



TECHNICAL MEMORANDUM

To: Don Carpenter, IDEQ, Boise

From: Mike Puett, TerraGraphics, Boise
Robin Nimmer, TerraGraphics, Moscow

Date: November 28, 2012

Subject: EMFR Floodwater Analysis April 2012

Job Code: 12025-08-02

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1 Introduction

The purpose of this memo is to summarize the results of floodwater sampling conducted at the East Mission Flats Repository (EMFR) on April 26 and April 30, 2012. The objective of the sampling was to evaluate the quality of floodwater surrounding EMFR after contaminated soil had been placed on the site. This sampling effort was not part of a regular sampling program but was conducted opportunistically to evaluate water quality during a flood event with approximately a 3 year recurrence interval.

2 General

The decision to sample was based on the level of floodwater observed onsite at EMFR. The event was triggered because Coeur d'Alene (CDA) River floodwater was observed flowing into the area surrounding EMFR through the culvert under Interstate-90 (I-90) at site EMF-SW-A, on April 25, 2012. Based on National Weather Service (NOAA, 2012) predictions, the CDA River at Cataldo was forecasted to peak the evening of April 26, 2012. The actual stage peak of 43.70 feet (22,200 cubic feet/second) above the gage baseline (2,100.00 feet amsl) was recorded by the U.S. Geological Survey (USGS) at 22:00 on that day. A stage-hydrograph of the CDA River is shown on Figure 1, and summarizes stage elevations from April 20, 2012 through May 4, 2012 (NOAA, 2012). Sampling floodwater before and after the peak flow provided water quality data for floodwater entering and leaving the area surrounding the repository.

Samples were collected on two separate days. The first set of samples was collected in the early afternoon of April 26, 2012 while water levels were rising at the base of EMFR. At that time, floodwater from the CDA River was observed flowing into the area surrounding EMFR through the culvert at EMF-SW-A and the culvert under the I-90 west-bound on-ramp west of the EMFR site. Floodwater at EMFR was also likely from rising water levels in the wetland west of EMFR. A second set of samples was collected during mid-morning of April 30, 2012, after the stage height dropped approximately 4 feet from the peak and water levels surrounding EMFR were receding.

On each sampling occasion, samples were collected from four locations chosen to represent the various hydrologic zones around EMFR. The sampling locations are shown on Figure 2 and described in Table 1. Location EMF-SW-A is located at the mouth of a culvert just south of the ICP dump pad. This sample location represents a mixture of floodwater from the CDA River flowing in and out of the area through the culvert running under Interstate 90 and the floodwater conveyed through the side channel running parallel to Canyon Road. Location EMF-SW-B is southwest of the repository. This location represents water flowing into and out of the catchment between I-90 and the exit 39 west bound exit ramp. EMF-SW-C is located west of the repository near the repository access road bridge. This location represents a mixture of Coeur d'Alene River floodwaters and water from the wetlands northwest of the repository that flows into the area surrounding the repository during high water events. EMF-SW-D is located northeast of the repository between Canyon road and the repository. This sample location represents the floodwater conveyed through the side channel running parallel to Canyon Road.

Field parameters were measured during sample collection and included: pH, conductivity, temperature, dissolved oxygen (DO), and oxidation-reduction potential (ORP). The samples were delivered to SVL Analytical, Inc. (SVL) in Kellogg, Idaho for analysis of total and dissolved antimony, arsenic, cadmium, lead, and zinc.

3 Field Observations

Visual observations during the rise of the floodwater in the area surrounding EMFR on April 26, 2012 were noted. Water was entering EMFR from the CDA River via a culvert at EMF-SW-A. Depth of the turbulent water in the 24-inch diameter culvert was measured to be 20 inches and the flow through the culvert was estimated to be 83 percent of the culvert's capacity. Water discharging from the culvert was observed flowing northwest toward EMF-SW-B. At EMF-SW-B, the mouth of the culvert was over a foot under water and fairly stagnant, but the direction of water flow could not be determined due to windy conditions. The catchment area connected via this culvert did not have water in it. In the area of monitoring well 09-EMF-MW-C-Deep, a small wake was observed behind this well indicating that water was flowing directly north toward the repository bridge. Water at surface water site EMF-SW-C (located under the repository bridge) was observed to be stagnant. However, surface water was observed flowing along the toe of the repository slope just north of the bridge in a southwesterly direction. Water at EMF-SW-D was observed flowing west-southwest towards EMF-SW-C along the toe of the repository slope.

Visual observations during water receding from EMFR on April 30, 2012 were noted. Surface water was observed flowing out of EMFR from the same culvert at site EMF-SW-A on the morning sampling occurred. Surface water flow direction could only be determined at EMF-SW-A, where water was turbulent. Windy conditions made visual observations difficult at the other sampling sites with minimal flow or stagnant water. Water depth in the culverts were not measured.

4 Results

The field parameters are summarized in Table 2 for the April 26 and 30, 2012 sampling events. pH values increased at EMF-SW-B and EMF-SW-C. Conductivity increased at all sites except

EMF-SW-B; whereas, DO decreased at these same sites. The water temperature and ORP increased at all four sites.

Water quality results for total recoverable and dissolved metals are summarized in Tables 3 and Table 4, respectively. Figures for total cadmium, lead, and zinc as well as dissolved cadmium and zinc are located in Attachment A. The laboratory reports are provided in Attachment B. Total and dissolved antimony and arsenic were not detected in any of the samples. Total and dissolved cadmium were detected in samples from all four sites during the April 26, 2012 sampling event. Total cadmium was detected in all of the April 30, 2012 samples from all sites with the exception of EMF-SW-C. Dissolved cadmium was only detected during the April 30, 2012 event in a sample from EMF-SW-A. Total and dissolved cadmium concentrations decreased between the two sampling events. Total lead was detected in samples from all sites during the April 26, 2012 sampling event; the highest concentration of 0.00645 milligrams per liter (mg/L) was detected at EMF-SW-B. Total lead was not detected in any of the samples from the April 30, 2012 sampling event. Dissolved lead was not detected in any of the samples from both events. Total and dissolved zinc were detected in all samples from both events. Total and dissolved zinc concentrations were highest in samples from all sites during the April 26, 2012 sampling event. EMF-SW-B had the highest total and dissolved zinc concentrations of 0.159 mg/L and 0.131 mg/L, respectively. For the April 30, 2012 sampling event, EMF-SW-A had the highest total and dissolved zinc concentrations of 0.0859 mg/L and 0.0900 mg/L, respectively.

The acute Criteria Maximum Concentration (CMC) for aquatic life in surface water according to the Idaho Administrative Code of the Department of Environmental Quality, IDAPA 58.01.02, "Water Quality Standards," were compared with the dissolved metal results. Because antimony has no CMC, the criteria for Human Health for Consumption of Water and Organisms was used. The regulatory thresholds for dissolved cadmium, lead, and zinc are dependent on water hardness. For this evaluation, the regulatory thresholds were calculated using the equations provided in IDAPA 58.01.02 and a hardness of 80 mg/L as calcium carbonate (CaCO_3) - the average hardness for the CDA River as reported by the Idaho Department of Environmental Quality (IDEQ) (TerraGraphics, 2008). Note: based on a hardness of 80 mg/L, the calculated regulatory threshold for dissolved cadmium is lower than the method reporting limit. In this evaluation, dissolved zinc exceeded the regulatory threshold at all sites but EMF-SW-D during the April 26, 2012 sampling event. None of the sites exceeded the dissolved zinc regulatory threshold during the April 30, 2012 sampling event.

