FOUR PERIOD TECHNICAL REPORT

SECOND HALF 2011 THROUGH FIRST HALF 2013

FRIENDS RECYCLING (FKA Big D Roofing, Inc.) 2350 NW 27th Avenue Ocala, Marion County, Florida

PREPARED FOR:

Florida Department of Environmental Protection Central District 3319 Maguire Blvd., Suite 232 Orlando, Florida 32803-3767

JAN 3 1 2013
DEP Central District

PREPARED BY:

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Registration No. 55311
Certificate of Authorization No. 8692

January 20, 2013

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Florida Department of Environmental Protection 3319 Maguire Boulevard, Suite 232 Orlando, FL 32803-3767

Attention:

Ms. Gloria Jean DePradine

RE:

Four Period Technical Report for the Second Half of 2011 through the First Half of 2013

Friends Recycling C&D Landfill Ocala, Marion County, Florida Permit No.: SO42-0019600-007

Dear Ms. DePradine:

Enviro-Technologies, Inc. (ETI) has completed the four period technical groundwater monitoring report of the second half of 2011 through the first half of 2013 for the Friends Recycling C&D Landfill located in Ocala, Marion County, Florida.

INTRODUCTION

The groundwater monitoring program for this site consists of groundwater sampling activities on Monitoring Wells: MW-1, MW-5, MW-6, MW-7, MW-8, and MW-9S. Information about the individual wells is provided in the Appendix of this report. To operate the Friends Recycling C&D Landfill, the conditions of the permit require that the following tasks must be performed as part of the five period technical report monitoring program:

- A. Tabular and graphical displays of any data that shows that a monitoring parameter has been detected, including hydrographs for all monitoring wells.
- B. Trend analyses of any monitoring parameters detected.
- C. Comparisons among shallow, middle, and deep zone wells.
- D. Comparison between upgradient and downgradient wells
- E. Correlation between related parameters such as total dissolved solids and specific conductance.
- F. Discussion of erratic and/or poorly correlated data.
- G. An interpretation of the groundwater contour maps, including an evaluation of groundwater flow rates.
- H. An evaluation of the adequacy of the water quality monitoring frequency and sampling locations based upon site conditions

TABULAR AND GRAPHICAL DATA

Tables and graphs of detected parameters have been prepared and are presented in the Appendix. The tables and graphs summarize the data collected for the past four periods. These parameters include: groundwater elevation, groundwater temperature, chloride, nitrate, sulfate, total dissolved solids (TDS), iron, sodium, pH, dissolved oxygen, turbidity, and specific conductance. During the past four periods between the second half of 2011 and the first half of 2013, exceedances above the MCL's were noted for Ammonia as N, Total Arsenic, Benzene, Iron, Nitrate as N, Sulfate, TDS, and Aluminum only.

TREND ANALYSIS

During the four periods from the second half of 2011 to the first half of 2013, detectable levels of the following parameters were noted with the following trends:

Parameter	MW-1	MW-5	MW-6	MW-7	MW-8	MW-9S
Aluminum - Total	N	N	N	N	N	N
Ammonia as N	N	N	N	N	N	N
Arsenic - Total	N	N	N	N	N	N
Benzene	N	N	N	N	N	N _
Bicarbonate as CaCO3	N	N	N	N	N	N
Chloride	N	D	N	U	U	υ
Chloromethane	N	N	N	N	N	N
cis-1,2-Dichloroethene	N	N	N	N	N	N
Dissolved Oxygen	N	N	D	N	N	N
Iron - Total	N	U	N	N	U	N
Lead - Total	_ N	N	N	N	N	N
Mercury - Total	N	N	N	N	N	D
Nitrate as N	N	N	N	D	N	N
Nitrate/Nitrite as N	N	N	N	N	N	N
рН	N	N	U	N	N	N
Phenolics	N	N	N	N	N	N
Sodium - Total	N	N	N	N	N	N
Specific Conductance (EC)	N	N	N	N	N	N
Sulfate	N	N	N	N	N	N
Temperature	N	N	N	N	N	N
Thallium - Total	N	N	N	N	N	N
Tetrachloroethene	N	N	N	N	N	N
Total Alkalinity	N	N	N	N	N	N
Total Dissolved Solids	N	U	N	D	N_	U
Trichloroethene	N	N	N	N	N	N
Turbidity	N	N	N	N	N	N
Vanadium - Total	N	N	N	N	N	N
Water Elevation	N	N	N	N	N	N

