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## TECHNICAL MEMORANDUM

**To:** Don Carpenter, IDEQ, Boise

**From:** Robin Nimmer, TerraGraphics, Moscow

**Date:** October 24, 2014

**Project Code:** IDEQ C985, 14005-08-02

**Subject:** Third Quarter 2014 Groundwater Monitoring at the East Mission Flats Repository

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The purpose of this memorandum is to summarize the East Mission Flats Repository (EMFR) Third Quarter 2014 Groundwater Sampling Event and present the data. An evaluation and discussion of the quarterly monitoring results will be completed in the 2014 annual report for EMFR.

### 1 Sampling Summary

Figure 1 shows the locations of the one decontamination well, seven groundwater monitoring wells, two piezometers, and two surface water level loggers in the vicinity of EMFR. Samples were collected from all seven of the groundwater monitoring wells on July 23, 2014.

A detailed description of the field sampling, handling, documentation, and analytical procedures is provided in the *Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP) for Groundwater and Surface Water Monitoring at the East Mission Flats Repository* (TerraGraphics 2010), hereinafter referred to as the EMFR SAP/QAPP, and *Addendum 3 to the East Mission Flats Sampling and Analysis Plan (SAP)/Quality Assurance Project Plan (QAPP)* (TerraGraphics 2014a), hereinafter referred to as the SAP/QAPP Addendum. As of July 2014, samples will no longer be analyzed for total metals and the Decon Well will no longer be sampled per the SAP/QAPP Addendum (TerraGraphics 2014a).

All field and analytical procedures were conducted according to the EMFR SAP/QAPP. Attachment A contains the field sheets for each sampled well.

### 2 Water Levels and Hydrographs

Figure 2 shows hydrographs of the water levels recorded at seven monitoring wells in the immediate vicinity of the repository and data from the U.S. Geological Survey (USGS) Gage

Station 12413500 on the Coeur d'Alene River near Cataldo, Idaho (USGS 2014). Two new dataloggers were installed at 08-EMF-MW-E and 08-EMF-MW-F during the third quarter. Data recording began on April 14, 2014, at 08-EMF-MW-F and on July 16, 2014, at 08-EMF-MW-E.

There was no water present at the two surface water level logger sites (LL-1 and LL-2) during the Third Quarter 2014 monitoring period. Piezometers 10-EMF-PZ-A and 10-EMF-PZ-B were dry during this sampling event.

### 3 Groundwater Monitoring Results

The historical and Third Quarter 2014 Sampling Event hydraulic gradient at the site is toward the southwest (Figure 3). Data from 09-EMF-MW-C Deep and 08-EMF-MW-E are not used to develop groundwater elevation contours because 09-EMF-MW-C Deep is screened deeper than the other monitoring wells, and 08-EMF-MW-E appears to be in a different hydrologic unit from the other wells based on water levels and water quality data.

Table 1 and Figure 4 display the cumulative field parameter data for the groundwater sites. Table 2 and Figure 5 display the cumulative groundwater sample results for dissolved metals<sup>1</sup>. The Third Quarter 2014 Sampling Event parameter and dissolved metal data are highlighted in green in each table.

Dissolved metal concentrations for this project are compared to the groundwater total metal regulatory thresholds because no specific dissolved metal regulatory thresholds exist, and it is assumed that dissolved concentrations are indicators of contamination in groundwater under all conditions (CH2M Hill 2006).

Dissolved metals results exceeding the respective regulatory threshold are highlighted in pink in Table 2. The Third Quarter 2014 dissolved metal exceedances in groundwater are as follows:

- Dissolved cadmium at 07-EMF-MW-C

Dissolved zinc and dissolved cadmium concentrations at 07-EMF-MW-C are higher than previously observed at this well, and dissolved cadmium at 07-EMF-MW-C exceeded the regulatory threshold for the first time. Dissolved cadmium and zinc will continue to be monitored and will be further evaluated in the 2014 annual report.

Attachment B contains the U.S. Environmental Protection Agency (USEPA) Contract Laboratory Program (CLP) analytical results (dissolved cations, total and dissolved metals, total hardness, and total phosphorus). Attachment C contains the SVL analytical results (dissolved anions and total alkalinity).

The Third Quarter 2014 Sampling Event data were considered acceptable, and no laboratory or field data were rejected. The following laboratory data were qualified as estimates (*J*) as discussed in the data quality review (TerraGraphics 2014b):

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<sup>1</sup> All results in Table 2 are displayed as reported by the laboratory with their associated qualifiers (prior to 2014, results below reporting limits were displayed as 'ND'). Figure 5 displays non-detected results using the detection limits (prior to 2014, non-detected results were displayed using half of the detection limits).

- All dissolved zinc, calcium, and magnesium results due to laboratory serial dilution
- Dissolved arsenic and lead at 07-EMF-MW-A, 07-EMF-MW-B, 07-EMF-MW-C, 09-EMF-MW-C-DEEP, and 08-EMF-MW-F (original and duplicate), and dissolved cadmium at 07-EMF-MW-B, 09-EMF-MW-C-DEEP, 08-EMF-MW-E, and 07-EMF-MW-D because the results were greater than or equal to MDLs but less than CRQLs
- Bicarbonate and total alkalinity results for 07-EMF-MW-B and 08-EMF-MW-F (original and duplicate) due to detections in the field blank
- All dissolved nitrate as nitrogen (NO<sub>3</sub>-N) results due to analysis occurring outside the required sample holding time

Any qualified data should be reviewed by an experienced data analyst before being used in analysis and interpretation.

## 4 References

CH2M Hill, 2006. Environmental Monitoring Plan, Operable Unit 2, Bunker Hill Mining and Metallurgical Complex Superfund Site. Prepared for USEPA Region 10. January.

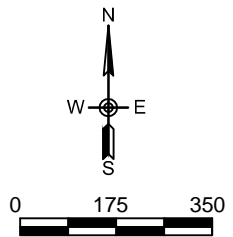
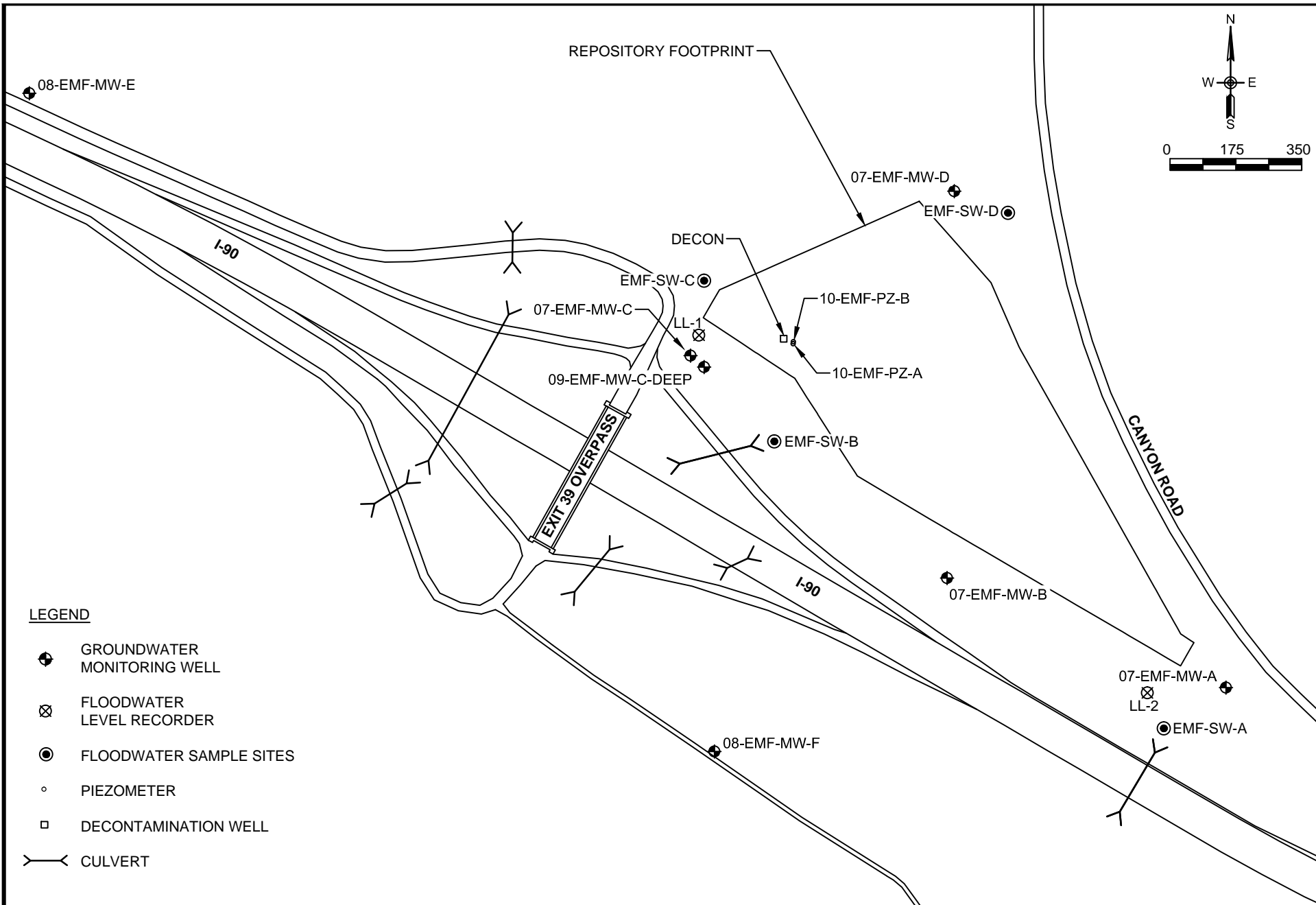
TerraGraphics Environmental Engineering, Inc. (TerraGraphics), 2010. Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP) for Groundwater and Surface Water Monitoring at the East Mission Flats Repository. Revision No. 1; October.

TerraGraphics, 2014a. Addendum 3 to the East Mission Flats Sampling and Analysis Plan (SAP)/Quality Assurance Project Plan (QAPP). August 2014.

TerraGraphics, 2014b. QA/QC Review of the Third Quarter 2014 Groundwater Monitoring at East Mission Flats Repository. Memorandum. October.

U.S. Geological Survey (USGS), 2014. 12413500 Coeur d'Alene River NR Cataldo ID, [http://waterdata.usgs.gov/id/nwis/uv/?site\\_no=12413500](http://waterdata.usgs.gov/id/nwis/uv/?site_no=12413500). July.

