

ATTACHMENT 4: FIELD LOGS

This attachment contains the groundwater sample collection field logs for the relatively shallow standpipe monitoring wells (MW-5 through MW-8, MW-10, MW-13, MW-15, and MW-16), as well as the field data sheets for the Westbay™ multiport wells (MW-3, MW-4, MW-11, MW-12, MW-14, and MW-17 through MW-26). Groundwater sample collection for the 3rd Quarter 2013 sampling event was conducted by Blaine Tech Services, Inc.

WELL MONITORING DATA SHEET

Project #: <u>130712-AW1</u>	Site: <u>JPL, Pasadena</u>
Sampler: <u>AW</u>	Gauging Date: <u>7-25-13</u>
Well I.D.: <u>MW-5</u>	Well Diameter: 2 3 <u>4</u> 6 8
Total Well Depth (TD): <u>140</u>	Depth to Water (DTW): <u>93.41</u>
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>PVC</u> Grade	Flow Cell Type <u>YSI-Pro Plus</u>
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: <u>102.72</u>	

Purge Method: Waterra Sampling Method:

Disposable Bailer 2" Rediflo pump Disposable Bailer
 Positive Air Displacement Extraction Pump Extraction Port
 Electric Submersible Other Dedicated RF2 Dedicated Tubing
Other:

Flow Rate= 2 gpm

Start Purge Date= 7-25-13 Pump @ 125'

<u>30.3</u> (Gals.) X	<u>3</u>	= <u>90.9</u> Gals.
I Case Volume	Specified Volumes	Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius ² * 0.163

Time	Temp (°C)	pH	Cond. (mS or μ S)	Turbidity (NTUs)	D.O. (mg/L)	ORP (mV)	Gals. Removed	DTW
0901	15.3	6.67	449	2	0.46	192.2	15 15	93.58
0909	15.3	6.62	450	1	0.38	148.4	31	93.61
0916	15.3	6.62	451	1	0.36	113.7	45	93.64
0924	15.3	6.62	451	1	0.37	118.2	61	93.66
0931	15.4	6.62	449	1	0.34	124.7	75	93.67
0939	15.3	6.63	450	1	0.35	127.2	91	93.68

Did well dewater? Yes No Gallons actually evacuated: 91

Sampling Date: 7-25-13 Sampling Time: 0945 Depth to Water: 93.68

Sample I.D.: MW-5 Laboratory: BC

Analyzed for: See COC Other: _____

EB I.D. (if applicable): _____ @ _____ Time Duplicate I.D. (if applicable): _____

FB I.D. (if applicable): _____ @ _____ Time Analyzed for: _____

D.O. (if req'd): Pre-purge: _____ mg/L Post-purge: _____ mg/L

O.R.P. (if req'd): Pre-purge: _____ mV Post-purge: _____ mV

WELL MONITORING DATA SHEET

Project #: <u>130712-AW1</u>	Site: <u>JPL, Pasadena</u>
Sampler: <u>AW</u>	Gauging Date: <u>7-25-13</u>
Well I.D.: <u>MW-6</u>	Well Diameter: 2 3 <u>(4)</u> 6 8
Total Well Depth (TD): <u>245</u>	Depth to Water (DTW): <u>198.91</u>
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>(PVC)</u> Grade	Flow Cell Type <u>YSI-Pro Plus</u>
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: <u>208.12</u>	

Purge Method: Waterra Sampling Method:

Disposable Bailer 2" Rediflo pump Disposable Bailer
 Positive Air Displacement Extraction Pump Extraction Port
 Electric Submersible Other Dedicated RFZ Dedicated Tubing

Flow Rate = 2 gpm Other: _____

Start Purge Date = 7-25-13 Pump @ 230'

30.0 (Gals.) X 3 = 90.0 Gals.

I Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius ² * 0.163

Time	Temp (°C)	pH	Cond. (mS or μ S)	Turbidity (NTUs)	D.O. (mg/L)	ORP (mV)	Gals. Removed	DTW
0733	21.2	6.47	1206	1	6.20	180.3	14	199.40
0741	21.2	6.47	1208	1	5.56	220.2	30	199.42
0748	20.8	6.46	1208	1	5.84	227.3	44	199.49
0756	20.8	6.46	1207	1	5.64	231.5	60	199.52
0803	20.8	6.46	1206	1	5.67	238.7	74	199.54
0811	20.8	6.46	1208	1	5.59	240.6	90	199.55

Did well dewater? Yes No Gallons actually evacuated: 90

Sampling Date: 7-25-13 Sampling Time: 0815 Depth to Water: 199.55

Sample I.D.: MW-6 Laboratory: BC

Analyzed for: See C.O.C. Other: _____

EB I.D. (if applicable): _____ @ _____ Time Duplicate I.D. (if applicable): _____

FB I.D. (if applicable): _____ @ _____ Time Analyzed for: _____

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: <u>130712-AW1</u>	Site: <u>JPL, Pasadena</u>
Sampler: <u>AW</u>	Gauging Date: <u>7-25-13</u>
Well I.D.: <u>MW-7</u>	Well Diameter: 2 3 <u>(4)</u> 6 8
Total Well Depth (TD): <u>275</u>	Depth to Water (DTW): <u>232.05</u>
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>PVC</u> Grade	Flow Cell Type <u>YSI-Pro Plus</u>
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: <u>240.64</u>	

Purge Method: Wattera Sampling Method:

Disposable Bailer 2" Rediflo pump Disposable Bailer
 Positive Air Displacement Extraction Pump Extraction Port
 Electric Submersible Other Dedicated RFZ Dedicated Tubing
Other: _____

Flow Rate = 2 gpm
 Start Purge Date = 7-25-13 Pump @ 265

28.0 (Gals.) X 3 = 84.0 Gals.
 1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius ² * 0.163

Time	Temp (°C)	pH	Cond. (mS or <u>µS</u>)	Turbidity (NTUs)	D.O. (mg/L)	ORP (mV)	Gals. Removed	DTW
1252	24.6	6.96	664	6	0.14	207.8	14	232.39
1259	24.7	6.94	662	2	0.14	204.6	28	232.41
1306	24.7	6.94	662	1	0.17	193.4	42	232.43
1313	24.7	6.94	661	1	0.18	193.0	56	232.44
1320	24.7	6.94	662	1	0.20	192.7	70	232.46
1327	24.8	6.93	661	1	0.21	192.2	84	232.47

Did well dewater? Yes No Gallons actually evacuated: 84

Sampling Date: 7-25-13 Sampling Time: 1330 Depth to Water: 232.47

Sample I.D.: MW-7 Laboratory: BC

Analyzed for: See ~~SON~~ ^{COC} Other: _____

EB I.D. (if applicable): _____ @ _____ Time Duplicate I.D. (if applicable): _____

FB I.D. (if applicable): _____ @ _____ Time Analyzed for: _____

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
D.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: <u>130712-AW1</u>	Site: <u>JPL, Pasadena</u>
Sampler: <u>AW</u>	Gauging Date: <u>7-24-13</u>
Well I.D.: <u>MW-8</u>	Well Diameter: 2 3 <u>(4)</u> 6 8 <u> </u>
Total Well Depth (TD): <u>205</u>	Depth to Water (DTW): <u>158.81</u>
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>PVC</u> Grade	Flow Cell Type <u>YSI-Pro Plus</u>
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: <u>168.04</u>	

Purge Method: Waterra Sampling Method:

Disposable Bailer 2" Rediflo pump Disposable Bailer
 Positive Air Displacement Extraction Pump Extraction Port
 Electric Submersible Other Dedicated RFZ Dedicated Tubing
Other:

Flow Rate = 3 gpm

Start Purge Date = 7-24-13

30.1 (Gals.) X 3 = 90.3 Gals.

I Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius ² * 0.163

Time	Temp (°C)	pH	Cond. (mS or <u>µS</u>)	Turbidity (NTUs)	D.O. (mg/L)	ORP (mV)	Gals. Removed	DTW
1244	16.7	6.97	441	1	2.25	318.2	16	159.00
1249	16.8	6.96	439	1	2.04	321.4	31	159.03
1254	16.8	6.96	440	1	1.91	329.6	46	159.10
1259	16.8	6.96	439	1	1.80	320.1	61	159.11
1304	16.8	6.96	439	1	1.67	322.8	76	159.12
1309	16.8	6.96	438	1	1.64	322.1	91	159.13

Did well dewater? Yes No Gallons actually evacuated: 91

Sampling Date: 7-24-13 Sampling Time: 1315 Depth to Water:

Sample I.D.: MW-8 Laboratory: BC

Analyzed for: See COC Other:

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

FB I.D. (if applicable): @ Time Analyzed for:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: <u>130712-AW1</u>	Site: <u>JPL, Pasadena</u>
Sampler: <u>AW</u>	Gauging Date: <u>7-25-13</u>
Well I.D.: <u>MW-10</u>	Well Diameter: 2 3 <u>(4)</u> 6 8
Total Well Depth (TD): <u>155</u>	Depth to Water (DTW): <u>107.84</u>
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>PVC</u> Grade	Flow Cell Type <u>YSI-Pro Plus</u>
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: <u>117.27</u>	

Purge Method: Waterra Sampling Method:

Disposable Bailer Positive Air Displacement Electric Submersible	2" Rediflo pump Extraction Pump Other <u>Dedicated RF2</u>	Disposable Bailer Extraction Port Dedicated <u>Tubing</u> Other:
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Flow Rate= 2 gpm
 Start Purge Date= 7-25-13 Pump @ 140'

30.7 (Gals.) X 3 = 92.1 Gals.
 I Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius ² * 0.163

Time	Temp (°C)	pH	Cond. (mS or <u>µS</u>)	Turbidity (NTUs)	D.O. (mg/L)	ORP (mV)	Gals. Removed	DTW
1018	20.2	6.59	1099	1	2.37	249.8	17	107.98
1026	20.2	6.57	1119	1	2.86	208.3	33	108.01
1033	20.2	6.57	1113	1	2.88	208.0	47	108.05
1041	20.3	6.57	1116	1	3.14	209.4	63	108.05
1048	20.3	6.57	1120	1	3.22	214.6	77	108.06
1056	20.3	6.58	1119	1	3.26	217.5	93	108.08

Did well dewater? Yes (No) Gallons actually evacuated: 93

Sampling Date: 7-25-13 Sampling Time: 1100 Depth to Water: 108.08

Sample I.D.: MW-10 Laboratory: BC

Analyzed for: See C.O.C. Other:

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

FB I.D. (if applicable): @ Time Analyzed for:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 130712-AW1	Site: JPL Pasadena
Sampler: AW	Gauging Date: 7-24-13
Well I.D.: MW-13	Well Diameter: 2 3 (4) 6 8
Total Well Depth (TD): 235	Depth to Water (DTW): 202.48
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	Flow Cell Type YSI-Pro Plus
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 208.98	

Purge Method: Waterra Sampling Method:

Disposable Bailer	2" Rediflo pump	Disposable Bailer
Positive Air Displacement	Extraction Pump	Extraction Port
Electric Submersible	Other: Dedicated RF2	Dedicated Tubing
		Other:

Flow Rate = 2 gpm
 Start Purge Date = 7-24-13 Pump @ 220'

21.2 (Gals.) X 3 = 63.6 Gals.
 I Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius ² * 0.163

Time	Temp (°C)	pH	Cond. (mS or μS)	Turbidity (NTUs)	D.O. (mg/L)	ORP (mV)	Gals. Removed	DTW
0826	22.9	6.86	638	12	5.00	169.2	12	202.59
0831	22.9	6.85	685	8	4.99	179.7	22	202.61
0837	22.9	6.85	648	18	4.87	180.2	34	202.63
0842	22.9	6.84	658	10	5.14	172.1	44	202.64
0848	22.9	6.83	658	9	5.16	169.7	56	202.66
0853	22.9	6.83	661	9	5.19	164.2	66	202.67

Did well dewater? Yes No Gallons actually evacuated: 66

Sampling Date: 7-24-13 Sampling Time: 0900 Depth to Water: 202.67

Sample I.D.: MW-13 Laboratory: BC

Analyzed for: See COC Other:

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

FB I.D. (if applicable): @ Time Analyzed for:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: <u>130712-AW1</u>	Site: <u>JPL, Pasadena</u>
Sampler: <u>AW</u>	Gauging Date: <u>7-24-13</u>
Well I.D.: <u>MW-15</u>	Well Diameter: 2 3 <u>(4)</u> 6 8
Total Well Depth (TD): <u>74</u>	Depth to Water (DTW): <u>33.09</u>
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>(PVC)</u> Grade	Flow Cell Type <u>YSI-Pro Plus</u>
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: <u>41.27</u>	

Purge Method: Waterra Sampling Method:

Disposable Bailer 2" Rediflo pump Disposable Bailer
 Positive Air Displacement Extraction Pump Extraction Port
 Electric Submersible Other _____ Dedicated Tubing
Other: _____

Flow Rate= 3 gpm

Start Purge Date= 7-24-13 Pump @ 54'

26.6 (Gals.) X _____ = 79.8 Gals.

I Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius ² * 0.163

Time	Temp (°C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	D.O. (mg/L)	ORP (mV)	Gals. Removed	DTW
0941	17.2	7.01	477	1	0.25	214.2	12	35.05
0946	17.2	7.03	480	1	0.14	187.9	27	35.07
0950	17.2	7.05	481	1	0.16	182.4	39	35.08
0955	17.2	7.06	480	1	0.28	177.2	54	35.09
0959	17.2	7.06	479	1	0.27	175.1	66	35.10
1004	17.2	7.08	480	1	0.26	172.3	81	35.10

Did well dewater? Yes (No) Gallons actually evacuated: 81

Sampling Date: 7-24-13 Sampling Time: 1010 Depth to Water:

Sample I.D.: MW-15 Laboratory: BC

Analyzed for: See COC Other:

EB I.D. (if applicable): @ _____ Time Duplicate I.D. (if applicable):

FB I.D. (if applicable): @ _____ Time Analyzed for:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: <u>130712-AW1</u>	Site: <u>JPL, Pasadena</u>
Sampler: <u>AW</u>	Gauging Date: <u>7-24-13</u>
Well I.D.: <u>MW-16</u>	Well Diameter: 2 3 <u>(4)</u> 6 8
Total Well Depth (TD): <u>285</u>	Depth to Water (DTW): <u>254.89</u>
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>PVC</u> Grade	Flow Cell Type <u>YSI-Pro Plus</u>
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: <u>260.91</u>	

Purge Method:	Watera	Sampling Method:
Disposable Bailer	2" Rediflo pump	Disposable Bailer
Positive Air Displacement	Extraction Pump	Extraction Port
Electric Submersible	<u>Other: Dedicated RF2</u>	Dedicated Tubing
Flow Rate= <u>19 gpm</u>		Other:

Start Purge Date= 7-24-13 Pump @ 265'

19.6 (Gals.) X 3 = 58.8 Gals.

I Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius ² * 0.163

Time	Temp (°C)	pH	Cond. (mS or μ S)	Turbidity (NTUs)	D.O. (mg/L)	ORP (mV)	Gals. Removed	DTW
1117	26.8	7.10	676	2	1.54	657.9	10	254.91
1127	26.8	7.08	675	2	1.51	727.1	20	254.97
1137	26.7	7.07	675	1	1.47	741.6	30	255.05
1147	26.7	7.06	675	1	1.44	745.4	40	255.08
1157	26.7	7.06	675	1	1.44	749.7	50	255.09
1207	26.4	7.06	675	1	1.40	749.9	60	255.10

Did well dewater? Yes No Gallons actually evacuated: 60

Sampling Date: 7-24-13 Sampling Time: 1215 Depth to Water: 255.10

Sample I.D.: MW-16 Laboratory: BC

Analyzed for: See COC Other:

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

FB I.D. (if applicable): @ Time Analyzed for:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WESTBAY™ GROUNDWATER MONITORING WELL
FIELD DATA LOG SHEET

WELL ID: MW-3
 SAMPLING DATE(S): 7-19-13
 LOCATION: JPL
 WATER LEVEL INSIDE CASING: 160.02'
 ATM. PRESSURE (PSI): (Start) 14.10 (Finish) 14.12
25.30°C 17.50°C

PROBE TYPE: Sampler 0-500 psi
 SERIAL NO.: FMS 2508
 PROJECT: JPL, Pasadena
 OPERATOR(S): tojaiff
 WEATHER: Clear

Port Number	Run Number	Probe to Top Collar		Surface Function Tests / Position Sampler (probe in top of collar) / (lower probe to port)				Sample Collection Checks (probe at sampling port in MP casing)						Field Parameters					Sample		
		Arm out / Land Probe		Shoe Out / Close Valve / Check Vacuum	Open Valve / Apply Vacuum (psi)	Close Valve / Shoe In / Arm In	Locate Port / Arm Out / Land Probe	Pressure in MP Casing (psi)	Shoe Out	Port Pressure (psi)	Open Valve	Port Pressure (psi)	Close Valve / Shoe In	Pressure in MP Casing (psi)	Sample Temp (°C)	SC (µS/cm)	pH	Turbidity (NTU)	Dissolved Oxygen (ppm)	ORP (mV)	Sample Time
4	1	✓		✓	✓	✓	✓	196.62	✓	196.62	✓	191.52	23.6	478	8.06	157	8.64	164	1000	MW-3-4	
3	1	✓		✓	✓	✓	✓	99.06	✓	104.84	✓	104.86	99.07	24.0	440	7.97	6	7.11	157	1040	MW-3-3
2	1	✓		✓	✓	✓	✓	58.06	✓	64.02	✓	64.04	58.08	23.2	406	7.97	5	6.36	210	1110	MW-3-2
	2	✓		✓	✓	✓	✓	58.08	✓	64.06	✓	64.07	58.12								

Comments: DUPE-5-3013 @ Port 2 Level IV @ Port 4
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WESTBAY™ GROUNDWATER MONITORING WELL
FIELD DATA LOG SHEET

WELL ID: MW-14
 SAMPLING DATE(S): 7-16-13
 LOCATION: JPL
 WATER LEVEL INSIDE CASING: 150.34'
 ATM. PRESSURE (PSI): (Start) 14.06 (Finish) 14.07
20.48°C 19.72°C

PROBE TYPE: Sampler 0-500 psi
 SERIAL NO.: E.M.S 2508
 PROJECT: JPL Pasadena
 OPERATOR(S): AWAF
 WEATHER: Clear

Port Number	Run Number	Probe to Top Collar	Surface Function Tests / Position Sampler (probe in top of collar) / (lower probe to port)				Sample Collection Checks (probe at sampling port in MP casing)						Field Parameters					Sample			
		Arm out / Land Probe	Shoe Out / Close Valve / Check Vacuum	Open Valve / Apply Vacuum (5 psi)	Close Valve / Shoe In / Arm In	Locate Port / Arm Out / Land Probe	Pressure in MP Casing (psi)	Shoe Out	Port Pressure (psi)	Open Valve	Port Pressure (psi)	Close Valve / Shoe In	Pressure in MP Casing (psi)	Sample Temp (°C)	SC (µS/cm)	pH	Turbidity (NTU)	Dissolved Oxygen (ppm)	ORP (mV)	Sample Time	Sample ID
5	1	✓	✓	✓	✓	✓	187.10	✓	168.82	✓	168.82	✓	187.08	18.0	333	8.44	14	7.10	44	0720	MW-14-5
4	1	✓	✓	✓	✓	✓	150.46	✓	132.54	✓	132.54	✓	150.47	18.1	730	7.92	3	7.75	152	0755	MW-14-4
3	1	✓	✓	✓	✓	✓	119.21	✓	100.49	✓	100.49	✓	119.24	19.1	1135	8.01	2	6.60	188	0830	MW-14-3
2	1	✓	✓	✓	✓	✓	73.48	✓	55.06	✓	55.06	✓	73.49	19.5	1197	7.89	3	5.48	167	0900	MW-14-2
	2	✓	✓	✓	✓	✓	73.49	✓	55.06	✓	55.04	✓	73.49								
1	1	✓	✓	✓	✓	✓	42.96	✓	25.28	✓	25.19	✓	42.98	20.5	1189	7.58	6	6.51	199	0940	MW-14-1

Comments: TB-2-7/16/13 0630 EB-2-7/16/13 0650 DUPE-2-3013 @ Port 2 0905

WESTBAY™ GROUNDWATER MONITORING WELL
FIELD DATA LOG SHEET

WELL ID: MW-19
 SAMPLING DATE(S): 7-15-13
 LOCATION: JPL
 WATER LEVEL INSIDE CASING: 135.26'
 ATM. PRESSURE (PSI): (Start) 14.02 (Finish) 14.06
29.38°C 22.72°C

PROBE TYPE: Sampler 0-500 psi
 SERIAL NO.: EMS 2508
 PROJECT: JPL, Pasadena
 OPERATOR(S): A. Wolff
 WEATHER: Clear

Port Number	Run Number	Probe to Top Collar	Surface Function Tests / Position Sampler (probe in top of collar) / (lower probe to port)					Sample Collection Checks (probe at sampling port in MP casing)						Field Parameters					Sample		
		Arm out / Land Probe	Shoe Out / Close Valve / Check Vacuum	Open Valve / Apply Vacuum (5 psi)	Close Valve / Shoe In / Arm In	Locate Port / Arm Out / Land Probe	Pressure in MP Casing (psi)	Shoe Out	Port Pressure (psi)	Open Valve	Port Pressure (psi)	Close Valve / Shoe In	Pressure in MP Casing (psi)	Sample Temp (°C)	SC (µS/cm)	pH	Turbidity (NTU)	Dissolved Oxygen (ppm)	ORP (mV)	Sample Time	Sample ID
5	1	✓	✓	✓	✓	✓	172.44	✓	148.66	✓	148.69	✓	172.44	26.9	630	8.05	1	5.79	130	1205	MW-19-5
	2	✓	✓	✓	✓	✓	172.46	✓	148.70	✓	148.68	✓	172.48								
4	1	✓	✓	✓	✓	✓	149.02	✓	125.33	✓	125.34	✓	149.02	24.5	586	8.09	1	5.21	132	1300	MW-19-4
3	1	✓	✓	✓	✓	✓	126.41	✓	106.61	✓	106.58	✓	126.42	24.6	653	7.88	1	5.62	140	1330	MW-19-3
2	1	✓	✓	✓	✓	✓	92.61	✓	72.56	✓	72.60	✓	92.62	26.1	1045	7.67	14	5.42	179	1400	MW-19-2
1	1	✓	✓	✓	✓	✓	61.33	✓	42.34	✓	42.34	✓	61.34	26.4	479	7.75	28	3.21	0	1430	MW-19-1

Comments: DUP-1-3013 @ Port 5
1210

WESTBAY™ GROUNDWATER MONITORING WELL
FIELD DATA LOG SHEET

WELL ID: MW-21
 SAMPLING DATE(S): 7-23-13
 LOCATION: JPL
 WATER LEVEL INSIDE CASING: 117.84'
 ATM. PRESSURE (PSI): (Start) 14.15 (Finish) 14.18
24.72°C 24.48°C

PROBE TYPE: Sampler 0-500 psi
 SERIAL NO.: EMS2508
 PROJECT: JPL, Pasadena
 OPERATOR(S): Wolf
 WEATHER: Clear

Port Number	Run Number	Probe to Top Collar	Surface Function Tests / Position Sampler (probe in top of collar) / (lower probe to port)				Sample Collection Checks (probe at sampling port in MP casing)						Field Parameters					Sample			
		Arm out / Land Probe	Shoe Out / Close Valve / Check Vacuum	Open Valve / Apply Vacuum (5 psi)	Close Valve / Shoe In / Arm In	Locate Port / Arm Out / Land Probe	Pressure in MP Casing (psi)	Shoe Out	Port Pressure (psi)	Open Valve	Port Pressure (psi)	Close Valve / Shoe In	Pressure in MP Casing (psi)	Sample Temp (°C)	SC (µS/cm)	pH	Turbidity (NTU)	Dissolved Oxygen (ppm)	ORP (mV)	Sample Time	Sample ID
5	1	✓	✓	✓	✓	✓	129.18	✓	142.80	✓	142.81	✓	129.18	23.3	840	8.05	1	8.11	191	1045	MW-21-5
4	1	✓	✓	✓	✓	✓	102.11	✓	115.93	✓	115.94	✓	102.14	23.2	781	7.90	3	6.79	160	1120	MW-21-4
	2	✓	✓	✓	✓	✓	102.18	✓	115.94	✓	115.96	✓	102.17								
3	1	✓	✓	✓	✓	✓	72.16	✓	86.09	✓	86.11	✓	72.17	23.6	1204	7.83	5	6.36	162	1200	MW-21-3
	2	✓	✓	✓	✓	✓	71.14	✓	86.09	✓	86.12	✓	71.14								
2	1	✓	✓	✓	✓	✓	37.64	✓	51.97	✓	52.00	✓	37.69	24.0	1344	7.90	2	5.56	160	1240	MW-21-2
1	1	✓	✓	✓	✓	✓	14.18	✓	20.88	✓	20.87	✓	14.18	26.1	1190	7.64	2	5.12	184	1330	MW-21-1

Comments: DUPE-7-30-13 @ Port 4 Level IV @ Port 4 MS/MSD @ Port 3
1125

WESTBAY™ GROUNDWATER MONITORING WELL
FIELD DATA LOG SHEET

WELL ID: MW-25
 SAMPLING DATE(S): 7-18-13
 LOCATION: JPL
 WATER LEVEL INSIDE CASING: 258.71
 ATM. PRESSURE (PSI): (Start) 14.20 (Finish) 14.21
25.56°C 20.03°C

PROBE TYPE: Sampler 0-500 psi
 SERIAL NO.: EMS2508
 PROJECT: JPL, Pasadena
 OPERATOR(S): AWJFF
 WEATHER: Clear

Port Number	Run Number	Probe to Top Collar	Surface Function Tests / Position Sampler (probe in top of collar) / (lower probe to port)				Sample Collection Checks (probe at sampling port in MP casing)						Field Parameters					Sample			
		Arm out / Land Probe	Shoe Out / Close Valve / Check Vacuum	Open Valve / Apply Vacuum (5 psi)	Close Valve / Shoe In / Arm In	Locate Port / Arm Out / Land Probe	Pressure in MP Casing (psi)	Shoe Out	Port Pressure (psi)	Open Valve	Port Pressure (psi)	Close Valve / Shoe In	Pressure in MP Casing (psi)	Sample Temp (°C)	SC (µS/cm)	pH	Turbidity (NTU)	Dissolved Oxygen (ppm)	ORP (mV)	Sample Time	Sample ID
5	1	✓	✓	✓	✓	✓	215.39	✓	213.34	✓	213.36	✓	215.42	23.4	426	8.66	3	7.10	-92	1030	MW-25-5
4	1	✓	✓	✓	✓	✓	180.86	✓	177.63	✓	177.63	✓	180.83	23.8	776	7.74	4	5.61	153	1110	MW-25-4
	2	✓	✓	✓	✓	✓	180.01	✓	177.64	✓	177.64	✓	180.00								
3	1	✓	✓	✓	✓	✓	124.62	✓	124.29	✓	124.29	✓	124.63	24.8	670	8.02	1	6.24	151	1215	MW-25-3
	2	✓	✓	✓	✓	✓	124.60	✓	124.28	✓	124.28	✓	124.61								
2	1	✓	✓	✓	✓	✓	89.81	✓	92.31	✓	92.32	✓	89.82	26.9	689	8.00	1	4.93	168	1315	MW-25-2
1	1	✓	✓	✓	✓	✓	61.48	✓	65.10	✓	65.12	✓	61.48	25.3	843	7.79	13	4.40	192	1350	MW-25-1

Comments: MS/MSD @ Port 4 DUPE-4-3Q13 @ Port 3
1220

ATTACHMENT 5: WATER LEVEL MEASUREMENTS

This attachment contains water level measurements for the JPL relatively shallow standpipe monitoring wells (MW-1, MW-5 through MW-10, MW-13, MW-15, and MW-16) and the Westbay™ multiport wells (MW-3, MW-4, MW-11, MW-12, MW-14, and MW-17 through MW-26) obtained during the 3rd Quarter 2013. Water level measurements were recorded before the sampling event on July 12, 2013 for the relatively shallow standpipe monitoring wells and for the Westbay™ multiport wells. Water level measurements were recorded after the sampling event on July 26, 2013 for the relatively shallow standpipe monitoring wells and the Westbay™ multiport wells. Water levels for the shallow wells were measured using a Solinst™ water level meter. In the deep multiport wells, the hydraulic head at each sampling port was measured with a Westbay™ MOSDAX sampling probe. Water level measurements were conducted by Blaine Tech Services, Inc.

