



www.terragraphics.com

**Corporate Office:**

121 S. Jackson St., Moscow, Idaho 83843  
Ph: (208) 882-7858; Fax: (208) 883-3785

**Other Office Locations:**

Kellogg, Idaho

Boise, Idaho

Deer Lodge, Montana

Las Vegas, Nevada

Richland, Washington

Pasco, Washington

## TECHNICAL MEMORANDUM

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

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

**Date:** February 1, 2016

**Project Code:** IDEQ C985 15019-08-02

**Subject:** Summary of the October 2015 Semi-Annual and Resampling Water Monitoring Events at the East Mission Flats Repository

---

The purpose of this memorandum is to summarize the East Mission Flats Repository (EMFR) October 2015 Semi-Annual and Resampling Water Monitoring events and present the data. An evaluation and discussion of the results will be completed in the 2015 annual water monitoring report for EMFR.

### 1 Sampling Summary

Figure 1 shows the locations of the seven groundwater monitoring wells, one decontamination well, two piezometers, and two floodwater levellogger sites in the vicinity of EMFR.

A detailed description of the field sampling, handling, documentation, and analytical procedures is provided in the *Sampling and Analysis Plan (SAP)/Quality Assurance Project Plan (QAPP) for Water Monitoring at the East Mission Flats Repository, Revision No. 2* (TerraGraphics 2014), hereinafter referred to as the EMFR SAP/QAPP; *Sample Plan Alteration Form (SPAF) #1 of the EMFR SAP/QAPP* (TerraGraphics 2015a), hereinafter referred to as SPAF #1; and *Resampling Sample Plan Alteration Form October 2015 Event #1* (TerraGraphics 2015c).

Samples were collected from all seven of the groundwater monitoring wells on October 21, 2015. The results indicated that the prediction limits (PLs) (TerraGraphics 2015b) for cadmium and zinc at 07-EMF-MW-C were exceeded during the October 2015 sampling event. Therefore, resampling was conducted at 07-EMF-MW-C for cadmium and zinc on December 15, 2015.

All field and analytical procedures were conducted according to the EMFR SAP/QAPP and subsequent SPAFs (TerraGraphics 2014, 2015a, 2015c).

Attachment A contains the field sheets for each sampled well.

## 2 Water Levels and Hydrographs

Figure 2 shows hydrographs of the water levels recorded by levelloggers at seven monitoring wells and two floodwater monitoring locations 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 2015) through October 2015.

Since the last monitoring event in April, water was detected at floodwater levellogger site LL-2 on October 10, 2015, but no water was detected at floodwater levellogger site LL-1 or in piezometers 10-EMF-PZ-A and 10-EMF-PZ-B. The field sampling crew downloaded levelloggers at LL-1, LL-2, and piezometers 10-EMF-PZ-A and 10-EMF-PZ-B during the October semi-annual event.

## 3 Groundwater Monitoring Results

The hydraulic gradient observed during the October 2015 Sampling Event is generally to the west (Figure 3). The historical gradient is to the southwest. Groundwater elevations calculated from hand measured data at the time of sampling were the lowest observed at all sites since monitoring began. 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, including the resampling event for 07-EMF-MW-C. The specific conductance values measured at 07-EMF-MW-B, 08-EMF-MW-E, and 08-EMF-MW-F in October 2015 were the highest yet recorded at these sites. The meter was calibrated at the start of the day and checked at the end of the day, and the data were considered acceptable.

Table 2 and Figure 5 display the cumulative groundwater sample results for dissolved metals.

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). The dissolved metal regulatory threshold exceedences in groundwater for the October 2015 and resampling events are as follows:

- Dissolved cadmium at 07-EMF-MW-C for the original October event

Dissolved cadmium and zinc at 07-EMF-MW-C exceeded the PLs of 0.00364 milligrams per liter (mg/L) and 2.03 mg/L, respectively, in the October 2015 semi-annual event. Dissolved cadmium and zinc did not exceed the PLs in the subsequent resampling event in December 2015.

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

The data from the October 2015 Semi-Annual and Resampling events were considered acceptable, and no laboratory or field data were rejected. The following data were qualified as estimates (*J*) as discussed in the data quality reviews (TerraGraphics 2016a and 2016b):

- Original October Sampling Event:
  - Dissolved arsenic results at 07-EMF-MW-A, 07-EMF-MW-B, 07-EMF-MW-C, 07-EMF-MW-D, 08-EMF-MW-F, and 09-EMF-MW-C-Deep because the results were greater than the method detection limit (MDL) but less than the contract required quantitation limit (CRQL)
  - Dissolved cadmium results at 07-EMF-MW-A, 07-EMF-MW-B, and 08-EMF-MW-E (duplicate only) because the results were greater than the MDL but less than the CRQL
  - Dissolved lead results at 07-EMF-MW-A, 07-EMF-MW-B, 07-EMF-MW-C, 07-EMF-MW-D, 08-EMF-MW-E (original only), 08-EMF-MW-F, and 09-EMF-MW-C-Deep because the results were greater than the MDL but less than the CRQL
  - Dissolved potassium at 07-EMF-MW-B because the result was greater than the MDL but less than the CRQL
  - Dissolved zinc results at 07-EMF-MW-B, 09-EMF-MW-C-Deep, and 08-EMF-MW-E (original and duplicate) due to the field blank results
  - All dissolved calcium, magnesium, sodium, and zinc results due to laboratory serial dilution
- Resampling Event #1:
  - Dissolved cadmium results for all samples due to serial dilution results

Any qualified data should be reviewed by an experienced data analyst before data 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, 2014. Sampling and Analysis Plan (SAP)/Quality Assurance Project Plan (QAPP) for Water Monitoring at the East Mission Flats Repository, Revision No. 2. December.

TerraGraphics, 2015a. Sample Plan Alteration Form #1 of the Sampling and Analysis Plan (SAP)/Quality Assurance Project Plan (QAPP) for Water Monitoring at the East Mission Flats Repository, Revision No. 2. June.

TerraGraphics, 2015b. Prediction Limit Approach for East Mission Flats Repository – White Paper. June.

TerraGraphics, 2015c. EMFR Resampling Sample Plan Alteration Form October 2015 Event #1. December.

Summary of the October 2015 Semi-Annual and Resampling Water Monitoring Events at EMFR

---

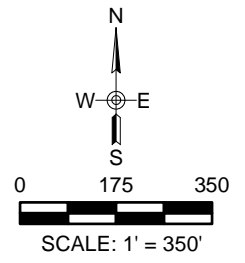
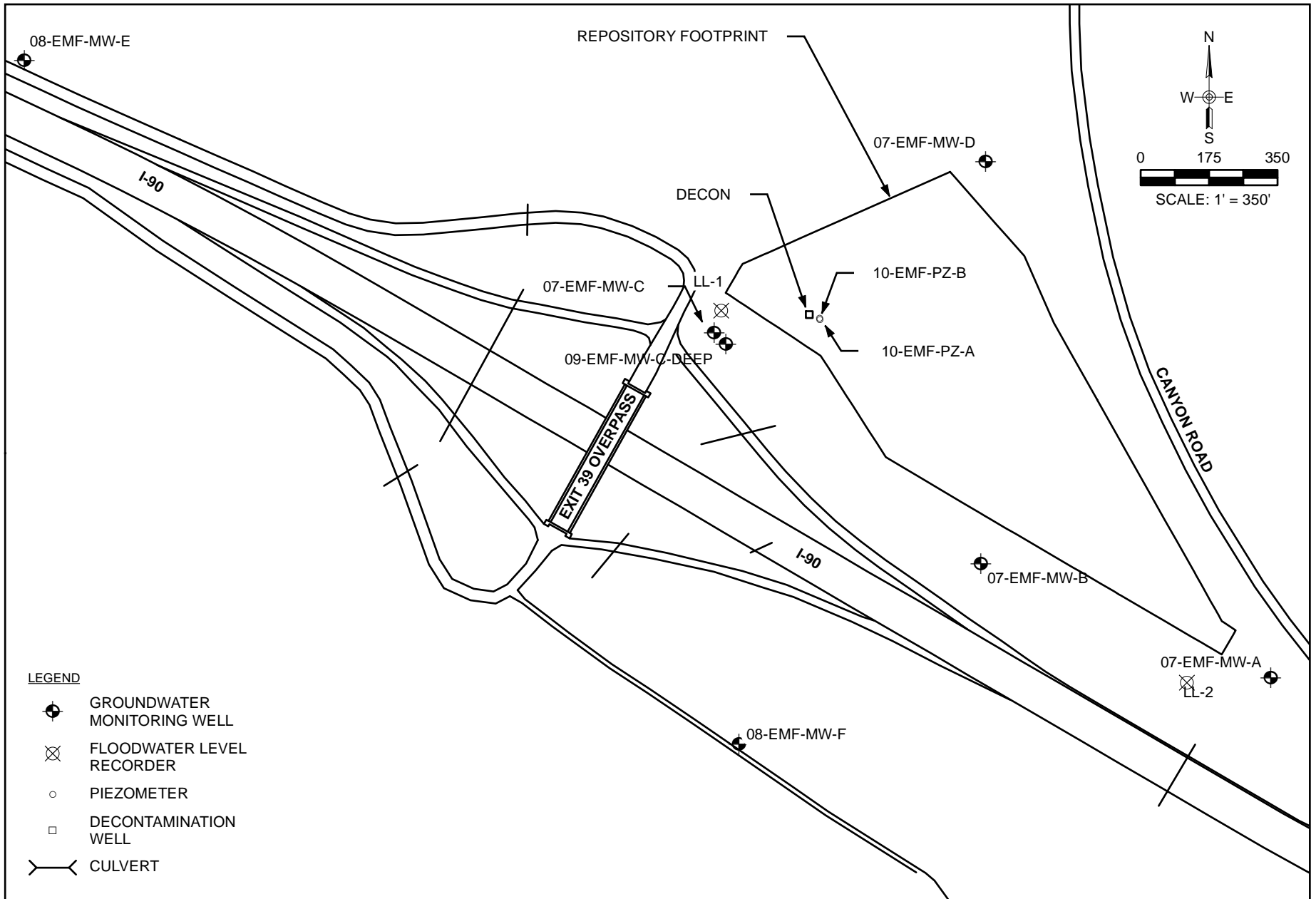
TerraGraphics, 2016a. QA/QC Review of the October 2015 Semi-Annual Water Monitoring Event at the East Mission Flats Repository. Memorandum. January.

