Data Validation Package

May 2016
Groundwater Sampling at the Lakeview, Oregon, Processing Site

August 2016

U.S. DEPARTMENT OF ENERGY | Legacy Management

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Sampling Event Summary

Site: Lakeview, Oregon, Processing Site

Sampling Period: May 23, 2016

This biennial event includes sampling five groundwater locations (four monitoring wells and one domestic well) at the Lakeview, Oregon, Processing Site. For this event, the domestic well (location 0543) could not be sampled because no one was in residence during the sampling event (Note: notification was provided to the resident prior to the event). Per Appendix A of the Groundwater Compliance Action Plan, sampling is conducted to monitor groundwater quality on a voluntary basis. 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). One duplicate sample was collected from location 0505. Water levels were measured at each sampled monitoring well.

The constituents monitored at the Lakeview site are manganese and sulfate. Monitoring locations that exceeded the U.S. Environmental Protection Agency (EPA) Secondary Maximum Contaminant Levels for these constituents are listed in Table 1.

Table 1. Lakeview Locations That Exceed Groundwater Standards

Analyte	EPA SMCL[a] (mg/L)	Location	Concentration (mg/L)
Manganese	0.05	0503	7.6
		0505	2.0
		0509	0.15
		0540	5.1
Sulfate	250	0503	2700
		0505	1800
		0540	560

mg/L = milligrams per liter
[a] SMCL = Secondary Maximum Contaminant Level (EPA, Safe Drinking Water Act)

Review of time-concentration graphs included in this report indicate that manganese and sulfate concentrations are consistent with historical measurements.

Steve Hall, Site Lead
Navarro Research and Engineering, Inc.

8/17/16
Date

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Lakeview, Oregon, Processing Site Sample Location Map

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Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	Lakeview, Oregon	**Date(s) of Water Sampling**	May 23, 2016
Date(s) of Verification	July 22, 2016	**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 April 18, 2016.
2. Were the sampling locations specified in the planning documents sampled?	No	Domestic well 0543 could not be sampled because no one was in residence.
3. Were field equipment calibrations conducted as specified in the above-named documents?	Yes	Calibrations were performed on May 13, 2016.
4. Was an operational check of the field equipment conducted daily?	Yes	An End of Event check was not performed.
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?	NA	All wells were Category I.
Was one pump/tubing volume removed prior to sampling?		
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	A duplicate sample was collected at location 0505.
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

Task ID:	LKV01.1-16050001
Sample Event:	May 23, 2016
Site(s):	Lakeview, Oregon, Processing Site
Laboratory:	ALS Laboratory Group, Fort Collins, Colorado
Work Order No.:	1605599
Analysis:	Metals and Wet Chemistry
Validator:	Stephen Donivan
Review Date:	July 22, 2016

This validation was performed according to the *Environmental Procedures Catalog*, (LMS/PRO/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 2.

Table 2. Analytes and Methods

Analyte	Line Item Code	Prep Method	Analytical Method
Metals: Mn	LMM-01	SW-846 3005A	SW-846 6010B
Sulfate	MIS-A-045	SW-846 9056	SW-846 9056

Data Qualifier Summary

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

Table 3. Data Qualifiers

Sample Number	Location	Analyte	Flag	Reason
All	All	Sulfate	J	Preservation temperature

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received five water samples on May 31, 2016, 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 cooler at 14.4 °C, which does not comply with requirements. The sulfate sample results are qualified with a "J" flag as estimated values. 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 SW-846 6010B, Metals
Calibrations were performed on June 3, 2016, using three calibration standards. The calibration curve correlation coefficient value was greater than 0.995. The absolute value of the intercept was greater than 3 times the MDL, but was less than 3 times the reporting limit and all results were above the reporting limit. Initial and continuing calibration verification checks were made at the required frequency resulting in four verification checks. All calibration checks met the acceptance criteria. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curve near the PQL and all results were within the acceptance range.

Method SW-846 9056, Sulfate
Initial calibrations were performed using five calibration standards on May 6, 2016. 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 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 associated with the samples were below the MDL for all analytes.