5 Conclusions and Recommendations

Similar to the May 2008 and May 2011 floodwater sampling results, the April 2012 floodwater sampling results showed a decrease in total metals as the floodwater receded from the area surrounding the EMFR. During the recession of floodwater from the area surrounding the EMFR, a detectable increase in total metals concentration has never been measured. The April 2012 data continue to support the hypothesis that the floodwater flowing back to the river is cleaner than the floodwater that entered the area. This is likely the result of the metals-laden sediment, transported by the floodwater, settling out while the water is on the floodplain. Deposition of sediment on the floodplain during flood events is a natural phenomenon occurring on many floodplains around the world and it is not related to the presence of the EMFR. The data provide no indication that the EMFR is adversely impacting surface water quality.

TerraGraphics recommends continued water quality monitoring during subsequent floodwater events to evaluate the hypothesis that metals concentrations are lower as water drains from the area surrounding the EMFR. It is recommended that future flood sampling attempts to capture larger flows than previously sampled. Future flood sampling results should continue to be generally compared to the historical results indicating that the area surrounding the EMFR is a depositional environment .

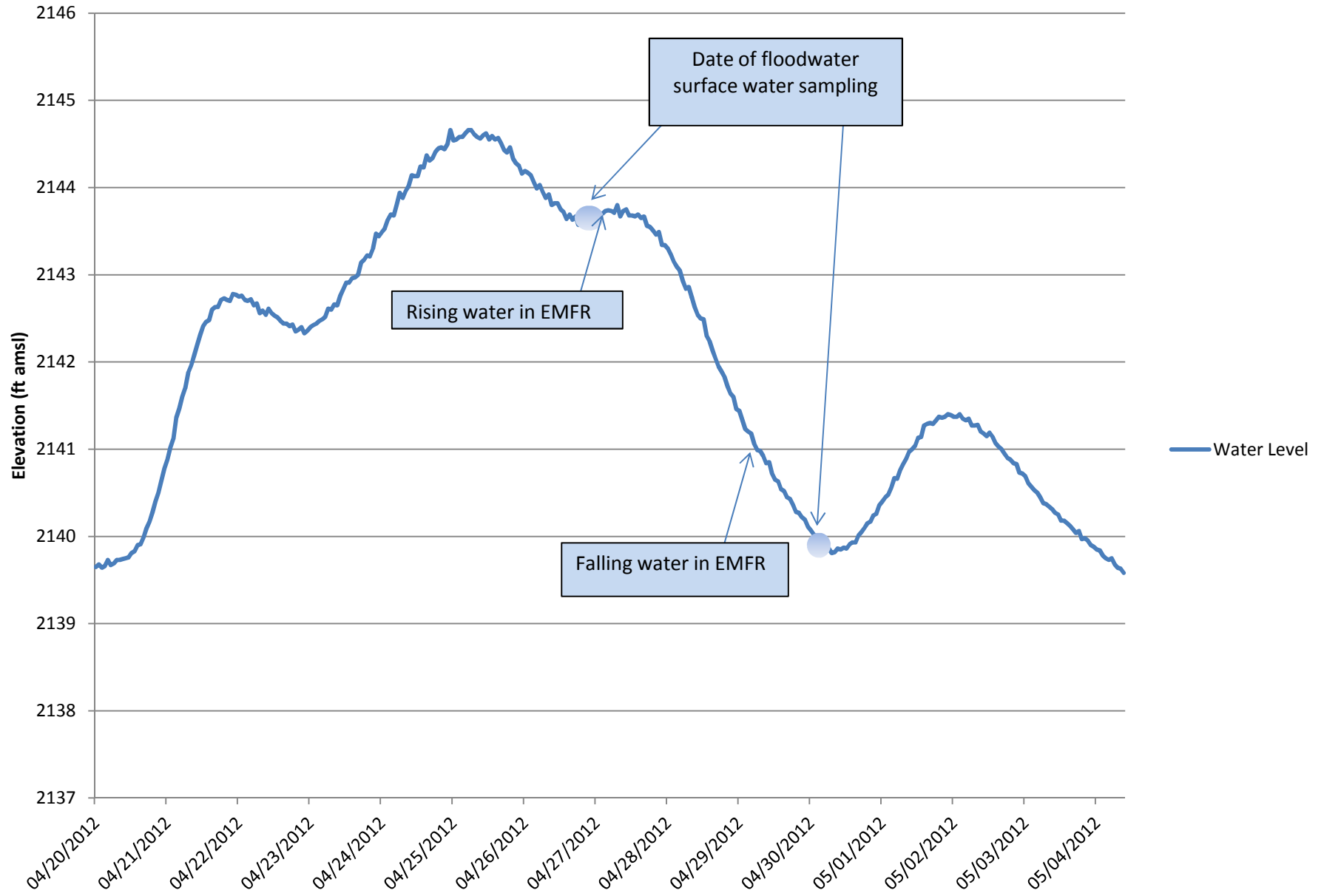
6 References

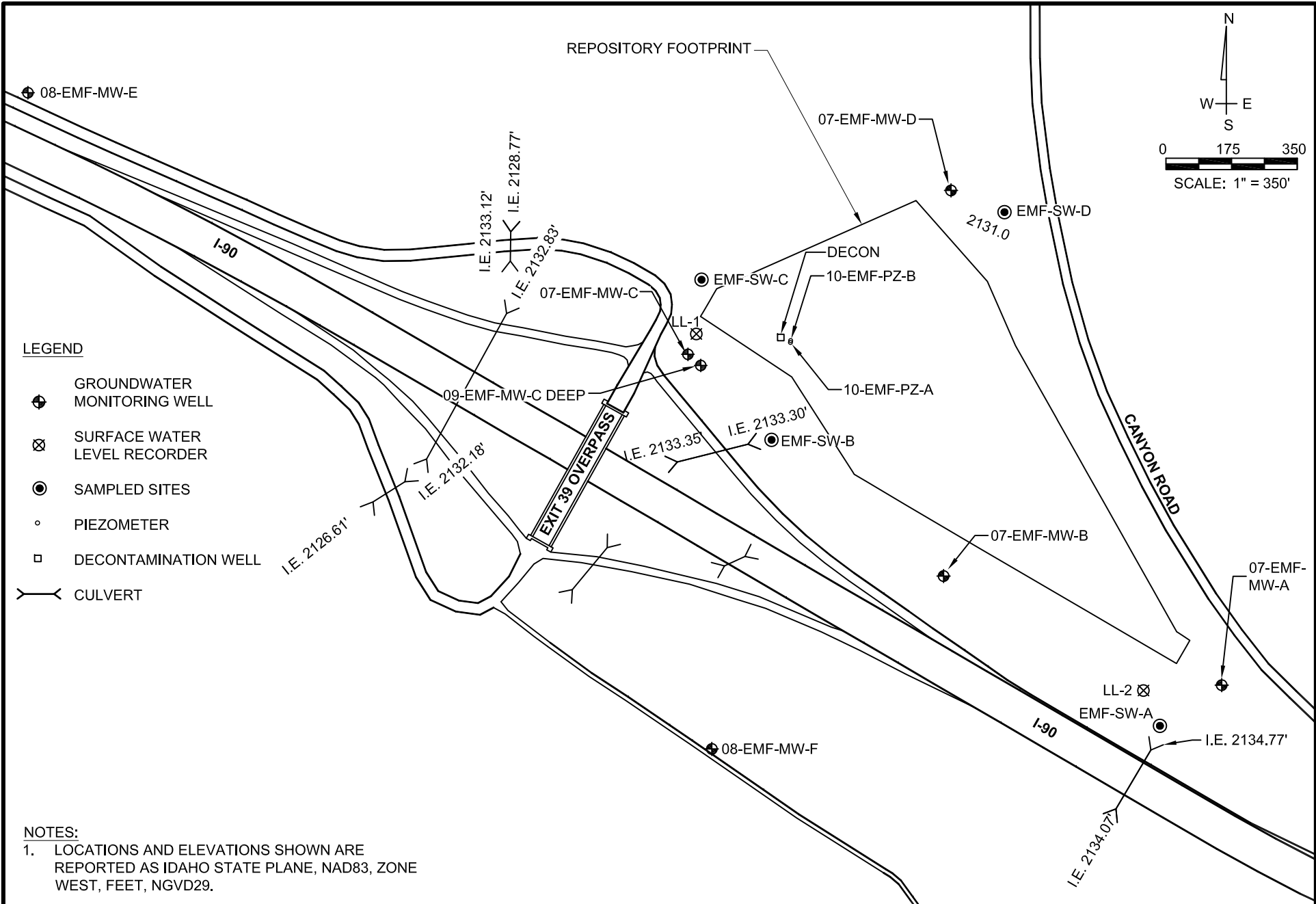
National Oceanic Atmospheric Association (NOAA). 2012. Coeur d'Alene River at Cataldo, data courtesy of the US Geologic Survey,

http://waterdata.usgs.gov/id/nwis/uv/?site_no=12413500.

