Data Validation Package

July 2015
Groundwater Sampling at the Sherwood, Washington, Disposal Site

October 2015

U.S. DEPARTMENT OF ENERGY | Legacy Management

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Sampling Event Summary

Site: Sherwood, Washington, Disposal Site

Sampling Period: July 14, 2015

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 analyses were conducted as specified in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites* (LMS/PRO/S04351, continually updated). Water levels were measured in the wells and in four piezometers completed in the tailings dam.

Time-concentration graphs included in this report indicate that the chloride, sulfate, and TDS concentrations are consistent with historical measurements. 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

David Traub, Site Lead
Navarro Research and Engineering, Inc.

10/7/15

Date

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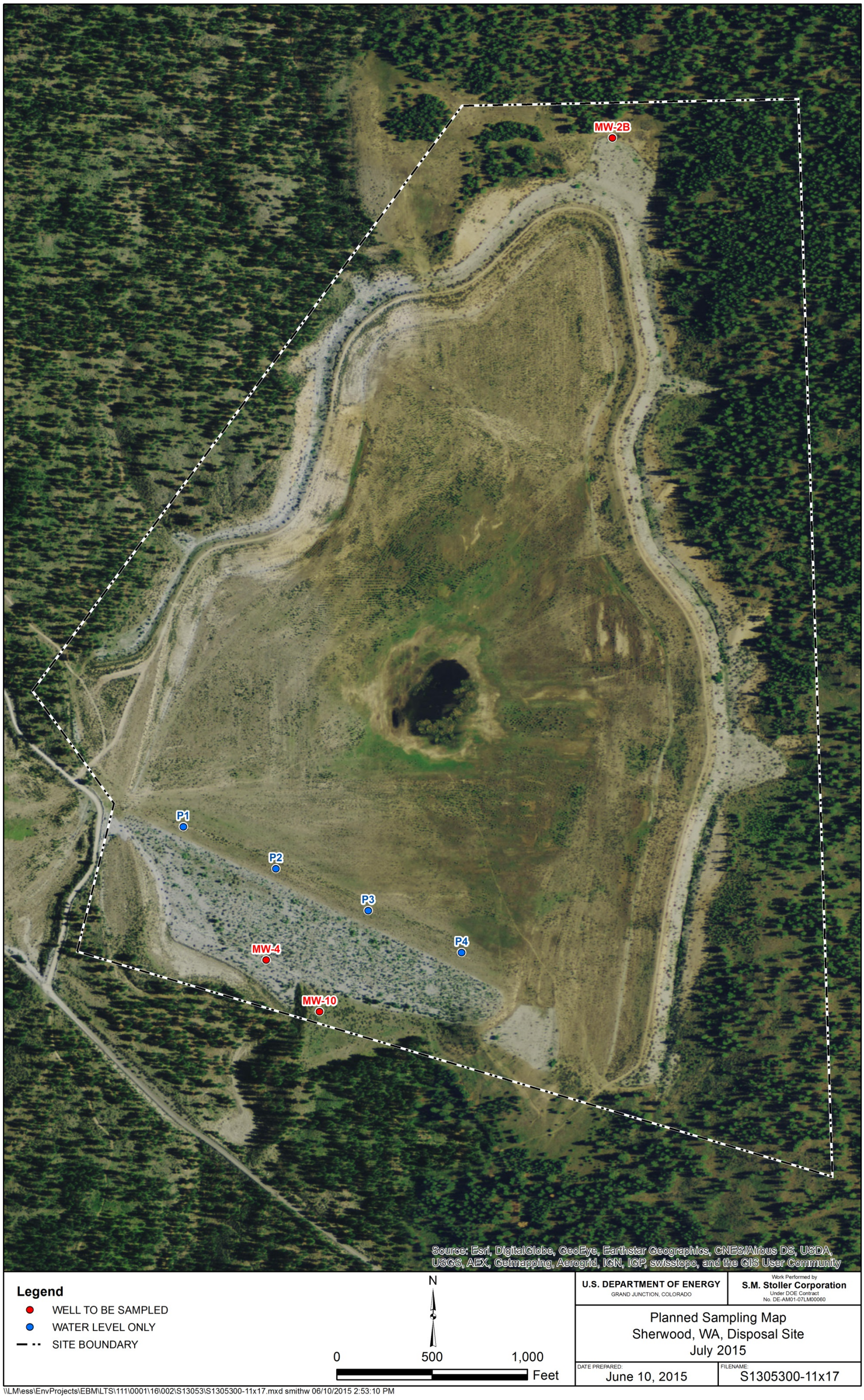