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) samples are used to measure method performance in the sample matrix. The MS/MSD data are not evaluated when the concentration of the unspiked sample is greater than 4 times the spike concentration (as was the case with the manganese spikes). 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 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. All control sample results were acceptable.

Metals Serial Dilution

Serial dilutions were prepared and analyzed for the metals analyses to monitor chemical or physical interferences in the sample matrix. Serial dilution data are evaluated when the concentration of the undiluted sample is greater than 50 times the MDL. All evaluated serial dilution data 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 17, 2016. The EDD was examined to verify that the file was complete and in compliance with requirements. The contents of the file were compared 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.

General Data Validation Report

Task Code: LKV01.1-16050001 **Lab Code:** PAR **Validator:** **Validation Date:** 07-22-2016

Project: Lakeview Processing Site Monitoring **# Samples:** 5

Analysis Type: [X] General Chemistry [X] Metals [ ] Organics [ ] Radiochemistry

Chain of Custody	***Sample***
Present: OK Signed: OK Dated: OK	Integrity: OK Preservation OK Temperature: OK

Check	Summary
Holding Times:	All analyses were completed within the applicable holding times.
Detection Limits:	The reported detection limits are equal to or below the contract required limits.
Field Duplicates:	There was 1 duplicate evaluated.

Metals Data Validation Worksheet

22-Jul-2016

Project: Lakeview Processing Site Monitoring **Task Code:** LKV01.1-16050001 **Lab Code:** PAR

Analyte	Method	Analysis Date	QC Type	Spike Recovery	Spike Dup Recovery	Lower Limit	Upper Limit	RPD	RPD Limit	ICSAB	Serial Dilution	CRI	Comments
Manganese	SW-846 6010	06-03-2016	LCS	102.00		80	120		20				
Manganese	SW-846 6010	06-03-2016	MB							100	7	114	MB < MDL
Manganese	SW-846 6010	06-03-2016	MS	86.00		80	120		20				
Manganese	SW-846 6010	06-03-2016	MSD		91.00	80	120	1	20				
Manganese	SW-846 6010	06-03-2016	R					1	20				

QC Types: LCS: Laboratory Control Sample MB: Method Blank MS: Matrix Spike MSD: Matrix Spike Duplicate R: Replicate

QC Checks: CRI: Quantitation limit check ICSAB: ICP interference check RPD: Relative Percent Difference

Wet Chemistry Data Validation Worksheet

22-Jul-2016

Project: Lakeview Processing Site Monitoring **Task Code:** LKV01.1-16050001 **Lab Code:** PAR

Analyte	Method	Analysis Date	QC Type	Spike Recovery	Spike Dup Recovery	Lower Limit	Upper Limit	RPD	RPD Limit	Comments
Sulfate	SW-846 9056	06-02-2016	LCS	99.19		90	110		15	
Sulfate	SW-846 9056	06-02-2016	MB							MB < MDL
Sulfate	SW-846 9056	06-08-2016	MS	94.00		85	115		15	
Sulfate	SW-846 9056	06-08-2016	MSD		95.00	85	115	0	15	

QC Types: LCS: Laboratory Control Sample MB: Method Blank MS: Matrix Spike MSD: Matrix Spike Duplicate R: Replicate

QC Checks: RPD: Relative Percent Difference

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 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.

Equipment Blank Assessment

Dedicated equipment was used for all sample collection and 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 0505. The duplicate manganese and sulfate results from location 0540 did not meet the criteria. The sample and duplicate manganese and sulfate results are qualified with a "J" flag as estimated values.

Validation Report: Field Duplicates

22-Jul-2016

Project: Lakeview Processing Site Monitoring **Task Code:** LKV01.1-16050001 Lab Code: PAR

	Duplicate: LKV01.1-16050001-006				Sample: LKV01.1-16050001-002 0505						
Analyte	**Result**	**Qualifiers**	**Uncert.**	**Dilution**	**Result**	**Qualifiers**	**Uncert.**	**Dilution**	**RPD**	**RER**	**Units**
Manganese	2.3			1	2			1	14.0		mg/L
Sulfate	1800			50	1800			50	0		mg/L