M:\Basin Repositories\EMF Water Monitoring\Drawings\EMF\_GW\_Site Map31114.dwg 10/24/2014



**LEGEND**

- ◆ GROUNDWATER MONITORING WELL
- ⊗ FLOODWATER LEVEL RECORDER
- FLOODWATER SAMPLE SITES
- PIEZOMETER
- DECONTAMINATION WELL
- > CULVERT

SCALE: AS NOTED  
 DRAWN BY: D.PFEIFER  
 ENGINEER: D.FORSETH



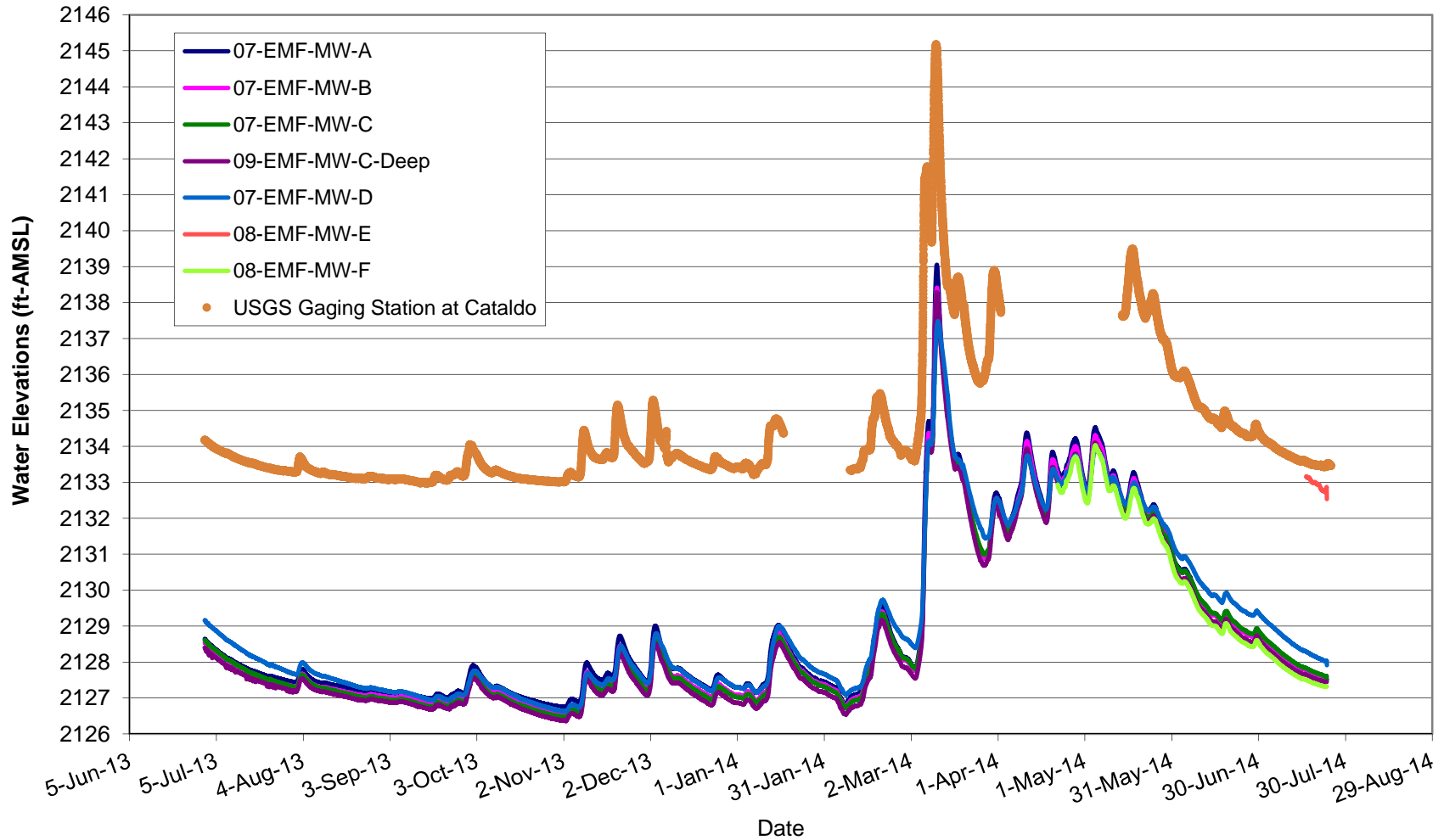
**TerraGraphics**  
 Environmental Engineering, Inc.

EAST MISSION FLATS  
 REPOSITORY  
 CATALDO, IDAHO

**FIGURE 1**  
 EMFR MONITORING  
 LOCATIONS

PROJECT NO: 14005-08-02  
 DATE: 10/24/2014  
 COORDINATE SYSTEM: NAD83 ISP, West, US FT, NGVD29

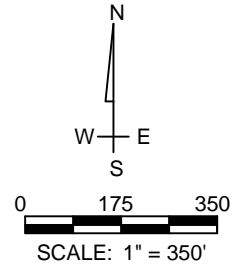
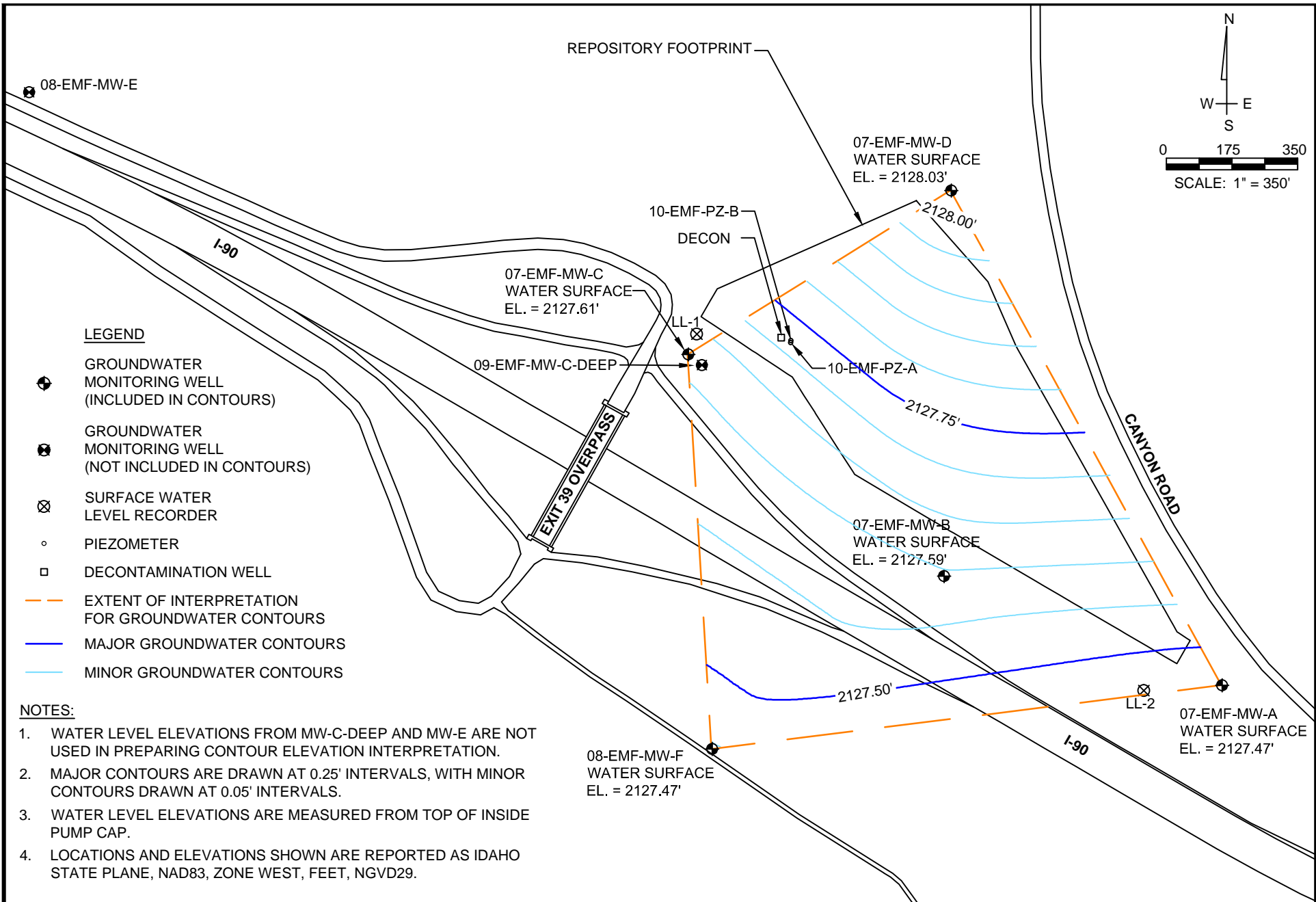
**Figure 2. Water Levels at EMFR Monitoring Wells Compared to River Stage at Cataldo**



Notes:

- Water was detected at LL-1 and LL-2 during mid March 2014; the data will be included in the 2014 floodwater memo.
- All elevations are based on the NGVD29 datum

V:\Basin\_Repository GW Maps\EMF\EMF GW MAP JUL2014\_91514.dwg 9/26/2014



**LEGEND**

- ⊕ GROUNDWATER MONITORING WELL (INCLUDED IN CONTOURS)
- ⊗ GROUNDWATER MONITORING WELL (NOT INCLUDED IN CONTOURS)
- ⊗ SURFACE WATER LEVEL RECORDER
- PIEZOMETER
- DECONTAMINATION WELL
- - - EXTENT OF INTERPRETATION FOR GROUNDWATER CONTOURS
- MAJOR GROUNDWATER CONTOURS
- MINOR GROUNDWATER CONTOURS

**NOTES:**

1. WATER LEVEL ELEVATIONS FROM MW-C-DEEP AND MW-E ARE NOT USED IN PREPARING CONTOUR ELEVATION INTERPRETATION.
2. MAJOR CONTOURS ARE DRAWN AT 0.25' INTERVALS, WITH MINOR CONTOURS DRAWN AT 0.05' INTERVALS.
3. WATER LEVEL ELEVATIONS ARE MEASURED FROM TOP OF INSIDE PUMP CAP.
4. LOCATIONS AND ELEVATIONS SHOWN ARE REPORTED AS IDAHO STATE PLANE, NAD83, ZONE WEST, FEET, NGVD29.

SCALE:  
1" = 350' (8.5x11 PRINT)  
DRAWN BY:  
ENGINEER:



**TerraGraphics**  
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EAST MISSION FLATS  
CATALDO, IDAHO

**FIGURE 3**  
JULY 2014 GROUNDWATER LEVEL  
ELEVATIONS AND CONTOURS

PROJECT NO:  
14005-08-02  
DATE:  
9/26/2014  
FILE NAME:  
EMF GW MAP  
JUL2014\_91514.DWG

Figure 4. Field Parameter Data at EMFR Groundwater Sites

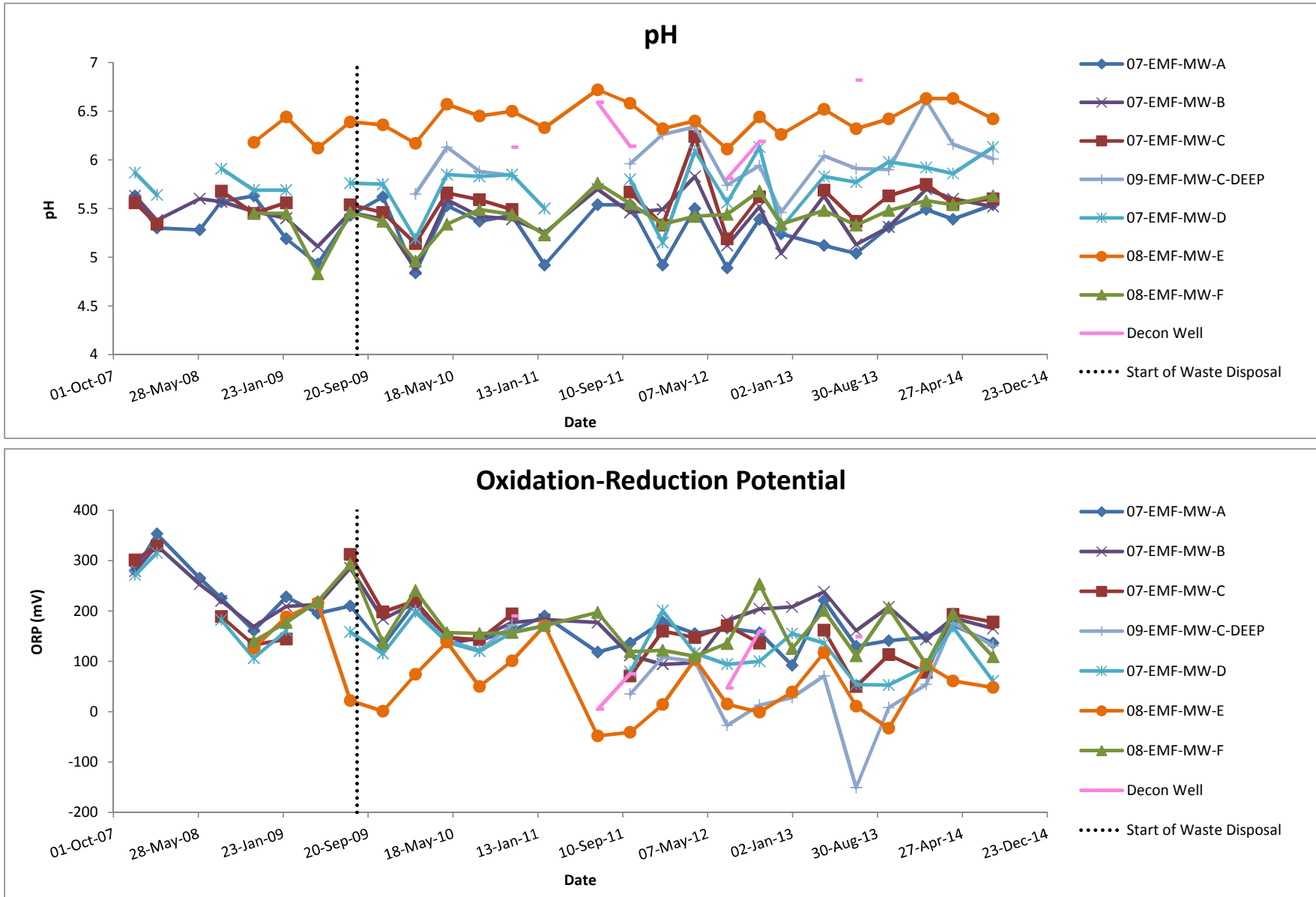


Figure 4. Field Parameter Data at EMFR Groundwater Sites

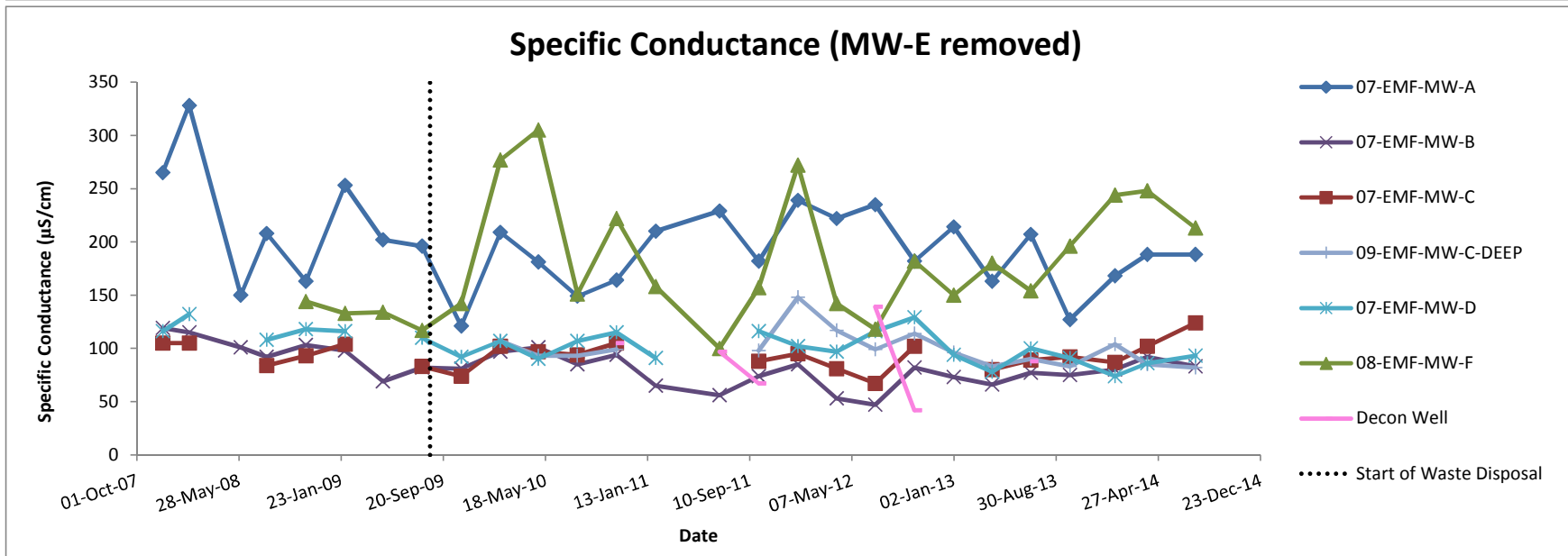
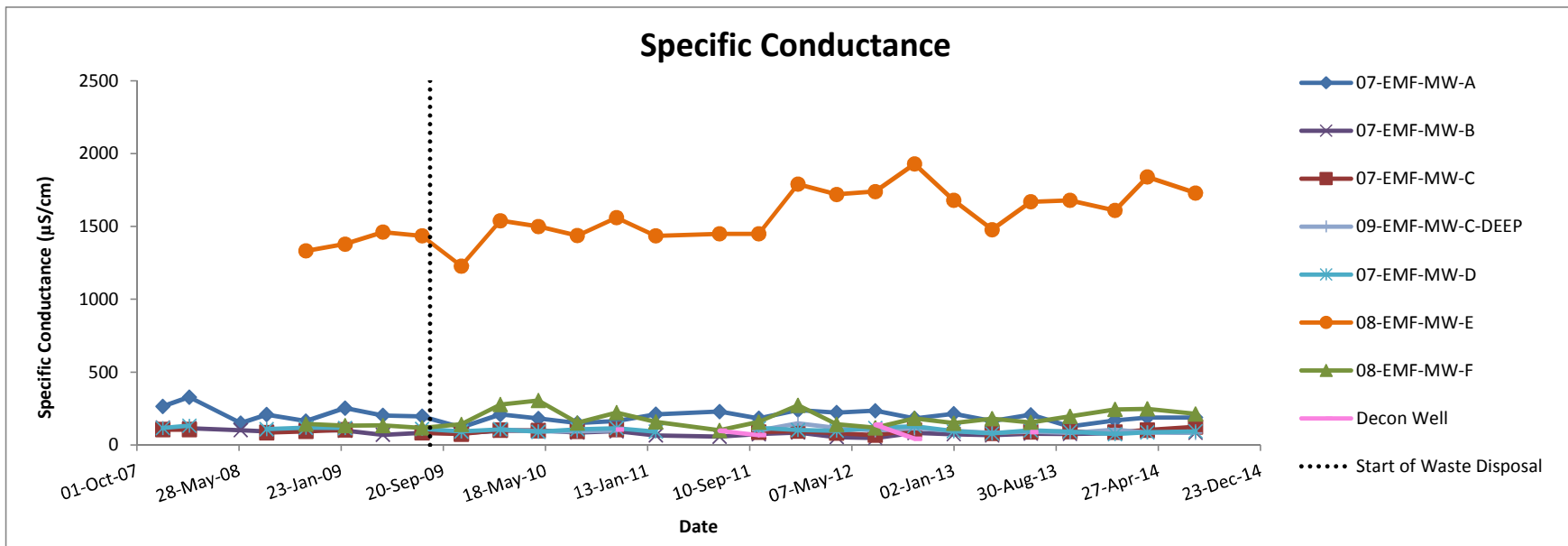




Figure 4. Field Parameter Data at EMFR Groundwater Sites

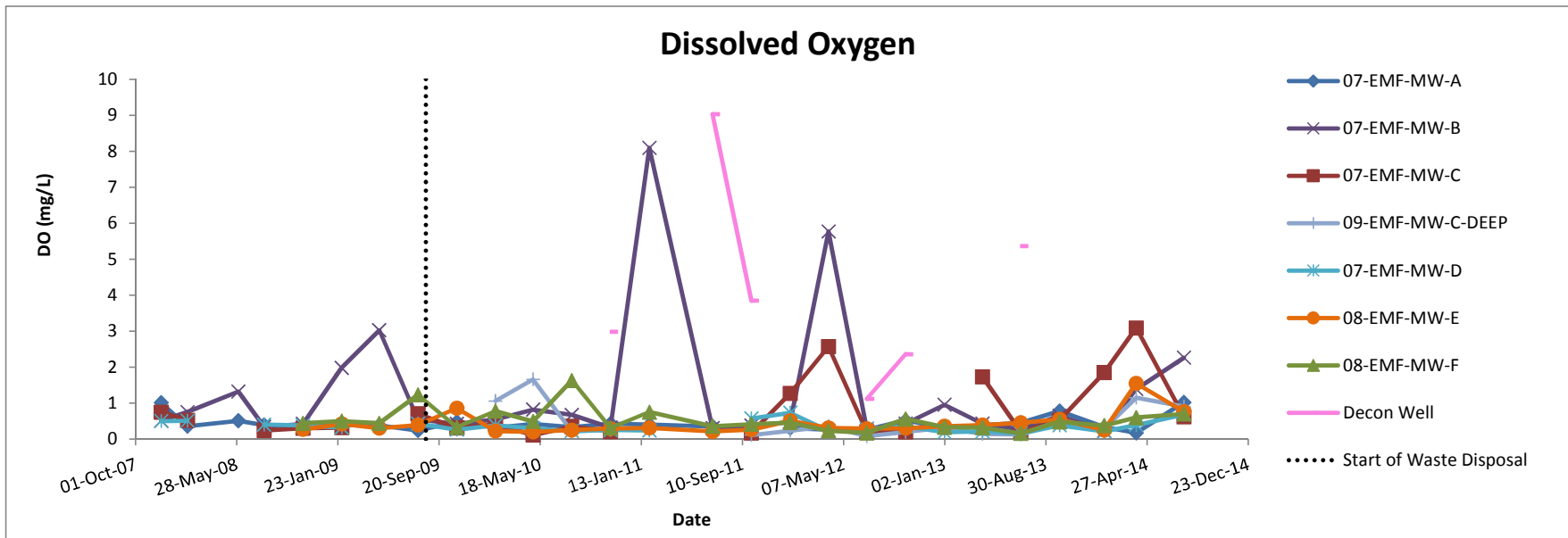
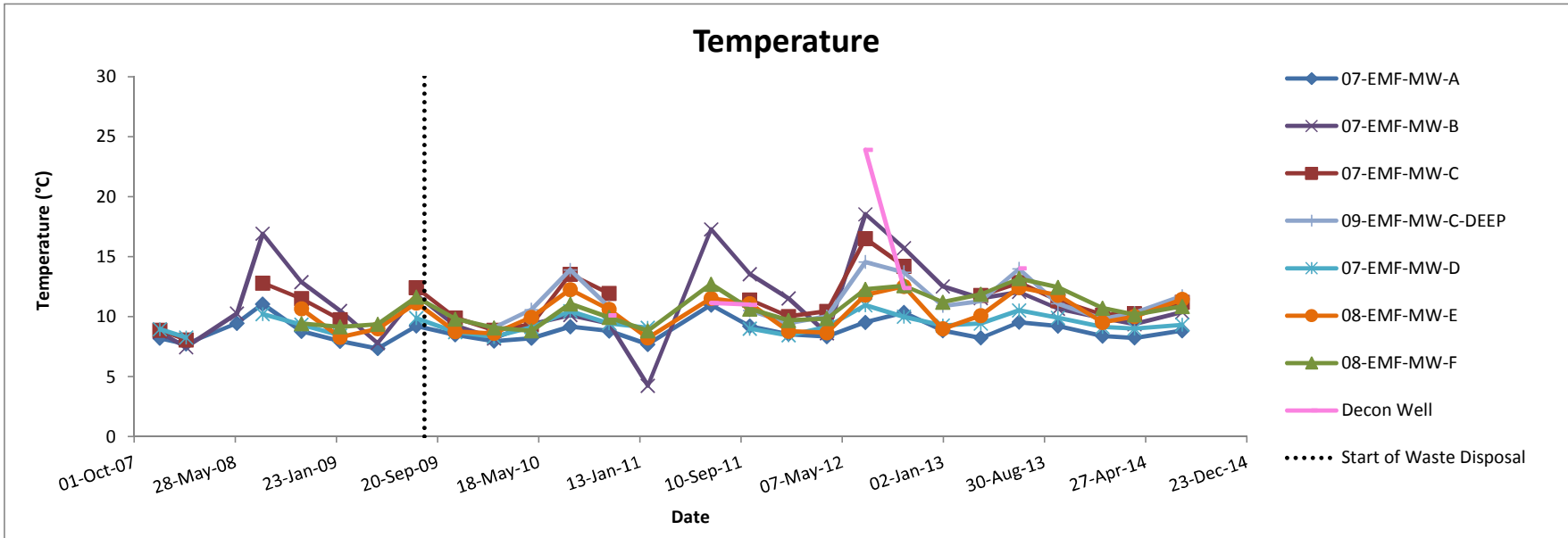