TerraGraphics. 2008. Internal memo from Kelly Kincella and Dan McCracken to Don Vernon regarding EMFR Flood Water Analysis, June 19, 2008.

Figure 1. Cataldo Stage Data





SCALE:
 1" = 350' (8.5x11 PRINT)
 DRAWN BY:
 S. LARSON
 ENGINEER:
 C. HALEY



EAST MISSION FLATS
 REPOSITORY
 CATALDO, IDAHO

FIGURE 2
 APRIL 2012 FLOOD SAMPLING

PROJECT NO:
 12025-08
 DATE:
 8/23/2012
 FILE NAME:
 emf_gw_apr2012.dwg

Table 1
Floodwater Sample Location Information
April 2012 Floodwater Event
East Mission Flats Repository

Hydrologic Zone	Water Action	Physical Location Description	Site Location ID
Floodwater from CDA River entering EMFR via culvert.	Flowing	Outlet of culvert by MW-A.	EMF-SW-A
Water in EMFR area and mouth of culvert connected to catchment area.	Stagnant	Outlet of culvert between MW-C and MW-B.	EMF-SW-B
Water likely from the wetland to the north and the river via culvert west of the overpass.	Stagnant	Northeast of the Interstate-90 overpass, near the overpass bridge.	EMF-SW-C
Steady flow from NE to SW, possibly from the river.	Flowing	Southeast of MW-D.	EMF-SW-D

Table 2
Field Parameters
EMFR Floodwater Monitoring Results
April 2012 Floodwater Event
East Mission Flats Repository

Site ID	Date	Parameter				
		pH	Conductivity (μ S/cm)	Temperature ($^{\circ}$ C)	DO (mg/L)	ORP (mV)
EMF-SW-A	26-Apr-12	6.69	46	8.25	9.75	203
	30-Apr-12	6.40	68	10.74	7.15	414
EMF-SW-B	26-Apr-12	6.41	75	10.24	7.17	186
	30-Apr-12	6.71	67	11.74	7.50	245
EMF-SW-C	26-Apr-12	6.65	65	10.48	8.10	183
	30-Apr-12	6.80	70	11.95	7.31	211
EMF-SW-D	26-Apr-12	6.88	65	11.55	7.69	182
	30-Apr-12	6.72	69	11.98	6.74	207

Notes:

$^{\circ}$ C = degree Celsius

mg/L = milligram per liter

mV = millivolt

μ S/cm = microSiemen per centimeter

DO = dissolved oxygen

ORP = oxygen reduction potential

Table 3
Total Recoverable Metals
EMFR Floodwater Monitoring Results
April 2012 Floodwater Event
East Mission Flats Repository

Sample ID	Analyte	Reporting Limit	Results (mg/L) ^a		
			26-Apr-12	30-Apr-12	Difference ^b
EMF-SW-A	Antimony	0.00300	ND	ND	0
	Arsenic	0.0030	ND	ND	0
	Cadmium	0.00020	0.00050	0.00030	-0.00020
	Lead	0.00300	0.0106	ND	-0.0106
	Zinc	0.0050	0.104	0.0859	-0.018
EMF-SW-B	Antimony	0.00300	ND	ND	0
	Arsenic	0.0030	ND	ND	0
	Cadmium	0.00020	0.00058	0.00021	-0.00037
	Lead	0.00300	0.00645	ND	-0.00645
	Zinc	0.0050	0.159	0.0625	-0.097
EMF-SW-C	Antimony	0.00300	ND	ND	0
	Arsenic	0.0030	ND	ND	0
	Cadmium	0.00020	0.00046	ND	-0.00046
	Lead	0.00300	0.00539	ND	-0.00539
	Zinc	0.0050	0.113	0.0552	-0.058
EMF-SW-D	Antimony	0.00300	ND	ND	0
	Arsenic	0.0030	ND	ND	0
	Cadmium	0.00020	0.00039	0.00022	-0.00017
	Lead	0.00300	0.00373	ND	-0.00373
	Zinc	0.0050	0.0713	0.0564	-0.0149

Notes

a. Samples analyzed by EPA Method 200.7

b. Difference = (26 April results) - (30 April results). Negative number indicates decrease in metals concentration over reporting period.

ND - Not detected above method reporting limit

Table 4
Dissolved Metals
EMFR Floodwater Monitoring Results
April 2012 Floodwater Event
East Mission Flats Repository

Sample ID	Analyte	Reporting Limit	Results (mg/L) ^a			Regulatory Threshold ^c
			26-Apr-12	30-Apr-12	Difference ^b	
EMF-SW-A	Antimony	0.00300	ND	ND	0	0.0056 ^d
	Arsenic	0.0030	ND	ND	0	0.340
	Cadmium	0.00020	0.00049	0.00026	-0.00023	0.0011
	Lead	0.00300	ND	ND	0	0.049
	Zinc	0.0050	0.113	0.0900	-0.023	0.097
EMF-SW-B	Antimony	0.00300	ND	ND	0	0.0056 ^d
	Arsenic	0.0030	ND	ND	0	0.340
	Cadmium	0.00020	0.00059	ND	-0.00059	0.0011
	Lead	0.00300	ND	ND	0	0.049
	Zinc	0.0050	0.131	0.0630	-0.068	0.097
EMF-SW-C	Antimony	0.00300	ND	ND	0	0.0056 ^d
	Arsenic	0.0030	ND	ND	0	0.340
	Cadmium	0.00020	0.00065	ND	-0.00065	0.0011
	Lead	0.00300	ND	ND	0	0.049
	Zinc	0.0050	0.111	0.0555	-0.056	0.097
EMF-SW-D	Antimony	0.00300	ND	ND	0	0.0056 ^d
	Arsenic	0.0030	ND	ND	0	0.340
	Cadmium	0.00020	0.00035	ND	-0.00035	0.0011
	Lead	0.00300	ND	ND	0	0.049
	Zinc	0.0050	0.0810	0.0567	-0.0243	0.097

Notes:

mg/L = milligram per liter

ND = Not detected above method reporting limit.

a. Samples analyzed by EPA Method 200.7.

b. Difference = (26 April results) - (30 April results). Negative number indicates decrease in metals concentration over reporting period.

c. Idaho Ambient Water Quality Criteria for Aquatic Life - Acute Criteria (Cd, Pb, and Zn values calculated based on a hardness of 80 mg/L)