QC Checks: RPD: Relative Percent Difference RER: Relative Error Ratio

Certification

All laboratory analytical quality control criteria were met except as qualified in this report. The data qualifiers listed on the environmental 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 — 8-4-2016 — Date

Data Validation Lead: Stephen Donivan — Stephen Donivan — 8-4-2016 — Date

Attachment 1

Assessment of Anomalous Data

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Potential Outliers Report

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Potential Outliers Report

Potential outliers are results that lie outside the historical range, possibly due to transcription errors, data calculation errors, or measurement system problems. However, outliers can also represent true values outside the historical range. Potential outliers are identified by generating the Data Validation Outliers Report from data in the environmental database. The new data are compared to historical values and data that fall outside the historical data range are listed on the report along with the historical minimum and maximum values. The potential outliers are further reviewed and may be subject to statistical evaluation using the ProUCL application developed by the EPA. The review also includes an evaluation of any notable trends in the data that may indicate the outliers represent true extreme values. There were no statistical outliers identified by ProUCL, and the data for this event are acceptable as qualified.

Data Validation Outliers Report - No Field Parameters **Report Date: 07/22/2016**

Comparison to Historical Data Since: 7/22/2005 12:00:00 AM Fraction: Any

Task: LKV01.1-16050001

Analyte	Location	Analysis Location	Units	Fraction	Result	Type	HistMIN	HistMAX	HistSetSize	Outlier?
Sulfate	0503	LB	mg/L	N	2700	> HistMAX	2300	2600	7	No
Manganese	0505	LB	mg/L	T	2	< HistMIN	2.2	3.8	5	No
Sulfate	0505	LB	mg/L	N	1800	> HistMAX	1600	1700	5	No

FRACTION: D = Dissolved N = NA T = Total

Attachment 2

Data Presentation

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Groundwater Quality Data

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Groundwater Quality Data by Location For Site LKV01, Lakeview Processing Site

Location: 0503

Report Date: 07/22/2016

Parameter	Units	Sample Date	Sample Type	Fraction	Result	Uncertainty	MDC/MDL	Lab	Data	QA
Manganese	mg/L	05/23/2016	F	T	7.6		0.00011		F	Y
Sulfate	mg/L	05/23/2016	F	N	2700		30		FJ	Y

Groundwater Quality Data by Location For Site LKV01, Lakeview Processing Site

Location: 0505

Report Date: 07/22/2016

Parameter	Units	Sample Date	Sample Type	Fraction	Result	Uncertainty	MDC/MDL	Lab	Data	QA
Manganese	mg/L	05/23/2016	F	T	2		0.00011		F	Y
Sulfate	mg/L	05/23/2016	F	N	1800		15		FJ	Y

Groundwater Quality Data by Location For Site LKV01, Lakeview Processing Site

Location: 0509

Report Date: 07/22/2016

Parameter	Units	Sample Date	Sample Type	Fraction	Result	Uncertainty	MDC/MDL	Lab	Data	QA
Manganese	mg/L	05/23/2016	F	T	0.15		0.00011		F	Y
Sulfate	mg/L	05/23/2016	F	N	45		1.5		FJ	Y

Groundwater Quality Data by Location For Site LKV01, Lakeview Processing Site

Location: 0540

Report Date: 07/22/2016

Parameter	Units	Sample Date	Sample Type	Fraction	Result	Uncertainty	MDC/MDL	Lab	Data	QA
Manganese	mg/L	05/23/2016	F	T	5.1		0.00011		F	Y
Sulfate	mg/L	05/23/2016	F	N	560		3		FJ	Y

SAMPLE TYPE: D = Duplicate E = Equipment Blank F = Field Sample FB = Field Blank TB = Trip Blank

FRACTION: D = Dissolved N = NA T = Total

MDC / MDL: MDC = Radiochemical minimum detectable concentration MDL = Non-radiochemical minimum detection limit

LAB QUALIFIERS (details can be found in laboratory report):
* = One or more quality control criteria failed (e.g., laboratory control sample, surrogate spike, or calibration verification recovery).
B = Blank contamination. The reported result is associated with a contaminated blank.
D = Result is from the analysis of a diluted sample.
H = Holding time was exceeded.
J = The reported result is an estimated value (e.g., matrix interference was observed or the analyte was detected at a concentration outside the quantitation range).
U = Analytical result is below the MDC or MDL.
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 not detected.
G = Possible grout contamination, pH > 9
Q = Qualitative result due to sampling technique.
X = Location is undefined.
J = Estimated value
R = Rejected, unusable result

QA QUALIFIER: Yes = Validated, acceptable as qualified.