Notes: D - indicates downward trend

U - indicates upward trend

N - indicates no definitive trend

COMPARISONS AMONG SHALLOW, MIDDLE, AND DEEP WELL ZONES

The Friends Recycling facility is located in the northwestern portion of the City of Ocala in Marion County, Florida. All monitoring wells at this site are between twenty-nine and fifty feet deep and extend directly into the Floridan aquifer, which is considered a deep well zone. There are no shallow or middle well zones in the area. Therefore, no comparisons of the well zones can be made.

COMPARISON BETWEEN UP-GRADIENT AND DOWN-GRADIENT WELLS

There was no definitive trend in temperature noted in background well MW-1 and there did not appear to have a definitive correlation to the parameters noted in compliance wells MW-5, MW-6, MW-7, MW-8, and MW-9S. Variations in arsenic concentrations in MW-5 and MW-8 appeared to increase and decrease in correlation with background well MW-1. Variations in groundwater elevations appeared to correspond between MW-1 and the other wells. Other trends noted in the various compliance wells appeared to have no correlation to the background well MW-1.

CORRELATION BETWEEN RELATED PARAMETERS SUCH AS TOTAL DISSOLVED SOLIDS AND SPECIFIC CONDUCTANCE

There appears to be a correlation between concentration levels of total dissolved solids, and specific conductance, and total dissolved solids in MW-1 through MW-9S. There also appears to be a correlation between concentration levels sodium and chloride in MW-8.

DISCUSSION OF ERRATIC AND/OR POORLY CORRELATED DATA

There were no significant instances of erratic or poorly correlated data for the period of evaluation.

INTERPRETATION OF THE GROUNDWATER CONTOUR MAPS, INCLUDING EVALUATION OF GROUNDWATER FLOW RATES

The groundwater flow regime has remained consistent through the period of evaluation except for a directional flow reversal during the second half of 2011 through the first half of 2013. Groundwater contour maps for the four periods are presented in the Appendix. Groundwater elevations appear to fluctuate similarly at all monitoring locations. However, there appears to be a greater change in groundwater elevations between MW-9S and MW-7 which allows a trough condition to be formed between these two wells during drought conditions and a ridge condition to be formed during periods of heavy rainfall, thus causing a localized flow reversal situation.

EVALUATION OF THE ADEQUACY OF THE WATER QUALITY MONITORING FREQUENCY AND SAMPLING LOCATIONS BASED UPON SITE CONDITIONS

Based on this review and evaluation, we do not recommend any revisions to the monitoring frequency at this time. The change in the groundwater flow patterns since the implementation of the groundwater monitoring program appear to be fairly consistent with the existing monitoring well layout. Based on the groundwater flow study for the Cross-Florida Barge Canal performed in the 1960's, the flow direction is expected to return to an east-southeasterly direction within the next few monitoring periods. There have been relatively few exceedances in parameters monitored and those exceedances noted could be more reflective of the monitored formation characteristics and background conditions. Therefore no changes to the monitoring locations are recommended at this time.

CLOSURE

Thank you for the opportunity to provide consulting services to the Friends Recycling C&D Landfill. If you have any questions or comments about this report, please feel free to contact me at (352) 694-1799.

Sincerely,

Robert M. Couch III, P.E.

Robert M. Cal The

President

ENVIRO-TECH, Inc.