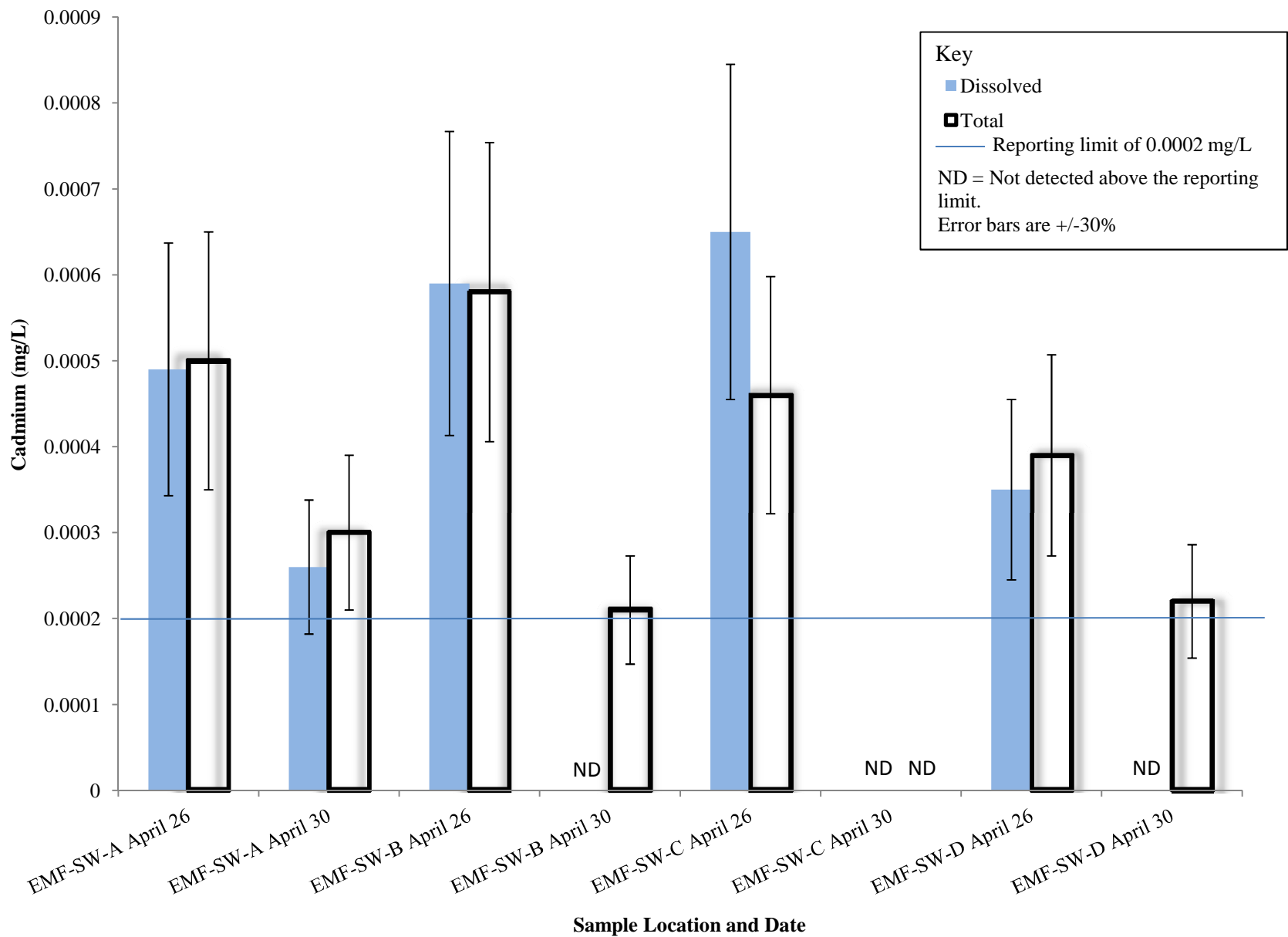
d. Idaho Ambient Water Quality Criteria - Human Health for Consumption of Water & Organisms