Static Water Level Data

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Static Water Levels For Site LKV01, Lakeview Processing Site

Measurement Date Between : 05/22/2016 and 05/25/2016

Report Date: 07/22/2016

Location Code	Measurement Date	Top of Casing Elevation	Water Elevation	Water Level Depth	Units	Dry (y/n)
0503	05/23/2016	4747.73	4737.78	9.95	ft	n
0505	05/23/2016	4744.64	4736.63	8.01	ft	n
0509	05/23/2016	4742.14	4735.99	6.15	ft	n
0540	05/23/2016	4747.89	4741.19	6.7	ft	n

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Hydrograph

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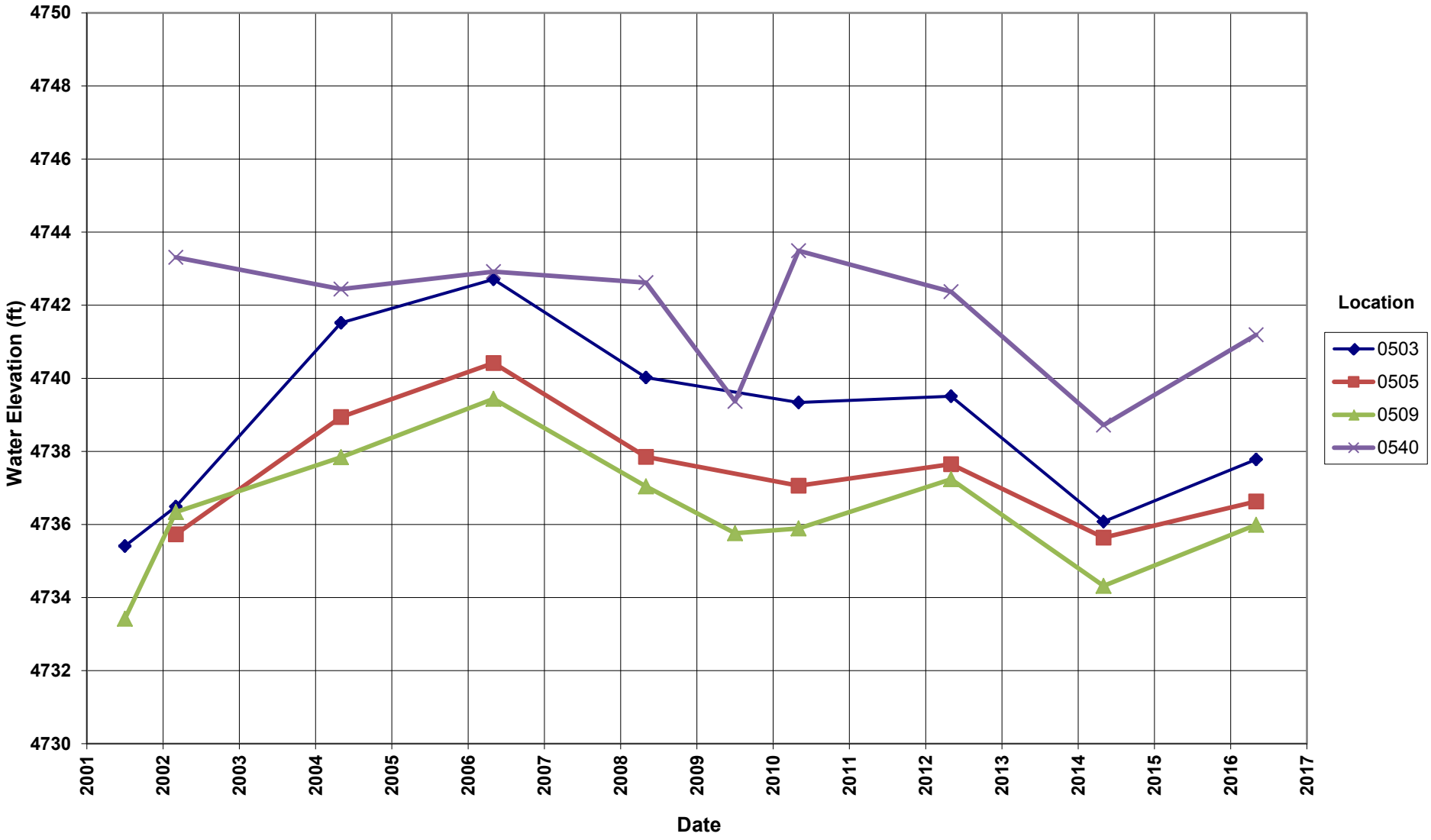
Lakeview Processing Site
Hydrograph