TerraGraphics, 2016b. QA/QC Review of the October 2015 Semi-Annual Water Monitoring Resampling Event at East Mission Flats Repository. Memorandum. January.






U.S. Geological Survey (USGS), 2015. 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). October.



U:\Moscow\Clients\idaho\EMF\MXDs\EMF\_GW\_Site\_Map\_20151014.mxd



**LEGEND**

-  GROUNDWATER MONITORING WELL
-  FLOODWATER LEVEL RECORDER
-  PIEZOMETER
-  DECONTAMINATION WELL
-  CULVERT

SCALE:	1" = 350' (8.5x11 PRINT)
DRAWN BY:	D.P.
ENGINEER:	D.F.

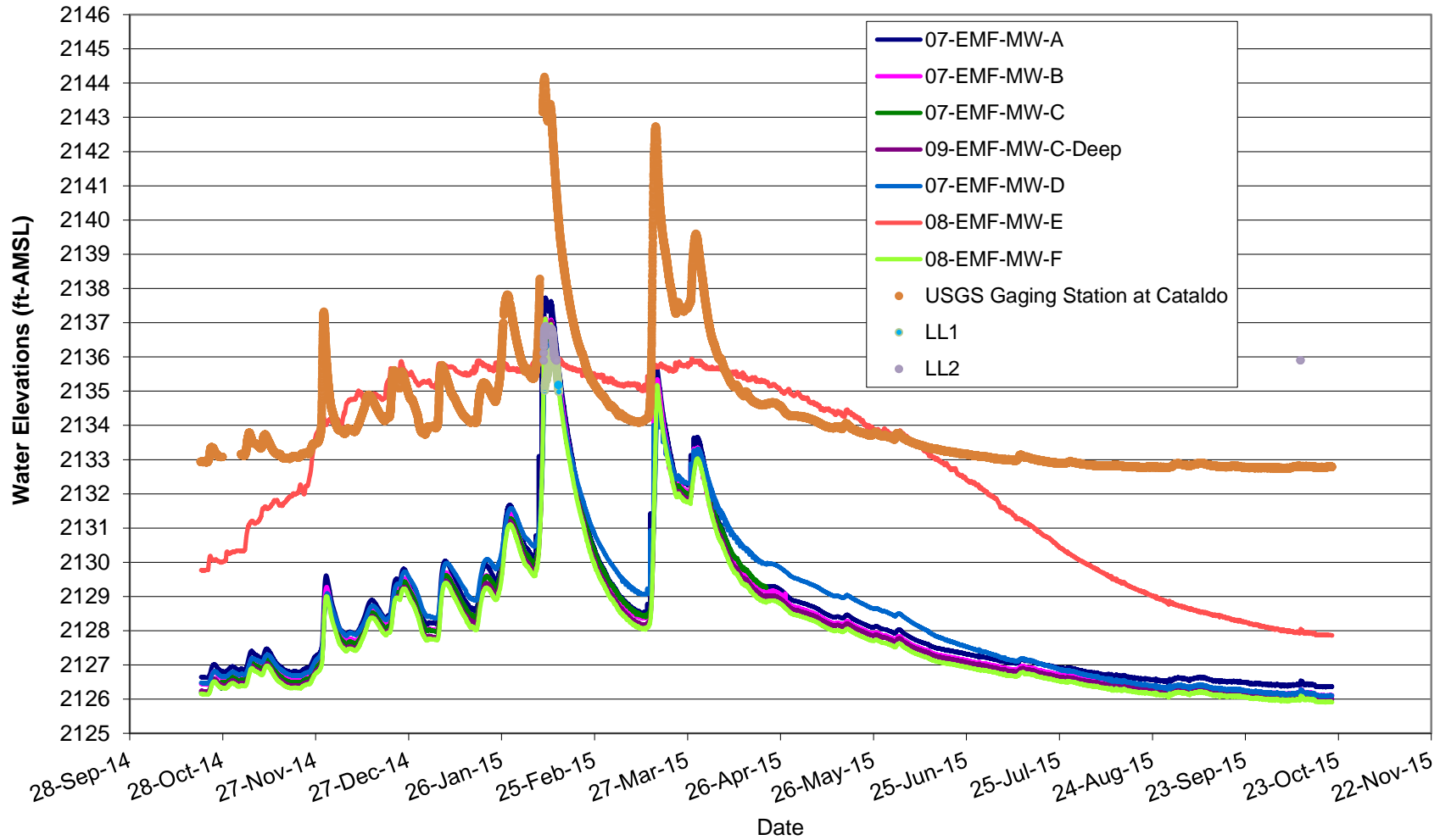


EAST MISSION FLATS  
REPOSITORY  
CATALDO, IDAHO

**FIGURE 1**  
EMFR SEMI-ANNUAL  
MONITORING LOCATIONS

PROJECT NO:	15019-08-02
DATE:	10/14/2015
COORDINATE SYSTEM:	NAD83 ISP, West, US FT, NGVD29

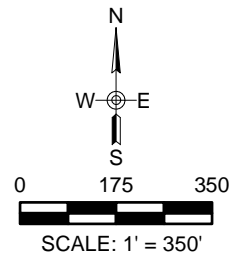
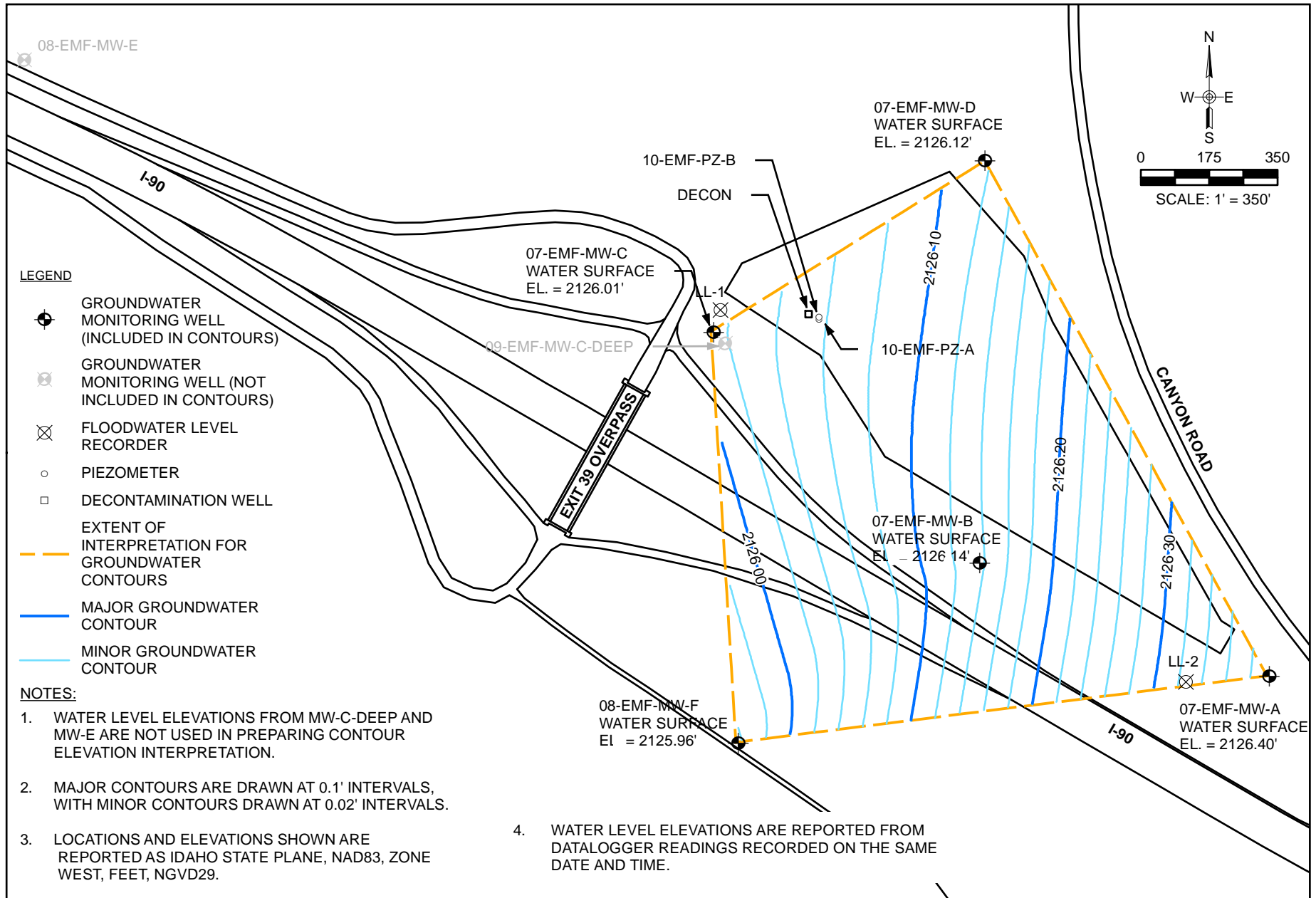
**Figure 2. Water Levels at EMFR Monitoring Wells Compared to River Stage at Cataldo**