= Value exceeds regulatory threshold

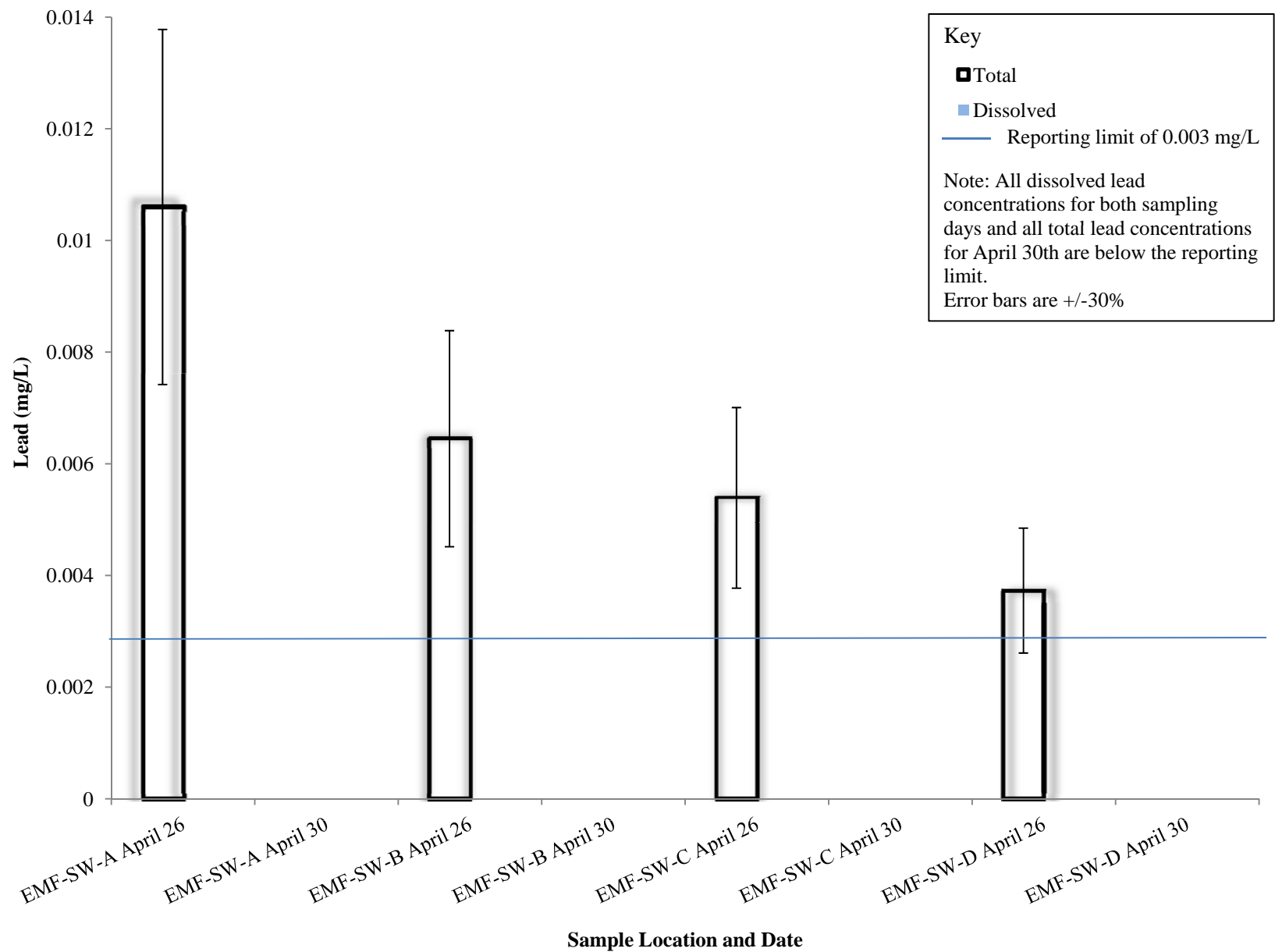
Attachment A

Metals Concentrations Figures

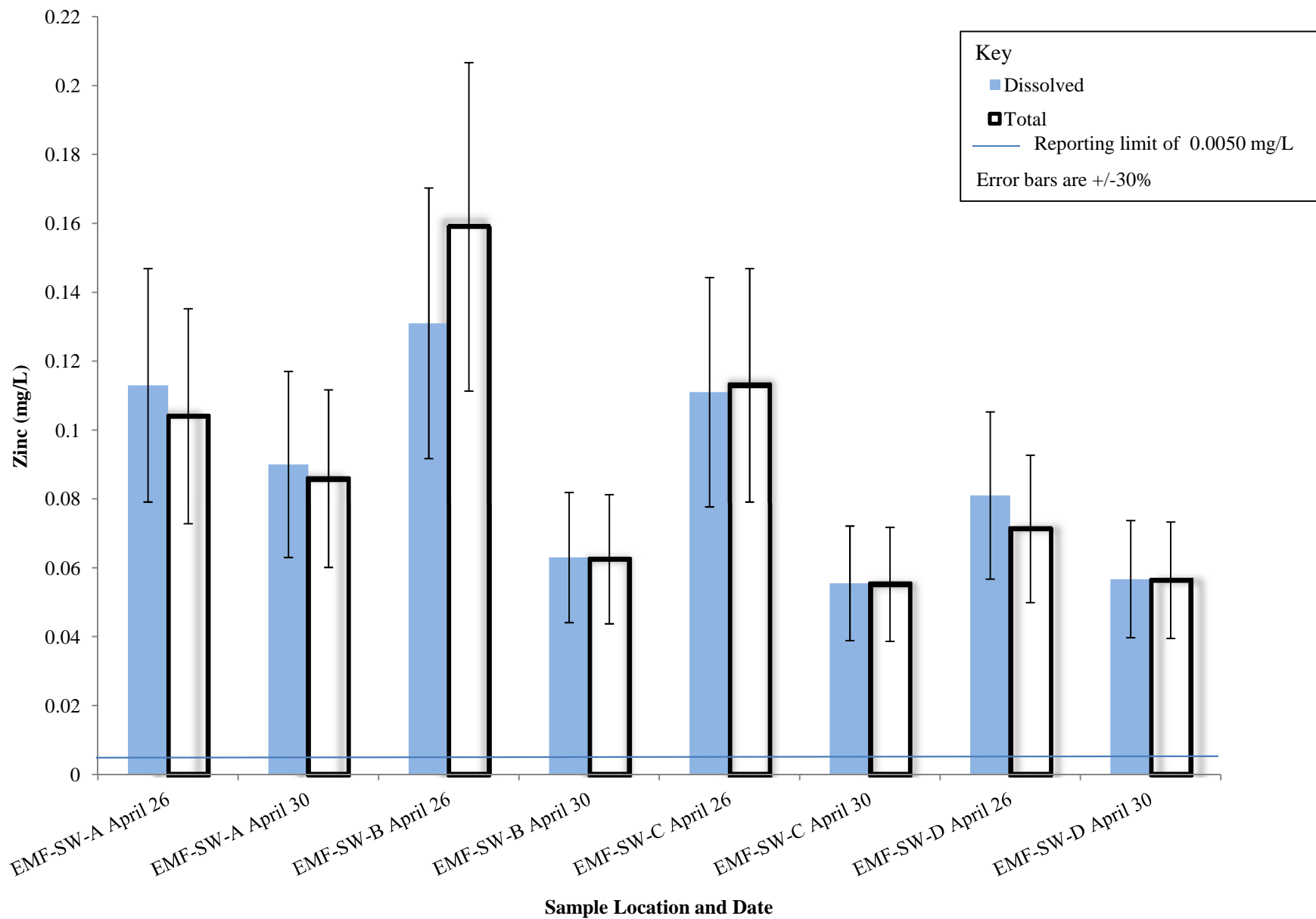
EMFR April 2012 Floodwater Monitoring Event: Cadmium



EMFR April 2012 Floodwater Monitoring Event: Lead



EMFR April 2012 Floodwater Monitoring Event: Zinc



Attachment B

SVL Laboratory Reports



Terragraphics (Moscow)
121 S Jackson
Moscow, ID 83843

Project Name: Terragraphics EMF Well
Work Order: **W2D0583**
Reported: 09-May-12 09:15

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
(EMF-SW-A)042612	W2D0583-01	Surface Water	26-Apr-12 12:30	GM	26-Apr-2012
(EMF-SW-B)042612	W2D0583-02	Surface Water	26-Apr-12 13:15	GM	26-Apr-2012
(EMF-SW-C)042612	W2D0583-03	Surface Water	26-Apr-12 13:45	GM	26-Apr-2012
(EMF-SW-C-C)042612	W2D0583-04	Surface Water	26-Apr-12 13:45	GM	26-Apr-2012
(EMF-SW-D)042612	W2D0583-05	Surface Water	26-Apr-12 14:10	GM	26-Apr-2012

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested.

Sample preparation is defined by the client as per their Data Quality Objectives.

This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.

The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

(208) 784-1258

Fax (208) 783-0891

Terragraphics (Moscow)
121 S Jackson
Moscow, ID 83843

Project Name: Terragraphics EMF Well
Work Order: **W2D0583**
Reported: 09-May-12 09:15

Client Sample ID: **(EMF-SW-A)042612**

SVL Sample ID: **W2D0583-01 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 26-Apr-12 12:30
Received: 26-Apr-12
Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W218018	KWH	05/08/12 10:16	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W218018	KWH	05/08/12 10:16	
EPA 200.8	Cadmium	0.00050	mg/L	0.00020	0.00002	2.5	W218018	KWH	05/08/12 10:16	
EPA 200.8	Lead	0.0106	mg/L	0.00300	0.000072	2.5	W218018	KWH	05/08/12 10:16	
EPA 200.8	Zinc	0.104	mg/L	0.0050	0.0010	2.5	W218018	KWH	05/08/12 10:16	

Metals (Dissolved)

EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W218032	KWH	05/08/12 09:35	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W218032	KWH	05/08/12 09:35	
EPA 200.8	Cadmium	0.00049	mg/L	0.00020	0.000014		W218032	KWH	05/08/12 09:35	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000058		W218032	KWH	05/08/12 09:35	
EPA 200.8	Zinc	0.113	mg/L	0.0050	0.0008		W218032	KWH	05/08/12 09:35	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



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Kellogg ID 83837-0929

(208) 784-1258

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Terragraphics (Moscow)
121 S Jackson
Moscow, ID 83843

Project Name: Terragraphics EMF Well
Work Order: **W2D0583**
Reported: 09-May-12 09:15

Client Sample ID: **(EMF-SW-B)042612**

SVL Sample ID: **W2D0583-02 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 26-Apr-12 13:15
Received: 26-Apr-12
Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total Recoverable--reportable as Total per 40 CFR 136)										
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W218018	KWH	05/08/12 10:47	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W218018	KWH	05/08/12 10:47	
EPA 200.8	Cadmium	0.00058	mg/L	0.00020	0.00002	2.5	W218018	KWH	05/08/12 10:47	
EPA 200.8	Lead	0.00645	mg/L	0.00300	0.000072	2.5	W218018	KWH	05/08/12 10:47	
EPA 200.8	Zinc	0.159	mg/L	0.0050	0.0010	2.5	W218018	KWH	05/08/12 10:47	
Metals (Dissolved)										
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W218032	KWH	05/08/12 09:48	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W218032	KWH	05/08/12 09:48	
EPA 200.8	Cadmium	0.00059	mg/L	0.00020	0.000014		W218032	KWH	05/08/12 09:48	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000058		W218032	KWH	05/08/12 09:48	
EPA 200.8	Zinc	0.131	mg/L	0.0050	0.0008		W218032	KWH	05/08/12 09:48	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



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Kellogg ID 83837-0929

(208) 784-1258

Fax (208) 783-0891

Terragraphics (Moscow)
121 S Jackson
Moscow, ID 83843

Project Name: Terragraphics EMF Well
Work Order: **W2D0583**
Reported: 09-May-12 09:15

Client Sample ID: **(EMF-SW-C)042612**

SVL Sample ID: **W2D0583-03 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 26-Apr-12 13:45
Received: 26-Apr-12
Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
--------	---------	--------	-------	----	-----	----------	-------	---------	----------	-------

Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W218018	KWH	05/08/12 10:52	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W218018	KWH	05/08/12 10:52	
EPA 200.8	Cadmium	0.00044	mg/L	0.00020	0.00002	2.5	W218018	KWH	05/08/12 10:52	
EPA 200.8	Lead	0.00536	mg/L	0.00300	0.000072	2.5	W218018	KWH	05/08/12 10:52	
EPA 200.8	Zinc	0.111	mg/L	0.0050	0.0010	2.5	W218018	KWH	05/08/12 10:52	

Metals (Dissolved)

EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W218032	KWH	05/08/12 09:53	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W218032	KWH	05/08/12 09:53	
EPA 200.8	Cadmium	0.00041	mg/L	0.00020	0.000014		W218032	KWH	05/08/12 09:53	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000058		W218032	KWH	05/08/12 09:53	
EPA 200.8	Zinc	0.110	mg/L	0.0050	0.0008		W218032	KWH	05/08/12 09:53	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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Terragraphics (Moscow)
121 S Jackson
Moscow, ID 83843

Project Name: Terragraphics EMF Well
Work Order: **W2D0583**
Reported: 09-May-12 09:15

Client Sample ID: **(EMF-SW-C-C)042612**

SVL Sample ID: **W2D0583-04 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 26-Apr-12 13:45
Received: 26-Apr-12
Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total Recoverable--reportable as Total per 40 CFR 136)										
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W218018	KWH	05/08/12 10:56	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W218018	KWH	05/08/12 10:56	
EPA 200.8	Cadmium	0.00046	mg/L	0.00020	0.00002	2.5	W218018	KWH	05/08/12 10:56	
EPA 200.8	Lead	0.00539	mg/L	0.00300	0.000072	2.5	W218018	KWH	05/08/12 10:56	
EPA 200.8	Zinc	0.113	mg/L	0.0050	0.0010	2.5	W218018	KWH	05/08/12 10:56	
Metals (Dissolved)										
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W218032	KWH	05/08/12 09:57	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W218032	KWH	05/08/12 09:57	
EPA 200.8	Cadmium	0.00065	mg/L	0.00020	0.000014		W218032	KWH	05/08/12 09:57	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000058		W218032	KWH	05/08/12 09:57	
EPA 200.8	Zinc	0.111	mg/L	0.0050	0.0008		W218032	KWH	05/08/12 09:57	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



One Government Gulch - PO Box 929

Kellogg ID 83837-0929

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Fax (208) 783-0891

Terragraphics (Moscow)
121 S Jackson
Moscow, ID 83843

Project Name: Terragraphics EMF Well
Work Order: **W2D0583**
Reported: 09-May-12 09:15

Client Sample ID: **(EMF-SW-D)042612**

SVL Sample ID: **W2D0583-05 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 26-Apr-12 14:10
Received: 26-Apr-12
Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W218018	KWH	05/08/12 11:01	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W218018	KWH	05/08/12 11:01	
EPA 200.8	Cadmium	0.00039	mg/L	0.00020	0.00002	2.5	W218018	KWH	05/08/12 11:01	
EPA 200.8	Lead	0.00373	mg/L	0.00300	0.000072	2.5	W218018	KWH	05/08/12 11:01	
EPA 200.8	Zinc	0.0713	mg/L	0.0050	0.0010	2.5	W218018	KWH	05/08/12 11:01	

Metals (Dissolved)

EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W218032	KWH	05/08/12 10:02	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W218032	KWH	05/08/12 10:02	
EPA 200.8	Cadmium	0.00035	mg/L	0.00020	0.000014		W218032	KWH	05/08/12 10:02	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000058		W218032	KWH	05/08/12 10:02	
EPA 200.8	Zinc	0.0810	mg/L	0.0050	0.0008		W218032	KWH	05/08/12 10:02	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Terragraphics (Moscow)
121 S Jackson
Moscow, ID 83843

Project Name: Terragraphics EMF Well
Work Order: **W2D0583**
Reported: 09-May-12 09:15

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
Metals (Total Recoverable--reportable as Total per 40 CFR 136)								
EPA 200.8	Antimony	mg/L	<0.00300	0.00015	0.00300	W218018	08-May-12	
EPA 200.8	Arsenic	mg/L	<0.0030	0.0003	0.0030	W218018	08-May-12	
EPA 200.8	Lead	mg/L	<0.00300	0.000072	0.00300	W218018	08-May-12	
EPA 200.8	Zinc	mg/L	<0.0050	0.0010	0.0050	W218018	08-May-12	
EPA 200.8	Cadmium	mg/L	<0.00020	0.00002	0.00020	W218018	08-May-12	
Metals (Dissolved)								
EPA 200.8	Antimony	mg/L	<0.00300	0.00012	0.00300	W218032	08-May-12	
EPA 200.8	Arsenic	mg/L	<0.0030	0.0002	0.0030	W218032	08-May-12	
EPA 200.8	Cadmium	mg/L	<0.00020	0.000014	0.00020	W218032	08-May-12	
EPA 200.8	Lead	mg/L	<0.00300	0.000058	0.00300	W218032	08-May-12	
EPA 200.8	Zinc	mg/L	<0.0050	0.0008	0.0050	W218032	08-May-12	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Total Recoverable--reportable as Total per 40 CFR 136)									
EPA 200.8	Antimony	mg/L	0.0273	0.0250	109	85 - 115	W218018	08-May-12	
EPA 200.8	Arsenic	mg/L	0.0249	0.0250	99.7	85 - 115	W218018	08-May-12	
EPA 200.8	Lead	mg/L	0.0256	0.0250	102	85 - 115	W218018	08-May-12	
EPA 200.8	Zinc	mg/L	0.0250	0.0250	100	85 - 115	W218018	08-May-12	
EPA 200.8	Cadmium	mg/L	0.0258	0.0250	103	85 - 115	W218018	08-May-12	
Metals (Dissolved)									
EPA 200.8	Antimony	mg/L	0.0256	0.0250	102	85 - 115	W218032	08-May-12	
EPA 200.8	Arsenic	mg/L	0.0256	0.0250	102	85 - 115	W218032	08-May-12	
EPA 200.8	Cadmium	mg/L	0.0256	0.0250	103	85 - 115	W218032	08-May-12	
EPA 200.8	Lead	mg/L	0.0250	0.0250	99.9	85 - 115	W218032	08-May-12	
EPA 200.8	Zinc	mg/L	0.0255	0.0250	102	85 - 115	W218032	08-May-12	

Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
Metals (Total Recoverable--reportable as Total per 40 CFR 136)									
EPA 200.8	Antimony	mg/L	<0.00300	<0.00300	<RL	20	W218018	08-May-12	
EPA 200.8	Arsenic	mg/L	<0.0030	<0.0030	<RL	20	W218018	08-May-12	
EPA 200.8	Lead	mg/L	0.0111	0.0106	4.9	20	W218018	08-May-12	
EPA 200.8	Zinc	mg/L	0.107	0.104	2.3	20	W218018	08-May-12	
EPA 200.8	Cadmium	mg/L	0.00051	0.00050	3.2	20	W218018	08-May-12	
Metals (Dissolved)									
EPA 200.8	Antimony	mg/L	<0.00300	<0.00300	<RL	20	W218032	08-May-12	
EPA 200.8	Arsenic	mg/L	<0.0030	<0.0030	<RL	20	W218032	08-May-12	
EPA 200.8	Cadmium	mg/L	0.00049	0.00049	0.3	20	W218032	08-May-12	
EPA 200.8	Lead	mg/L	<0.00300	<0.00300	<RL	20	W218032	08-May-12	
EPA 200.8	Zinc	mg/L	0.114	0.113	1.3	20	W218032	08-May-12	



Terragraphics (Moscow)
121 S Jackson
Moscow, ID 83843

Project Name: Terragraphics EMF Well
Work Order: **W2D0583**
Reported: 09-May-12 09:15