Note: no samples were collected from MW-1 or MW-9 during the third quarter 2013 sampling event; however water levels were obtained.

WELL GAUGING DATA

Project # 130712-AW1 Date 7-12-13 Client Battelle

Site JPL Pasadena

Well ID	Time	Well Size (in.)	Sheen / Odor	Depth to Immiscible Liquid (ft.)	Thickness of Immiscible Liquid (ft.)	Volume of Immiscibles Removed (ml)	Depth to water (ft.)	Depth to well bottom (ft.)	Survey Point: TOB or TOC	Notes
MW-1	1141	4					18.81	QED		
MW-5	0745	4					92.41			
MW-6	1032	4					197.77			
MW-7	0624	4					230.03			
MW-8	0650	4					157.17			
MW-9	1130	4					19.92			
MW-10	0736	4					106.96			
MW-13	0613	4					201.26			
MW-15	0813	4					33.36			
MW-16	1348	4					253.80	↓	↓	

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-3
 DATE: 7-12-13
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING: 1100.34
 WEATHER: Sun w/ Clouds

PROBE TYPE: Westbay
 SERIAL NO.: EMS 2508
 PROJECT: JPL Pasadena
 OPERATOR(S): A Wolff
 ATM. PRESSURE (Patm): (start) 14.14 (finish) 14.08
 Temp (°C) 25.10 19.77

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ₂ O Inside Casing	Trans. Temp. (°C)				
5	653	650	228.96	237.87	228.96	23.49	516.15	136.05	653	1156
4	558	556	187.71	196.82	187.71	23.44	421.44	136.56	558	1157
3	346	344	95.48	105.11	95.48	22.86	209.87	136.13	346	1158
2	252	250	54.62	64.34	54.62	22.11	115.81	136.19	252	1159
1	172	171	19.87	32.69	19.87	20.84	42.79	129.21	172	1200

Comments: Collar detect @ 2' above port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-4
 DATE: 7/12/13
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING 1082.84
 WEATHER: Overcast

PROBE TYPE Westbay
 SERIAL NO. EMS 2508
 PROJECT JPL, Pasadena
 OPERATOR(S) A Wolf
 ATM. PRESSURE (Patm): (start) 14.13 (finish) 14.10
 Temp (°C) 22.52 20.28

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi)	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ² O Inside Casing	Trans. Temp. (°C)				
5	513	511	150.02	187.99	150.02	21.91	401.10	111.91	513	0901
4	392	391	97.37	135.60	97.37	22.15	280.23	111.71	392	0902
3	322	321	66.82	105.24	66.82	21.91	210.19	111.81	322	0903
2	240	239	31.22	69.80	31.22	21.57	128.43	111.57	240	0904
1	150	149	14.15	34.02	14.15	22 20.99	45.89	104.11	150	0905

Comments: Collar detect @ 2' above

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-11
 DATE: 7-12-13
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING: 1139.36
 WEATHER: Partly Cloudy

PROBE TYPE: Westbay
 SERIAL NO.: EMS 2508
 PROJECT: JPL Pasadena
 OPERATOR(S): A Wolf
 ATM. PRESSURE (Patm): (start) 14.09 (finish) 14.10
 Temp (oC) 20.51 18.38

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi)	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ₂ O Inside Casing	Trans. Temp. (oC)				
5	639	637	222.23	210.33	222.23	20.39	452.73	186.27	639	0759
4	524	522	172.72	172.91	172.72	20.82	366.40	157.60	524	0800
3	429	427	131.88	129.60	131.88	20.63	266.48	162.52	429	0801
2	259	257	58.27	58.44	58.27	19.71	102.32	156.68	259	0802
1	144	148	14.16	27.52	14.16	18.89	30.98	118.02	144	0803

Comments: Collar detect @ 6" above port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-12
 DATE: 7/12/13
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING: 1102.14
 WEATHER: Cloudy, Overcast

PROBE TYPE: Westbay
 SERIAL NO.: EMS 2508
 PROJECT: JPL, Pasadena
 OPERATOR(S): A Wolff
 ATM. PRESSURE (Patm): (start) 14.13 (finish) 14.06
 Temp (°C) 21.52 17.37

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ₂ O Inside Casing	Trans. Temp. (°C)				
5	548	546	206.98	187.91	206.98	21.02	400.91	147.09	548	0933
4	436	434	158.21	145.31	158.21	21.19	302.63	133.37	436	0934
3	323	321	109.16	96.83	109.16	20.75	190.79	132.21	323	0935
2	243	241	74.30	62.87	74.30	19.83	112.44	130.56	243	0936
1	140	138	29.43	23.07	29.43	18.14	20.62	119.38	140	0937

Comments: Collar detail @ 6" above port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-14
 DATE: 7/12/13
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING: 1173.47
 WEATHER: Sunny w/ Clouds

PROBE TYPE: Westbay
 SERIAL NO.: EAS 2508
 PROJECT: JPL, Pasadena
 OPERATOR(S): A. W. I. P.
 ATM. PRESSURE (Patm): (start) 14.08 (finish) 14.03
 Temp (°C) 22.74 19.93

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi)	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ₂ O Inside Casing	Trans. Temp. (°C)				
5	540	538	184.34	169.10	184.34	21.84	357.63	182.37	540	1020
4	456	454	147.69	132.92	147.69	21.75	274.16	181.84	456	1021
3	382	380	115.54	100.86	115.54	21.30	200.20	181.80	382	1022
2	277	2525 275	69.92	55.39	69.92	20.78	95.30	181.70	277	1023
1	207	205	39.39	25.48	39.38	20.31	26.30	180.70	207	1024

Comments: Collar detect @ 6" above

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-18
 DATE: 7-12-13
 LOCATION: JPL
 ELEV. TOP OF WASTBAY CASING 1225.41
 WEATHER: Overcast

PROBE TYPE Westbay
 SERIAL NO. Ems 2508
 PROJECT JPL, Pasadena
 OPERATOR(S) A Wolff
 ATM. PRESSURE (Patm): (start) 14.07 (finish) 14.06
 Temp (oC) 22.44 18.07

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi)	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ₂ O Inside Casing	Trans. Temp. (oC)				
5	684	682	184.98	190.24	184.98	21.60	406.42	277.58	684	1220
4	564	563	132.84	138.94	132.84	21.46	288.28	275.92	564	1221
3	424	423	71.96	81.97	71.96	20.60	156.65	267.35	424	1222
2	330	329	31.12	42.68	31.12	19.51	66.00	264.00	330	1223
1	270	269	14.15	16.87	14.15	18.67	6.46	263.54	270	1224

Comments: Collar defect @ 6" above port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: WA MW-19
 DATE: 7-12-13
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING: 1147.94
 WEATHER: Sun LI Clouds

PROBE TYPE: Westbay
 SERIAL NO.: EM5 2508
 PROJECT: JPL, Pasadena
 OPERATOR(S): A. Wolf
 ATM. PRESSURE (Patm): (start) 14.14 (finish) 14.08
 Temp (°C) 23.35 18.08

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi)	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ₂ O Inside Casing	Trans. Temp. (°C)				
5	498	495	171.40	147.97	171.40	21.48	311.05	186.95	498	1114
4	444	441	147.91	125.63	147.91	21.04	257.21	186.79	444	1115
3	392	389	125.46	106.83	125.46	20.70	213.84	178.16	392	1116
2	314	311	91.61	72.82	91.61	20.37	135.37	178.63	314	1117
1	242	239	60.32	42.55	60.32	19.12	65.54	176.46	242	1118

Comments: Collar defect @ 6" above

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-21
 DATE: 7-12-13
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING: 1059.10
 WEATHER: Sun w/ Clouds

PROBE TYPE: Westbay
 SERIAL NO.: FMS 2808
 PROJECT: JPL, Pasadena
 OPERATOR(S): A. W. G. / A
 ATM. PRESSURE (Patm): (start) 14.12 (finish) 14.10
 Temp (°C) 26.12 28.56

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi)	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ₂ O Inside Casing	Trans. Temp. (°C)				
5	372	371	125.44	143.29	125.44	24.11	298.00	74.00	372	1052
4	310	309	98.48	116.44	98.48	23.08	236.05	73.95	310	1053
3	240	240	68.41	86.56	68.41	22.34	147.12	72.88	240	1054
2	161	161	34.07	52.42	34.07	21.63	88.36	72.64	161	1055
1	90	89	14.14	21.20	14.14	20.91	16.33	73.67	90	1056

Comments: Collar defect @ 2' above

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-23
 DATE: 7/12/13
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING 1108.24
 WEATHER: Partly Cloudy

PROBE TYPE Westbay
 SERIAL NO. EMS 2502
 PROJECT JPL, Pasadena
 OPERATOR(S) A Wolff
 ATM. PRESSURE (Patm): (start) 14.05 (finish) 14.09
 Temp (°C) 19.65 20.06

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi)	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ₂ O Inside Casing	Trans. Temp. (°C)				
5	542	540	203.01	190.37	203.01	20.44	406.77	135.23	542	0715
4	445	443	160.96	148.41	160.96	20.99	309.97	135.03	445	0716
3	319	317	106.43	96.51	106.43	20.94	190.24	128.76	319	0717
2	254	252	78.22	68.43	78.22	20.75	125.45	108.55	254	0718
1	172 ₁₇₄	172	43.51	34.77	43.51	20.26	47.80	126.20	174	0719

Comments: Collar detect @ 1' above sample port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-24
 DATE: 7/12/13
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING: 1200.94
 WEATHER: Partly Cloudy

PROBE TYPE: Westbay
 SERIAL NO.: EMS 2508
 PROJECT: JPL, Pasadena
 OPERATOR(S): A. W. J. P.
 ATM. PRESSURE (Patm): (start) 14.07 (finish) 14.07
 Temp (°C) 20.24 21.86

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ₂ O Inside Casing	Trans. Temp. (°C)				
5	678	675	221.47	205.55	221.47	21.41	441.74	234.26	678	0830
4	554	553	168.78	154.63	168.78	21.53	324.27	229.73	554	0831
3	435	433	116.27	105.64	116.27	21.59	211.25	223.15	435	0832
2	373	371	89.42	78.94	89.42	21.63	149.66	223.34	373	0833
1	279	277	48.68	40.11	48.68	21.60	60.07	218.93	279	0834

Comments: Collar detect @ 6" above port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-24
 DATE: 7-12-13
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING: 1059.08
 WEATHER: Sunny

PROBE TYPE: Westbay
 SERIAL NO.: EMS 2508
 PROJECT: JPL Pasadena
 OPERATOR(S): A Wolpp
 ATM. PRESSURE (Patm): (start) 14.16 (finish) 14.11
23.28 20.74

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) $P(ft) = (P2 - Patm) * 2.307$ ft/psi	Depth to Water Outside Port (ft) DTW = Dp - P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing <i>P2</i>	mH ₂ O Inside Casing	Trans. Temp. (oC)				
2	215	213	76.73	65.210	76.73	22.19	117.52	97.48	215	1306
1	135	133	41.92	30.25	41.92	21.45	37.12	97.88	135	1307

Comments: 2' below for collar depth

WELL GAUGING DATA

Project # 130712-XW1 Date 7-26-13 Client Battelle

Site JPL, Pasadena

Well ID	Time	Well Size (in.)	Sheen / Odor	Depth to Immiscible Liquid (ft.)	Thickness of Immiscible Liquid (ft.)	Volume of Immiscibles Removed (ml)	Depth to water (ft.)	Depth to well bottom (ft.)	Survey Point: TOB or TOC	Notes
MW-1	0940	4					29.90	Pump		
MW-5	0648	4					93.21			
MW-6	0843	4					198.76			
MW-7	1204	4					231.82			
MW-8	0800	4					158.36			
MW-9	0936	4					20.80			
MW-10	0641	4					107.78			
MW- 14 ¹³	0734	4					202.34			
MW-15	0746	4					34.41			
MW-16	1208	4					254.96	↓	↓	

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-17
 DATE: 7-26-13
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING: 1191.21
 WEATHER: Sun / Clouds

PROBE TYPE: Sampler 0-500 psi
 SERIAL NO.: ENS 2508
 PROJECT: JPL Pasadena
 OPERATOR(S): A Wolf
 ATM. PRESSURE (Patm): (start) 14.17 (finish) 14.16
 Temp (°C) 20.21 17.05

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ₂ O Inside Casing	Trans. Temp. (°C)				
5	726	725	240.42	229.22	240.42	19.71	494.12	229.98		1013
4	582	582	178.03	166.66	178.03	19.84	351.79	230.21		1014
3	468	468	128.63	114.83	128.63	19.28	232.22	235.76		615
2	370	370	86.10	75.64	86.10	18.62	141.81	228.19		1016
1	250	251	34.01	24.14	34.01	17.60	23.00	227.00		1017

Comments: Caller detect @ 6" above port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-19
 DATE: 7-26-13
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING: 1142.94
 WEATHER: Sun w/ clouds

PROBE TYPE: Sampler 0-500 psi
 SERIAL NO.: EMS 2528
 PROJECT: JPL Pasadena
 OPERATOR(S): A Wolff
 ATM. PRESSURE (Patm): (start) 14.16 (finish) 14.17
20.78 18.14