**Notes:**

- Data not available for the USGS Gaging Station at Cataldo from October 28, 2014 to November 2, 2014, and from 10:00 am February 7, 2015 to 8:15 am February 8, 2015.
- All elevations are based on the NGVD29 datum

U:\Moscow\Clients\Idaho\EMF\MXDs\EMF\_GW\_MAP\_OCT2015.mxd



SCALE:	1" = 350' (8.5x11 PRINT)
DRAWN BY:	B.B.
ENGINEER:	D.F.



EAST MISSION FLATS REPOSITORY  
CATALDO, IDAHO

FIGURE 3  
OCTOBER 2015 GROUNDWATER LEVEL  
ELEVATIONS AND CONTOURS

PROJECT NO:	15019-08-02
DATE:	02/01/2016
FILE NAME:	EMF_GW_MAP_APR2015.MXD

Figure 4. Field Parameter Data at EMFR Groundwater Sites

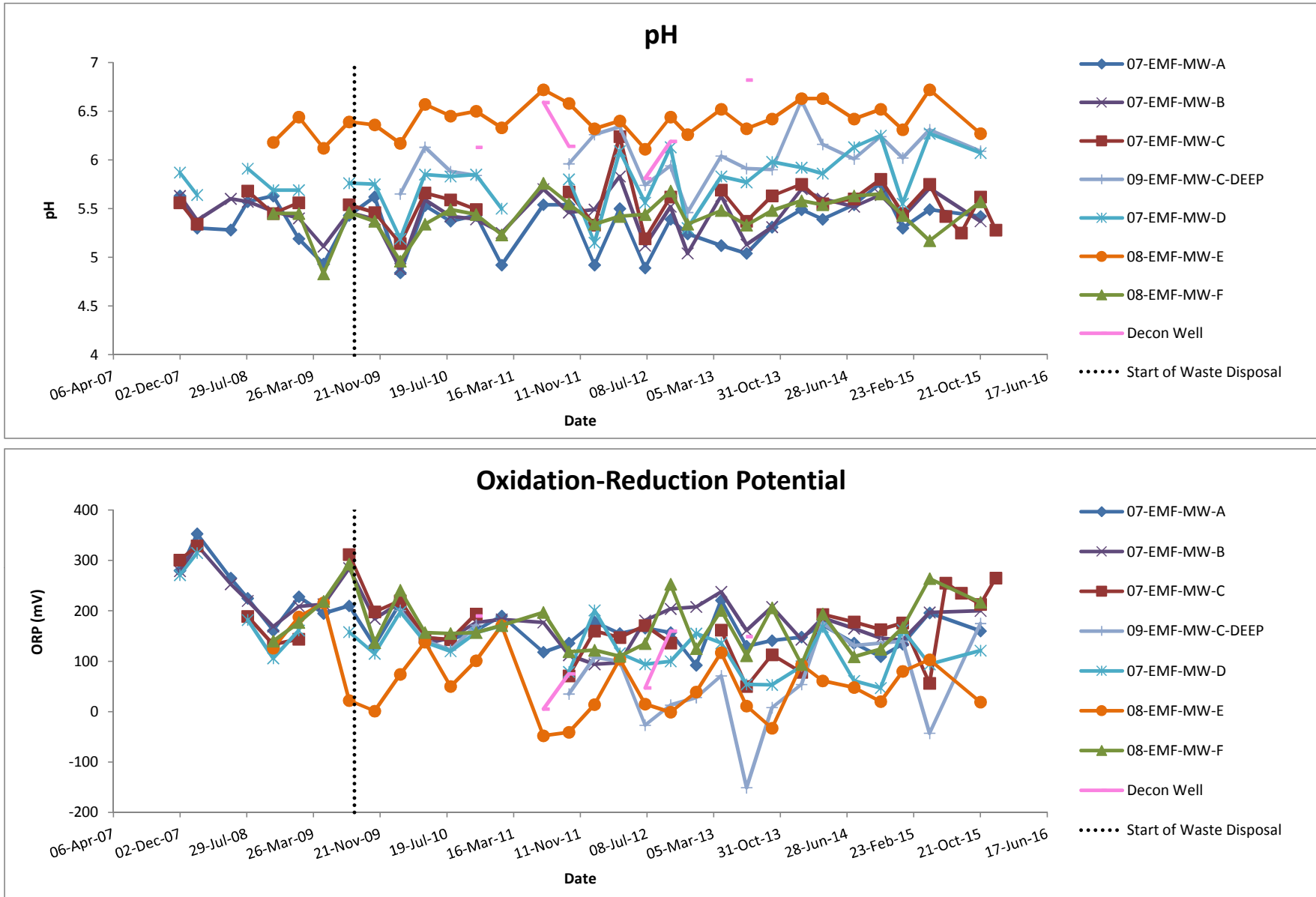


Figure 4. Field Parameter Data at EMFR Groundwater Sites

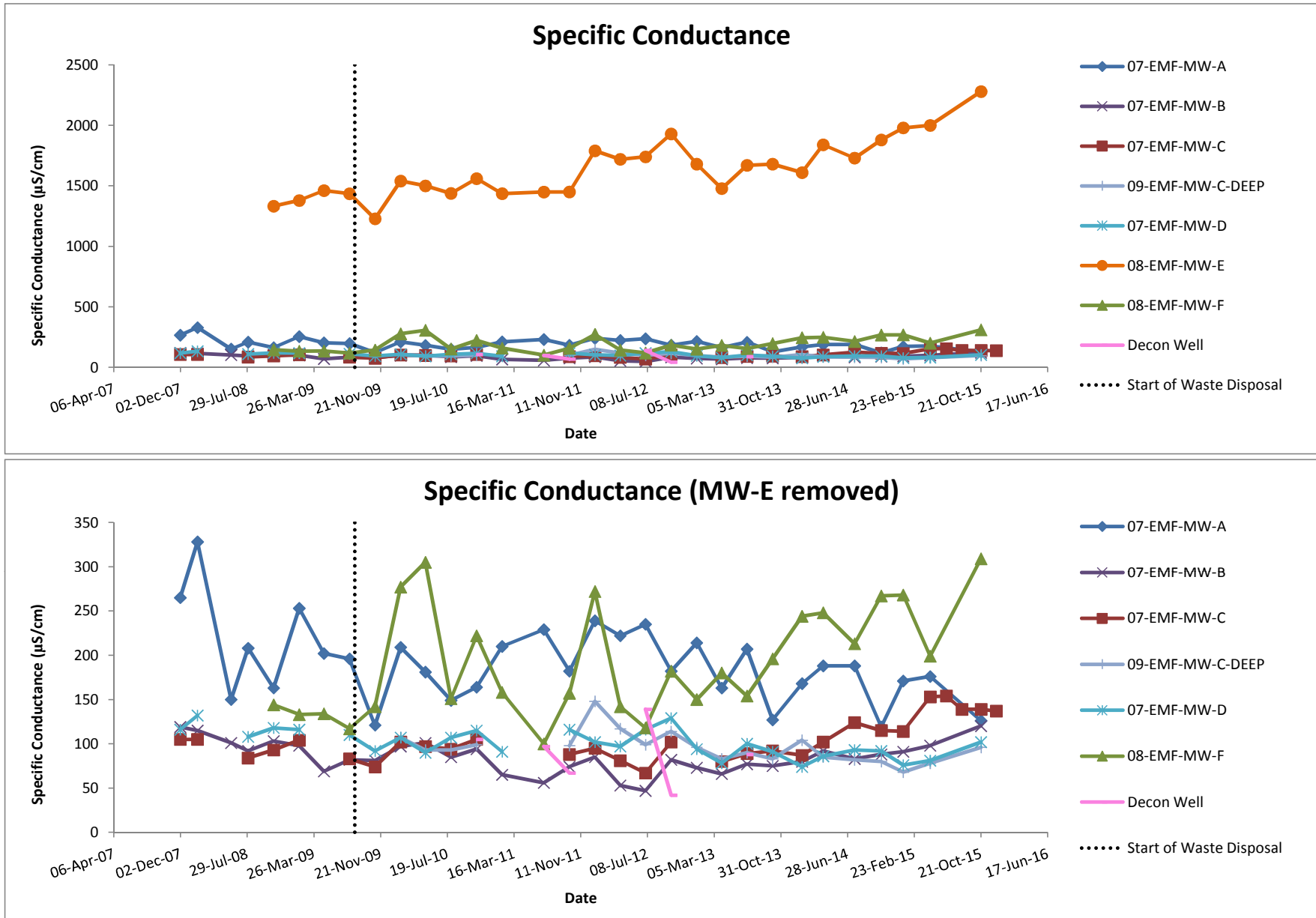


Figure 4. Field Parameter Data at EMFR Groundwater Sites

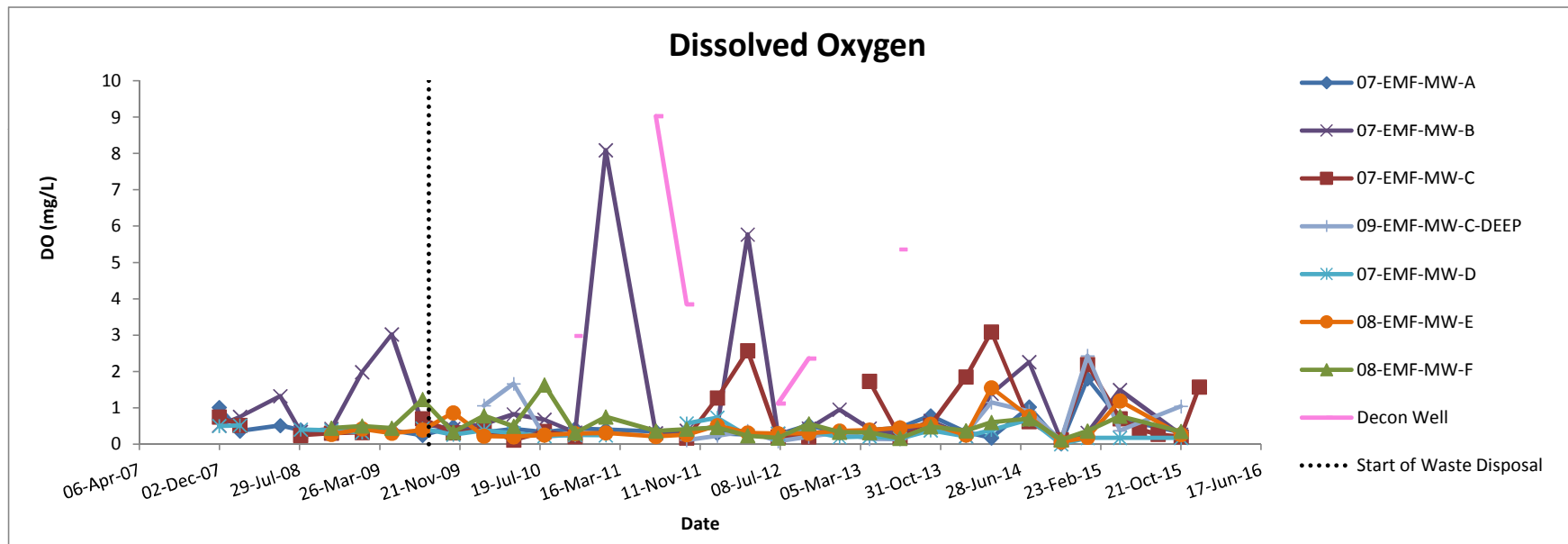
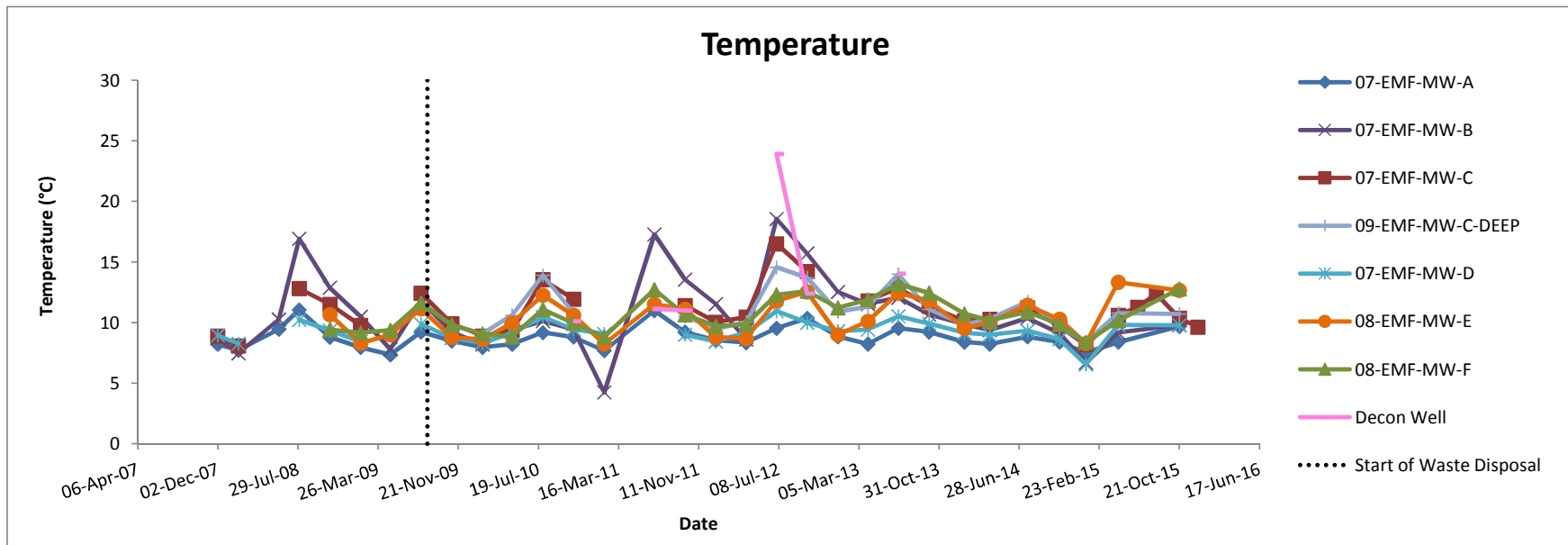