Cc: Gloria Jean DePradine- Florida Department of Environmental Protection

APPENDIX

TABLES

Parameter	MW-1	2011 2nd Half	2012 1st Half	2012 2nd Half	2013 1st Half
Aluminum - Total	MW-1	0	0	0	0
Ammonia as N	MW-1	2.9	1.8	1.2	2.8
Arsenic - Total	MW-1	20.6	19.8	6.44	16
Benzene	MW-1	0	0	0	0
Bicarbonate as CaCO3	MW-1	0	0	0	0
Chloride	MW-1	24	24	34	25
Chloromethane	MW-1	0	0	0	0
cis-1,2-Dichloroethene	MW-1	0	0	0	0
Dissolved Oxygen	MW-1	0.71	0.25	0.38	0.33
Iron - Total	MW-1	5870	5470	2530	6090
Copper - Total	MW-1	0	0	0	0
Lead - Total	MW-1	0	2.64	0	0
Mercury - Total	MW-1	0	0	0.0966	0.0278
Nickel - Total	MW-1	0	0	0	22.6
Nitrate as N	MW-1	0	0	0.77	0.061
Nitrate/Nitrite as N	MW-1	0	0	0	0
pH	MW-1	6.67	6.49	6.5	6.65
Phenolics	MW-1	0	0	0	0
Sodium - Total	MW-1	34.2	34.9	98.3	43.9
Specific Conductance (EC)	MW-1	1207	1294	1652	1486
Sulfate	MW-1	150	0	0	380
Temperature	MW-1	23.65	24.7	21.97	25.21
Thallium - Total	MW-1	0	0	0.607	0.595
Tetrachloroethene	MW-1	0	0	0	0
Total Alkalinity	MW-1	0	0	0	0
Total Dissolved Solids	MW-1	770	830	1900	1100
Trichloroethene	MW-1	0	0	0	0
Turbidity	MW-1	2.4	1.2	0.9	1
Vanadium - Total	MW-1	0	0	0	0
Water Elevation	MW-1	40.16	39.88	42.15	43.16

Parameter	MW-5	2011 2nd Half	2012 1st Half	2012 2nd Half	2013 1st Half
Aluminum - Total	MW-5	0	0	0	0
Ammonia as N	MW-5	0.6	0.74	1.9	1.1
Arsenic - Total	MW-5	4.72	0	0	0
Benzene	MW-5	0	0	0	1.6
Bicarbonate as CaCO3	MW-5	0	0	0	0
Chloride	MW-5	6.2	6.1	6.1	4.4
Chloromethane	MW-5	0	0	0	0
cis-1,2-Dichloroethene	MW-5	0	0	0	0
Dissolved Oxygen	MW-5	0.8	0.21	0.36	0.23
Iron - Total	MW-5	10700	11000	15300	20700
Copper - Total	MW-5	0	0	0	3.02
Lead - Total	MW-5	0	0	0	0
Mercury - Total	MW-5	0	0	0	0
Nickel - Total	MW-5	0	0	0	12.7
Nitrate as N	MW-5	0	0	0	0
Nitrate/Nitrite as N	MW-5	0	0	0	0
pH	MW-5	6.71	6.44	6.5	6.5
Phenolics	MW-5	0	0	0	0
Sodium - Total	MW-5	4.42	4.06	6.3	4.99
Specific Conductance (EC)	MW-5	882	958	846	1068
Sulfate	MW-5	9	9.1	3.5	0.69
Temperature	MW-5	23.07	24.02	21.97	24.4
Thallium - Total	MW-5	0	0	0	0
Tetrachloroethene	MW-5	0	0	0	0
Total Alkalinity	MW-5	0	0	0	0
Total Dissolved Solids	MW-5	490	530	540	610
Trichloroethene	MW-5	0	0	0	0
Turbidity	MW-5	1.3	1.5	1.3	0.6
Vanadium - Total	MW-5	0	0	0	0
Water Elevation	MW-5	40.17	39.74	42.21	41.9

Parameter	MW-6	2011 2nd Half	2012 1st Half	2012 2nd Half	2013 1st Half
Aluminum - Total	MW-6	0	0	0	0
Ammonia as N	MW-6	0	0	0	0
Arsenic - Total	MW-6	0	0	0	0
Benzene	MW-6	0	0	0	0
Bicarbonate as CaCO3	MW-6	0	0	0	0
Chloride	MW-6	3.3	3.6	3.1	1.9
Chloromethane	MW-6	0	0	0	0
cis-1,2-Dichloroethene	MW-6	0	0	0	0
Dissolved Oxygen	MW-6	2.85	1.44	1.43	1.21
Iron - Total	MW-6	0	0	0	0
Copper - Total	MW-6	0	0	0	0
Lead - Total	MW-6	0	0	0	0
Mercury - Total	MW-6	0	0	0	0.0403
Nickel - Total	MW-6	0	0	0	0
Nitrate as N	MW-6	1.7	1.4	0.49	0.51
Nitrate/Nitrite as N	MW-6	0	0	0	0
pH	MW-6	6	6.58	6.74	6.84
Phenolics	MW-6	0	0	0	0
Sodium - Total	MW-6	5.57	4.66	3.71	4.16
Specific Conductance (EC)	MW-6	726	790	536	730
Sulfate	MW-6	22	21	13	14
Temperature	MW-6	22.02	23.03	20.11	23.23
Thallium - Total	MW-6	0	0	0	0
Tetrachloroethene	MW-6	0	0	0	0
Total Alkalinity	MW-6	0	0	0	0
Total Dissolved Solids	MW-6	420	470	400	460
Trichloroethene	MW-6	0	0	0	0
Turbidity	MW-6	3.4	1.4	3.4	5
Vanadium - Total	MW-6	0	2.27	0	0
Water Elevation	MW-6	40	39.9	42.28	42.03