Figure 5. Dissolved Metals Data at EMFR Groundwater Sites

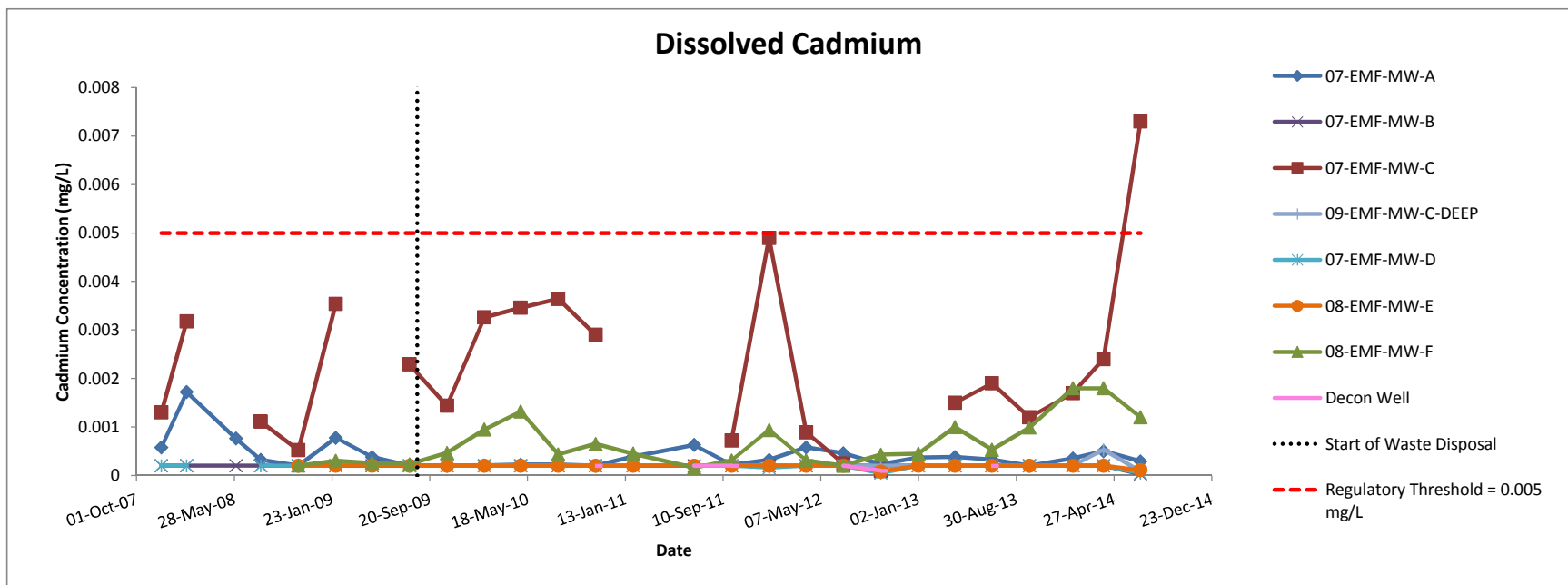
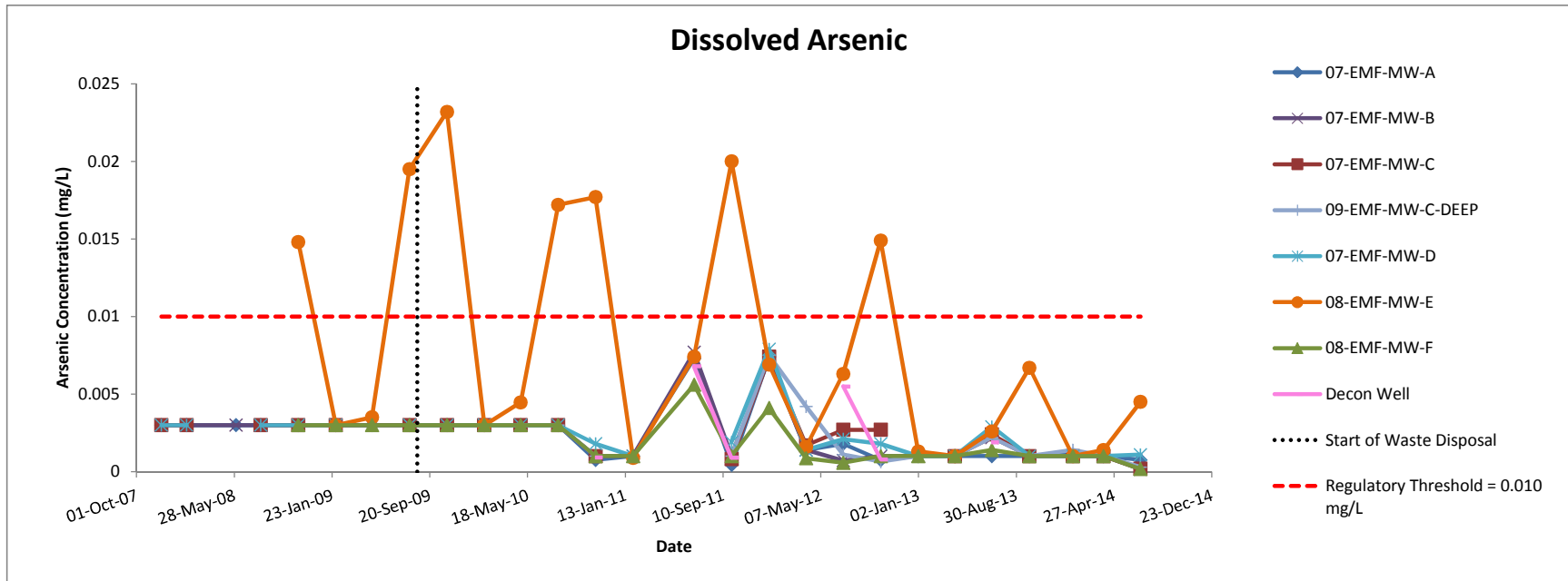
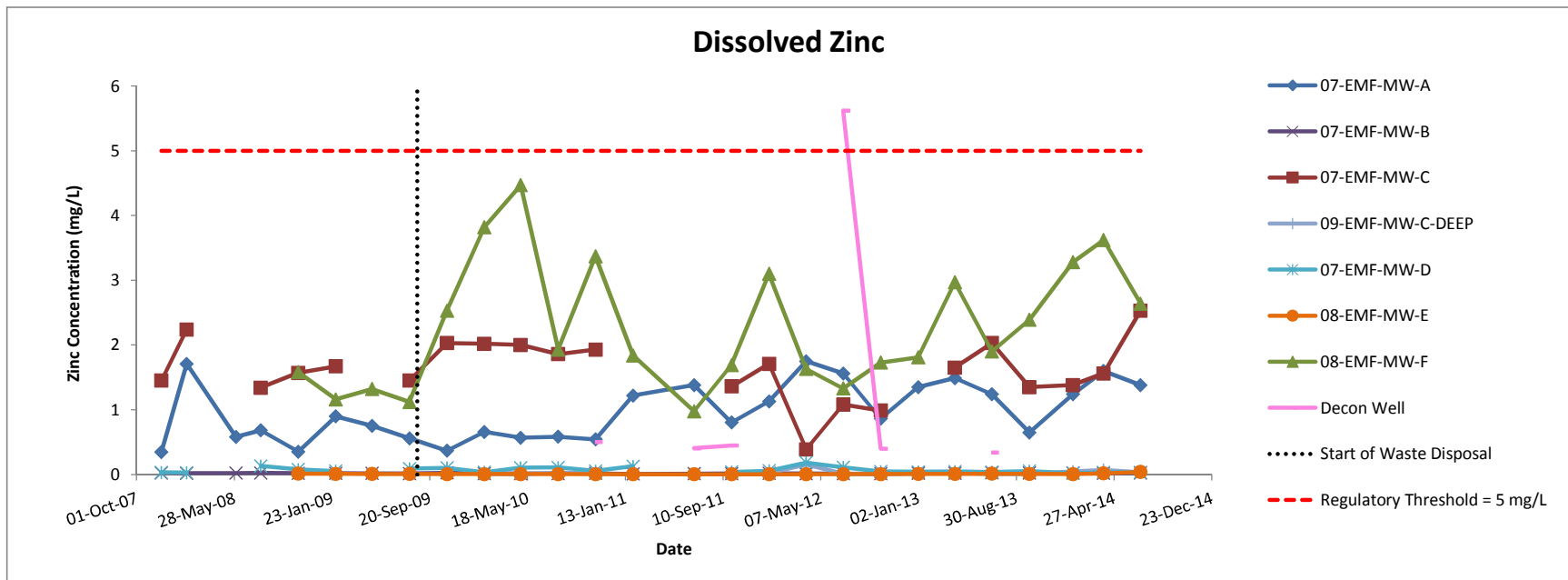
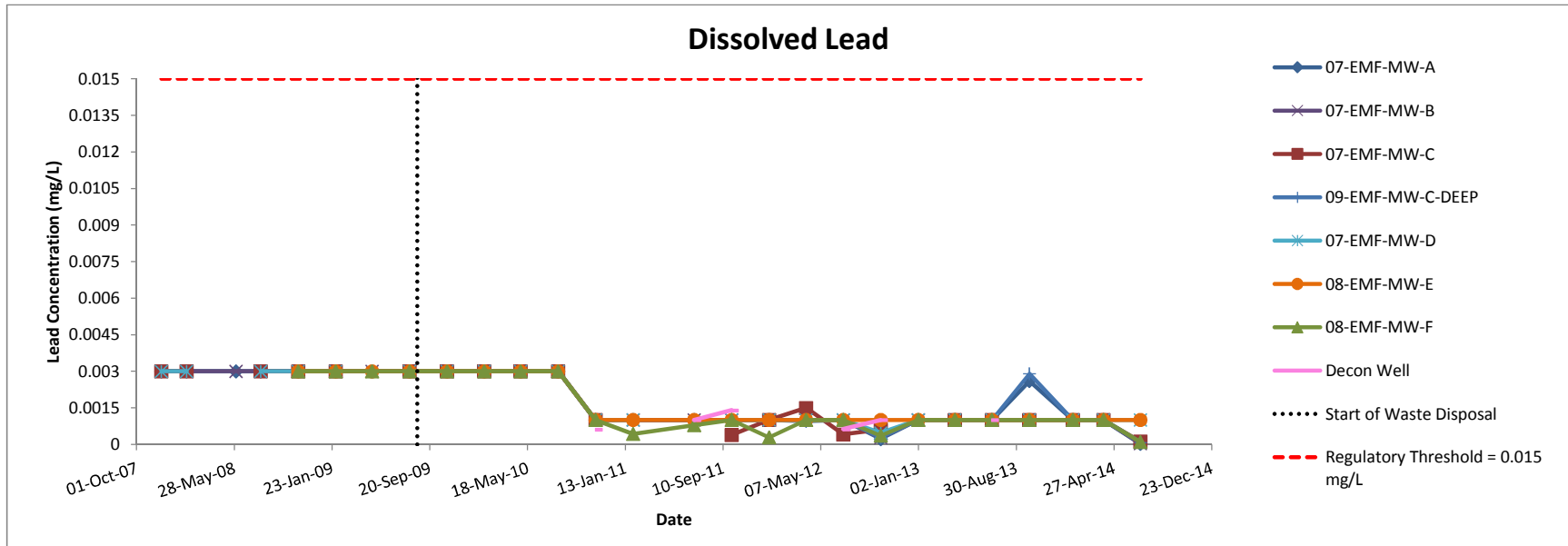


Figure 5. Dissolved Metals Data at EMFR Groundwater Sites



\*Dissolved antimony not shown as it has never been detected at EMFR.