Figure 5. Dissolved Metals Data at EMFR Groundwater Sites

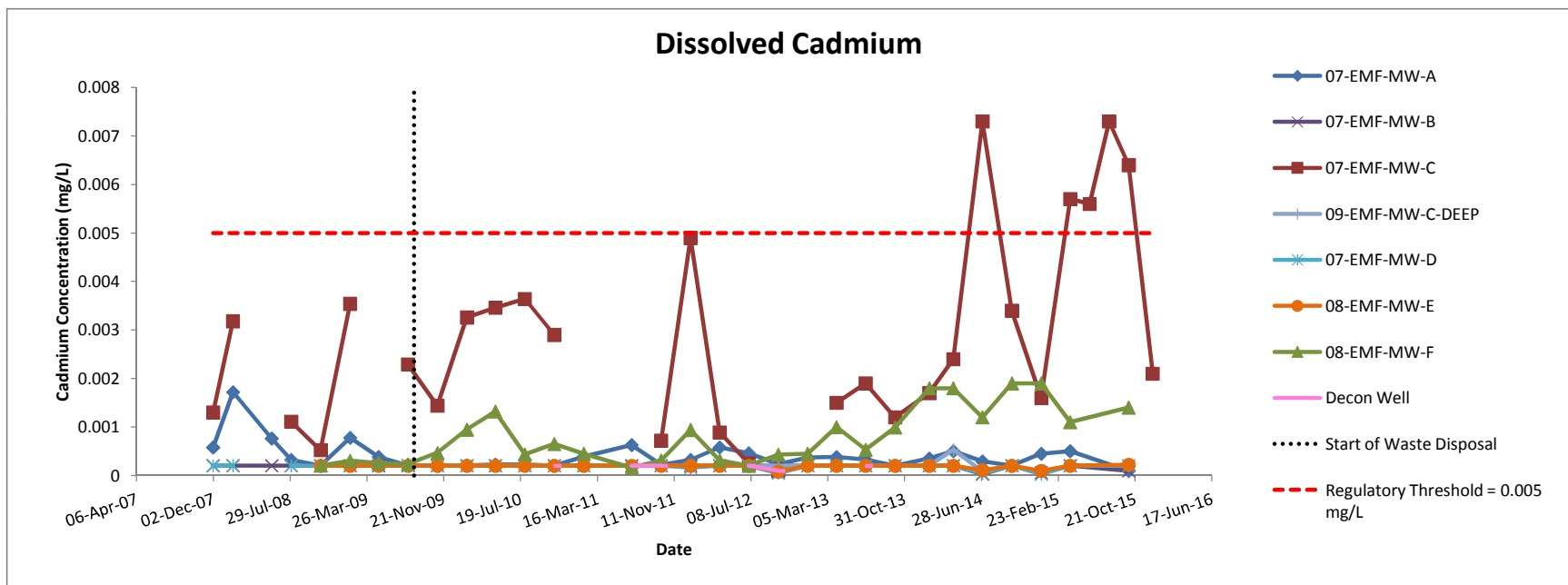
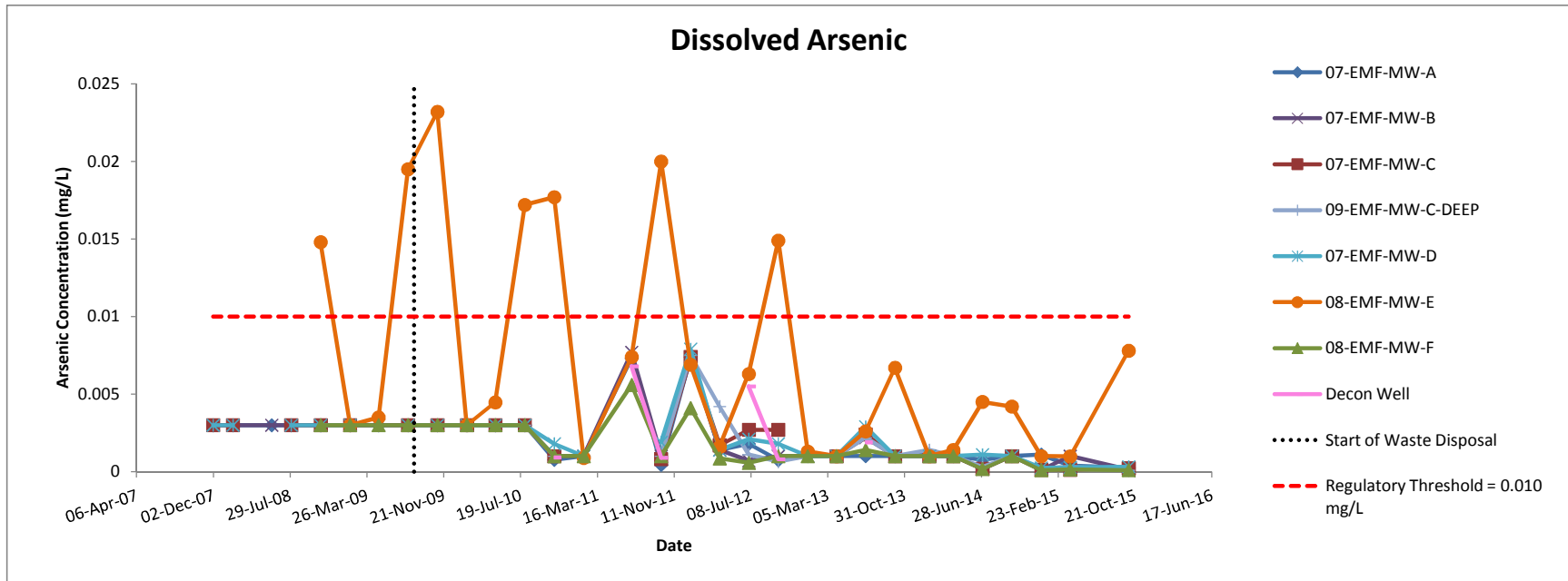
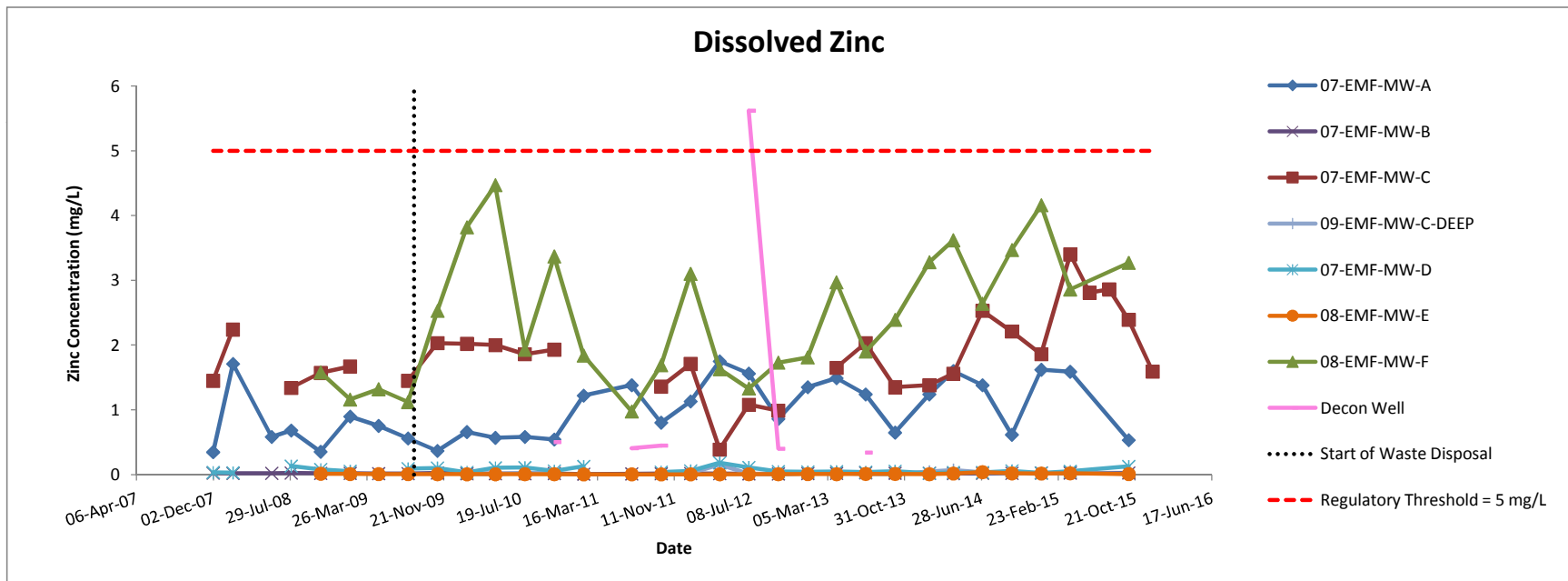
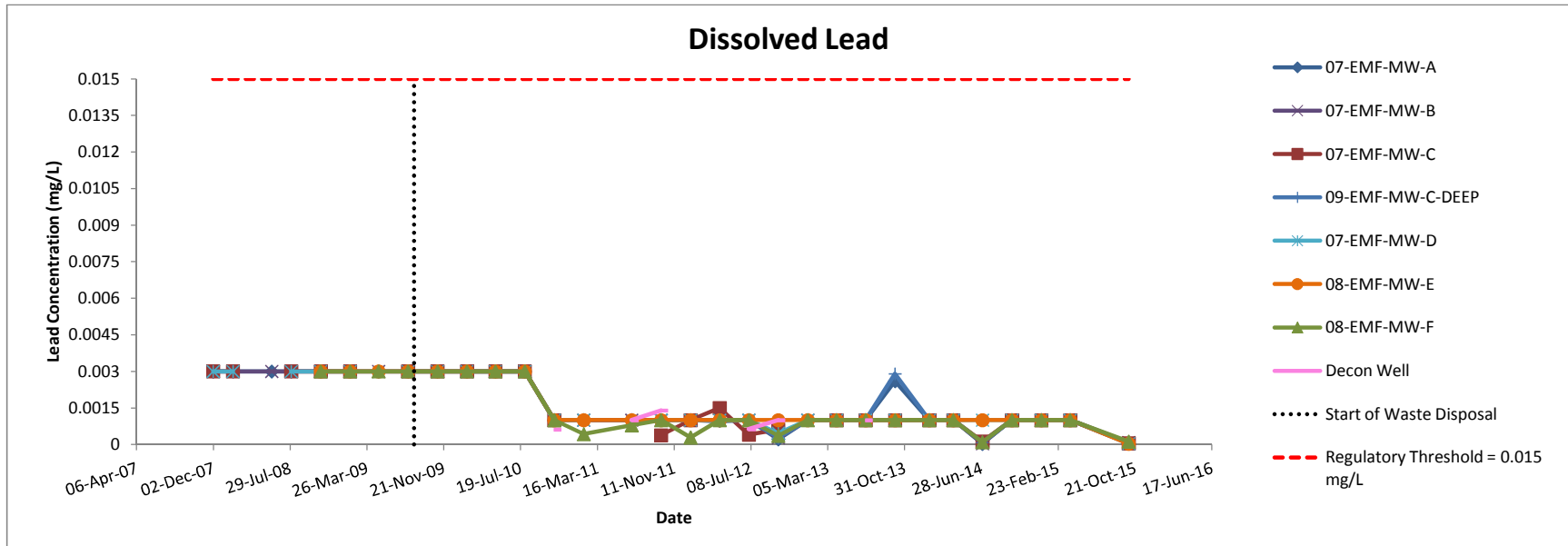