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Time-Concentration Graphs

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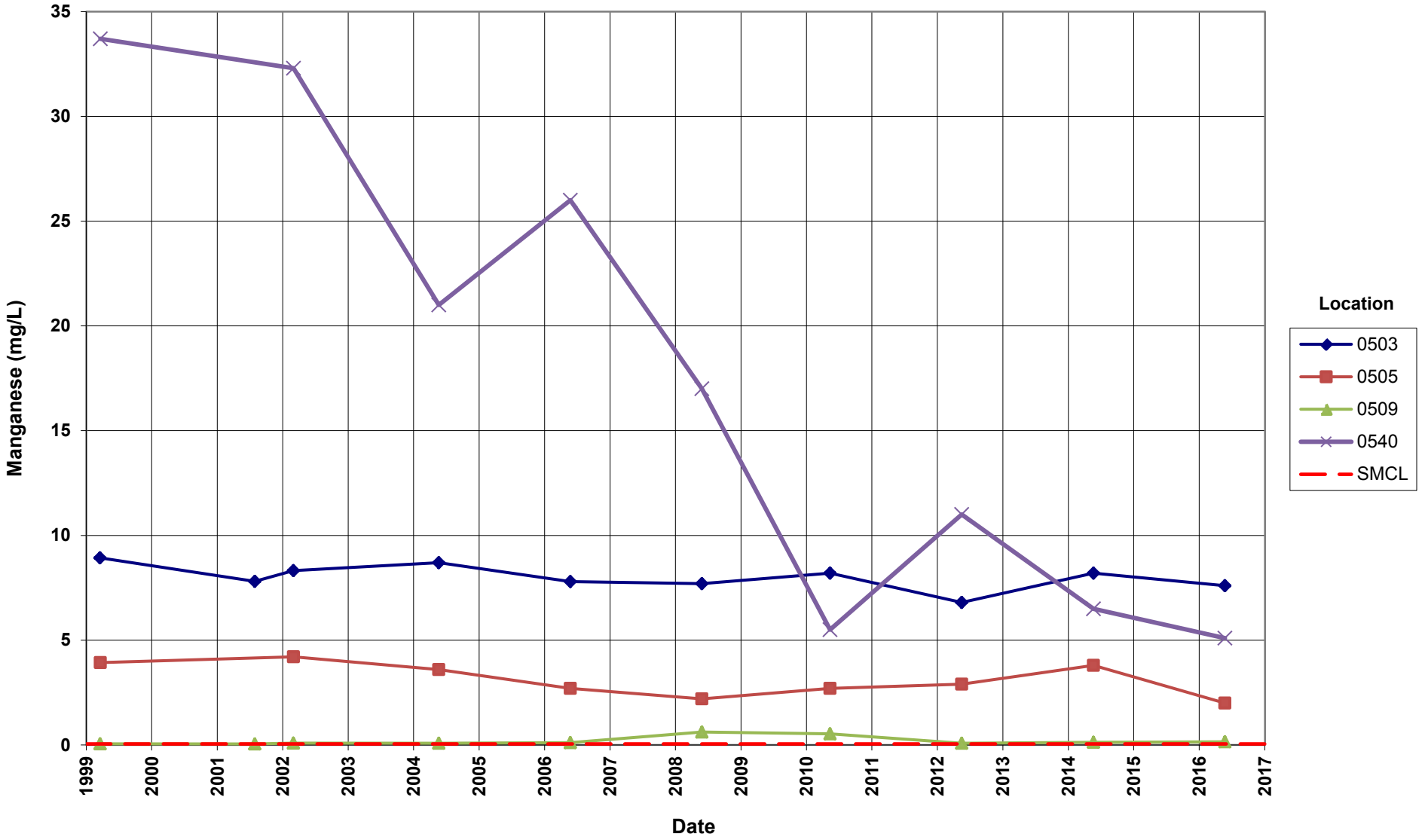