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ² O Inside Casing	Trans. Temp. (oC)				
5	498	498	171.48	152.78	171.48	19.98	319.80	178.20	498	0925
4	444	442	148.01	129.42	148.01	19.84	265.90	178.10	444	0926
3	392	390	125.78	108.16	125.78	19.71	214.86	175.14	392	0927
2	314	313	91.60	73.94	91.60	19.58	137.91	176.09	314	0927
1	242	241	60.40	42.81	60.40	19.23	66.10	175.90	242	0928

Comments: Collar defect @ 6" above sample port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

WELL ID: MW-20
 DATE: 7-26-13
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING 1165.05
 WEATHER: Sun w/ Clouds

PROBE TYPE Sampler 0-800 psi
 SERIAL NO. EMS 2508
 PROJECT JPL Pasadena
 OPERATOR(S) A Walpp
 ATM. PRESSURE (Patm): (start) 14.17 (finish) 14.17
 Temp (°C) 19.821 17.88

Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi)	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ₂ O Inside Casing	Trans. Temp. (°C)				
5	900	896	321.31	314.81	321.31	21.10	693.58	206.42	900	1050
4	700	696	234.54	221.99	234.54	21.96	479.44	220.56	700	1052
3	562	558	174.83	158.79	174.83	21.50	333.64	228.36	562	1053
2	392	388	101.08	90.71	101.08	20.36	174.58	215.42	392	1054
1	230	226	30.72	20.30	30.72	18.95	14.14	215.86	230	1055

Comments: Collar detect @ 6" above sample port

**WESTBAY™ GROUNDWATER MONITORING WELL
WATER LEVEL MEASUREMENT LOG SHEET**

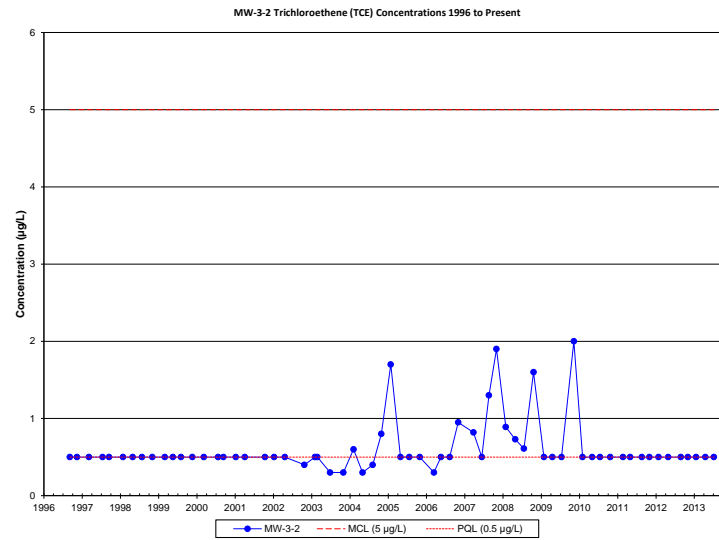
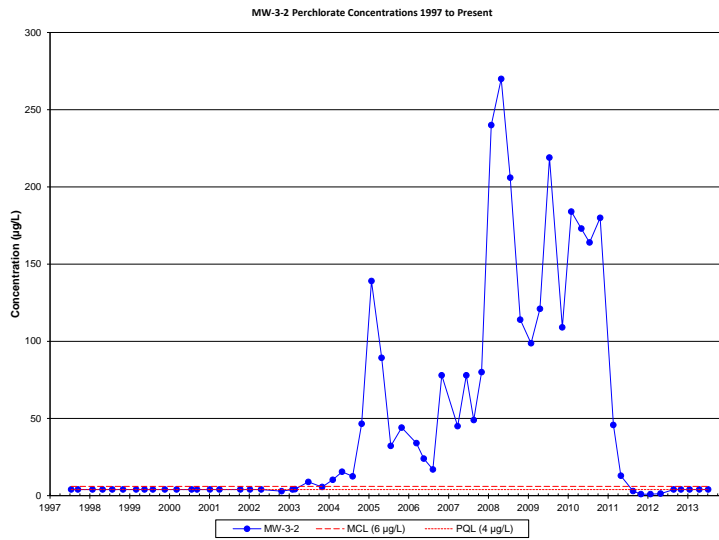
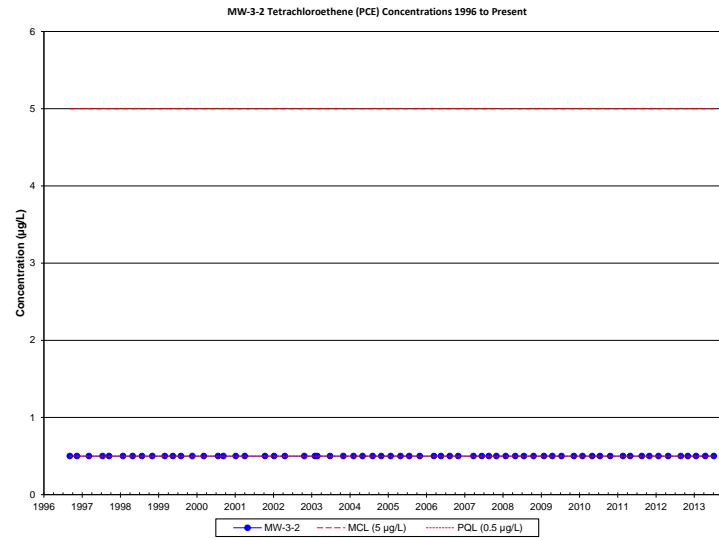
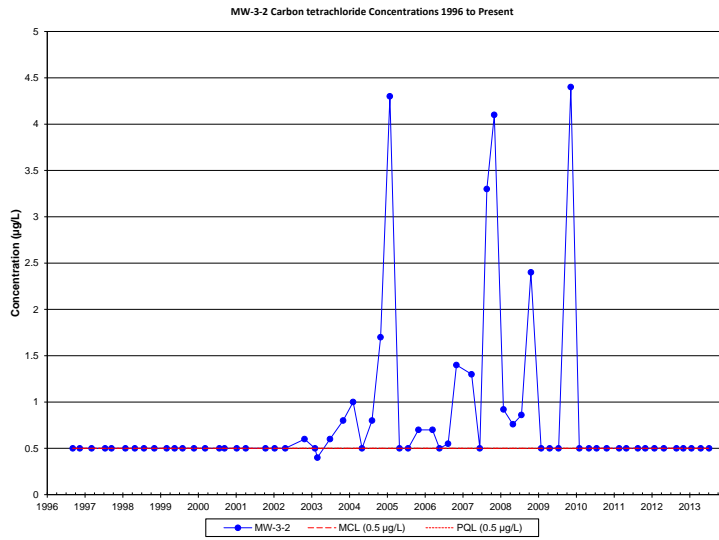
WELL ID: MW-22
 DATE: 7/26/13
 LOCATION: JPL
 ELEV. TOP OF WESTBAY CASING: 1176.98
 WEATHER: Cloudy

PROBE TYPE: Westbay ^{MK} Sampler 0-500 psi
 SERIAL NO. FMS 2508
 PROJECT: JPL Pasadena
 OPERATOR(S): A Wolff
 ATM. PRESSURE (Patm): (start) 14.13 (finish) 14.13
 Temp (°C) 23.34 20.85

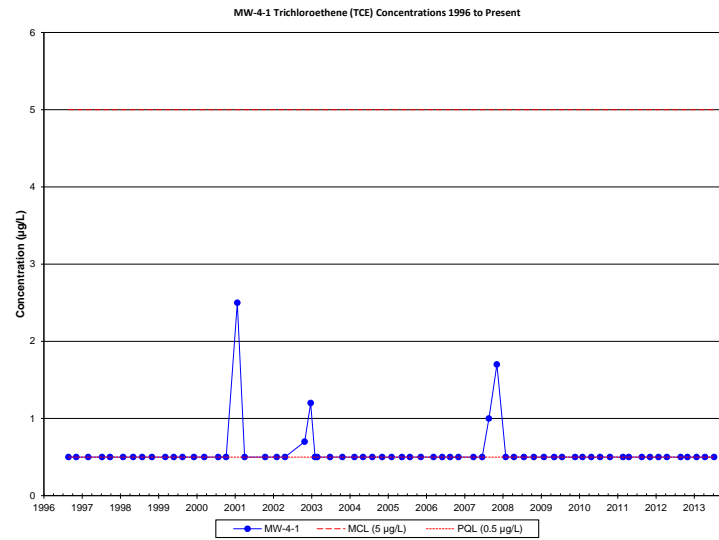
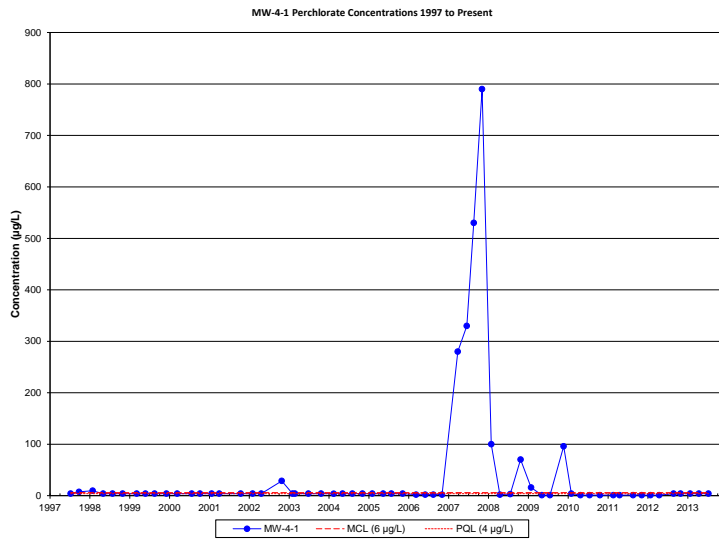
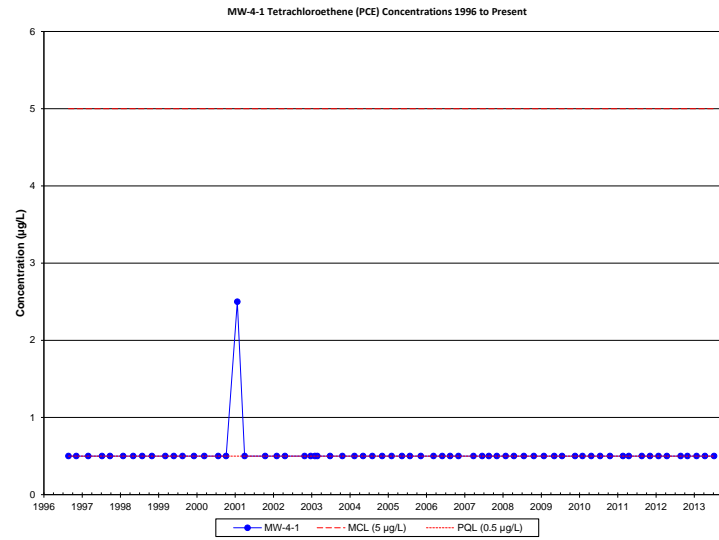
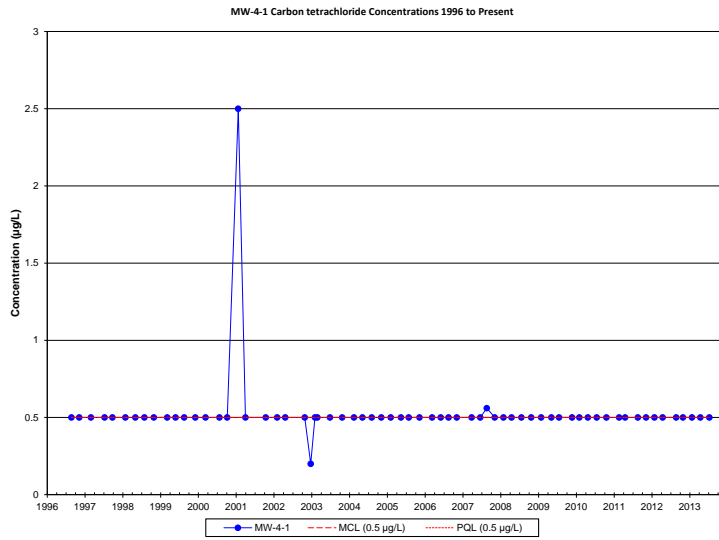
Port No.	Depth to Meas. Port Valve (ft)		Pressure Readings (psi)				Pressure Head Outside Port (ft) P(ft)=(P2-Patm)*2.307 ft/psi)	Depth to Water Outside Port (ft) DTW = Dp-P(ft)	True Port Depth (Dp) (ft)	Time
	From Log (Dp)	From Cable	psi Inside Casing	kg/cm ² Outside Casing P2	mH ₂ O Inside Casing	Trans. Temp. (°C)				
5	588	587	200.30	183.10	200.30	22.49	389.81	198.19	588	0606
4	467	467	147.98	131.97	147.98	22.43	271.86	195.14	467	0608
3	389	389	114.21	99.76	114.21	22.21	197.55	191.45	389	0608
2	329	329	88.14	73.64	88.14	21.94	137.29	191.71	329	0609
1	245	245	51.22	36.42	51.22	21.41 21.41	51.42	193.58	245	0610