**Table 1  
Field Parameter Data  
East Mission Flats Repository**

Well	Parameter					
	Date	pH	Specific Conductance (µS/cm)	Temperature (°C)	DO (mg/L)	ORP (mV)
07-EMF-MW-A	11-Dec-07	5.63	265	8.21	1.01	280
	25-Feb-08	5.30	328	7.73	0.36	353
	3-Jun-08	5.28	150	9.45	0.51	265
	19-Aug-08	5.57	208	11.05	0.39	225
	10-Nov-08	5.63	163	8.79	0.34	161
	4-Feb-09	5.19	253	7.95	0.39	228
	7-May-09	4.93	202	7.35	0.38	195
	10-Aug-09	5.43	196	9.23	0.24	210
	11-Nov-09	5.62	121	8.49	0.48	131
	25-Feb-10	4.84	209	7.97	0.32	216
	19-May-10	5.53	181	8.21	0.42	147
	25-Aug-10	5.37	149	9.17	0.33	142
	16-Nov-10	5.43	164	8.81	0.43	161
	10-Feb-11	4.92	210	7.69	0.40	190
	6-Jul-11	5.54	229	10.98	0.35	118
	24-Oct-11	5.54	182	9.21	R	136
	25-Jan-12	4.92	239	8.54	0.30	178
	10-Apr-12	5.50	222	8.34	0.26	155
	31-Jul-12	4.89	235	9.53	0.26	166
	29-Oct-12	5.39	182	10.35	0.52	157
	23-Jan-13	5.24	214	8.84	0.30	92
	2-Apr-13	5.12	163	8.23	0.39	221
	23-Jul-13	5.04	207	9.54	0.45	130
	17-Oct-13	5.31	127	9.22	0.78	141
	15-Jan-14	5.49	168	8.39	0.33	148
	1-Apr-14	5.39	188	8.23	0.17	172
	23-Jul-14	5.54	188	8.83	1.02	136
07-EMF-MW-B	10-Dec-07	5.63	119	8.71	0.51	279
	25-Feb-08	5.38	115	7.46	0.75	330
	3-Jun-08	5.60	101	10.26	1.32	253
	19-Aug-08	5.57	92	16.92	0.34	220
	10-Nov-08	5.47	103	12.88	0.42	169
	4-Feb-09	5.40	98	10.48	1.98	209
	7-May-09	5.11	69	7.8	3.02	213
	10-Aug-09	5.46	82	11.81	0.55	285
	11-Nov-09	5.39	81	9.24	0.42	184
	25-Feb-10	4.88	97	8.2	0.55	216
	19-May-10	5.59	101	9.37	0.82	135
	25-Aug-10	5.42	85	10.13	0.67	146
	16-Nov-10	5.39	94	9.44	0.32	177
	10-Feb-11	5.25	65	4.24	8.09	183
	6-Jul-11	5.70	56	17.28	0.30	177
	24-Oct-11	5.46	74	13.55	0.37 J	112
	25-Jan-12	5.49	85	11.53	0.47	94
	10-Apr-12	5.83	53	8.61	5.77	97
	31-Jul-12	5.12	47	18.55	0.28	181
	29-Oct-12	5.52	82	15.71	0.43	204
	24-Jan-13	5.04	73	12.53	0.95	208
	2-Apr-13	5.63	66	11.54	0.43	238
	23-Jul-13	5.13	77	12.06	0.27	161
	17-Oct-13	5.31	75	10.67	0.64	208
	15-Jan-14	5.70	80	9.88	0.22	143
	1-Apr-14	5.60	92	9.38	1.39	186
	23-Jul-14	5.52	83	10.38	2.26	165

Well	Parameter						
	Date	pH	Specific Conductance (µS/cm)	Temperature (°C)	DO (mg/L)	ORP (mV)	
07-EMF-MW-C	10-Dec-07	5.56	105	8.89	0.75	301	
	25-Feb-08	5.34	105	8.07	0.52	329	
	3-Jun-08	NS	NS	NS	NS	NS	
	19-Aug-08	5.68	84	12.81	0.24	189	
	10-Nov-08	5.45	93	11.51	0.3	133	
	3-Feb-09	5.56	104	9.76	0.32	144	
	7-May-09	NS	NS	NS	NS	NS	
	10-Aug-09	5.54	83	12.42	0.7	312	
	11-Nov-09	5.46	74	9.91	0.31	198	
	25-Feb-10	5.14	102	8.89	0.42	220	
	19-May-10	5.66	97	9.33	0.11 J	147	
	25-Aug-10	5.59	94	13.54	0.35	143	
	16-Nov-10	5.49	105	11.94	0.21	194	
	10-Feb-11	NS	NS	NS	NS	NS	
	6-Jul-11	NS	NS	NS	NS	NS	
	24-Oct-11	5.67	88	11.41	0.17 J	71	
	25-Jan-12	5.33	95	10.03	1.27	160	
	10-Apr-12	6.24	81	10.45	2.57	147	
	31-Jul-12	5.19	67	16.51	0.2	171	
	29-Oct-12	5.62	102	14.22	0.20	136	
	23-Jan-13	NS	NS	NS	NS	NS	
	2-Apr-13	5.69	80	11.78	1.73	162	
	23-Jul-13	5.37	89	12.85	0.2	50	
17-Oct-13	5.63	92	11.36	0.52	113		
15-Jan-14	5.75	87	10.14	1.85	78		
1-Apr-14	5.55	102	10.27	3.09	193		
	23-Jul-14	5.60	124	11.21	0.62	178	
09-EMF-MW-C Deep	25-Feb-10	5.65	107	9.07	1.06	201	
	19-May-10	6.13	93	10.60	1.66	141	
	25-Aug-10	5.88	93	13.90	0.21	122	
	16-Nov-10	5.84	99	10.79	0.26	172	
	10-Feb-11	NS	NS	NS	NS	NS	
	6-Jul-11	NS	NS	NS	NS	NS	
	24-Oct-11	5.96	98	10.52	0.11	35	
	25-Jan-12	6.26	148	9.46	0.23	108	
	10-Apr-12	6.34	117	10.03	0.36	100	
	31-Jul-12	5.74	99	14.56	0.08	-27	
	29-Oct-12	5.94	114	13.70	0.20	13	
	23-Jan-13	5.46	96	10.90	0.32	28	
	2-Apr-13	6.04	83	11.29	0.14	71	
	23-Jul-13	5.91	90	13.99	0.13	-151	
	17-Oct-13	5.9	83	11.09	0.50	8	
	15-Jan-14	6.61	104	9.82	0.29	54	
	1-Apr-14	6.16	85	10.31	1.15	176	
		23-Jul-14	6.01	82	11.72	0.90	131

Well	Parameter					
	Date	pH	Specific Conductance (µS/cm)	Temperature (°C)	DO (mg/L)	ORP (mV)
07-EMF-MW-D	10-Dec-07	5.87	116	8.95	0.5	271
	25-Feb-08	5.64	132	8.26	0.51	315
	3-Jun-08	NS	NS	NS	NS	NS
	19-Aug-08	5.91	108	10.22	0.4	182
	10-Nov-08	5.69	118	9.34	0.38	106
	3-Feb-09	5.69	116	8.43	0.32	161
	7-May-09	NS	NS	NS	NS	NS
	11-Aug-09	5.76	110	9.87	0.43	158
	11-Nov-09	5.75	92	8.72	0.26	115
	25-Feb-10	5.19	107	8.32	0.38	198
	19-May-10	5.85	90	9.13	0.30	138
	25-Aug-10	5.83	107	10.46	0.22	120
	16-Nov-10	5.85	115	9.44	0.25	157
	10-Feb-11	5.50	91	9.07	0.24	170
	6-Jul-11	NS	NS	NS	NS	NS
	25-Oct-11	5.80	116	9	0.57 J	79
	26-Jan-12	5.15	102	8.44	0.73	201
	10-Apr-12	6.09	97	9.16	0.23	116
	1-Aug-12	5.56	116	10.95	0.29	94
	30-Oct-12	6.13	129	9.99	0.36	100
	24-Jan-13	5.30	94	9.27	0.19	155
	2-Apr-13	5.83	78	9.43	0.21	136
	23-Jul-13	5.77	100	10.52	0.15	54
	17-Oct-13	5.98	91	9.91	0.38	53
	15-Jan-14	5.92	74	9.15	0.21	90
	1-Apr-14	5.86	86	9.00	0.39	168
	23-Jul-14	6.13	93	9.32	0.68	61
08-EMF-MW-E	10-Nov-08	6.18	1,332	10.66	0.27	126
	3-Feb-09	6.44	1,379	8.29	0.42	188
	7-May-09	6.12	1,461	8.99	0.3	216
	11-Aug-09	6.39	1,435	11.14	0.39	22
	11-Nov-09	6.36	1,228	8.77	0.86	1
	25-Feb-10	6.17	1,540	8.61	0.22	74
	19-May-10	6.57	1,500	9.96	0.20	138
	25-Aug-10	6.45	1,438	12.26	0.25	50
	16-Nov-10	6.50	1,560	10.61	0.29	101
	10-Feb-11	6.33	1,436	8.23	0.31	171
	6-Jul-11	6.72	1,449	11.52	0.21	-48
	24-Oct-11	6.58	1,450	11.1	0.26	-41
	26-Jan-12	6.32	1,790	8.79	0.51	14
	11-Apr-12	6.40	1,720	8.67	0.31	104
	1-Aug-12	6.11	1,740	11.81	0.29	15
	29-Dec-12	6.44	1,930	12.53	0.30	-1
	23-Jan-13	6.26	1,680	8.99	0.36	39
	2-Apr-13	6.52	1,478	10.10	0.39	117
	23-Jul-13	6.32	1,670	12.43	0.45	11
	17-Oct-13	6.42	1,680	11.79	0.55	-33
	15-Jan-14	6.63	1,610	9.53	0.25	93
	1-Apr-14	6.63	1,840	10.01	1.55	61
	23-Jul-14	6.42	1,730	11.44	0.76	48