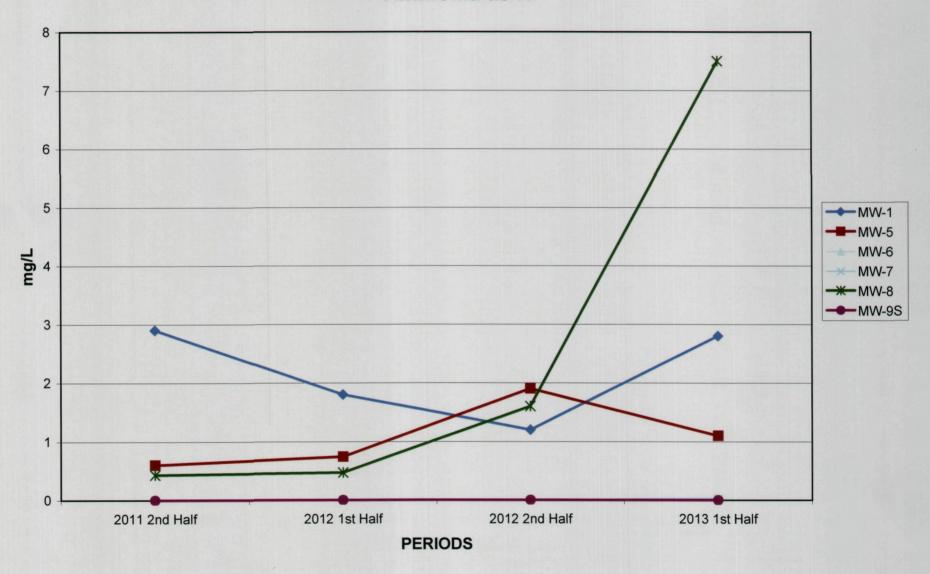
Parameter	MW-7	2011 2nd Half	2012 1st Half	2012 2nd Half	2013 1st Half
Aluminum - Total	MW-7	315	0	0	121
Ammonia as N	MW-7	0	0	0	0.031
Arsenic - Total	MW-7	0	0	0	0
Benzene	MW-7	0	0	0	0
Bicarbonate as CaCO3	MW-7	0	0	0	0
Chloride	MW-7	9.7	9.7	9.8	8.3
Chloromethane	MW-7	0	0	0	0
cis-1,2-Dichloroethene	MW-7	0	0	0	0
Dissolved Oxygen	MW-7	0.7	0.19	0.3	0.2
Iron - Total	MW-7	135	43.6	0	181
Copper - Total	MW-7	0	0	0	5.05
Lead - Total	MW-7	0	0	0	0
Mercury - Total	MW-7	0.0371	0.0329	0.0642	0.176
Nickel - Total	MW-7	0	0	0	0
Nitrate as N	MW-7	11	11	7.3	6.4
Nitrate/Nitrite as N	MW-7	0	0	0	0
pH	MW-7	6.63	6.47	6.5	6.68
Phenolics	MW-7	0	0	0	0
Sodium - Total	MW-7	15.9	10	12.8	11
Specific Conductance (EC)	MW-7	955	940	753	818
Sulfate	MW-7	38	36	37	38
Temperature	MW-7	23.3	24.44	22.1	24.5
Thallium - Total	MW-7	0	0	0	0
Tetrachloroethene	MW-7	0	0	0	0
Total Alkalinity	MW-7	0	0	0	0
Total Dissolved Solids	MW-7	580	570	550	540
Trichloroethene	MW-7	0	0	0	0
Turbidity	MW-7	2.4	1.9	2.8	2.2
Vanadium - Total	MW-7	13.2	14.8	13.4	12.4
Water Elevation	MW-7	38.61	39.76	42.15	41.89