Comments: Collar detect @ 1' above sample port

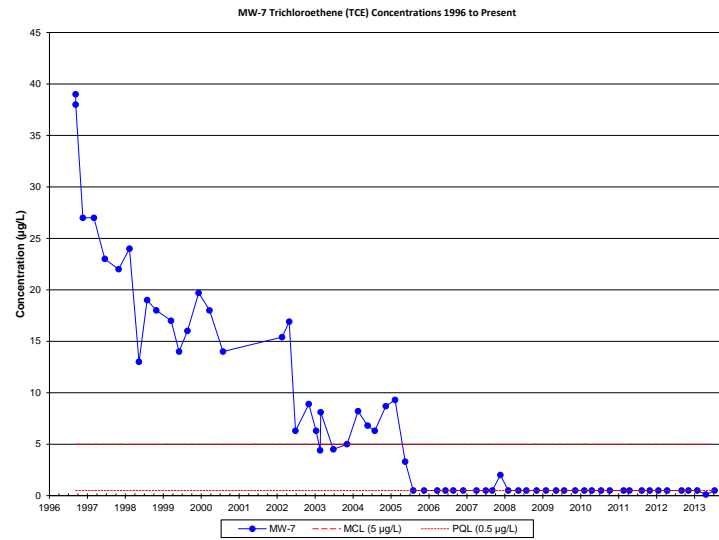
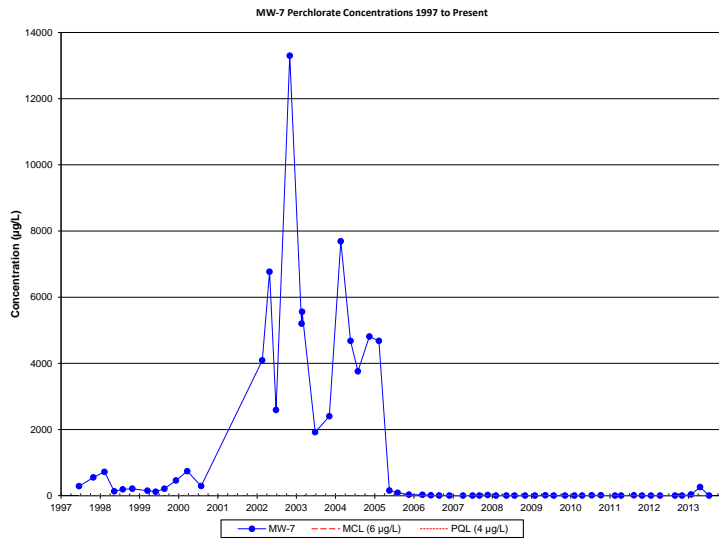
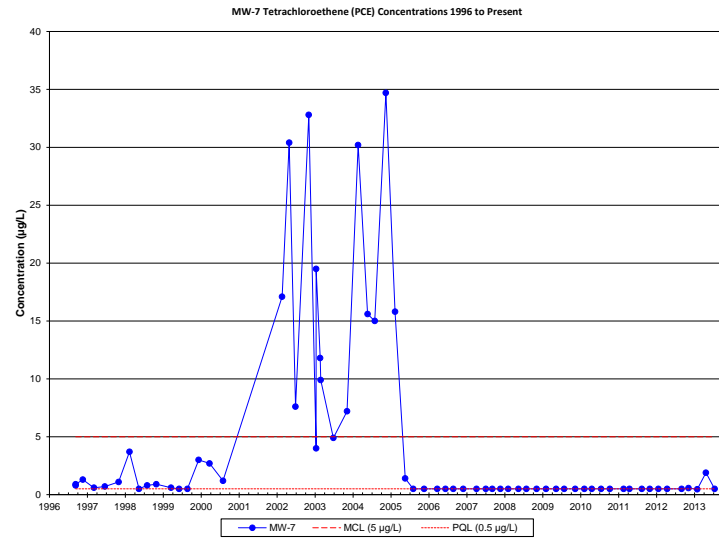
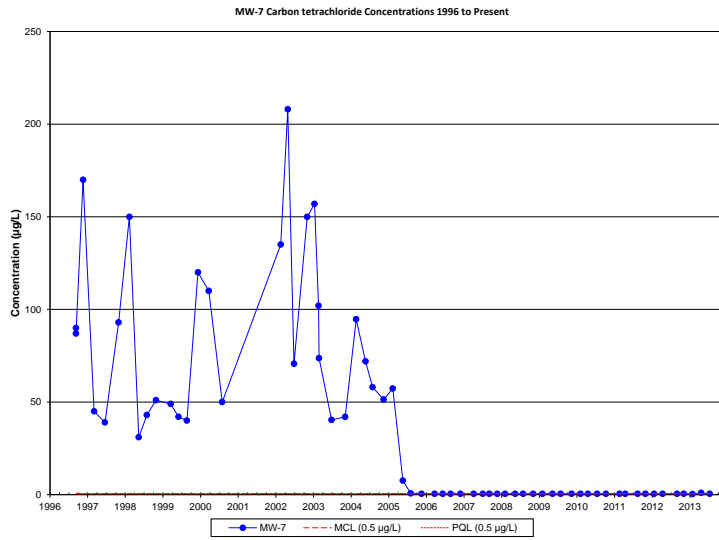
ATTACHMENT 6: TIME SERIES PLOTS



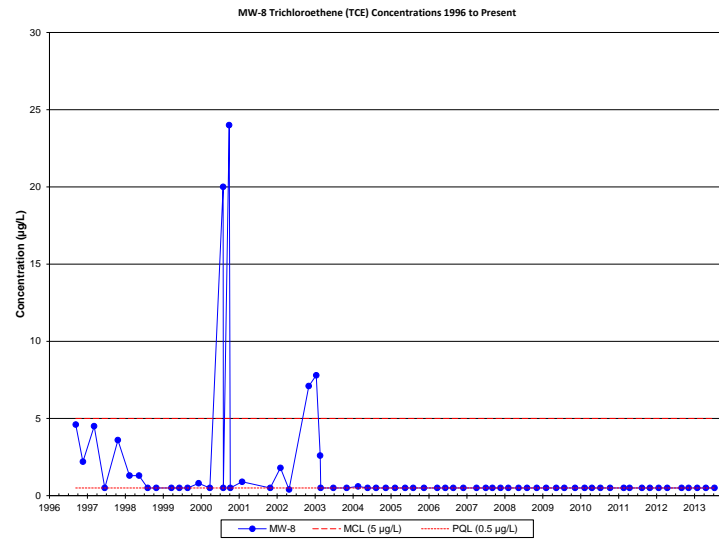
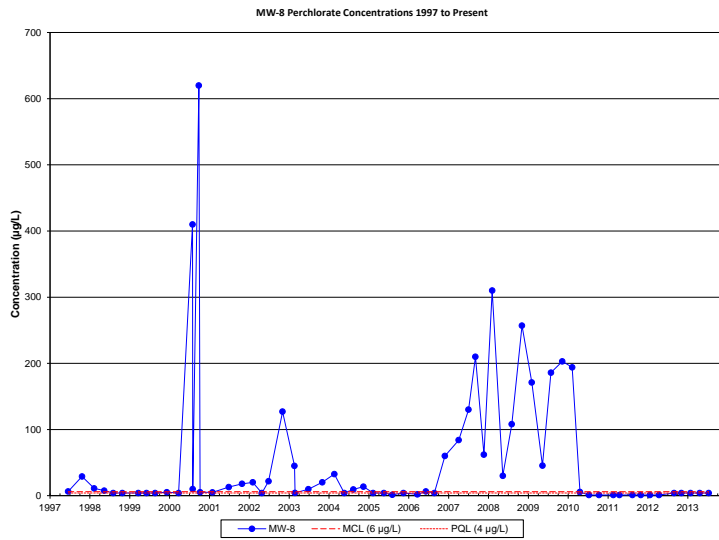
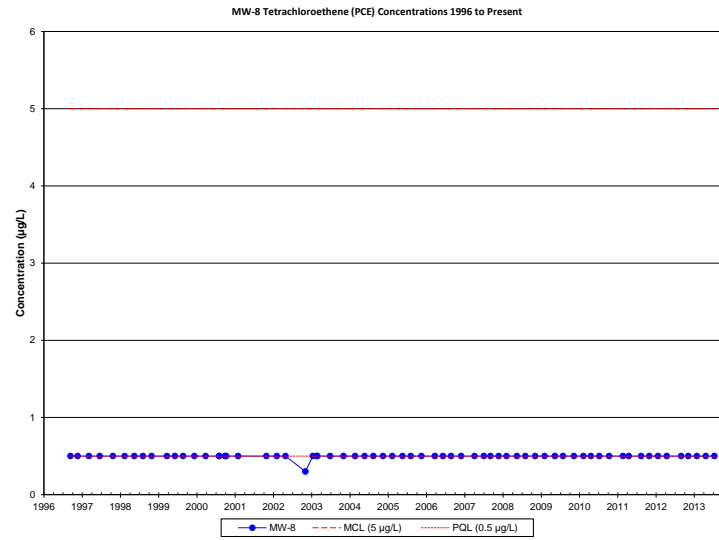
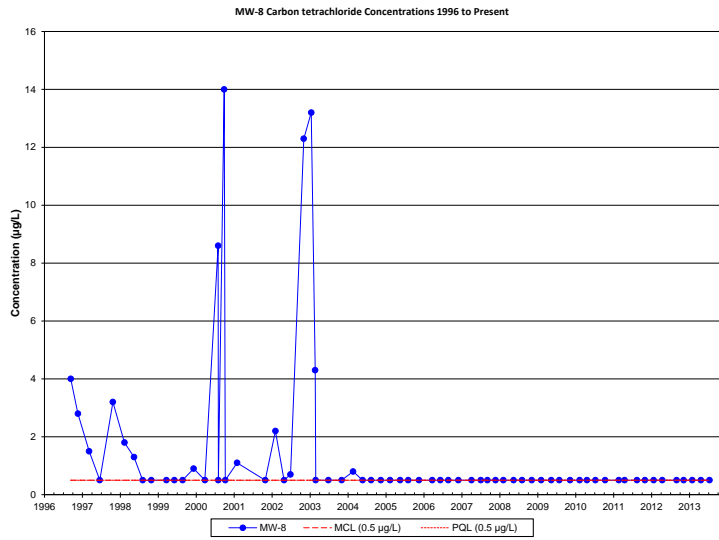
VOCs and Perchlorate Time Series Plots for MW-3-2



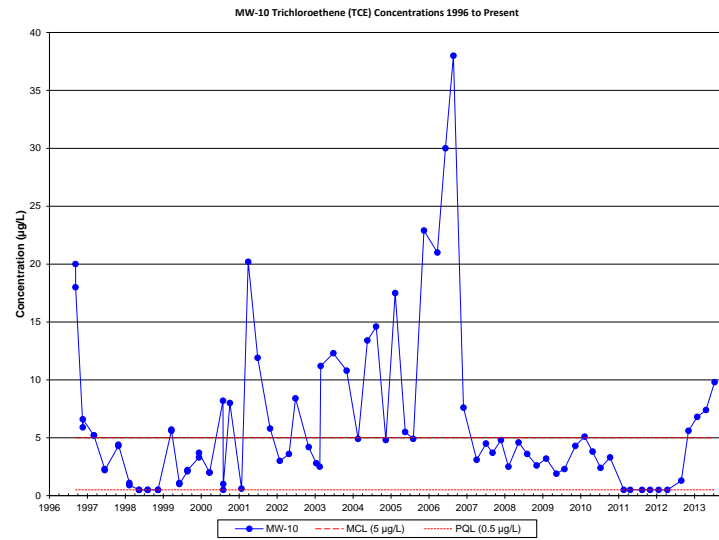
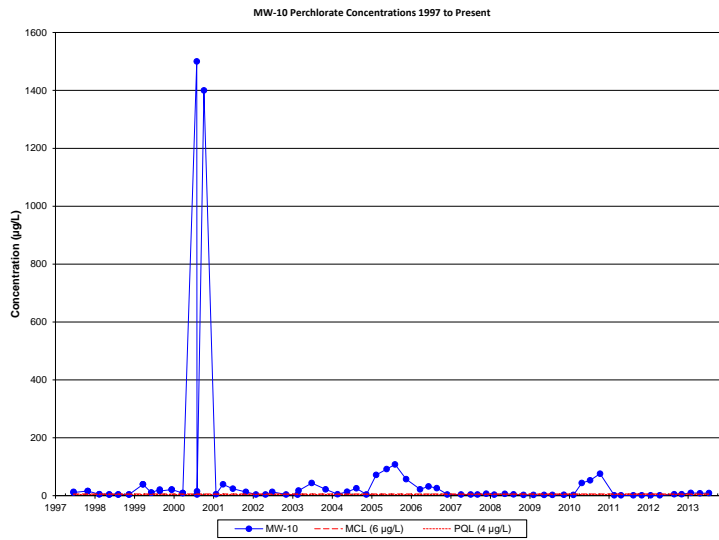
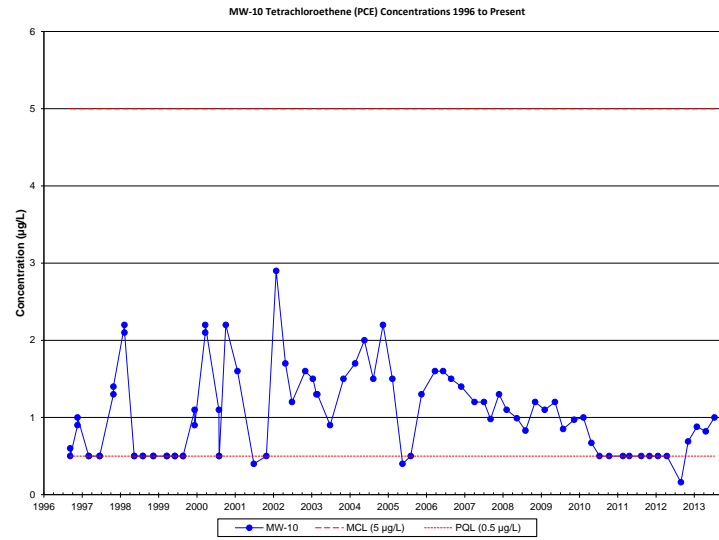
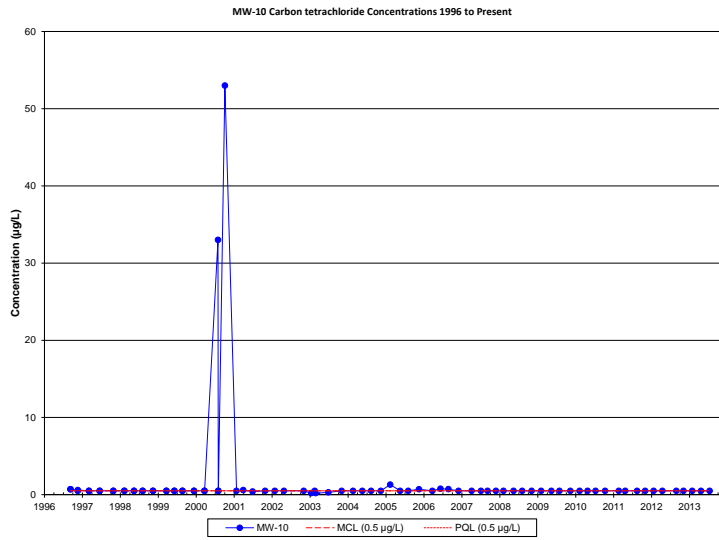
VOCs and Perchlorate Time Series Plots for MW-4-1