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.8	Antimony	mg/L	0.0269	<0.00300	0.0250	107	70 - 130	W218018	08-May-12	
EPA 200.8	Arsenic	mg/L	0.0250	<0.0030	0.0250	97.8	70 - 130	W218018	08-May-12	
EPA 200.8	Lead	mg/L	0.0369	0.0106	0.0250	105	70 - 130	W218018	08-May-12	
EPA 200.8	Zinc	mg/L	0.129	0.104	0.0250	101	70 - 130	W218018	08-May-12	
EPA 200.8	Cadmium	mg/L	0.0260	0.00050	0.0250	102	70 - 130	W218018	08-May-12	

Metals (Dissolved)

EPA 200.8	Antimony	mg/L	0.0261	<0.00300	0.0250	103	70 - 130	W218032	08-May-12	
EPA 200.8	Arsenic	mg/L	0.0260	<0.0030	0.0250	102	70 - 130	W218032	08-May-12	
EPA 200.8	Cadmium	mg/L	0.0268	0.00049	0.0250	105	70 - 130	W218032	08-May-12	
EPA 200.8	Lead	mg/L	0.0270	<0.00300	0.0250	104	70 - 130	W218032	08-May-12	
EPA 200.8	Zinc	mg/L	0.137	0.113	0.0250	96.6	70 - 130	W218032	08-May-12	

Notes and Definitions

LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable



Terragraphics (Moscow)
121 S Jackson
Moscow, ID 83843

Project Name: Terragraphics EMF Well
Work Order: **W2D0641**
Reported: 14-May-12 14:19

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Sampled By	Date Received
(EMF-SW-A)043012	W2D0641-01	Surface Water	30-Apr-12 09:35	GM	30-Apr-2012
(EMF-SW-B)043012	W2D0641-02	Surface Water	30-Apr-12 10:00	GM	30-Apr-2012
(EMF-SW-C)043012	W2D0641-03	Surface Water	30-Apr-12 10:35	GM	30-Apr-2012
(EMF-SW-C-C)043012	W2D0641-04	Surface Water	30-Apr-12 10:35	GM	30-Apr-2012
(EMF-SW-D)043012	W2D0641-05	Surface Water	30-Apr-12 11:00	GM	30-Apr-2012

Solid samples are analyzed on an as-received, wet-weight basis, unless otherwise requested.

Sample preparation is defined by the client as per their Data Quality Objectives.

This report supercedes any previous reports for this Work Order. The complete report includes pages for each sample, a full QC report, and a notes section.

The results presented in this report relate only to the samples, and meet all requirements of the NELAC Standards unless otherwise noted.



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Terragraphics (Moscow)
121 S Jackson
Moscow, ID 83843

Project Name: Terragraphics EMF Well
Work Order: **W2D0641**
Reported: 14-May-12 14:19

Client Sample ID: **(EMF-SW-A)043012**

SVL Sample ID: **W2D0641-01 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 30-Apr-12 09:35
Received: 30-Apr-12
Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W218174	KWH	05/14/12 10:44	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W218174	KWH	05/14/12 10:44	
EPA 200.8	Cadmium	0.00030	mg/L	0.00020	0.00002	2.5	W218174	KWH	05/14/12 10:44	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000072	2.5	W218174	KWH	05/14/12 10:44	
EPA 200.8	Zinc	0.0859	mg/L	0.0050	0.0010	2.5	W218174	KWH	05/14/12 10:44	

Metals (Dissolved)

EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W218179	KWH	05/14/12 10:24	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W218179	KWH	05/14/12 10:24	
EPA 200.8	Cadmium	0.00026	mg/L	0.00020	0.000014		W218179	KWH	05/14/12 10:24	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000058		W218179	KWH	05/14/12 10:24	
EPA 200.8	Zinc	0.0900	mg/L	0.0050	0.0008		W218179	KWH	05/14/12 10:24	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



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Terragraphics (Moscow)
121 S Jackson
Moscow, ID 83843

Project Name: Terragraphics EMF Well
Work Order: **W2D0641**
Reported: 14-May-12 14:19

Client Sample ID: **(EMF-SW-B)043012**

SVL Sample ID: **W2D0641-02 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 30-Apr-12 10:00
Received: 30-Apr-12
Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total Recoverable--reportable as Total per 40 CFR 136)										
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W218174	KWH	05/14/12 10:49	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W218174	KWH	05/14/12 10:49	
EPA 200.8	Cadmium	0.00021	mg/L	0.00020	0.00002	2.5	W218174	KWH	05/14/12 10:49	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000072	2.5	W218174	KWH	05/14/12 10:49	
EPA 200.8	Zinc	0.0625	mg/L	0.0050	0.0010	2.5	W218174	KWH	05/14/12 10:49	
Metals (Dissolved)										
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W218179	KWH	05/14/12 10:29	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W218179	KWH	05/14/12 10:29	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000014		W218179	KWH	05/14/12 10:29	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000058		W218179	KWH	05/14/12 10:29	
EPA 200.8	Zinc	0.0630	mg/L	0.0050	0.0008		W218179	KWH	05/14/12 10:29	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



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Terragraphics (Moscow)
121 S Jackson
Moscow, ID 83843

Project Name: Terragraphics EMF Well
Work Order: **W2D0641**
Reported: 14-May-12 14:19

Client Sample ID: **(EMF-SW-C)043012**

SVL Sample ID: **W2D0641-03 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 30-Apr-12 10:35
Received: 30-Apr-12
Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total Recoverable--reportable as Total per 40 CFR 136)										
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W218174	KWH	05/14/12 10:51	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W218174	KWH	05/14/12 10:51	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W218174	KWH	05/14/12 10:51	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000072	2.5	W218174	KWH	05/14/12 10:51	
EPA 200.8	Zinc	0.0550	mg/L	0.0050	0.0010	2.5	W218174	KWH	05/14/12 10:51	
Metals (Dissolved)										
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W218179	KWH	05/14/12 10:31	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W218179	KWH	05/14/12 10:31	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000014		W218179	KWH	05/14/12 10:31	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000058		W218179	KWH	05/14/12 10:31	
EPA 200.8	Zinc	0.0552	mg/L	0.0050	0.0008		W218179	KWH	05/14/12 10:31	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



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Terragraphics (Moscow)
121 S Jackson
Moscow, ID 83843

Project Name: Terragraphics EMF Well
Work Order: **W2D0641**
Reported: 14-May-12 14:19

Client Sample ID: **(EMF-SW-C-C)043012**

SVL Sample ID: **W2D0641-04 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 30-Apr-12 10:35
Received: 30-Apr-12
Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total Recoverable--reportable as Total per 40 CFR 136)										
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W218174	KWH	05/14/12 10:53	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W218174	KWH	05/14/12 10:53	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.00002	2.5	W218174	KWH	05/14/12 10:53	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000072	2.5	W218174	KWH	05/14/12 10:53	
EPA 200.8	Zinc	0.0552	mg/L	0.0050	0.0010	2.5	W218174	KWH	05/14/12 10:53	
Metals (Dissolved)										
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W218179	KWH	05/14/12 10:33	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W218179	KWH	05/14/12 10:33	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000014		W218179	KWH	05/14/12 10:33	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000058		W218179	KWH	05/14/12 10:33	
EPA 200.8	Zinc	0.0555	mg/L	0.0050	0.0008		W218179	KWH	05/14/12 10:33	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



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Kellogg ID 83837-0929

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Terragraphics (Moscow)
121 S Jackson
Moscow, ID 83843

Project Name: Terragraphics EMF Well
Work Order: **W2D0641**
Reported: 14-May-12 14:19