Well	Parameter						
	Date	pH	Specific Conductance (µS/cm)	Temperature (°C)	DO (mg/L)	ORP (mV)	
08-EMF-MW-F	11-Nov-08	5.45	144	9.43	0.44	140	
	3-Feb-09	5.45	133	9.16	0.5	177	
	7-May-09	4.83	134	9.37	0.44	219	
	10-Aug-09	5.46	117	11.63	1.23	293	
	11-Nov-09	5.37	142	9.81	0.33	137	
	25-Feb-10	4.96	277	9.07	0.78	241	
	19-May-10	5.34	305	8.82	0.49	157	
	25-Aug-10	5.49	151	11.08	1.63	155	
	16-Nov-10	5.44	222	9.94	0.31	157	
	10-Feb-11	5.23	158	8.82	0.75	171	
	6-Jul-11	5.76	100	12.72	0.36	197	
	25-Oct-11	5.55	157	10.65	0.41 J	119	
	26-Jan-12	5.34	272	9.70	0.46	122	
	11-Apr-12	5.42	142	9.85	0.23	110	
	1-Aug-12	5.44	118	12.29	0.17	135	
	30-Oct-12	5.68	182	12.59	0.56	253	
	23-Jan-13	5.34	150	11.22	0.33	125	
	2-Apr-13	5.48	180	11.87	0.32	201	
	23-Jul-13	5.33	154	13.18	0.16	111	
	17-Oct-13	5.48	196	12.45	0.48	206	
	15-Jan-14	5.58	244	10.72	0.37	94	
	1-Apr-14	5.54	248	10.17	0.6	194	
	23-Jul-14	5.63	213	10.86	0.7	109	
Decon Well	16-Nov-10	6.13	105	10.12	2.98	190	
	10-Feb-11	NS	NS	NS	NS	NS	
	6-Jul-11	6.59	97	11.14	9.03	5	
	25-Oct-11	6.14	67	11.00	3.85	75	
	26-Jan-11	NS	NS	NS	NS	NS	
	10-Apr-12	NS	NS	NS	NS	NS	
	1-Aug-12	5.81	139	23.92	1.12	47	
	30-Oct-12	6.19	42	12.40	2.36	160	
	23-Jan-13	NS	NS	NS	NS	NS	
	2-Apr-13	NS	NS	NS	NS	NS	
	24-Jul-13	6.82	88	14.05	5.36	149	
	17-Oct-13	NS	NS	NS	NS	NS	
	sampling discontinued after April 2014	15-Jan-14	NS	NS	NS	NS	NS
		1-Apr-14	NS	NS	NS	NS	NS

Notes:

°C = degrees Celsius

mg/L = milligrams per liter

mV = millivolts

µS/cm = microSiemens per centimeter

DO = Dissolved oxygen

ORP = Oxidation-reduction potential

NS = Not sampled

R = Rejected

J = Estimate

= Data from the current sampling event.

**Table 2  
Groundwater Monitoring Results  
Dissolved Metals  
East Mission Flats Repository**

Well No.	Sample Date	Constituents (mg/L)				
		Antimony	Arsenic	Cadmium	Lead	Zinc
07-EMF-MW-A	11-Dec-07	0.003 U	0.003 U	0.000578 J	0.003 U	0.347 J
	25-Feb-08	0.003 U	0.003 U	0.00172	0.003 U	1.71 J
	3-Jun-08	0.003 U	0.003 U	0.000763	0.003 U	0.582
	19-Aug-08	0.003 U	0.003 U	0.000321	0.003 U	0.683
	10-Nov-08	0.003 U	0.003 U	0.0002 U	0.003 U	0.353
	4-Feb-09	0.003 U	0.003 U	0.000777	0.003 U	0.898
	7-May-09	0.003 U	0.003 U	0.000382	0.003 U	0.753
	10-Aug-09	0.003 U	0.003 U	0.000204	0.003 U	0.558
	11-Nov-09	0.003 U	0.003 U	0.0002 U	0.003 U	0.368
	25-Feb-10	0.003 U	0.003 U	0.000208	0.003 U	0.657
	19-May-10	0.003 U	0.003 U	0.000225	0.003 U	0.568
	25-Aug-10	0.003 U	0.003 U	0.000227	0.003 U	0.584
	16-Nov-10	0.002 U	0.00076 J	0.0002 U	0.001 U	0.544 J
	10-Feb-11	0.002 U	0.001 U	0.00039	0.001 U	1.22 J
	6-Jul-11	0.002 U	0.0073 J*	0.00063	0.001 U	1.38
	24-Oct-11	0.002 U	0.00044 J	0.000220	0.001 UJ	0.804
	25-Jan-12	0.002 U	0.0074 J*	0.00032	0.001 U	1.13
	10-Apr-12	0.002 U	0.0014	0.00058	0.001 U	1.75
	31-Jul-12	0.002 U	0.0018	0.00046	0.001 U	1.56
	29-Oct-12	0.002 U	0.00075 J	0.00023	0.00022 J	0.862 J
	23-Jan-13	0.002 U	0.001 U	0.00037	0.001 U	1.35
	2-Apr-13	0.002 U	0.001 U	0.00038	0.001 U	1.49
	23-Jul-13	0.002 U	0.001 U	0.00033	0.001 U	1.24
	17-Oct-13	0.002 U	0.001 U	0.0002 U	0.0026	0.648
	15-Jan-14	0.002 U	0.0011	0.00035	0.001 U	1.24 J
	1-Apr-14	0.002 U	0.001 U	0.00050	0.001 U	1.60 J
23-Jul-14	0.002 U	0.00076 J	0.00029	0.000025 J	1.38 J	
07-EMF-MW-B	10-Dec-07	0.003 U	0.003 U	0.0002 U	0.003 U	0.0243 J
	25-Feb-08	0.003 U	0.003 U	0.0002 U	0.003 U	0.0198 J
	3-Jun-08	0.003 U	0.003 U	0.0002 U	0.003 U	0.0212
	19-Aug-08	0.003 U	0.003 U	0.0002 U	0.003 U	0.0244
	10-Nov-08	0.003 U	0.003 U	0.0002 U	0.003 U	0.0197
	4-Feb-09	0.003 U	0.003 U	0.0002 U	0.003 U	0.0210
	7-May-09	0.003 U	0.003 U	0.0002 U	0.003 U	0.0168
	10-Aug-09	0.003 U	0.003 U	0.0002 U	0.003 U	0.0160
	11-Nov-09	0.003 U	0.003 U	0.0002 U	0.003 U	0.0264
	25-Feb-10	0.003 U	0.003 U	0.0002 U	0.003 U	0.0153
	19-May-10	0.003 U	0.003 U	0.0002 U	0.003 U	0.0157
	25-Aug-10	0.003 U	0.003 U	0.0002 U	0.003 U	0.0157
	16-Nov-10	0.002 U	0.001 U	0.0002 U	0.001 U	0.0187 J
	10-Feb-11	0.002 U	0.001 U	0.0002 U	0.001 U	0.0091 J*
	6-Jul-11	0.002 U	0.0077 J*	0.0002 U	0.001 U	0.0126
	24-Oct-11	0.002 U	0.001 U	0.0002 U	0.001 UJ	0.0148 J*
	25-Jan-12	0.002 U	0.0073 J*	0.0002 U	0.001 U	0.0180
	10-Apr-12	0.002 U	0.0014	0.0002 U	0.001 U	0.0162
	31-Jul-12	0.002 U	0.00071 J	0.0002 U	0.001 U	0.0142
	29-Oct-12	0.002 U	0.001 U	0.0002 U	0.00028 J	0.0121 J
	24-Jan-13	0.002 U	0.001 U	0.0002 U	0.001 U	0.0181
	2-Apr-13	0.002 U	0.001 U	0.0002 U	0.001 U	0.0197
	23-Jul-13	0.002 U	0.0022 J*	0.0002 U	0.001 U	0.0285 J*
	17-Oct-13	0.002 U	0.001 U	0.0002 U	0.001 U	0.0227
	15-Jan-14	0.002 U	0.001 U	0.0002 U	0.001 U	0.0226 J
	1-Apr-14	0.002 U	0.001 U	0.0002 U	0.001 U	0.0182 J
23-Jul-14	0.002 U	0.00016 J	0.000031 J	0.000037 J	0.0219 J	



Well No.	Sample Date	Constituents (mg/L)					
		Antimony	Arsenic	Cadmium	Lead	Zinc	
07-EMF-MW-C	10-Dec-07	0.003 U	0.003 U	0.0013 J	0.003 U	1.45 J	
	25-Feb-08	0.003 U	0.003 U	0.00318	0.003 U	2.24 J	
	3-Jun-08	NS	NS	NS	NS	NS	
	19-Aug-08	0.003 U	0.003 U	0.00111	0.003 U	1.34	
	10-Nov-08	0.003 U	0.003 U	0.000522	0.003 U	1.57	
	3-Feb-09	0.003 U	0.003 U	0.00354	0.003 U	1.67	
	7-May-09	NS	NS	NS	NS	NS	
	10-Aug-09	0.003 U	0.003 U	0.00229	0.003 U	1.45	
	11-Nov-09	0.003 U	0.003 U	0.00144	0.003 U	2.03	
	25-Feb-10	0.003 U	0.003 U	0.00326	0.003 U	2.02	
	19-May-10	0.003 U	0.003 U	0.00346	0.003 U	2.00	
	25-Aug-10	0.003 U	0.003 U	0.00364	0.003 U	1.86	
	16-Nov-10	0.002 U	0.001 U	0.0029	0.001 U	1.93 J	
	10-Feb-11	NS	NS	NS	NS	NS	
	6-Jul-11	NS	NS	NS	NS	NS	
	24-Oct-11	0.002 U	0.00081 J	0.00072	0.00038 J	1.36	
	25-Jan-12	0.002 U	0.0074 J*	0.0049	0.001 U	1.71	
	10-Apr-12	0.002 U	0.0017	0.00089	0.0015	0.388	
	31-Jul-12	0.002 U	0.0027	0.00025	0.00041 J	1.08	
	29-Oct-12	0.002 U	0.0027	0.00010 J	0.00061 J	0.988 J	
	23-Jan-13	NS	NS	NS	NS	NS	
	2-Apr-13	0.002 U	0.001 U	0.0015	0.001 U	1.65	
	23-Jul-13	0.002 U	0.0024 J*	0.0019	0.001 U	2.03	
	17-Oct-13	0.002 U	0.001 U	0.0012	0.001 U	1.35	
	15-Jan-14	0.002 U	0.001 U	0.0017	0.001 U	1.38 J	
	1-Apr-14	0.002 U	0.001 U	0.0024	0.001 U	1.56 J	
	23-Jul-14	0.002 U	0.00019 J	0.0073	0.00012 J	2.53 J	
	09-EMF-MW-C Deep	25-Feb-10	0.003 U	0.003 U	0.0002 U	0.003 U	0.0113
		19-May-10	0.003 U	0.003 U	0.0002 U	0.003 U	0.005 U
		25-Aug-10	0.003 U	0.003 U	0.0002 U	0.003 U	0.0317
16-Nov-10		0.002 U	0.001 U	0.0002 U	0.001 U	0.0216 J	
10-Feb-11		NS	NS	NS	NS	NS	
6-Jul-11		NS	NS	NS	NS	NS	
24-Oct-11		0.002 U	0.001 U	0.0002 U	0.001 UJ	0.0167	
25-Jan-12		0.002 U	0.0075 J*	0.0002 U	0.001 U	0.0191	
10-Apr-12		0.002 U	0.0042 J*	0.0002 U	0.00095 J	0.154	
31-Jul-12		0.002 U	0.0011	0.0002 U	0.001 U	0.0116	
29-Oct-12		0.002 U	0.00065 J	0.0002 U	0.00028 J	0.0032 J	
23-Jan-13		0.002 U	0.001 U	0.0002 U	0.001 U	0.0226	
2-Apr-13		0.002 U	0.001 U	0.0002 U	0.001 U	0.0237	
23-Jul-13		0.002 U	0.0022 J*	0.0002 U	0.001 U	0.0088 J*	
17-Oct-13		0.002 U	0.001 U	0.0002 U	0.0029	0.0096 J*	
15-Jan-14		0.002 U	0.0014	0.0002 U	0.001 U	0.0463 J	
1-Apr-14		0.002 U	0.001 U	0.00053	0.001 U	0.0724 J	
23-Jul-14		0.002 U	0.00029 J	0.000085 J	0.000079 J	0.0328 J	