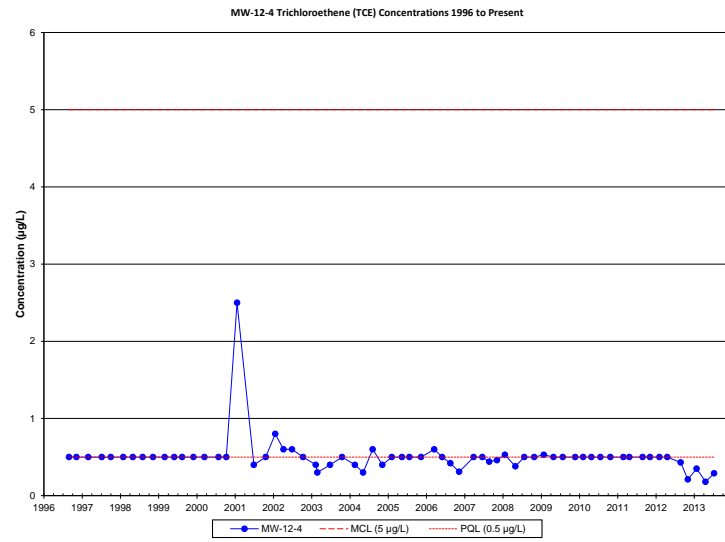
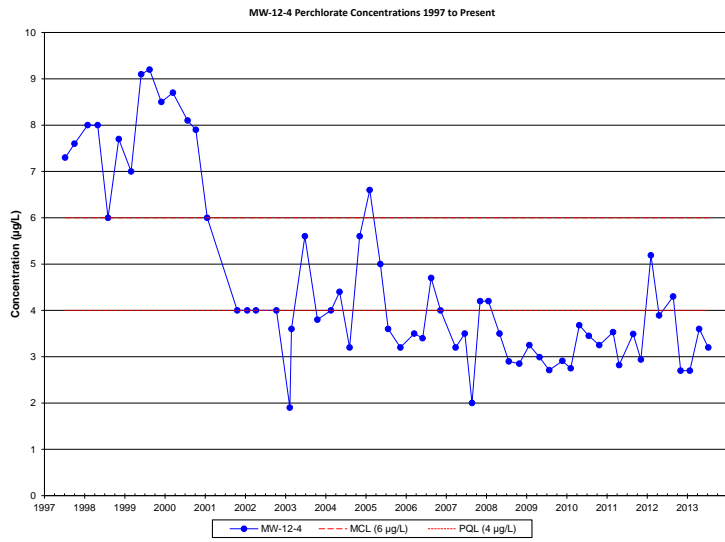
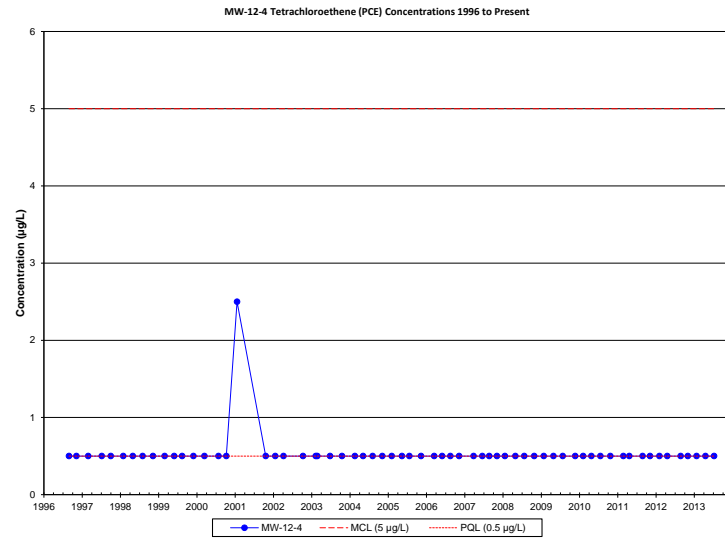
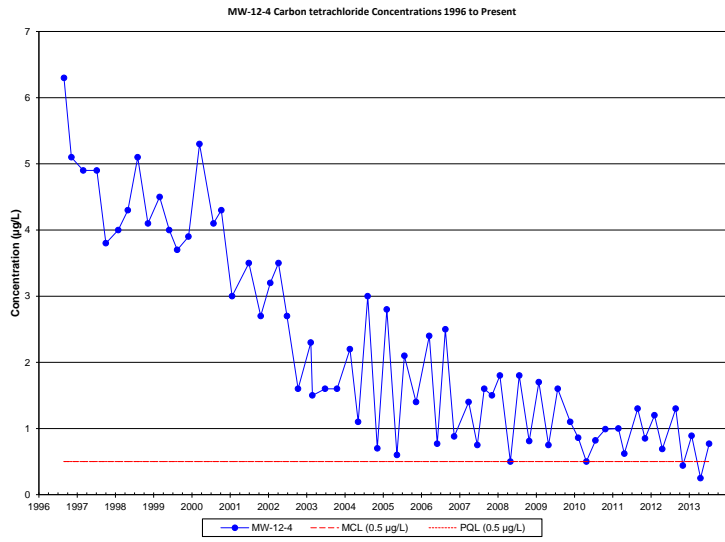
VOCs and Perchlorate Time Series Plots for MW-7



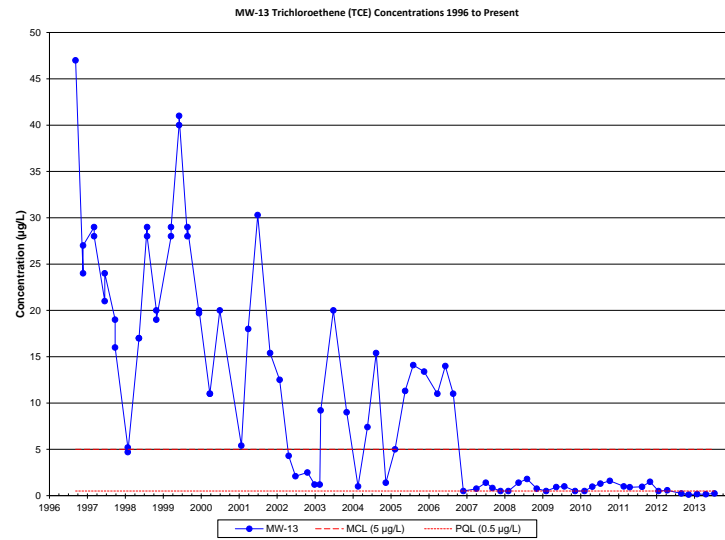
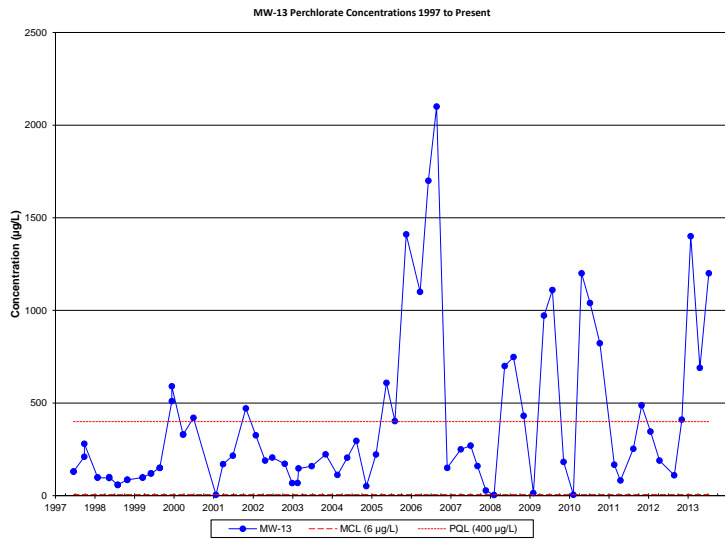
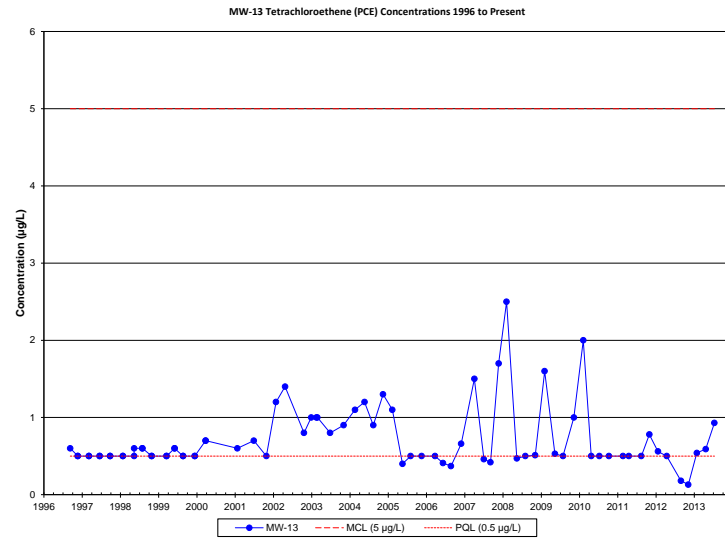
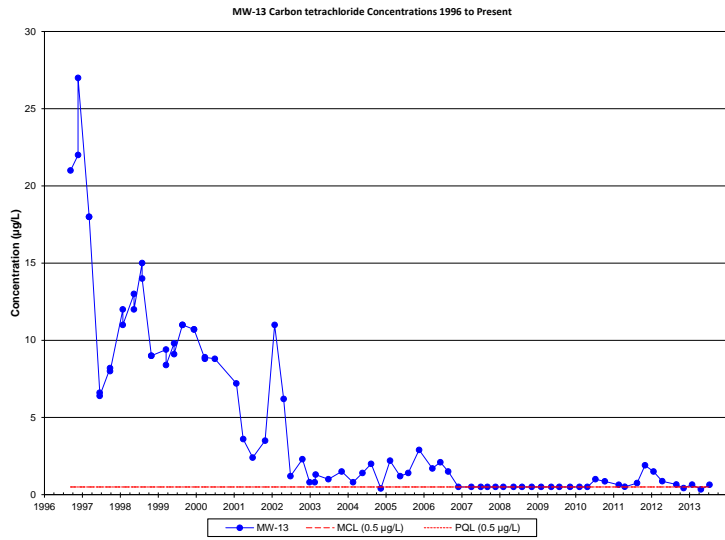
VOCs and Perchlorate Time Series Plots for MW-8



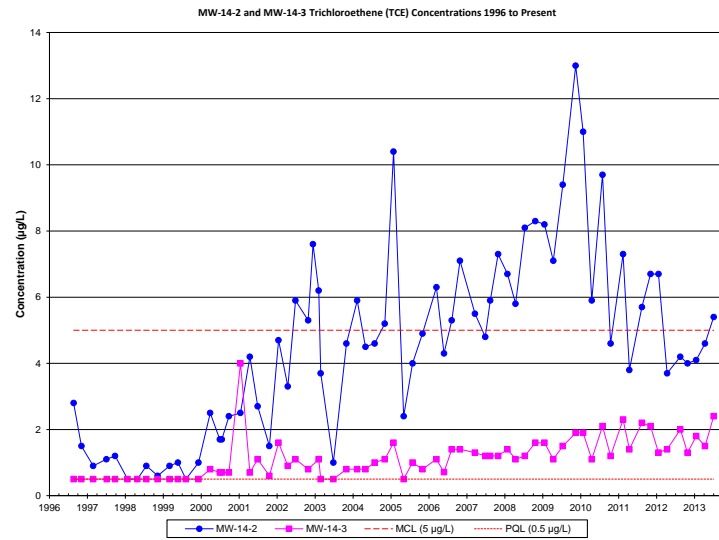
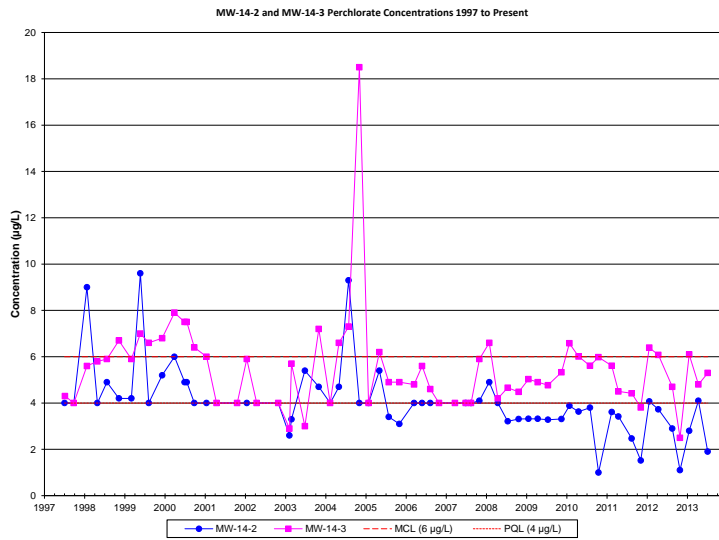
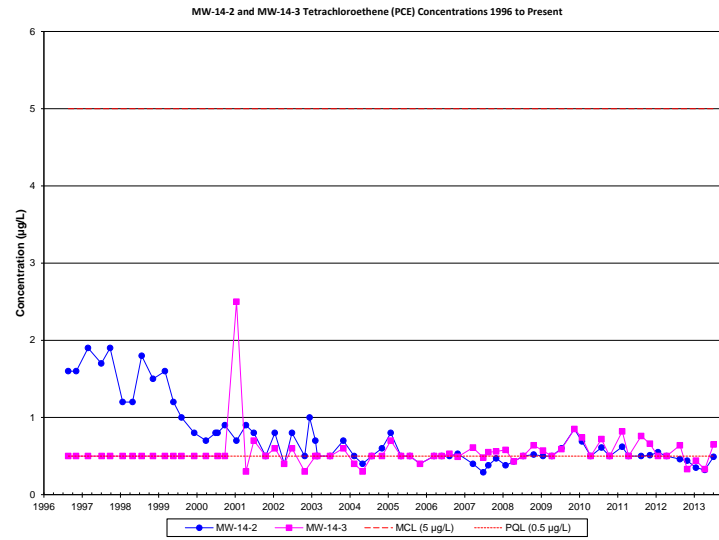
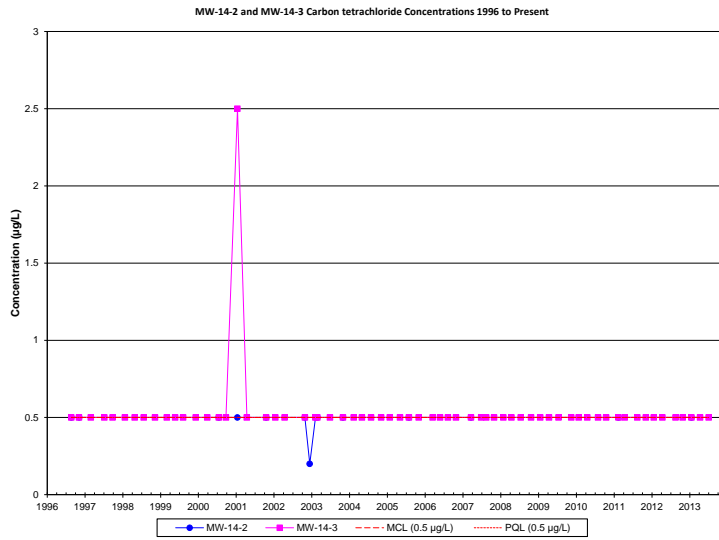
VOCs and Perchlorate Time Series Plots for MW-10