Figure 5. Dissolved Metals Data at EMFR Groundwater Sites



\*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
	27-Oct-14	5.76	119	8.39	0.01	109
	14-Jan-15	5.30	171	7.51	1.8 J	134
	21-Apr-15	5.49	176	8.38	0.69	196
21-Oct-15	5.42	126	9.68	0.32	160	
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
	27-Oct-14	5.64	88	9.10	0.11	146
	14-Jan-15	5.41	91	6.68	0.31	142
	21-Apr-15	5.71	98	9.17	1.49	197
21-Oct-15	5.37	120	9.80	0.26	200	

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	5.6	124	11.21	0.62	178
	27-Oct-14	5.80	115	9.71	0.12	163
	14-Jan-15	5.45	114	8.16	2.19	176
	21-Apr-15	5.75	153	10.60	0.70	56
	18-Jun-15	5.42	154	11.26	0.41	255
	13-Aug-15	5.25	139	12.37	0.27	235
	21-Oct-15	5.62	139	10.36	0.20	213
15-Dec-15	5.28	137	9.63	1.57	265	
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
	27-Oct-14	6.24	80	9.67	0.11	136
	14-Jan-15	6.02	68	8.36	2.43	140
	21-Apr-15	6.31	78	10.78	0.37	-43
	21-Oct-15	6.09	96	10.71	1.04	175

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
	27-Oct-14	6.25	92	8.63	0.00	47
	14-Jan-15	5.55	76	6.55	0.17	162
	21-Apr-15	6.27	81	9.80	0.17	94
	21-Oct-15	6.07	102	9.77	0.17	121
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
	27-Oct-14	6.52	1,880	10.28	0.06	20
	14-Jan-15	6.31	1,980	8.27	0.19	80
	21-Apr-15	6.72	2,000	13.33	1.19	103
	21-Oct-15	6.27	2,280	12.66	0.26	19

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	
	27-Oct-14	5.65	267	9.85	0.12	124	
14-Jan-15	5.43	268	8.38	0.36	167		
22-Apr-15	5.17	199	10.16	0.77	264		
	21-Oct-15	5.57	309	12.78	0.35	217	
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

amsl = above mean sea level

DO = Dissolved oxygen

ORP = Oxidation-reduction potential

NS = Not sampled

R = Rejected

J = Estimate

  = Data from the recent sampling events.

**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	0.0020 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	1.600 J
	23-Jul-14	0.002 U	0.00076 J	0.00029	0.000025 J	1.38 J
	27-Oct-14	0.002 U	0.001 U	0.0002 U	0.001 U	0.616
	14-Jan-15	NS	0.0011	0.00045	0.001 U	1.62 J
	21-Apr-15	NS	0.00039 J	0.00050	0.001 U	1.59 J
21-Oct-15	NS	0.00026 J	0.000097 J	0.000039 J	0.533 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
	27-Oct-14	0.002 U	0.001 U	0.0002 U	0.001 U	0.0207
	14-Jan-15	NS	0.00011 J	0.000058 J	0.001 U	0.0268 J
	21-Apr-15	NS	0.001 U	0.0002 U	0.001 U	0.0254 J*
21-Oct-15	NS	0.00013 J	0.000093 J	0.000083 J	0.0266 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 J*	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
	27-Oct-14	0.002 U	0.001 U	0.0034	0.001 U	2.21
	14-Jan-15	NS	0.00013 J	0.0016	0.001 U	1.86 J
	21-Apr-15	NS	0.00013 J	0.0057	0.001 U	3.4 J
	18-Jun-15	NS	NS	0.0056	NS	2.8
	13-Aug-15	NS	NS	0.0073	NS	2.86 J
	21-Oct-15	NS	0.00022 J	0.0064	0.000051 J	2.39 J
15-Dec-15	NS	NS	0.0021 J	NS	1.59	
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	0.00009 J	0.000079 J	0.0328 J
	27-Oct-14	0.002 U	0.001 U	0.0002 U	0.001 U	0.0222
	14-Jan-15	NS	0.0002 J	0.000045 J	0.001 U	0.012 J
21-Apr-15	NS	0.00032 J	0.0002 U	0.001 U	0.0304 J	
21-Oct-15	NS	0.000087 J	0.0002 U	0.000047 J	0.0133 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
	27-Oct-14	0.002 U	0.001 U	0.0002 U	0.001 U	0.0587
	14-Jan-15	NS	0.00024 J	0.000028 J	0.001 U	0.0251 J
	21-Apr-15	NS	0.00027 J	0.0002 U	0.001 U	0.0506 J
21-Oct-15	NS	0.00032 J	0.0002 U	0.000037 J	0.127 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	0.0001 J	0.001 U	0.0392 J
	27-Oct-14	0.002 U	0.0042	0.0002 U	0.001 U	0.0198
	14-Jan-15	NS	0.001	0.000096 J	0.001 U	0.0175 J
	21-Apr-15	NS	0.00099 J	0.0002 U	0.001 U	0.0218 J*
	21-Oct-15	NS	0.0078	0.00022	0.000032 J	0.0090 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	0.0018	0.001 U	3.28 J
	1-Apr-14	0.002 U	0.001 U	0.0018	0.001 U	3.62 J
	23-Jul-14	0.002 U	0.00017 J	0.0012	0.000098 J	2.64 J
	27-Oct-14	0.002 U	0.001 U	0.0019	0.001 U	3.47
	14-Jan-15	NS	0.0001 J	0.0019	0.001 U	4.16 J
	22-Apr-15	NS	0.00014 J	0.0011	0.001 U	2.86 J
	21-Oct-15	NS	0.00010 J	0.0014	0.00012 J	3.27 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
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 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

Antimony no longer analyzed for as of December 2014.

	= Value exceeds the regulatory threshold
	= Data from the recent sampling events.

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



**Groundwater Sampling Record**

Project: East Mission Flats Repository				Well Number: MW-A			
Project Number: 15019-08-02-01				Sample Number: (07-EMF-MW-A)102115			
Location:				Weather: cloudy 46°			
Date: 10/21/2015				Sampler(s): GM/RJK			
[De-Ionized Water Date: ]							
Depth to Bottom (ft): 29.59				Purge Time: 20 min			
Depth to Water (ft): 15.38				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** [1 L = 0.2642 gal • 1 gal = 3.7854 L]

Purged Volume (gal)	Time	pH	Spec. Cond. (µS/cm)	Temp (°C)	Dissolved Oxygen		ORP (mV)
					mg/L	%	
	00:00	4.94	0.226	10.18	7.83	25.4	278
	16:00	5.39	0.126	9.78	0.38	3.6	183
	18:00	5.41	0.126	9.63	0.34	3.3	161
	20:00	5.42	0.126	9.68	0.32	3.0	160

Sampling Date: 10/21/2015      Sampling Method: Low Flow      Time Sampled: 10:23

Container	Volume	Preservative	Cooled	Filtered	Analyte	Lab
Poly	1L	HNO3	Y	N	Hard, TP	CLP
Poly	1L	HNO3	Y	Y	DM, Cations	CLP
Poly	500mL	none	Y	N	Alkalinity	SVL
Poly	500mL	none	Y	Y	Anions	SVL

Chain-of-Custody: Yes/No      Duplicate Sample Number:

Chain-of-Custody Number:      QC Sample Number:      Time:

Notes: Rusty color

Deviations/Observations:

Picture Log:

Expendable Supplies Used: 1 H: Cap





**Groundwater Sampling Record**

Project: East Mission Flats Repository				Well Number: <i>MW-B</i>			
Project Number: 15019-08-02-01				Sample Number: <i>(07-EMF-MW-B)102115</i>			
Location:				Weather: <i>Partly Sunny 50°</i>			
Date: <i>10/21/2015</i>				Sampler(s): <i>50° GM/RTK</i>			
[De-Ionized Water Date: ]				<i>RTK</i>			
Depth to Bottom (ft): <i>30.25</i>				Purge Time: <i>12 min</i>			
Depth to Water (ft): <i>13.00</i>				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**

[1 L = 0.2642 gal • 1 gal = 3.7854 L]

Purged Volume (gal)	Time	pH	Spec. Cond. (mS/cm)	Temp (°C)	Dissolved Oxygen		ORP (mV)
					mg/L	%	
	00:00	<i>5.72</i>	<i>0.112</i>	<i>9.90</i>	<i>5.40</i>	<i>51.7</i>	<i>174</i>
	<i>08:00</i>	<i>5.38</i>	<i>0.120</i>	<i>9.71</i>	<i>0.33</i>	<i>3.2</i>	<i>196</i>
	<i>10:00</i>	<i>5.37</i>	<i>0.120</i>	<i>9.76</i>	<i>0.29</i>	<i>2.7</i>	<i>198</i>
	<i>12:00</i>	<i>5.37</i>	<i>0.120</i>	<i>9.80</i>	<i>0.26</i>	<i>2.5</i>	<i>200</i>

Sampling Date: <i>10/21/2015</i>		Sampling Method: Low Flow			Time Sampled: <i>10:52</i>		
Container	Volume	Preservative	Cooled	Filtered	Analyte	Lab	
Poly	1L	HNO3	Y	N	Hard, TP	CLP	
Poly	1L	HNO3	Y	Y	DM, Cations	CLP	
Poly	500mL	none	Y	N	Alkalinity	SVL	
Poly	500mL	none	Y	Y	Anions	SVL	