Sherwood, Washington, Disposal Site, Sample Location Map

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Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	Sherwood, Washington	**Date(s) of Water Sampling**	July 14, 2015
Date(s) of Verification	September 24, 2015	**Name of Verifier**	Stephen Donivan

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures?	Yes	
List any Program Directives or other documents, SOPs, instructions.		Work Order letter dated June 16, 2015.
2. Were the sampling locations specified in the planning documents sampled?	Yes	
3. Were calibrations conducted as specified in the above-named documents?	Yes	Calibrations were performed July 10, 2015.
4. Was an operational check of the field equipment conducted daily?	Yes	
Did the operational checks meet criteria?	Yes	
5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified?	Yes	
6. Were wells categorized correctly?	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 meet criteria prior to sampling?	Yes	
Was the flow rate less than 500 mL/min?	Yes	

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-10.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with non-dedicated equipment?	NA	An equipment blank was not required.
11. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
12. Were the true identities of the QC samples documented?	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. Was all pertinent information documented on the field data sheets?	Yes	
18. Was the presence or absence of ice in the cooler documented at every sample location?	Yes	
19. Were water levels measured at the locations specified in the planning documents?	Yes	

Laboratory Performance Assessment

General Information

Requisition No. (RIN):	15077204
Sample Event:	July 14, 2015
Site(s):	Sherwood, Washington
Laboratory:	ALS Laboratory Group, Fort Collins, Colorado
Work Order No.:	1507277
Analysis:	Inorganics
Validator:	Stephen Donivan
Review Date:	September 24, 2015

This validation was performed according to the *Environmental Procedures Catalog*, (LMS/POL/S04325, continually updated) "Standard Practice for Validation of Environmental 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-045	SW-846 9056	SW-846 9056
Sulfate, SO4	MIS-A-045	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 July 15, 2015, 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; signatures and dates were present to indicate 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 2.8 °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 measured reliably, and the PQL 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 Total Dissolved Solids.

Method SW-846 9056, Chloride and Sulfate
Initial calibrations were performed using five (5) calibration standards on July 10, 2015. 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 with all calibration checks meeting 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 July 23, 2015. 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: 15077204 **Lab Code:** PAR **Validator:** Stephen Donivan **Validation Date:** 09/24/2015

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	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

Wet Chemistry Data Validation Worksheet

RIN: 15077204 **Lab Code:** PAR **Date Due:** 08/12/2015

Matrix: Water **Site Code:** SHE01 **Date Completed:** 07/23/2015

Analyte	Date Analyzed	CALIBRATION				Method Blank	LCS %R	MS %R	MSD %R	DUP RPD	Serial Dil. %R
		Int.	R^2	CCV	CCB						
CHLORIDE	07/17/2015	0.000	1.0000	OK	OK	OK	101.00	104.0	110.0	4.00	
SULFATE	07/17/2015	0.000	1.0000	OK	OK	OK	97.00	98.0	99.0	0	
TOTAL DISSOLVED SOLIDS	07/21/2015					OK	102.00				

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.

Equipment Blank Assessment

An equipment blank was not required.

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-10. The duplicate results met the criteria, demonstrating acceptable overall precision.

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: Stephen Donivan — Stephen Donivan — 10-6-2015 — Date

Data Validation Lead: Stephen Donivan — Stephen Donivan — 10-6-2015 — 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 can result from transcription errors, data-coding errors, or measurement system problems. However, outliers can also represent true extreme values of a distribution and can 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.** Do this by generating the Outliers Report using the Sample Management System from data in the environmental database. The application compares the new data set (in standard environmental database units) with historical data and lists the new data that fall outside the historical data range. A determination is also made as to whether the data are normally distributed using the Shapiro-Wilk Test.
2. **Apply the appropriate statistical test.** Dixon's Test for extreme values 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 review should include an evaluation of any notable trends in the data that may indicate the outliers represent true extreme values.