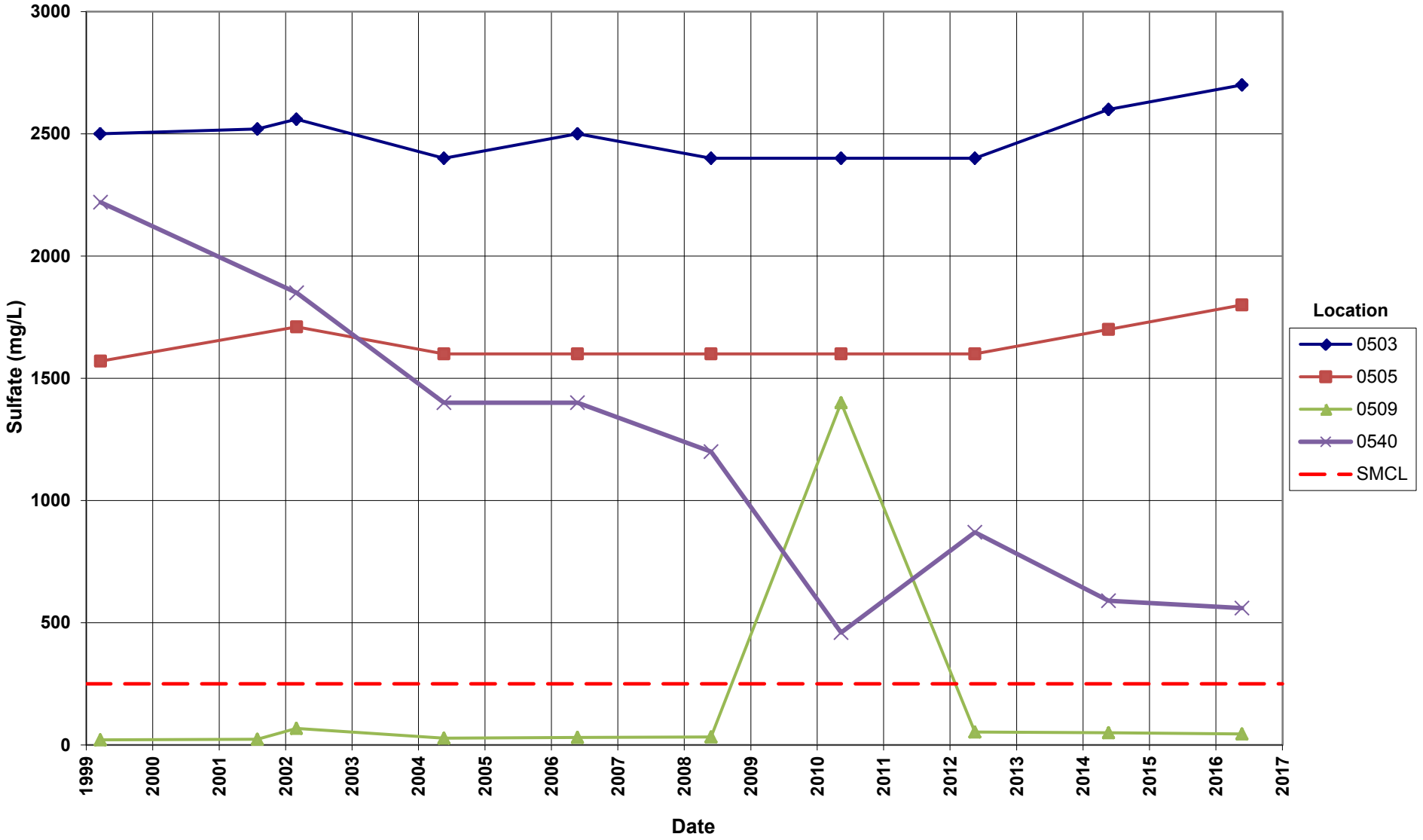
Lakeview Processing Site
Manganese Concentration
Secondary Maximum Contaminant Level (SMCL) = 0.05 mg/L



