to Cat II based on water level drawdown.
MW-2B	Cat II based on water level drawdown. A full equipment volume was purged before sampling.
MW-4	Cat II based on water level drawdown. A full equipment volume was purged before sampling. The specific conductivity slowly dropped even after the minimum purge was collected: a duplicate was collected at this location. The water level of 238.12 ft is consistent with historical levels. The water level taken in July 2011 (230.84 ft) was likely a reading or transcription error because it is 10 ft higher in elevation than all other recorded readings.

Quality Control Sample Cross Reference: The following are the false identifications assigned to the quality control samples.

False ID	Ticket Number	True ID	Sample Type	Associated Matrix
2100	KGT 409	MW-4	Duplicate	Groundwater

Report Identification Number (RIN) Assigned: Samples were assigned to RIN 12054531. Field data sheets can be found in Crow\sms\12054531 in the FieldData folder.

Sample Shipment: Samples were shipped overnight by FedEx to ALS Laboratory Group from Copy Junction, 13015 W 14th Ave., Airway Heights, WA, on May 18, 2012.

Water Level Measurements: Water levels were collected in all three sampled wells and in four piezometers on the tailings dam. A water level data report for these 4 piezometers (SHE01_5222012.pdf) can be found in Crow\sms\FDCS\WATER LEVELS.

Well Inspection Summary: Well inspections were conducted at all sampled wells. All wells were in good condition. Piezometer lid hinges are rusted and hard to open. A hammer or similar tool is necessary to open and close the lids. An assortment of screwdrivers is helpful for reattaching the lock to the lid on piezometer P1.

Field Variance: None. Samples were collected according to the *Sampling and Analysis Plan for U. S. Department of Energy Office of Legacy Management Sites*.

Equipment: All equipment functioned properly. All wells were sampled using the low-flow procedure. Wells were sampled with a dedicated bladder pump. The Field Data Collection System was used to collect data. The times collected are in the PDT time zone.

Regulatory: Nothing to note.

Institutional Controls:

Fences, Gates, and Locks: The gate on Elijah Road (aka Sherwood Mine Road), used to access wells MW-4 and MW-10, was unlocked and open. The gate was left as-is by the samplers.

Signs: A site boundary sign was installed. Tamper-proof nuts were used.



Trespassing/Site Disturbances: Vehicle ruts were observed near piezometer P1.

David Traub
May 23, 2012
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Site Issues: Cell phone service (Verizon) was weak but available at the site. Some horses, but no buffalo, were seen on the cell.

Disposal Cell/Drainage Structure Integrity: Appeared to be acceptable.

Vegetation/Noxious Weed Concerns: There is a significant amount of vegetation growing on the riprap-covered tailings dam face. Many small pine trees are growing around well MW-4. Some small pine trees were removed to enable truck access to that well.

Maintenance Requirements: None observed.

Safety Issues: None.

Access Issues:

- The road leading to well MW-2B is becoming eroded by water runoff, but is still in fair condition.
- During the July 2011 event, it was observed that some power lines south of Elijah Road at the gate are down and are touching the ground. These lines are still down and are obviously not 'live': broken ends of the cables can be seen. The downed lines are not impeding access.

Corrective Action Required/Taken: None.

(GB/lb)

cc: (electronic)
Richard Bush, DOE
Gretchen Baer, Stoller
Steve Donovan, Stoller
David Traub, Stoller
EDD Delivery

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