There were no potential outliers identified, and the data for this event are acceptable as qualified.

Data Validation Outliers Report - No Field Parameters

Comparison: All historical Data Beginning 01/01/2005

Laboratory: ALS Laboratory Group

RIN: 15077204

Report Date: 09/24/2015

					Current			**Historical Maximum**			**Historical Minimum**			**Number of Data Points**		**Statistical Outlier**
						Qualifiers			*Qualifiers*			*Qualifiers*				
Site Code	Location Code	Sample ID	Sample Date	Analyte	Result	*Lab*	*Data*	Result	*Lab*	*Data*	Result	*Lab*	*Data*	N	N Below Detect	
SHE01	MW-4	N001	07/14/2015	Chloride	0.400		FQ	66.0		FQ	0.510		FQ	13	0	NA

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.

NA: Data are not normally or lognormally distributed.

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: 09/24/2015
Location: MW-10 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Chloride	mg/L	07/14/2015	N001	224	-	234	1.1		F	#	0.2	
Chloride	mg/L	07/14/2015	N002	224	-	234	1.1		F	#	0.2	
Oxidation Reduction Potential	mV	07/14/2015	N001	224	-	234	175.7		F	#		
pH	s.u.	07/14/2015	N001	224	-	234	7.18		F	#		
Specific Conductance	umhos /cm	07/14/2015	N001	224	-	234	1030		F	#		
Sulfate	mg/L	07/14/2015	N001	224	-	234	30		F	#	0.5	
Sulfate	mg/L	07/14/2015	N002	224	-	234	30		F	#	0.5	
Temperature	C	07/14/2015	N001	224	-	234	16.2		F	#		
Total Dissolved Solids	mg/L	07/14/2015	N001	224	-	234	620		F	#	20	
Total Dissolved Solids	mg/L	07/14/2015	N002	224	-	234	620		F	#	20	
Turbidity	NTU	07/14/2015	N001	224	-	234	0.41		F	#		

Groundwater Quality Data by Location (USEE100) FOR SITE SHE01, Sherwood Disposal Site
REPORT DATE: 09/24/2015
Location: MW-2B WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Chloride	mg/L	07/14/2015	N001	47.4	-	57.4	1.8		FQ	#	0.2	
Oxidation Reduction Potential	mV	07/14/2015	N001	47.4	-	57.4	95.2		FQ	#		
pH	s.u.	07/14/2015	N001	47.4	-	57.4	7.02		FQ	#		
Specific Conductance	umhos /cm	07/14/2015	N001	47.4	-	57.4	280		FQ	#		
Sulfate	mg/L	07/14/2015	N001	47.4	-	57.4	3.6		FQ	#	0.5	
Temperature	C	07/14/2015	N001	47.4	-	57.4	15.03		FQ	#		
Total Dissolved Solids	mg/L	07/14/2015	N001	47.4	-	57.4	220		FQ	#	20	
Turbidity	NTU	07/14/2015	N001	47.4	-	57.4	2.32		FQ	#		

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

REPORT DATE: 09/24/2015

Location: MW-4 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Chloride	mg/L	07/14/2015	N001	184	-	197.5	0.4		FQ	#	0.2	
Oxidation Reduction Potential	mV	07/14/2015	N001	184	-	197.5	-140		FQ	#		
pH	s.u.	07/14/2015	N001	184	-	197.5	7.35		FQ	#		
Specific Conductance	umhos /cm	07/14/2015	N001	184	-	197.5	596		FQ	#		
Sulfate	mg/L	07/14/2015	N001	184	-	197.5	18		FQ	#	0.5	
Temperature	C	07/14/2015	N001	184	-	197.5	16.07		FQ	#		
Total Dissolved Solids	mg/L	07/14/2015	N001	184	-	197.5	340		FQ	#	20	
Turbidity	NTU	07/14/2015	N001	184	-	197.5	5.52		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.