Lakeview Processing Site
Sulfate Concentration
Secondary Maximum Contaminant Level (SMCL) = 250 mg/L



Attachment 3

Sampling and Analysis Work Order

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April 18, 2016

Task Assignment 103
Control Number 16-0512

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

SUBJECT: Contract No. DE-LM0000421, Navarro Research & Engineering, Inc. (Navarro)
Task Assignment 103 LTS&M-UMTRCA TI & TII Sites, D&D Sites, Other Sites, and Other
May 2016 Environmental Sampling at the Lakeview, Oregon, Processing Site

REFERENCE: Task Assignment 103, 1-103-1-02-109, Lakeview, Oregon, Processing Site

Dear Mr. Bush:

The purpose of this letter is to inform you of the upcoming sampling event at the Lakeview, Oregon, processing site. Enclosed are the map and tables specifying sample locations and analytes for monitoring at the 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 16, 2016.

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

MONITORING WELLS

Processing Site

503 Sp 505 Sp 509 Sp 540 Al

*NOTE: Al = alluvium; Sp = Sand or Gravelly Sand, Poorly Graded

Domestic Well

543

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) 248-6019 if you have any questions.

Sincerely,

Scott C. Smith

Digitally signed by Scott C. Smith
Date: 2016.04.11 16:34:36 -06'00'

Scott Smith
LMS Site Lead

SS/lcg/bkb

Enclosures (3)

cc: (electronic)
Christina Pennal, DOE
Jeff Carman, Navarro
Bev Cook, Navarro
Steve Donivan, Navarro
Lauren Goodknight, Navarro
Sam Marutzky, Navarro
Diana Osborne, Navarro
Scott Smith, Navarro
EDD Delivery
rc-grand.junction
File: LKV 400.02

Sampling Frequencies for Locations at Lakeview, Oregon

Location ID	Quarterly	Semiannually	Annually	Biennially	Every 5 years	Notes
Monitoring Wells						
LKV01 - Processing Site						
503				Even year		Next sampling in 5/2016
505				Even year		Next sampling in 5/2016
509				Even year		Next sampling in 5/2016
540				Even year		Next sampling in 5/2016
LKV02 - Disposal Site						
515					X	Every 5 years; next in 5/2019
602					X	Every 5 years; next in 5/2019
603					X	Every 5 years; next in 5/2019
604					X	Every 5 years; next in 5/2019
605					X	Every 5 years; next in 5/2019
606					X	Every 5 years; next in 5/2019
607					X	Every 5 years; next in 5/2019
608					X	Every 5 years; next in 5/2019
609					X	Every 5 years; next in 5/2019
Private Wells						
LKV01 - Processing Site						
543				Even year		Next sampling in 5/2016

Sampling conducted in May.

Constituent Sampling Breakdown

Site	Lakeview				
Analyte	**Groundwater**		**Required Detection Limit (mg/L)**	**Analytical Method**	**Line Item Code**
Approx. No. Samples/yr	5 every 2 yrs; 9 every 5 yrs				
Field Measurements					
Alkalinity	X				
Dissolved Oxygen					
Redox Potential	X				
pH	X				
Specific Conductance	X				
Turbidity	X				
Temperature	X				
Laboratory Measurements	***Disposal Site***	***Processing Site***			
Aluminum					
Ammonia as N (NH3-N)					
Arsenic	X		0.0001	SW-846 6020	LMM-02
Cadmium	X		0.001	SW-846 6020	LMM-02
Calcium	X		5	SW-846 6010	LMM-01
Chloride	X		0.5	SW-846 9056	WCH-A-039
Gross Alpha					
Gross Beta					
Iron	X		0.05	SW-846 6020	LMM-02
Lead					
Magnesium	X		5	SW-846 6010	LMM-01
Manganese	X	X	0.005	SW-846 6010	LMM-01
Molybdenum					
Nickel					
Nickel-63					
Nitrate + Nitrite as N (NO_3+NO_2)-N					
Potassium	X		1	SW-846 6010	LMM-01
Radium-226					
Radium-228					
Selenium					
Silica	X		0.1	SW-846 6010	LMM-01
Sodium	X		1	SW-846 6010	LMM-01
Strontium					
Sulfate	X	X	0.5	SW-846 9056	MIS-A-044
Sulfide					