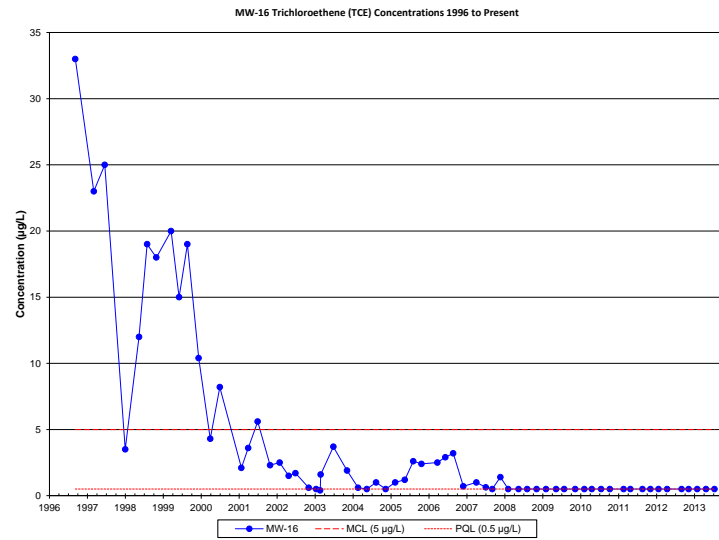
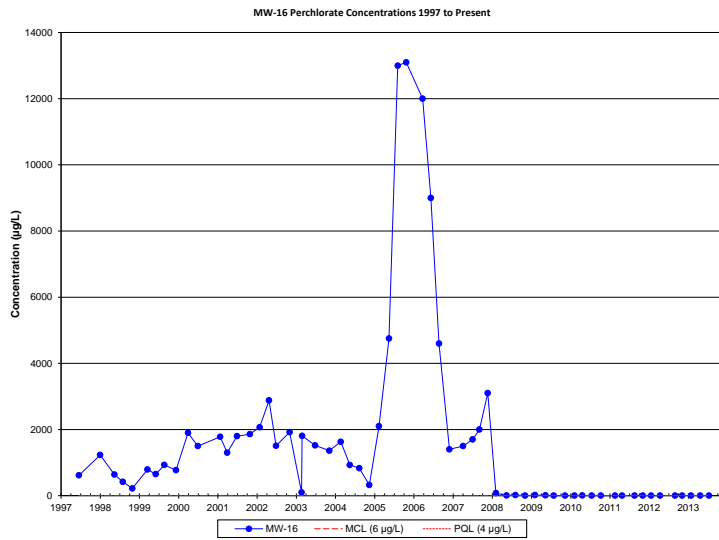
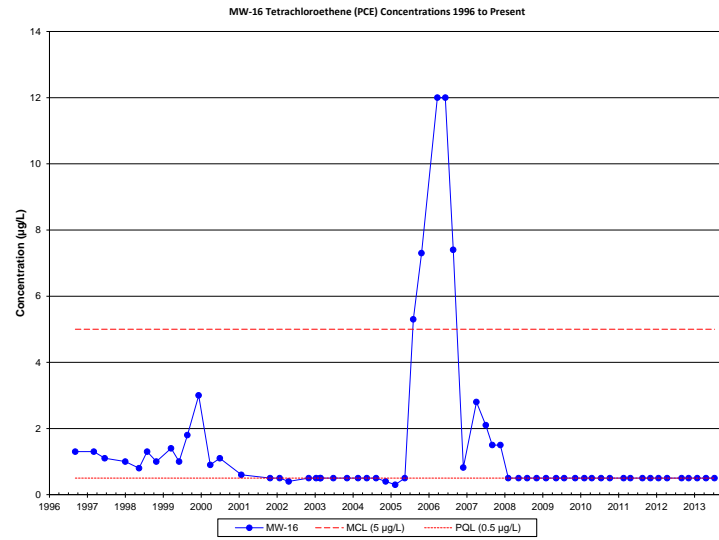
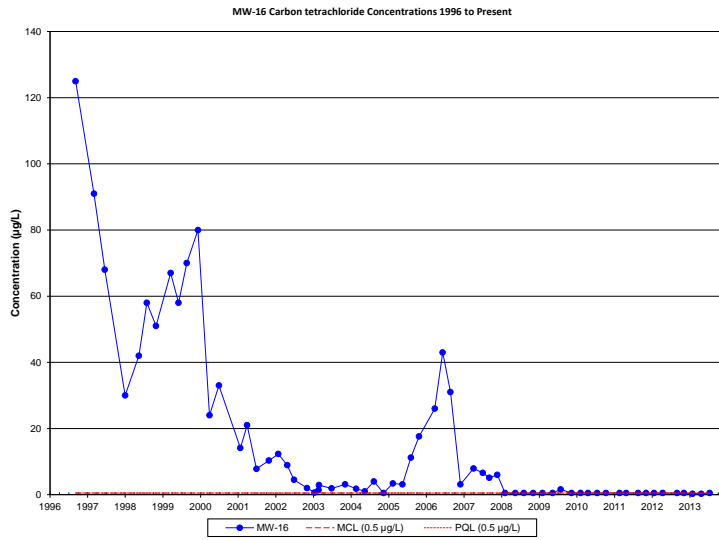
VOCs and Perchlorate Time Series Plots for MW-12-4



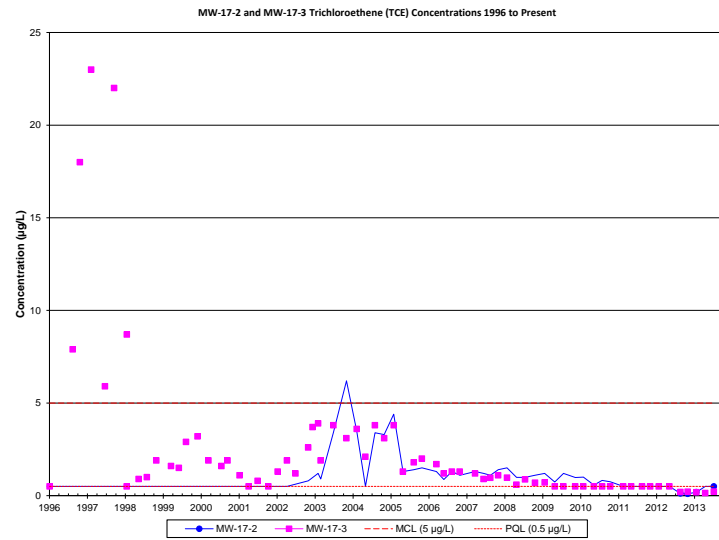
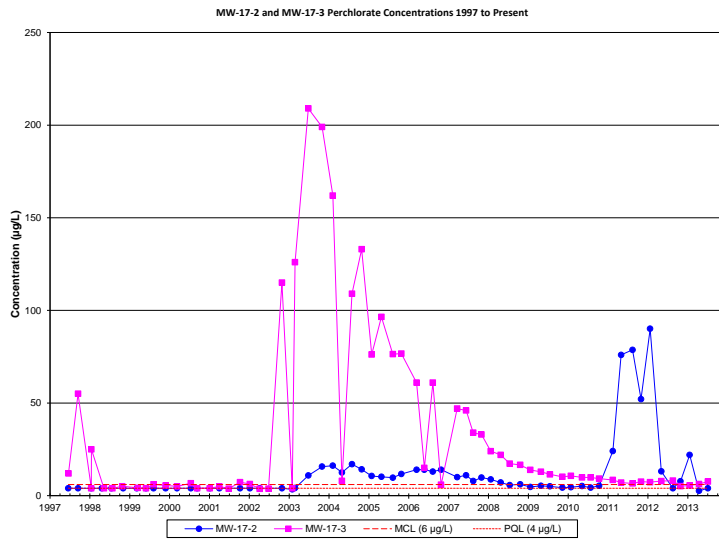
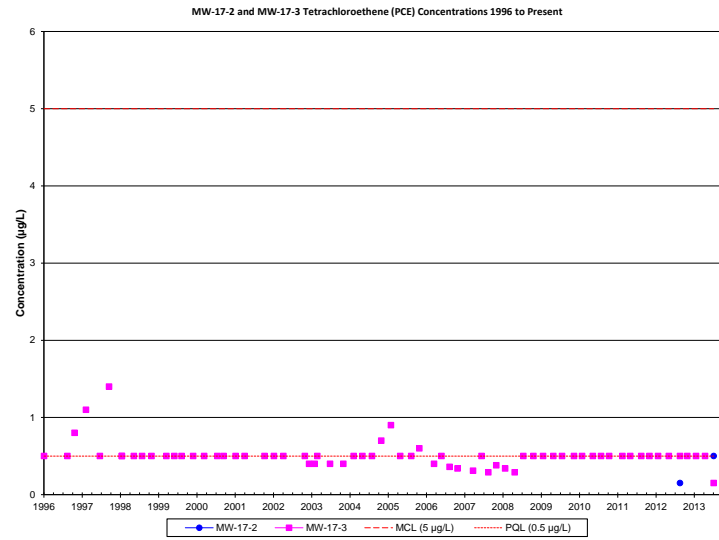
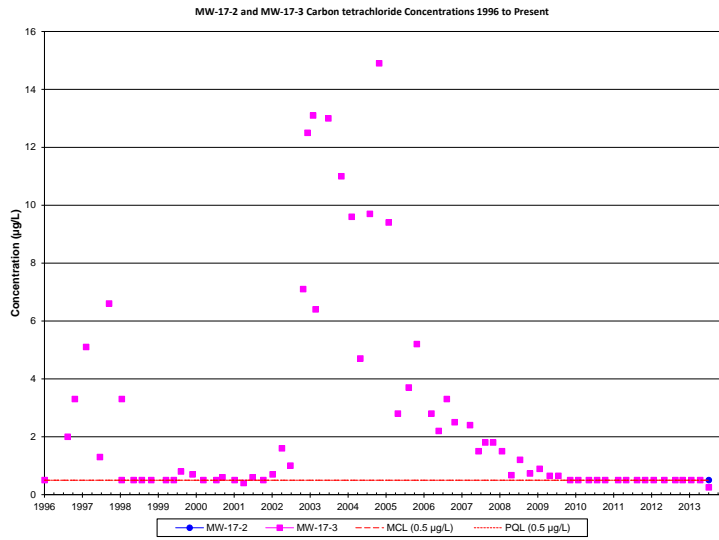
VOCs and Perchlorate Time Series Plots for MW-13