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Static Water Level Data

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STATIC WATER LEVELS (USEE700) FOR SITE SHE01, Sherwood Disposal Site
REPORT DATE: 09/24/2015

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	07/14/2015	10:00:56	228.7	1780.23	
MW-2B		2116.04	07/14/2015	12:15:23	55.6	2060.44	
MW-4		NA	07/14/2015	10:45:40	239.66	NA	

FLOW CODES: B BACKGROUND C CROSS GRADIENT D DOWNGRADIENT
F OFFSITE N UNKNOWN O ONSITE U UPGRADIENT

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

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Time-Concentration Graphs

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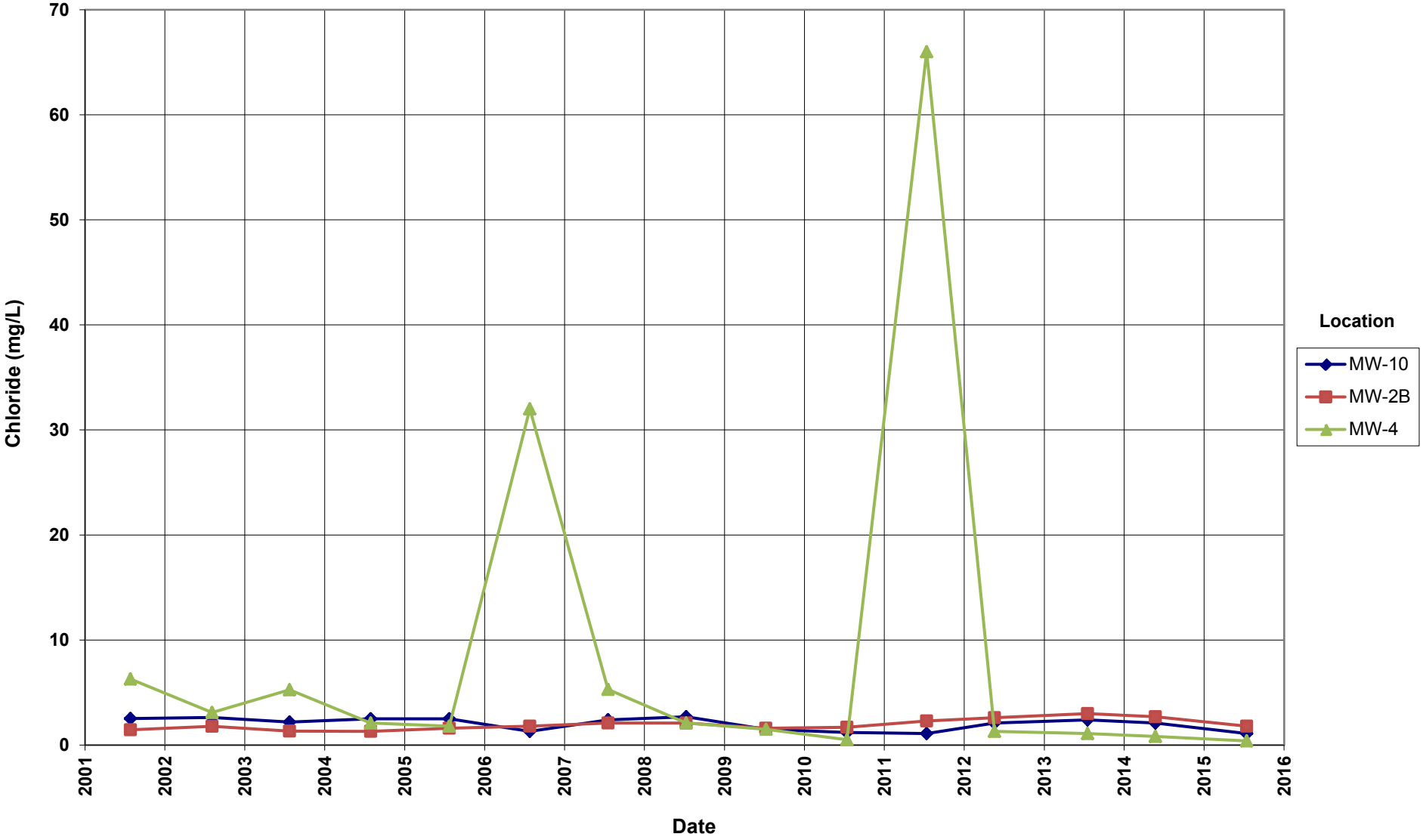
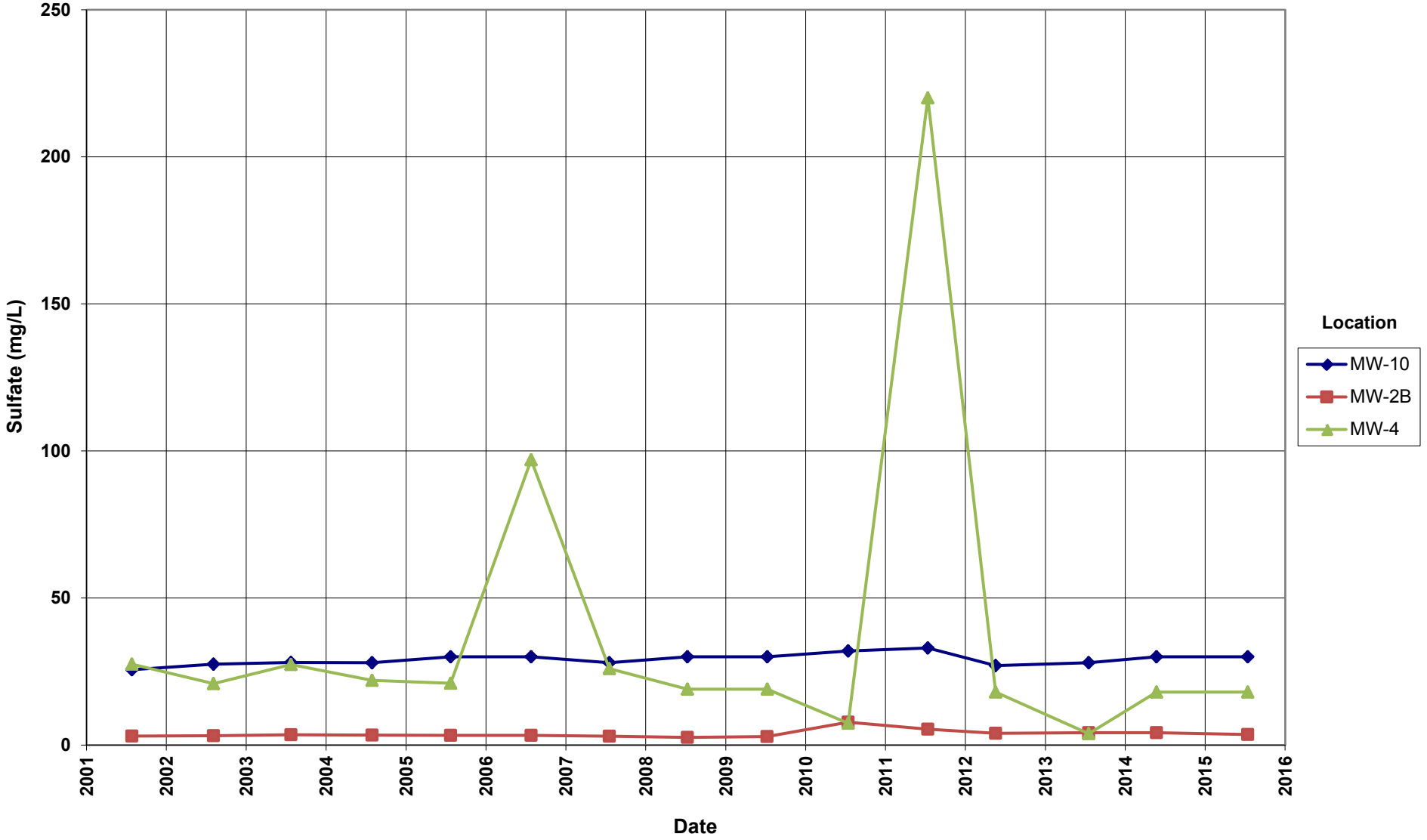
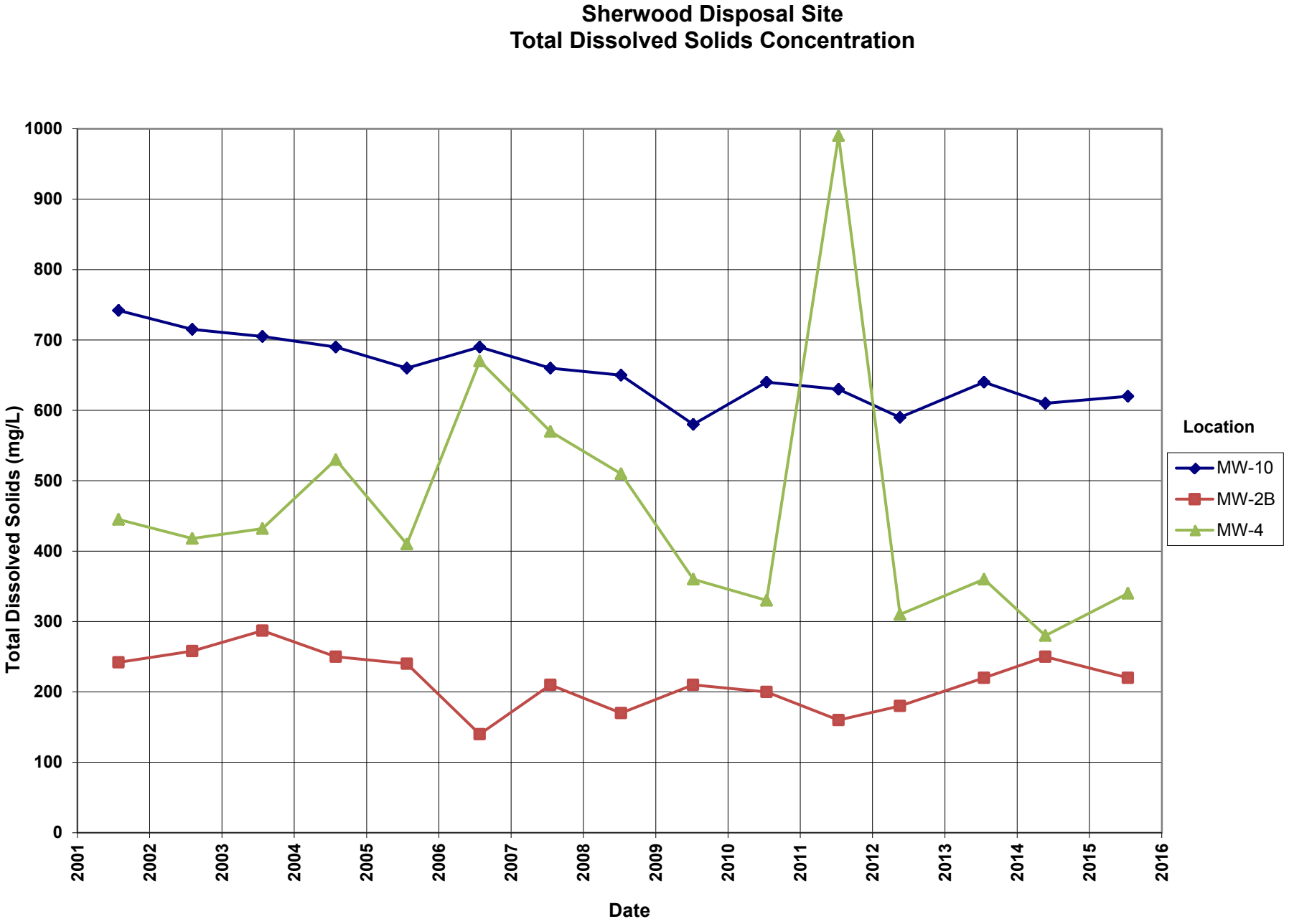
Sherwood Disposal Site
Chloride Concentration