Chain-of-Custody: Yes/No	Duplicate Sample Number:
Chain-of-Custody 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: MW-C			
Project Number: 15019-08-02-01				Sample Number: (07-EMP-MW-C)102115			
Location:				Weather: Partly Sunny 55°			
Date: 10/21/2015				Sampler(s): GM/RJK			
[De-Ionized Water Date: ]							
Depth to Bottom (ft): 30.32				Purge Time: 10 min			
Depth to Water (ft): 10.60				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 0.632	6" diameter 1.469	8" diameter 2.611

**GROUNDWATER DATA**

[1 L = 0.2642 gal • 1 gal = 3.7854 L]

Purged Volume (gal)	Time	pH	Spec. Cond. (µS/cm)	Temp (°C)	Dissolved Oxygen		ORP (mV)
					mg/L	%	
	00:00	6.04	0.135	10.98	5.96	62.4	191
	08:00	5.63	0.139	10.37	0.27	2.6	211
	10:00	5.63	0.138	10.36	0.23	2.2	212
	12:00	5.62	0.139	10.36	0.20	1.9	213

Sampling Date: 10/21/2015      Sampling Method: Low Flow      Time Sampled: 11:48

Container	Volume	Preservative	Cooled	Filtered	Analyte	Lab
Poly	1L	HNO3	Y	N	Hard, TP	CLP
Poly	1L	HNO3	Y	Y	DM, Cations	CLP
Poly	500mL	none	Y	N	Alkalinity	SVL
Poly	500mL	none	Y	Y	Anions	SVL

Chain-of-Custody: Yes/No      Duplicate Sample Number:

Chain-of-Custody 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: <i>MW-CDEEP</i>			
Project Number: 15019-08-02-01				Sample Number: <i>(09-EMF-MW-CDEEP) 102115</i>			
Location:				Weather: <i>Partly Sunny 53°</i>			
Date: <i>10/21/2015</i>				Sampler(s): <i>GM/EJK</i>			
[De-Ionized Water Date: ]							
Depth to Bottom (ft): <i>98.30</i>				Purge Time: <i>12 min</i>			
Depth to Water (ft): <i>10.43</i>				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**

[1 L = 0.2642 gal • 1 gal = 3.7854 L]

Purged Volume (gal)	Time	pH	Spec. Cond. (µS/cm)	Temp (°C)	Dissolved Oxygen		ORP (mV)
					mg/L	%	
	00:00	<i>6.03</i>	<i>0.092</i>	<i>10.71</i>	<i>2.49</i>	<i>24.3</i>	<i>176</i>
	<i>08:00</i>	<i>6.08</i>	<i>0.096</i>	<i>10.66</i>	<i>0.95</i>	<i>9.2</i>	<i>175</i>
	<i>10:00</i>	<i>6.09</i>	<i>0.095</i>	<i>10.69</i>	<i>1.01</i>	<i>9.8</i>	<i>175</i>
	<i>12:00</i>	<i>6.09</i>	<i>0.096</i>	<i>10.71</i>	<i>1.04</i>	<i>10.1</i>	<i>175</i>

Sampling Date: <i>10/21/2015</i>		Sampling Method: Low Flow		Time Sampled: <i>11:26</i>		
Container	Volume	Preservative	Cooled	Filtered	Analyte	Lab
Poly	1L	HNO3	Y	N	Hard, TP	CLP
Poly	1L	HNO3	Y	Y	DM, Cations	CLP
Poly	500mL	none	Y	N	Alkalinity	SVL
Poly	500mL	none	Y	Y	Anions	SVL

Chain-of-Custody: Yes/No	Duplicate Sample Number:
Chain-of-Custody Number:	QC Sample Number: _____ Time: _____

Notes: *Observed fine particulates in unfiltered samples*

Deviations/Observations:

---



---



---



---

Picture Log:

Expendable Supplies Used: *1 H: Cap*





**Groundwater Sampling Record**

Project: East Mission Flats Repository				Well Number: MW-D			
Project Number: 15019-08-02-01				Sample Number: (07-EMF-MW-D)102115			
Location:				Weather: Mostly Sunny 65°			
Date: 10/21/2015				Sampler(s): GM/RJK			
[De-Ionized Water Date: ]							
Depth to Bottom (ft): 30.35				Purge Time: 10 min			
Depth to Water (ft): 11.54				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** [1 L = 0.2642 gal • 1 gal = 3.7854 L]

Purged Volume (gal)	Time	pH	Spec. Cond. (mS/cm)	Temp (°C)	Dissolved Oxygen		ORP (mV)
					mg/L	%	
	00:00	6.45	0.088	16.85	7.46	73.1	152
	06:00	6.10	0.101	9.78	0.25	2.5	124
	08:00	6.07	0.102	9.78	0.20	1.9	123
	10:00	6.07	0.102	9.77	0.17	1.6	121

Sampling Date: 10/21/2015      Sampling Method: Low Flow      Time Sampled: 13:49

Container	Volume	Preservative	Cooled	Filtered	Analyte	Lab
Poly	1L	HNO3	Y	N	Hard, TP	CLP
Poly	1L	HNO3	Y	Y	DM, Cations	CLP
Poly	500mL	none	Y	N	Alkalinity	SVL
Poly	500mL	none	Y	Y	Anions	SVL

Chain-of-Custody: Yes/No      Duplicate Sample Number:

Chain-of-Custody Number:      QC Sample Number: (07-EMF-MW-D)102115-E      Time: 14:02

Notes: Rusty color

Deviations/Observations:

Picture Log:  
Expendable Supplies Used: 1 HiCap / 1 REGULAR filter 3 P+ Masterflex

19.38    13.15  
19.43



**Groundwater Sampling Record**

Project: East Mission Flats Repository				Well Number: MW-E			
Project Number: 15019-08-02-01				Sample Number: (08-EMF-MW-E)102115			
Location:				Weather: Mostly Sunny 60°			
Date: 10/21/2015				Sampler(s): GM/RJK			
[De-Ionized Water Date: ]							
Depth to Bottom (ft): 27.38				Purge Time: 12 min			
Depth to Water (ft): 12.76				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**

[1 L = 0.2642 gal • 1 gal = 3.7854 L]

Purged Volume (gal)	Time	pH	Spec. Cond. (µS/cm)	Temp (°C)	Dissolved Oxygen		ORP (mV)
					mg/L	%	
	00:00	6.28	2.24	12.60	7.08	72.7	124
	08:00	6.25	2.28	12.76	0.33	3.4	26
	10:00	6.26	2.28	12.68	0.29	3.0	22
	12:00	6.27	2.28	12.66	0.26	2.7	19

Sampling Date: 10/21/2015      Sampling Method: Low Flow      Time Sampled: 12:30

Container	Volume	Preservative	Cooled	Filtered	Analyte	Lab
Poly	1L	HNO3	Y	N	Hard, TP	CLP
Poly	1L	HNO3	Y	Y	DM, Cations	CLP
Poly	500mL	none	Y	N	Alkalinity	SVL
Poly	500mL	none	Y	Y	Anions	SVL

Chain-of-Custody: Yes/No      Duplicate Sample Number: (08-EMF-MW-E)102115-C

Chain-of-Custody 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: MW-F			
Project Number: 15019-08-02-01				Sample Number: (08-EMF-MW-F) 102115			
Location:				Weather: Mostly Sunny 62°			
Date: 10/21/2015				Sampler(s): GM/RJK			
[De-Ionized Water Date: ]							
Depth to Bottom (ft): 31.63				Purge Time: 22 min			
Depth to Water (ft): 12.97				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** [1 L = 0.2642 gal • 1 gal = 3.7854 L]

Purged Volume (gal)	Time	pH	Spec. Cond. (µS/cm)	Temp (°C)	Dissolved Oxygen		ORP (mV)
					mg/L	%	
	00:00	7.40	0.251	13.06	6.94	71.4	70
	18:00	5.63	0.309	12.48	0.37	3.8	207
	20:00	5.60	0.309	12.61	0.36	3.6	212
	22:00	5.57	0.309	12.78	0.35	3.5	217

Sampling Date: 10/21/2015      Sampling Method: Low Flow      Time Sampled: 13:15

Container	Volume	Preservative	Cooled	Filtered	Analyte	Lab
Poly	1L	HNO3	Y	N	Hard, TP	CLP
Poly	1L	HNO3	Y	Y	DM, Cations	CLP
Poly	500mL	none	Y	N	Alkalinity	SVL
Poly	500mL	none	Y	Y	Anions	SVL

Chain-of-Custody: Yes/No      Duplicate Sample Number:

Chain-of-Custody Number:      QC Sample Number:      Time:

Notes:

Deviations/Observations:

Picture Log:

Expendable Supplies Used: 1 standard fi) ter



**Groundwater Sampling Record**

Project: East Mission Flats Repository				Well Number: <i>PZ-A</i>			
Project Number: 15019-08-02-01				Sample Number:			
Location:				Weather: <i>Mostly Sunny 65°</i>			
Date: <i>10/21/2015 14:19</i>				Sampler(s): <i>GM/BJK</i>			
[De-Ionized Water Date: ]							
Depth to Bottom (ft): <i>19.43</i>				Purge Time:			
Depth to Water (ft): <i>19.38</i>				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** [1 L = 0.2642 gal • 1 gal = 3.7854 L]