Total Dissolved Solids	X		10	SM2540 C	WCH-A-033
Total Organic Carbon					
Uranium	X		0.0001	SW-846 6020	LMM-02
Vanadium					
Zinc					
Total No. of Analytes	13	2			

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

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Attachment 4

Trip Report

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memo

NAVARRO

To: Scott Smith, Navarro
From: David Atkinson, Navarro
Date: June 9, 2016
CC: Rich Bush, DOE
Steve Donivan, Navarro
EDD Delivery
Re: Sampling/Redevelopment Trip Report

Site: Lakeview, Oregon, Processing Site

Dates of Event: May 22 – 23, 2016.

Team Members: David Atkinson and Eric Szabelski, Navarro.

Number of Locations Redeveloped: Monitoring wells 0503 and 0540 were redeveloped. Well 0518 could not be redeveloped due to time constraints. Attempts to redevelop well 0503 were made on May 21 and again on May 22, but could not achieve a turbidity of less than 10 NTUs despite repeated surging and extended pumping. It is suspected that there is a break in the well screen, or the screen is too coarse to prevent very fine silt from entering the well. It is suggested that the well be inspected with a downhole camera. Redevelopment data is presented in the following table.

Date	Location	Start Time	Stop Time	Purge Rate (gal/min)	Number of Well Surges	Total Volume Purged (gal)	Final Turbidity (NTUs)
5/21/2016	0503	1500	1730	0.75	5	173	+900
5/22/2016	0540	900	1130	2.00	4	460	5.6
5/22/2016	0503	1300	1630	0.75	5	248	+/- 20

Number of Locations Sampled: Water samples were collected at the following monitoring wells: 0503, 0505, 0509, and 0540.

Locations Not Sampled/Reason: Domestic well location 0543 could not be sampled because no one was home during the time the samplers were present to collect samples.

Location Specific Information: Access at locations 0505, 0509, and 0540 was difficult due to wet, marshy ground conditions and no vehicle access to well areas. Vehicle access should be established prior to future redevelopment of these locations.

Quality Control Sample Cross Reference: The following table presents quality control information.

Location	Sample Date	Sample Time	QC Type	QC Parent Location
2628	5/23/2016	1200	Duplicate	0505

Task Identification Number Assigned: All samples were assigned to LKV01.1-16050001. Field data sheets can be found in \\crow\SMS\LKV01.1-16050001\FieldData.

Sample Shipment: Samples were shipped from Grand Junction to ALS Laboratory Group on May 26, 2016.

Water Level Measurements: Water levels were measured in all wells prior to sampling.

Well Inspection Summary: All wells appeared in good condition.

Field Variance: None.

Equipment: Wells were sampled with a peristaltic pump and dedicated tubing.

Stakeholder/Regulatory: Nothing to note.

Institutional Controls:

Fences, Gates, and Locks: All gates were in good condition.
Signs: N/A
Trespassing/Site Disturbances: None observed.
Site Issues: None.
Disposal Cell/Drainage Structure Integrity: N/A
Vegetation/Noxious Weed Concerns: None observed.
Maintenance Requirements: None.
Safety Issues: None.
Access Issues: Wet, marshy conditions made access to the wells located several hundred feet from the road extremely difficult. Due to the amount of equipment required for well redevelopment it is suggested that effective vehicle access to these wells be established prior to undertaking well redevelopment in the future.

Corrective Action Required/Taken: N/A