Sherwood Disposal Site
Sulfate Concentration




Sherwood Disposal Site
Total Dissolved Solids Concentration
Total Dissolved Solids (mg/L)
1000
900
800
700
600
500
400
300
200
100
0
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
Date
Location
MW-10
MW-2B
MW-4

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Attachment 3
Sampling and Analysis Work Order

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Stoller Newport News Nuclear

June 16, 2015

Task Assignment 103
Control Number 15-0598

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

SUBJECT: Contract No. DE-LM0000415, Stoller Newport News Nuclear, Inc. (SN3), a wholly owned subsidiary of Huntington Ingalls Industries, Inc.
Task Assignment 103 LTS&M - UMTRCA TI & TII, D&D, Others, and AS&T
July 2015 Environmental Sampling at the Sherwood, Washington, Disposal Site

REFERENCE: Task Assignment 103, 3-103-1-03-221, Sherwood, Washington, Disposal Site

Dear Mr. Petrosky:

The purpose of this letter is to inform you of the upcoming sampling event at Sherwood, Washington. Enclosed are the map and tables specifying sample locations and analytes for monitoring at the Sherwood Disposal Site. Water quality data will be collected at this site as part of the routine environmental sampling currently scheduled to begin the week of July 13, 2015.

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.

Sincerely,

David Traub
Site Lead

DT/lcg/bkb

Enclosures (3)

cc: (electronic)
Christina Pennal, DOE
Steve Donivan, SN3
Lauren Goodknight, SN3
Diana Osborne, SN3
David Traub, SN3
EDD Delivery
rc-grand.junction
File: SHE 400.02

A SUBSIDIARY OF HUNTINGTON INGALLS INDUSTRIES
2597 Legacy Way • Grand Junction, CO 81503-1789 • Telephone (970) 248-6000 • Fax (970) 248-6040

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				
Analyte	Groundwater	Surface Water	Required Detection Limit (mg/L)	Analytical Method	Line Item Code
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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Stoller Newport News Nuclear

Memorandum

DATE: July 29, 2015

TO: David Traub

FROM: David Atkinson

SUBJECT: Trip Report

Site: Sherwood, Washington, Disposal Site

Dates of Sampling Event: July 14, 2015

Team Members: David Atkinson and Rob Rice

Number of Locations Sampled: Samples were collected from all 3 locations identified on the sampling notification letter; 1 duplicate sample was collected. In addition, water levels were measured at 4 piezometers on the site.

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

Location Specific Information: Below is a table showing the measured depths of piezometers 1 through 4. All depth measurements were taken from the top of the inner well casing.

Piezometer ID	Measured Total Depth (ft.)	True Total Depth (ft.)*	Protective casing stick-up height (ft.)	Inner casing stick-up height (ft.)	Depth to water (ft.)
P1	22.40	**22.47**	2.95	2.87	22.09
P2	62.88	**62.95**	2.96	2.81	62.17
P3	67.46	**67.53**	2.66	2.42	67.40
P4	22.55	**22.62**	2.86	2.64	21.82

*True total depth is the measured depth plus the length of the probe tip which is 0.068 ft (13/16 inches).

Quality Control Sample Cross Reference: The following is the false identification assigned to the quality control sample.

False ID	Ticket Number	True ID	Sample Type	Associated Matrix	Associated Samples
2397	NIY 236	MW-10	Duplicate	Groundwater	N/A

Requisition Index Number (RIN) Assigned: Samples were assigned to RIN 15077204. Field data sheets can be found in \\crow\SMS\15077204\FieldData.

Sample Shipment: Samples were shipped overnight via FedEx from Spokane, Washington, to ALS Laboratory Group in Fort Collins, CO, on July 14, 2015.

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Water Level Measurements Water levels were measured at all wells prior to the start of sampling.

Well Inspection Summary: All wells were in good condition, with the exception of a southwest corner bollard that has been knocked down at monitoring well location MW-4.

Sampling Method: Samples were collected according to the *Sampling and Analysis Plan (SAP) for the U. S. Department of Energy Office of Legacy Management Sites* (LMS/PRO/S04351, continually updated).

Field Variance: None. Samples were collected according to the SAP.

Equipment: All equipment functioned properly.

Stakeholder/Regulatory/DOE: Nothing to note

Institutional Controls:

Fences, Gates, and Locks: No issues identified.
Signs: Signs P3 and P4 were located as shown on the 2015 site inspection map, and verified to be legible. Sign P2 was replaced per site lead's instructions. Boundary markers 1 and 5 were also located and verified to be in place.
Trespassing/Site Disturbances: None observed.

Site Issues:

Disposal Cell/Drainage Structure Integrity: None.

Safety Issues: None.

Access Issues: Vegetation (including small pine trees) growing near location MW-4 has made it difficult to drive to the well and needs to be trimmed to improve access.

General Information: Nothing to note.

Immediate Actions Taken: None.

Future Actions Required or Suggested: Vegetation trimming near location MW-4.

cc: (electronic)
Terry Petrosky, DOE
Steve Donivan, SN3
David Traub, SN3
EDD Delivery