Well No.	Sample Date	Constituents (mg/L)				
		Antimony	Arsenic	Cadmium	Lead	Zinc
07-EMF-MW-D	10-Dec-07	0.003 U	0.003 U	0.0002 U	0.003 U	0.0326 J
	25-Feb-08	0.003 U	0.003 U	0.0002 U	0.003 U	0.0285 J
	3-Jun-08	NS	NS	NS	NS	NS
	19-Aug-08	0.003 U	0.003 U	0.0002 U	0.003 U	0.132
	10-Nov-08	0.003 U	0.003 U	0.0002 U	0.003 U	0.0794
	3-Feb-09	0.003 U	0.003 U	0.0002 U	0.003 U	0.0531
	7-May-09	NS	NS	NS	NS	NS
	11-Aug-09	0.003 U	0.003 U	0.0002 U	0.003 U	0.0918
	11-Nov-09	0.003 U	0.003 U	0.0002 U	0.003 U	0.103
	25-Feb-10	0.003 U	0.003 U	0.0002 U	0.003 U	0.0352
	19-May-10	0.003 U	0.003 U	0.0002 U	0.003 U	0.105
	25-Aug-10	0.003 U	0.003 U	0.0002 U	0.003 U	0.109
	16-Nov-10	0.002 U	0.0018	0.0002 U	0.001 U	0.0563 J
	10-Feb-11	0.002 U	0.001 U	0.0002 U	0.001 U	0.127 J*
	6-Jul-11	NS	NS	NS	NS	NS
	25-Oct-11	0.002 U	0.0019	0.0002 U	0.001 UJ	0.0395
	26-Jan-12	0.002 U	0.0079 J*	0.00016 J	0.001 U	0.0584
	10-Apr-12	0.002 U	0.0014	0.0002 U	0.001 U	0.184
	1-Aug-12	0.002 U	0.0021	0.0002 U	0.001 U	0.112
	30-Oct-12	0.002 U	0.0018	0.00005 J	0.00047 J	0.0464 J
	24-Jan-13	0.002 U	0.001 U	0.0002 U	0.001 U	0.0425
	2-Apr-13	0.002 U	0.001 U	0.0002 U	0.001 U	0.0466
	23-Jul-13	0.002 U	0.0029 J*	0.0002 U	0.001 U	0.0387 J*
	17-Oct-13	0.002 U	0.001 U	0.0002 U	0.001 U	0.0537
	15-Jan-14	0.002 U	0.001 U	0.0002 U	0.001 U	0.0210 J
	1-Apr-14	0.002 U	0.001 U	0.0002 U	0.001 U	0.0326 J
	23-Jul-14	0.002 U	0.0011	0.000048 J	0.001 U	0.0331 J
08-EMF-MW-E	10-Nov-08	0.003 U	0.0148	0.0002 U	0.003 U	0.0141
	3-Feb-09	0.003 U	0.003 U	0.0002 U	0.003 U	0.01 U
	7-May-09	0.003 U	0.0035	0.0002 U	0.003 U	0.00889
	11-Aug-09	0.003 U	0.0195	0.0002 U	0.003 U	0.00848
	11-Nov-09	0.003 U	0.0232	0.0002 U	0.003 U	0.00671
	25-Feb-10	0.003 U	0.003 U	0.0002 U	0.003 U	0.00599
	19-May-10	0.003 U	0.00447	0.0002 U	0.003 U	0.00633
	25-Aug-10	0.003 U	0.0172	0.0002 U	0.003 U	0.00687
	16-Nov-10	0.002 U	0.0177	0.0002 U	0.001 U	0.0069 J
	10-Feb-11	0.002 U	0.00089 J	0.0002 U	0.001 U	0.0042 J
	6-Jul-11	0.002 U	0.0074 J*	0.0002 U	0.001 U	0.0048 J
	24-Oct-11	0.002 U	0.020	0.0002 U	0.001 UJ	0.0045
	26-Jan-12	0.002 U	0.0069 J*	0.0002 U	0.001 U	0.0051 J*
	11-Apr-12	0.002 U	0.002	0.0002 U	0.001 U	0.0063 J*
	1-Aug-12	0.002 U	0.0063	0.0002 U	0.001 U	0.0064
	29-Oct-12	0.002 U	0.0149	0.00008 J	0.001 U	0.0071 J*
	23-Jan-13	0.002 U	0.0013	0.0002 U	0.001 U	0.0091 J*
	2-Apr-13	0.002 U	0.001 U	0.0002 U	0.001 U	0.0083 J*
	23-Jul-13	0.002 U	0.0026 J*	0.0002 U	0.001 U	0.0124 J*
	17-Oct-13	0.002 U	0.0067	0.0002 U	0.001 U	0.0120 J*
	15-Jan-14	0.002 U	0.001 U	0.0002 U	0.001 U	0.0073 J
	1-Apr-14	0.002 U	0.0014	0.0002 U	0.001 U	0.0175 J
	23-Jul-14	0.002 U	0.0045	0.00011 J	0.001 U	0.0392 J

Well No.	Sample Date	Constituents (mg/L)				
		Antimony	Arsenic	Cadmium	Lead	Zinc
08-EMF-MW-F	11-Nov-08	0.003 U	0.003 U	0.000205	0.003 U	1.58
	3-Feb-09	0.003 U	0.003 U	0.000304	0.003 U	1.16
	7-May-09	0.003 U	0.003 U	0.000258	0.003 U	1.32
	10-Aug-09	0.003 U	0.003 U	0.00023	0.003 U	1.12
	11-Nov-09	0.003 U	0.003 U	0.000464	0.003 U	2.53
	25-Feb-10	0.003 U	0.003 U	0.000947	0.003 U	3.82
	19-May-10	0.003 U	0.003 U	0.00132	0.003 U	4.47
	25-Aug-10	0.003 U	0.003 U	0.000436	0.003 U	1.93
	16-Nov-10	0.002 U	0.001 U	0.00065	0.001 U	3.37 J
	10-Feb-11	0.002 U	0.001 U	0.00045	0.00043 J	1.84 J
	6-Jul-11	0.002 U	0.0056 J*	0.00016 J	0.00079 J	0.976
	25-Oct-11	0.002 U	0.001 U	0.00031	0.001 UJ	1.69
	26-Jan-12	0.002 U	0.0041 J*	0.00094	0.00029 J	3.10
	11-Apr-12	0.002 U	0.00086 J	0.00031	0.001 U	1.63
	1-Aug-12	0.002 U	0.00057 J	0.0002 U	0.001 U	1.33
	30-Oct-12	0.002 U	0.001 U	0.00043	0.00036 J	1.73 J
	23-Jan-13	0.002 U	0.001 U	0.00045	0.001 U	1.81
	2-Apr-13	0.002 U	0.001 U	0.0010	0.001 U	2.97
	23-Jul-13	0.002 U	0.0014 J*	0.00053	0.001 U	1.90
	17-Oct-13	0.002 U	0.001 U	0.00099	0.001 U	2.39
	15-Jan-14	0.002 U	0.001 U	0.00180	0.001 U	3.28 J
	1-Apr-14	0.002 U	0.001 U	0.00180	0.001 U	3.62 J
	23-Jul-14	0.002 U	0.00017 J	0.0012	0.000098 J	2.64 J
Decon Well	16-Nov-10	0.002 U	0.00092 J	0.0002 U	0.00061 J	0.504 J
	10-Feb-11	NS	NS	NS	NS	NS
	6-Jul-11	0.002 U	0.0068 J*	0.0002 U	0.001 U	0.407
	25-Oct-11	0.002 U	0.0009 J	0.0002 U	0.0014 J	0.449
	26-Jan-12	NS	NS	NS	NS	NS
	10-Apr-12	NS	NS	NS	NS	NS
	1-Aug-12	0.002 U	0.0055	0.0002 U	0.00063 J	5.62
	30-Oct-12	0.002 U	0.00080 J	0.000099 J	0.001 U	0.401 J
	23-Jan-13	NS	NS	NS	NS	NS
	2-Apr-13	NS	NS	NS	NS	NS
	24-Jul-13	0.002 U	0.00190 J*	0.0002 U	0.001 U	0.342
	17-Oct-13	NS	NS	NS	NS	NS
	15-Jan-14	NS	NS	NS	NS	NS
sampling discontinued after April 2014	1-Apr-14	NS	NS	NS	NS	NS
Regulatory Threshold		0.006 <sup>a</sup>	0.01 <sup>a</sup>	0.005 <sup>a</sup>	0.015 <sup>a</sup>	5.0 <sup>b</sup>

Notes:

mg/L = milligrams per liter

NS = Not sampled

U = Concentration was not detected (detection limits used by the laboratories are the contract required quantitation limit, the reporting limit, or the method detection limit, depending on the laboratory).

J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

J\* = The result is an estimated quantity. This analyte was detected in both the sample result and an associated field blank sample during the same sampling event.

a. National Primary Drinking Water Regulation (Maximum Contaminant Level)

b. National Secondary Drinking Water Regulation

	= Value exceeds the regulatory threshold
	= Data from the current sampling event.

**Attachment A**  
**Field Sheets**



# TerraGraphics

Environmental Engineering, Inc.

## Groundwater Sampling Record

Project: East Mission Flats Repository				Well Number: 07EMF-MW-A			
Project Number: 14005-08-06-02				Sample Number: (07-EMF-MW-A)072314			
Location:				Weather: Sunny 68°			
Date: 07/23/2014				Sampler(s): GM/RJK			
[De-Ionized Water Date ]							
Depth to Bottom (ft):				Purge Time: 20 mins			
Depth to Water (ft): 14.00				Purge Method: Low Flow			
DTB-DTW (ft):				Volume Measurement Method:			
1 Well Volume (gal):				Purge Volume (Volume x 3) (gal):			
Conversion Factors (height x factor= 1 well volume)	¾" diameter 0.023	1" diameter 0.041	1 ¼" diameter 0.092	2" diameter 0.163	4" diameter 0.652	6" diameter 1.469	8" diameter 2.611

### GROUNDWATER DATA

Purged Volume (gal)	Time	pH	Spec. Cond. (mS/cm)	Temp (°C)	Dissolved Oxygen		ORP (mV)
					mg/L	%	
	00:00	5.79	0.165	10.73	8.17	79.9	241
	16:00	5.51	0.190	8.99	1.07	10.0	138
	18:00	5.54	0.189	8.82	0.98	9.2	136
	20:00	5.54	0.188	8.83	1.02	9.6	136

Sampling Date: 07/23/14      Sampling Method: Low Flow      Time Sampled: 10:52

Container	Volume	Preservative	Cooled	Filtered	Analyte	Lab
Poly	1L	HNO3	Y	Y	DM, Cations	CLP
Poly	1L	HNO3	Y	N	Hard, TP	CLP
Poly	500mL	---	Y	Y	Dissolved Anions	SVL
Poly	500mL	---	Y	N	Alkalinity	SVL

Duplicate Sample Number:

QC Sample Number:

Time:

Notes:

Deviations/Observations:

Picture Log:

Expendable Supplies Used: 1 Standard filter



**Groundwater Sampling Record**

Project: East Mission Flats Repository				Well Number: 07-EMF-MW-B			
Project Number: 14005-08-06-02				Sample Number: (07-EMF-MW-B)072314			
Location:				Weather: Sunny 70°			
Date: 07/23/2014				Sampler(s): GM/RJK			
[De-Ionized Water Date				]			
Depth to Bottom (ft):				Purge Time: 24 mins			
Depth to Water (ft): 11.62				Purge Method: Low Flow			
DTB-DTW (ft):				Volume Measurement Method:			
1 Well Volume (gal):				Purge Volume (Volume x 3) (gal):			
Conversion Factors (height x factor= 1 well volume)	¾" diameter 0.023	1" diameter 0.041	1 ½" diameter 0.092	2" diameter 0.163	4" diameter 0.652	6" diameter 1.469	8" diameter 2.611