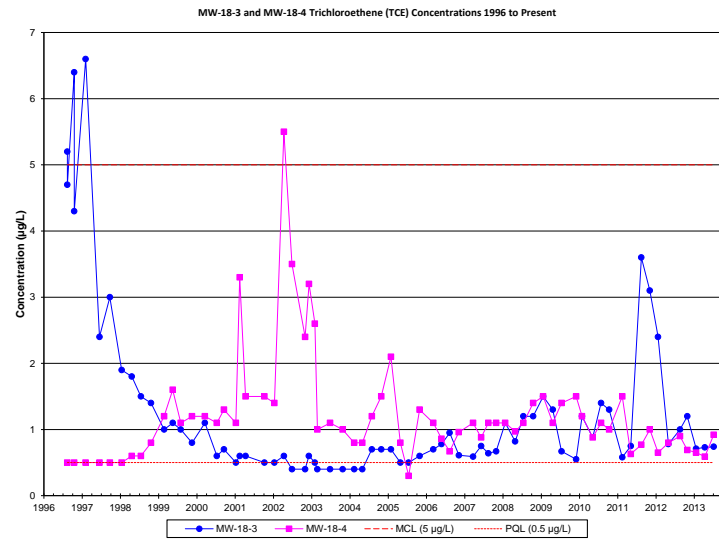
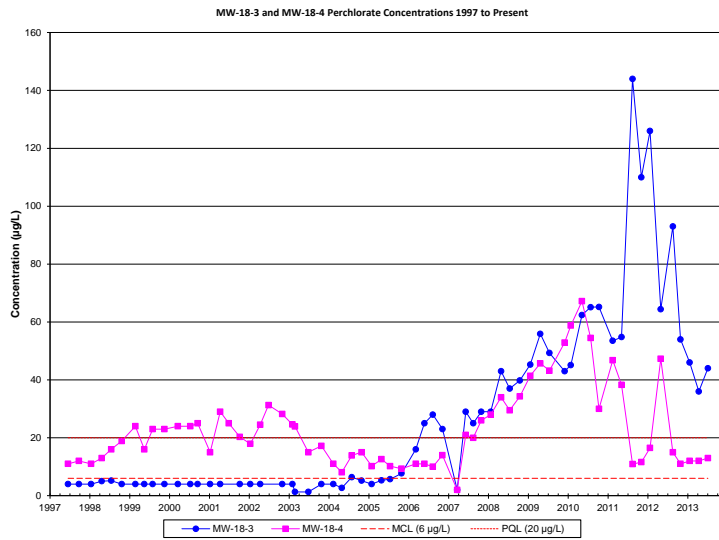
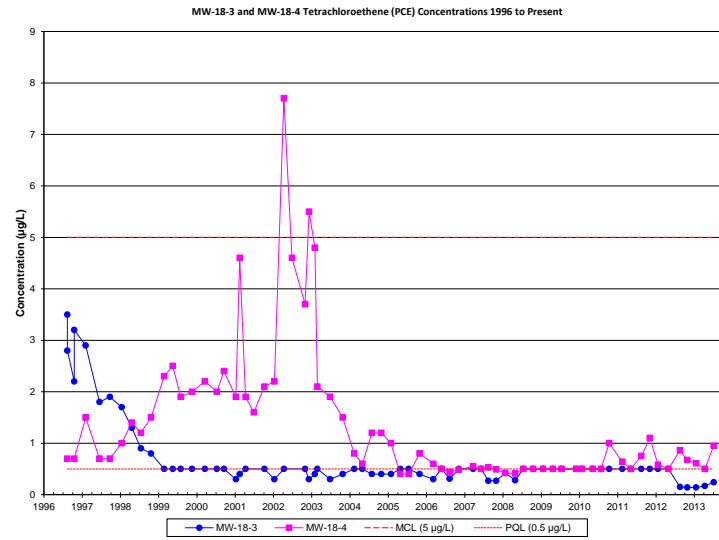
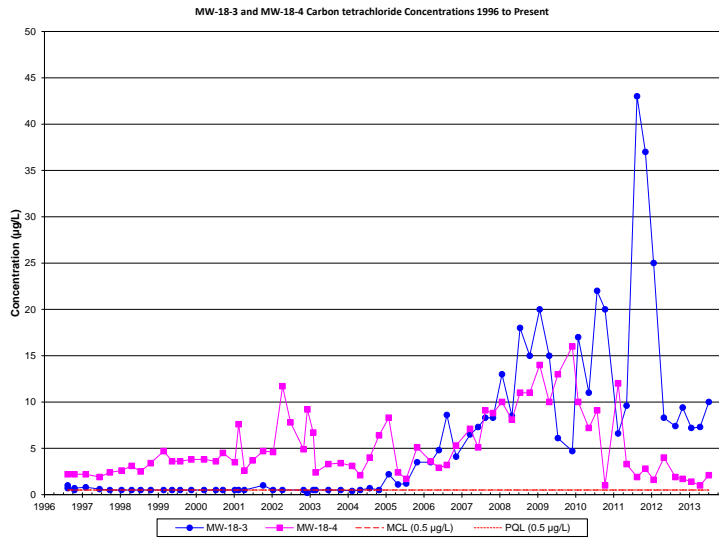
VOCs and Perchlorate Time Series Plots for MW-14-2 and MW-14-3



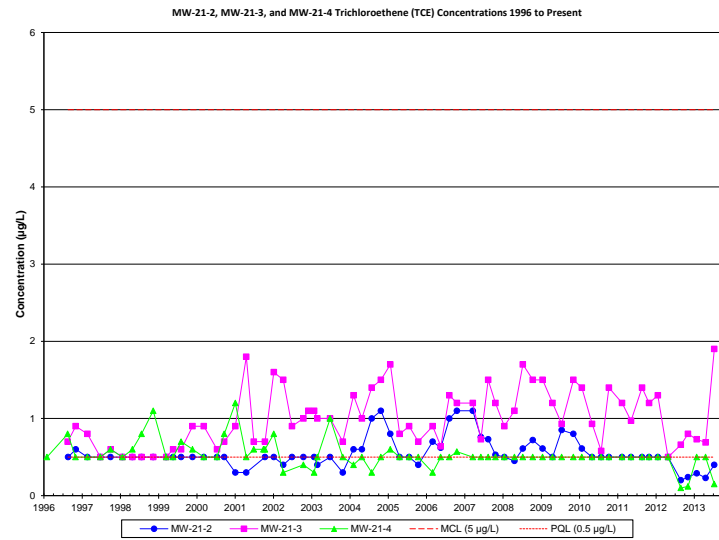
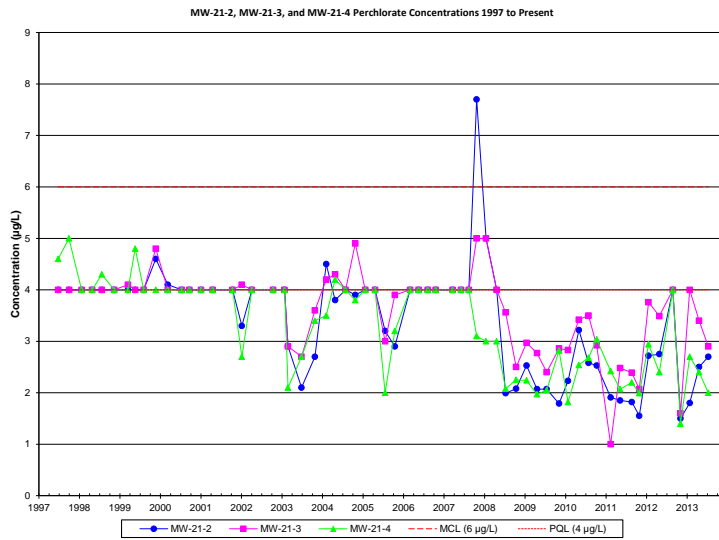
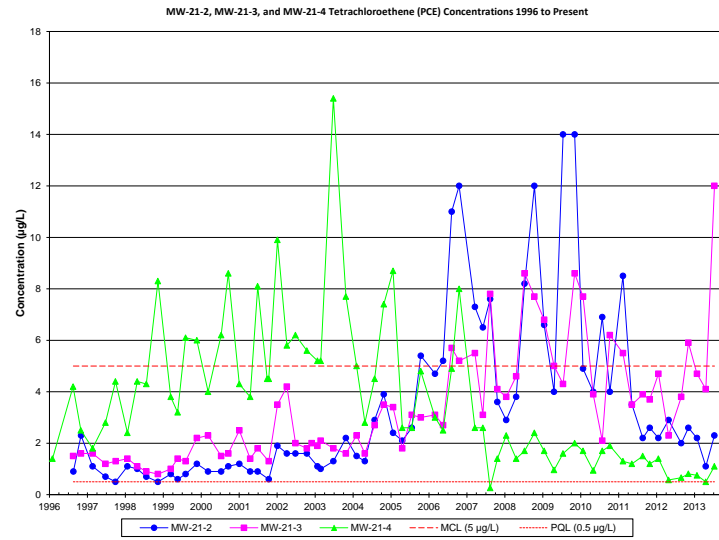
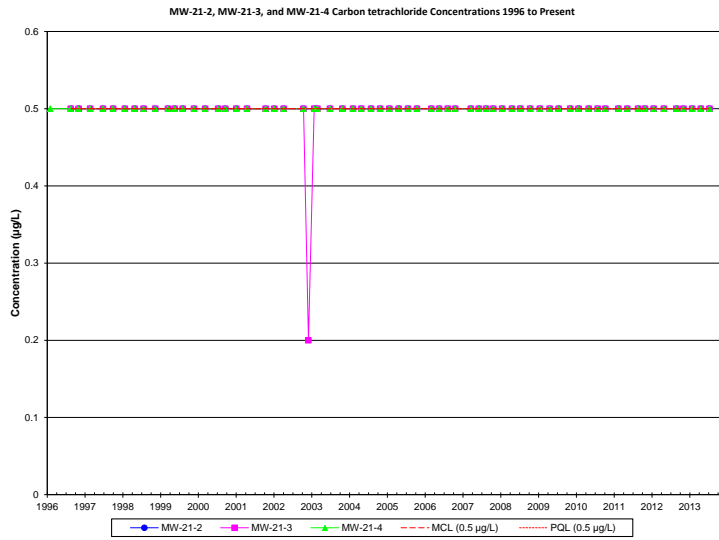
VOCs and Perchlorate Time Series Plots for MW-16



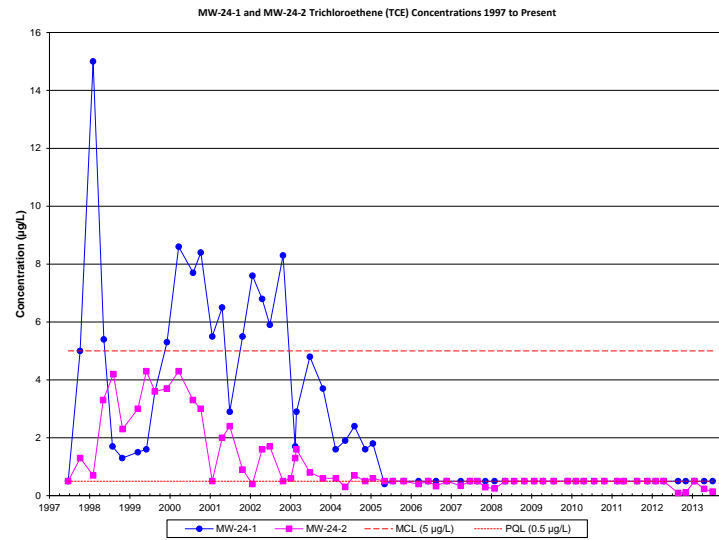
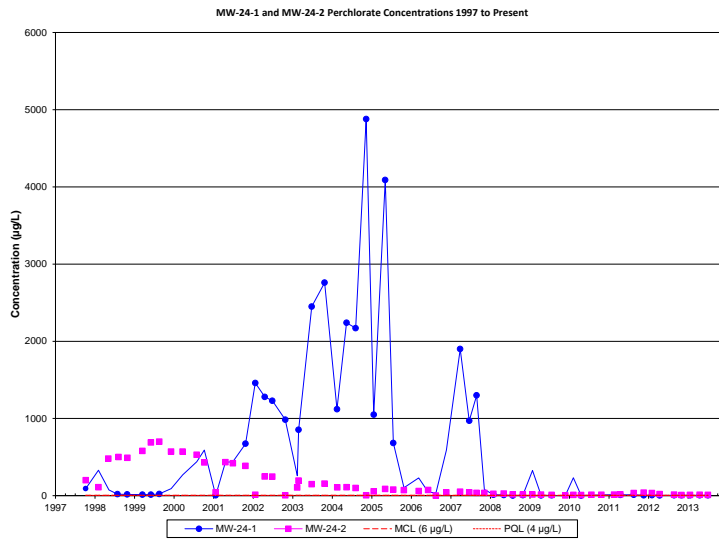
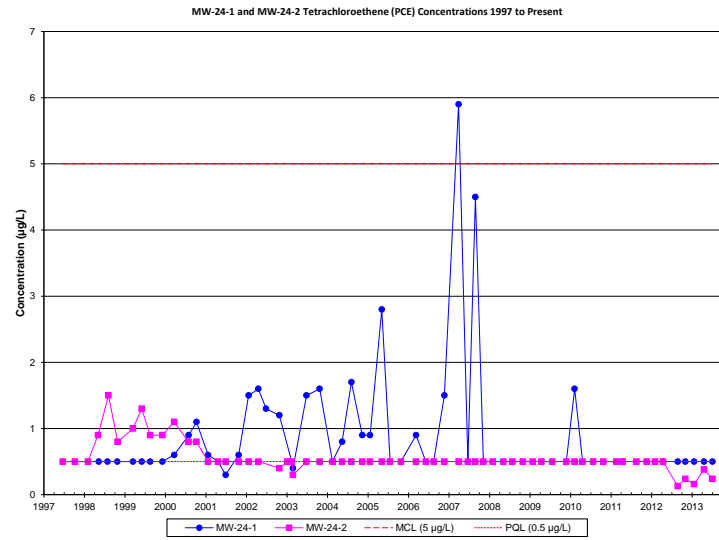
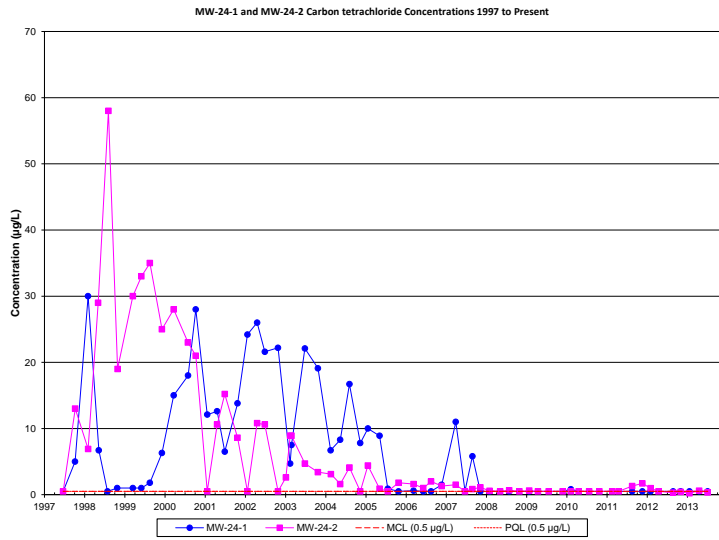
VOCs and Perchlorate Time Series Plots for MW-17-2 and MW-17-3



VOCs and Perchlorate Time Series Plots for MW-18-3 and MW-18-4



VOCs and Perchlorate Time Series Plots for MW-21-2 and MW-21-3 and MW-21-4



VOCs and Perchlorate Time Series Plots for MW-24-1 and MW-24-2