Client Sample ID: **(EMF-SW-D)043012**

SVL Sample ID: **W2D0641-05 (Surface Water)**

Sample Report Page 1 of 1

Sampled: 30-Apr-12 11:00
Received: 30-Apr-12
Sampled By: GM

Method	Analyte	Result	Units	RL	MDL	Dilution	Batch	Analyst	Analyzed	Notes
Metals (Total Recoverable--reportable as Total per 40 CFR 136)										
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00015	2.5	W218174	KWH	05/14/12 10:55	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0003	2.5	W218174	KWH	05/14/12 10:55	
EPA 200.8	Cadmium	0.00022	mg/L	0.00020	0.00002	2.5	W218174	KWH	05/14/12 10:55	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000072	2.5	W218174	KWH	05/14/12 10:55	
EPA 200.8	Zinc	0.0564	mg/L	0.0050	0.0010	2.5	W218174	KWH	05/14/12 10:55	
Metals (Dissolved)										
EPA 200.8	Antimony	< 0.00300	mg/L	0.00300	0.00012		W218179	KWH	05/14/12 10:35	
EPA 200.8	Arsenic	< 0.0030	mg/L	0.0030	0.0002		W218179	KWH	05/14/12 10:35	
EPA 200.8	Cadmium	< 0.00020	mg/L	0.00020	0.000014		W218179	KWH	05/14/12 10:35	
EPA 200.8	Lead	< 0.00300	mg/L	0.00300	0.000058		W218179	KWH	05/14/12 10:35	
EPA 200.8	Zinc	0.0567	mg/L	0.0050	0.0008		W218179	KWH	05/14/12 10:35	

This data has been reviewed for accuracy and has been authorized for release by the Laboratory Director or designee.

John Kern
Laboratory Director



Terragraphics (Moscow)
121 S Jackson
Moscow, ID 83843

Project Name: Terragraphics EMF Well
Work Order: **W2D0641**
Reported: 14-May-12 14:19

Quality Control - BLANK Data

Method	Analyte	Units	Result	MDL	MRL	Batch ID	Analyzed	Notes
Metals (Total Recoverable--reportable as Total per 40 CFR 136)								
EPA 200.8	Antimony	mg/L	<0.00300	0.00015	0.00300	W218174	14-May-12	
EPA 200.8	Arsenic	mg/L	<0.0030	0.0003	0.0030	W218174	14-May-12	
EPA 200.8	Lead	mg/L	<0.00300	0.000072	0.00300	W218174	14-May-12	
EPA 200.8	Zinc	mg/L	<0.0050	0.0010	0.0050	W218174	14-May-12	
EPA 200.8	Cadmium	mg/L	<0.00020	0.00002	0.00020	W218174	14-May-12	
Metals (Dissolved)								
EPA 200.8	Antimony	mg/L	<0.00300	0.00012	0.00300	W218179	14-May-12	
EPA 200.8	Arsenic	mg/L	<0.0030	0.0002	0.0030	W218179	14-May-12	
EPA 200.8	Cadmium	mg/L	<0.00020	0.000014	0.00020	W218179	14-May-12	
EPA 200.8	Lead	mg/L	<0.00300	0.000058	0.00300	W218179	14-May-12	
EPA 200.8	Zinc	mg/L	<0.0050	0.0008	0.0050	W218179	14-May-12	

Quality Control - LABORATORY CONTROL SAMPLE Data

Method	Analyte	Units	LCS Result	LCS True	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
Metals (Total Recoverable--reportable as Total per 40 CFR 136)									
EPA 200.8	Antimony	mg/L	0.0284	0.0250	113	85 - 115	W218174	14-May-12	
EPA 200.8	Arsenic	mg/L	0.0261	0.0250	104	85 - 115	W218174	14-May-12	
EPA 200.8	Lead	mg/L	0.0255	0.0250	102	85 - 115	W218174	14-May-12	
EPA 200.8	Zinc	mg/L	0.0271	0.0250	108	85 - 115	W218174	14-May-12	
EPA 200.8	Cadmium	mg/L	0.0254	0.0250	102	85 - 115	W218174	14-May-12	
Metals (Dissolved)									
EPA 200.8	Antimony	mg/L	0.0254	0.0250	102	85 - 115	W218179	14-May-12	
EPA 200.8	Arsenic	mg/L	0.0262	0.0250	105	85 - 115	W218179	14-May-12	
EPA 200.8	Cadmium	mg/L	0.0257	0.0250	103	85 - 115	W218179	14-May-12	
EPA 200.8	Lead	mg/L	0.0258	0.0250	103	85 - 115	W218179	14-May-12	
EPA 200.8	Zinc	mg/L	0.0267	0.0250	107	85 - 115	W218179	14-May-12	

Quality Control - DUPLICATE Data

Method	Analyte	Units	Duplicate Result	Sample Result	RPD	RPD Limit	Batch ID	Analyzed	Notes
Metals (Total Recoverable--reportable as Total per 40 CFR 136)									
EPA 200.8	Antimony	mg/L	<0.00300	<0.00300	<RL	20	W218174	14-May-12	
EPA 200.8	Arsenic	mg/L	<0.0030	<0.0030	<RL	20	W218174	14-May-12	
EPA 200.8	Lead	mg/L	<0.00300	<0.00300	<RL	20	W218174	14-May-12	
EPA 200.8	Zinc	mg/L	0.0852	0.0859	0.9	20	W218174	14-May-12	
EPA 200.8	Cadmium	mg/L	0.00030	0.00030	0.3	20	W218174	14-May-12	
Metals (Dissolved)									
EPA 200.8	Antimony	mg/L	<0.00300	<0.00300	<RL	20	W218179	14-May-12	
EPA 200.8	Arsenic	mg/L	<0.0030	<0.0030	<RL	20	W218179	14-May-12	
EPA 200.8	Cadmium	mg/L	0.00026	0.00026	1.0	20	W218179	14-May-12	
EPA 200.8	Lead	mg/L	<0.00300	<0.00300	<RL	20	W218179	14-May-12	
EPA 200.8	Zinc	mg/L	0.0889	0.0900	1.2	20	W218179	14-May-12	



Terragraphics (Moscow)
 121 S Jackson
 Moscow, ID 83843

Project Name: Terragraphics EMF Well
 Work Order: **W2D0641**
 Reported: 14-May-12 14:19

Quality Control - MATRIX SPIKE Data

Method	Analyte	Units	Spike Result	Sample Result (R)	Spike Level (S)	% Rec.	Acceptance Limits	Batch ID	Analyzed	Notes
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Metals (Total Recoverable--reportable as Total per 40 CFR 136)

EPA 200.8	Antimony	mg/L	0.0288	<0.00300	0.0250	114	70 - 130	W218174	14-May-12	
EPA 200.8	Arsenic	mg/L	0.0277	<0.0030	0.0250	105	70 - 130	W218174	14-May-12	
EPA 200.8	Lead	mg/L	0.0282	<0.00300	0.0250	101	70 - 130	W218174	14-May-12	
EPA 200.8	Zinc	mg/L	0.113	0.0859	0.0250	108	70 - 130	W218174	14-May-12	
EPA 200.8	Cadmium	mg/L	0.0263	0.00030	0.0250	104	70 - 130	W218174	14-May-12	

Metals (Dissolved)

EPA 200.8	Antimony	mg/L	0.0256	<0.00300	0.0250	100	70 - 130	W218179	14-May-12	
EPA 200.8	Arsenic	mg/L	0.0285	<0.0030	0.0250	109	70 - 130	W218179	14-May-12	
EPA 200.8	Cadmium	mg/L	0.0261	0.00026	0.0250	103	70 - 130	W218179	14-May-12	
EPA 200.8	Lead	mg/L	0.0267	<0.00300	0.0250	99.3	70 - 130	W218179	14-May-12	
EPA 200.8	Zinc	mg/L	0.115	0.0900	0.0250	101	70 - 130	W218179	14-May-12	

Notes and Definitions

LCS	Laboratory Control Sample (Blank Spike)
RPD	Relative Percent Difference
UDL	A result is less than the detection limit
R > 4S	% recovery not applicable, sample concentration more than four times greater than spike level
<RL	A result is less than the reporting limit
MRL	Method Reporting Limit
MDL	Method Detection Limit
N/A	Not Applicable