Purged Volume (gal)	Time	pH	Spec. Cond. (µS/cm)	Temp (°C)	Dissolved Oxygen		ORP (mV)
					mg/L	%	
	00:00						
<i>Insufficient water column - No Sample</i>							

Sampling Date: \_\_\_\_\_ Sampling Method: Low Flow Time Sampled: \_\_\_\_\_

Container	Volume	Preservative	Cooled	Filtered	Analyte	Lab
Poly	1L	HNO3	Y	N	Hard, TP	CLP
Poly	1L	HNO3	Y	Y	DM, Cations	CLP
Poly	500mL	none	Y	N	Alkalinity	SVL
Poly	500mL	none	Y	Y	Anions	SVL

Chain-of-Custody: Yes/No \_\_\_\_\_ Duplicate Sample Number: \_\_\_\_\_

Chain-of-Custody Number: \_\_\_\_\_ QC Sample Number: \_\_\_\_\_ Time: \_\_\_\_\_

Notes:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Deviations/Observations:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Picture Log:

Expendable Supplies Used:





**Groundwater Sampling Record**

Project: East Mission Flats Repository				Well Number: PZ-B			
Project Number: 15019-08-02-01				Sample Number:			
Location:				Weather: Mostly Sunny 65°			
Date: 10/21/2015 14:15				Sampler(s): GM/ATK			
[De-Ionized Water Date: ]							
Depth to Bottom (ft): 13.15				Purge Time:			
Depth to Water (ft): Dry				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**

[1 L = 0.2642 gal • 1 gal = 3.7854 L]

Purged Volume (gal)	Time	pH	Spec. Cond. (µS/cm)	Temp (°C)	Dissolved Oxygen		ORP (mV)
					mg/L	%	
	00:00						

Dry

Sampling Date:			Sampling Method: Low Flow		Time Sampled:		
Container	Volume	Preservative	Cooled	Filtered	Analyte	Lab	
Poly	1L	HNO3	Y	N	Hard, TP	CLP	
Poly	1L	HNO3	Y	Y	DM, Cations	CLP	
Poly	500mL	none	Y	N	Alkalinity	SVL	
Poly	500mL	none	Y	Y	Anions	SVL	

Chain-of-Custody: Yes/No	Duplicate Sample Number:
Chain-of-Custody Number:	QC Sample Number: Time:

Notes:

Deviations/Observations:

Picture Log:  
Expendable Supplies Used:



**Groundwater Sampling Record**

Project: East Mission Flats Repository				Well Number: MW-C			
Project Number: 15019-08-02-03				Sample Number: (07-EMF-MW-C)121515			
Location:				Weather: <i>cloudy 37°</i>			
Date: 12/15/2015				Sampler(s): GM/RJK			
[De-Ionized Water Date: <i>9/8/15</i> ]							
Depth to Bottom (ft):				Purge Time: <i>30 mins</i>			
Depth to Water (ft): <i>7.65</i>				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**

[1 L = 0.2642 gal • 1 gal = 3.7854 L]

Purged Volume (gal)	Time	pH	Spec. Cond. (µS/cm)	Temp (°C)	Dissolved Oxygen		ORP (mV)
					mg/L	%	
	00:00	<i>4.30</i>	<i>4.16</i>	<i>14.64</i>	<i>1.24</i>	<i>13.4</i>	<i>275</i>
	<i>26:00</i>	<i>5.28</i>	<i>0.136</i>	<i>9.55</i>	<i>1.61</i>	<i>15.3</i>	<i>264</i>
	<i>28:00</i>	<i>5.27</i>	<i>0.137</i>	<i>9.60</i>	<i>1.61</i>	<i>15.3</i>	<i>264</i>
	<i>30:00</i>	<i>5.28</i>	<i>0.137</i>	<i>9.63</i>	<i>1.57</i>	<i>14.9</i>	<i>265</i>

Sampling Date: 12/15/2015      Sampling Method: Low Flow      Time Sampled: *11:30*

Container	Volume	Preservative	Cooled	Filtered	Analyte	Lab
Poly	1L	HNO3	Y	Y	DM (Cd, Zn)	CLP

Chain-of-Custody: Yes/No      Duplicate Sample Number: (07-EMF-MW-C)121515-C

Chain-of-Custody Number:      QC Sample Number: (07-EMF-MW-C)121515-E      Time: *11:12*

Notes:

Deviations/Observations:

Picture Log:  
Expendable Supplies Used: *1 Standard filter 1 Nalgene*

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





CLP Data

CASE NUMBER	SAMPLE DELIVERY GROUP	SAMPLE ID	CAS NUMBER	ANALYTE	FINAL RESULT	RESULT UNITS	FINAL VALIDATION QUALIFIER	IDEQ QUALIFIER	COMB QUALIFIER	DATA VAL LABEL	NONMOISTURE SAMPLE				NONMOISTURE SAMPLE				LAB SAMPLE TYPE	SPIKE ADDED	STATION LOCATION	SCRIBE SAMPLE NUMBER	PARENT SAMPLE NAME	PARENT SAMPLE LOCATION	LAB REPLICATE TYPE	SAMPLE SOURCE				
											ADJUSTED CRQL	ADJUSTED MDL	LAB RESULT	LAB QUALIFIERS	METHOD CRQL	ADJUSTED CRQL	CRQL UNITS	INSTRUMEN T MDL									ADJUSTED MDL	MDL UNITS	SAMPLE DATE TIME	
45689	MJHBJO	MJHBJ8	7440-70-2	Calcium	40.1	ug/L	J	J	J	S4VEM	40.0	8.5	40.1	*	40	40.0	ug/L	8.5	8.5	ug/L	10/21/2015 02:02:00	Field_Sample	07-EMF-MW-D	(07-EMF-MW-D) 102115-E	DM, Cations				FIELD	
45689	MJHBJO	MJHBJ8	7439-95-4	Magnesium	60.0	ug/L	UJ	UJ	UJ	S4VEM	60.0	12.9	60.0	U*	60	60.0	ug/L	12.9	12.9	ug/L	10/21/2015 02:02:00	Field_Sample	07-EMF-MW-D	(07-EMF-MW-D) 102115-E	DM, Cations				FIELD	
45689	MJHBJO	MJHBJ8	7440-09-7	Potassium	500	ug/L	U	U	U	S4VEM	500	49.5	500	U	500	500	ug/L	49.5	49.5	ug/L	10/21/2015 02:02:00	Field_Sample	07-EMF-MW-D	(07-EMF-MW-D) 102115-E	DM, Cations				FIELD	
45689	MJHBJO	MJHBJ8	7440-23-5	Sodium	500	ug/L	UJ	UJ	UJ	S4VEM	500	13.6	500	U*	500	500	ug/L	13.6	13.6	ug/L	10/21/2015 02:02:00	Field_Sample	07-EMF-MW-D	(07-EMF-MW-D) 102115-E	DM, Cations				FIELD	
45689	MJHBJO	LCS01	7440-70-2	Calcium	73.2	ug/L				S4VEM	40.0	8.5	73.2		40	40.0	ug/L	8.5	8.5	ug/L		Laboratory_Con 80								LAB
45689	MJHBJO	LCS01	7439-95-4	Magnesium	114	ug/L				S4VEM	60.0	12.9	114		60	60.0	ug/L	12.9	12.9	ug/L		Laboratory_Con 120								LAB
45689	MJHBJO	LCS01	7440-09-7	Potassium	952	ug/L				S4VEM	500	49.5	952		500	500	ug/L	49.5	49.5	ug/L		Laboratory_Con 1000								LAB
45689	MJHBJO	LCS01	7440-23-5	Sodium	1260	ug/L				S4VEM	500	13.6	1260		500	500	ug/L	13.6	13.6	ug/L		Laboratory_Con 1000								LAB
45689	MJHBJO	PBW01	7440-70-2	Calcium	40.0	ug/L	U		U	S4VEM	40.0	8.5	40.0	U	40	40.0	ug/L	8.5	8.5	ug/L		Method_Blank								LAB
45689	MJHBJO	PBW01	7439-95-4	Magnesium	60.0	ug/L	U		U	S4VEM	60.0	12.9	60.0	U	60	60.0	ug/L	12.9	12.9	ug/L		Method_Blank								LAB
45689	MJHBJO	PBW01	7440-09-7	Potassium	500	ug/L	U		U	S4VEM	500	49.5	500	U	500	500	ug/L	49.5	49.5	ug/L		Method_Blank								LAB
45689	MJHBJO	PBW01	7440-23-5	Sodium	14.3	ug/L	J		J	S4VEM	500	13.6	14.3	J	500	500	ug/L	13.6	13.6	ug/L		Method_Blank								LAB

Highlighted columns IDEQ QUALIFIER and COMB QUALIFIER entered by TerraGraphics to show all data qualifiers.  
 Entire electronic data deliverable is available upon request.

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