**GROUNDWATER DATA**

Purged Volume (gal)	Time	pH	Spec. Cond. (mS/cm)	Temp (°C)	Dissolved Oxygen		ORP (mV)
					mg/L	%	
	00:00	6.68	0.089	17.30	6.79	70.2	123
	20:00	5.54	0.083	10.26	2.42	23.3	162
	22:00	5.51	0.083	10.14	2.28	22.0	165
	24:00	5.52	0.083	10.38	2.26	21.9	165

Sampling Date: 07/23/2014      Sampling Method: Low Flow      Time Sampled: 11:34

Container	Volume	Preservative	Cooled	Filtered	Analyte	Lab
Poly	1L	HNO3	Y	Y	DM, Cations	CLP
Poly	1L	HNO3	Y	N	Hard, TP	CLP
Poly	500mL	---	Y	Y	Dissolved Anions	SVL
Poly	500mL	---	Y	N	Alkalinity	SVL

Duplicate Sample Number: \_\_\_\_\_  
QC Sample Number: \_\_\_\_\_      Time: \_\_\_\_\_

Notes:

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Deviations/Observations:

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Picture Log:

Expendable Supplies Used: 1 standard filter



**Groundwater Sampling Record**

Project: East Mission Flats Repository				Well Number: 09-EMF-MW-C DEEP-072314			
Project Number: 14005-08-06-02				Sample Number: (09-EMF-MW-C DEEP) 072314			
Location:				Weather: Sunny 76°			
Date: 07/23/2014				Sampler(s): GM/RJK			
[De-Ionized Water Date ]							
Depth to Bottom (ft):				Purge Time: 22 min			
Depth to Water (ft): 9.02				Purge Method: Low Flow			
DTB-DTW (ft):				Volume Measurement Method:			
1 Well Volume (gal):				Purge Volume (Volume x 3) (gal):			
Conversion Factors (height x factor= 1 well volume)	¾" diameter 0.023	1" diameter 0.041	1 ½" diameter 0.092	2" diameter 0.163	4" diameter 0.652	6" diameter 1.469	8" diameter 2.611

**GROUNDWATER DATA**

Purged Volume (gal)	Time	pH	Spec. Cond. (mS/cm)	Temp (°C)	Dissolved Oxygen		ORP (mV)
					mg/L	%	
	00:00	6.05	0.083	11.80	1.81	19.1	131
	04:00	6.01	0.083	11.73	0.79	7.9	132
	06:00	6.01	0.082	11.75	0.71	7.2	131
	08:00	6.01	0.082	11.72	0.90	8.9	131

Sampling Date: 07/23/2014      Sampling Method: Low Flow      Time Sampled: 12:13

Container	Volume	Preservative	Cooled	Filtered	Analyte	Lab
Poly	1L	HNO3	Y	Y	DM, Cations	CLP
Poly	1L	HNO3	Y	N	Hard, TP	CLP
Poly	500mL	---	Y	Y	Dissolved Anions	SVL
Poly	500mL	---	Y	N	Alkalinity	SVL

Duplicate Sample Number:  
QC Sample Number:      Time:

Notes:  
*Discovered flow cell was not storing data after 14 mins of purging. Began storing at 12:05*

Deviations/Observations:

Picture Log:  
Expendable Supplies Used: *1 standard filter*



**Groundwater Sampling Record**

Project: East Mission Flats Repository				Well Number: 07-EMF-MW-C			
Project Number: 14005-08-06-02				Sample Number: (07-EMF-MW-C)072314			
Location:				Weather: Sunny 78°			
Date: 07/23/2014				Sampler(s): GM/RJK			
[De-Ionized Water Date]							
Depth to Bottom (ft):				Purge Time: 14 mins			
Depth to Water (ft): 9.03				Purge Method: Low Flow			
DTB-DTW (ft):				Volume Measurement Method:			
1 Well Volume (gal):				Purge Volume (Volume x 3) (gal):			
Conversion Factors (height x factor= 1 well volume)	¾" diameter 0.023	1" diameter 0.041	1 ½" diameter 0.092	2" diameter 0.163	4" diameter 0.652	6" diameter 1.469	8" diameter 2.611

**GROUNDWATER DATA**

Purged Volume (gal)	Time	pH	Spec. Cond. (mS/cm)	Temp (°C)	Dissolved Oxygen		ORP (mV)
					mg/L	%	
	00:00	5.99	0.099	12.30	5.00	50.6	155
	10:00	5.58	0.124	11.26	0.46	4.5	177
	12:00	5.59	0.124	11.11	0.52	5.2	178
	14:00	5.60	0.124	11.21	0.62	6.1	178

Sampling Date: 07/23/2014			Sampling Method: Low Flow			Time Sampled: 12:38	
Container	Volume	Preservative	Cooled	Filtered	Analyte	Lab	
Poly	1L	HNO3	Y	Y	DM, Cations	CLP	
Poly	1L	HNO3	Y	N	Hard, TP	CLP	
Poly	500mL	---	Y	Y	Dissolved Anions	SVL	
Poly	500mL	---	Y	N	Alkalinity	SVL	

Duplicate Sample Number: \_\_\_\_\_  
QC Sample Number: \_\_\_\_\_ Time: \_\_\_\_\_

Notes:

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Deviations/Observations:

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Picture Log:

Expendable Supplies Used: 1 standard P: / 4-





**Groundwater Sampling Record**

Project: East Mission Flats Repository				Well Number: 08-EMF-MW-E			
Project Number: 14005-08-06-02				Sample Number: (08-EMF-MW-E)072314			
Location:				Weather: Sunny 82°			
Date: 07/23/2014				Sampler(s): GM/RJK			
[De-Ionized Water Date ]							
Depth to Bottom (ft):				Purge Time: 26 min			
Depth to Water (ft): 7.84				Purge Method: Low Flow			
DTB-DTW (ft):				Volume Measurement Method:			
1 Well Volume (gal):				Purge Volume (Volume x 3) (gal):			
Conversion Factors (height x factor= 1 well volume)	¾" diameter 0.023	1" diameter 0.041	1 ½" diameter 0.092	2" diameter 0.163	4" diameter 0.652	6" diameter 1.469	8" diameter 2.611

GROUNDWATER DATA							
Purged Volume (gal)	Time	pH	Spec. Cond. (mS/cm)	Temp (°C)	Dissolved Oxygen		ORP (mV)
					mg/L	%	
	00:00	6.71	1.70	14.36	6.45	68.7	153
	22:00	6.43	1.74	11.29	0.57	5.6	50
	24:00	6.43	1.73	11.28	0.76	7.6	49
	26:00	6.42	1.73	11.44	0.76	7.5	48

Sampling Date: 07/23/2014		Sampling Method: Low Flow		Time Sampled: 13:25		
Container	Volume	Preservative	Cooled	Filtered	Analyte	Lab
Poly	1L	HNO3	Y	Y	DM, Cations	CLP
Poly	1L	HNO3	Y	N	Hard, TP	CLP
Poly	500mL	---	Y	Y	Dissolved Anions	SVL
Poly	500mL	---	Y	N	Alkalinity	SVL

Duplicate Sample Number: \_\_\_\_\_  
 QC Sample Number: \_\_\_\_\_ Time: \_\_\_\_\_

Notes:

Deviations/Observations:

Picture Log:

Expendable Supplies Used: 1 standard filter



**Groundwater Sampling Record**

Project: East Mission Flats Repository				Well Number: 07-EMF-MW-D			
Project Number: 14005-08-06-02				Sample Number: (07-EMF-MW-D)072314			
Location:				Weather: SUNNY 86°			
Date: 07/23/2014				Sampler(s): GM/RJK			
[De-Ionized Water Date				]			
Depth to Bottom (ft):				Purge Time: 10 mins			
Depth to Water (ft): 9.65				Purge Method: Low Flow			
DTB-DTW (ft):				Volume Measurement Method:			
1 Well Volume (gal):				Purge Volume (Volume x 3) (gal):			
Conversion Factors (height x factor= 1 well volume)	¾" diameter 0.023	1" diameter 0.041	1 ½" diameter 0.092	2" diameter 0.163	4" diameter 0.652	6" diameter 1.469	8" diameter 2.611

**GROUNDWATER DATA**

Purged Volume (gal)	Time	pH	Spec. Cond. (mS/cm)	Temp (°C)	Dissolved Oxygen		ORP (mV)
					mg/L	%	
	00:00	6.85	0.095	9.86	3.76	36.0	56
	06:00	6.21	0.094	9.53	0.85	8.0	57
	08:00	6.15	0.094	9.50	0.81	7.7	60
	10:00	6.13	0.093	9.32	0.68	6.4	61

Sampling Date: 07/23/2014			Sampling Method: Low Flow			Time Sampled: 14:02	
Container	Volume	Preservative	Cooled	Filtered	Analyte	Lab	
Poly	1L	HNO3	Y	Y	DM, Cations	CLP	
Poly	1L	HNO3	Y	N	Hard, TP	CLP	
Poly	500mL	---	Y	Y	Dissolved Anions	SVL	
Poly	500mL	---	Y	N	Alkalinity	SVL	

Duplicate Sample Number: \_\_\_\_\_  
 QC Sample Number: (07-EMF-MW-D)072314-78 Time: 14:16  
 RJK 7/23/14

Notes:

Deviations/Observations:

Picture Log:  
 Expendable Supplies Used: 5 ft Masterflex | Hoegs filter | standard filter



**Groundwater Sampling Record**

Project: East Mission Flats Repository				Well Number: 08-EMF-MW-F			
Project Number: 14005-08-06-02				Sample Number: (08-EMF-MW-F)072314			
Location:				Weather: Cloudy 86°			
Date: 07/23/2014				Sampler(s): GM/RJK			
[De-Ionized Water Date ]							
Depth to Bottom (ft):				Purge Time: 10 min			
Depth to Water (ft): 11.60				Purge Method: Low Flow			
DTB-DTW (ft):				Volume Measurement Method:			
1 Well Volume (gal):				Purge Volume (Volume x 3) (gal):			
Conversion Factors (height x factor= 1 well volume)	¾" diameter 0.023	1" diameter 0.041	1 ½" diameter 0.092	2" diameter 0.163	4" diameter 0.652	6" diameter 1.469	8" diameter 2.611

GROUNDWATER DATA							
Purged Volume (gal)	Time	pH	Spec. Cond. (mS/cm)	Temp (°C)	Dissolved Oxygen		ORP (mV)
					mg/L	%	
	00:00	6.04	0.227	14.20	6.94	73.2	97
	06:00	5.64	0.210	10.96	0.71	7.0	105
	08:00	5.62	0.212	10.94	0.62	6.1	108
	10:00	5.63	0.213	10.86	0.70	6.9	109

Sampling Date: 07/23/2014			Sampling Method: Low Flow			Time Sampled: 14:41	
Container	Volume	Preservative	Cooled	Filtered	Analyte	Lab	
Poly	1L	HNO3	Y	Y	DM, Cations	CLP	
Poly	1L	HNO3	Y	N	Hard, TP	CLP	
Poly	500mL	---	Y	Y	Dissolved Anions	SVL	
Poly	500mL	---	Y	N	Alkalinity	SVL	

Duplicate Sample Number: (08-EMF-MW-F)072314-C			
QC Sample Number:		Time:	

Notes:

Deviations/Observations:

Picture Log:

Expendable Supplies Used: 14: Cap 1/2 liter

**Attachment B**  
**CLP Analytical Results**





**Attachment C**  
**SVL Analytical Results**