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Parameter Total	MW-8	2011 2nd Half	2012 1st Half	2012 2nd Half	2013 1st Half
Aluminum - Total	MW-8	0	0	0	- 0
Ammonia as N	MW-8	0.43	0.47	1.6	7.5
Arsenic - Total	MW-8	6.36	9.78	6.81	7.96
Benzene	MW-8	1.3	0	0	0
Bicarbonate as CaCO3	MW-8	0	0	0	0
Chloride	MW-8	18	18	20	23
Chloromethane	MW-8	0	0	0	0
cis-1,2-Dichloroethene	MW-8	1.1	0.87	0.95	1
Dissolved Oxygen	MW-8	0.96	0.16	0.24	0.2
Iron - Total	MW-8	9670	9970	15400	15700
Copper - Total	MW-8	0	0	0	3.1
Lead - Total	MW-8	0	0	0	o
Mercury - Total	MW-8	0	0	0	0
Nickel - Total	MW-8	0	0	0	14.9
Nitrate as N	MW-8	0	0	0	0
Nitrate/Nitrite as N	8-WM	0	0	0	o
pH	MW-8	6.49	6.32	6.37	6.53
Phenolics	MW-8	0	0	0	ol
Sodium - Total	MW-8	13.9	12.7	16.2	18.3
Specific Conductance (EC)	MW-8	1128	1129	938	1116
Sulfate	MW-8	6.7	6.4	4	2.2
Temperature	MW-8	23.83	24.91	21.96	24.8
Thallium - Total	MW-8	0	0	0	0
Tetrachloroethene	MW-8	0	0	0	ol
Total Alkalinity	MW-8	0	0	0	ol
Total Dissolved Solids	MW-8	630	650	620	650
Trichloroethene	MW-8	0	0	0	0
Turbidity	MW-8	1.5	0.9	5.9	1.9
Vanadium - Total	MW-8	0	0	0.0	ol
Water Elevation	MW-8	40.15	39.68	42.08	41.86

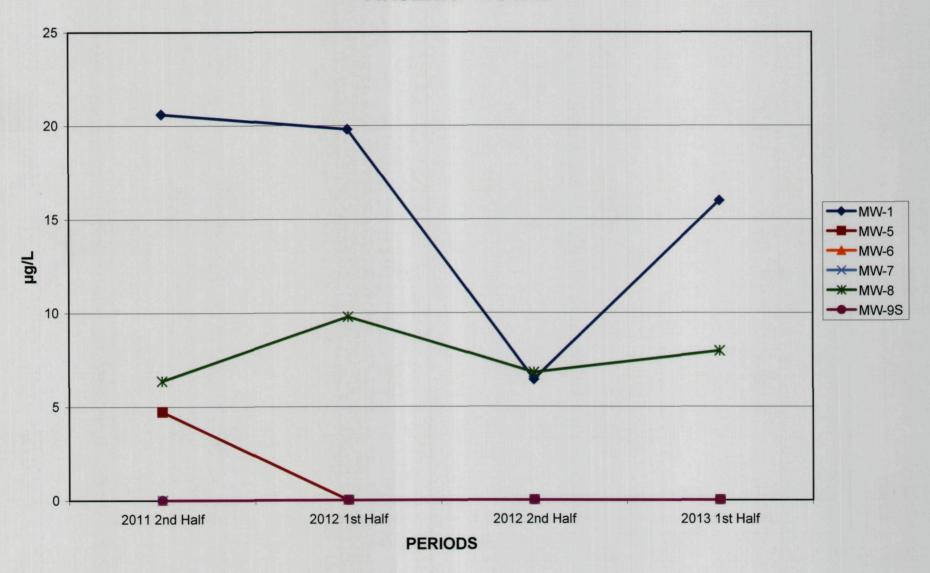
Parameter	MW-9S	2011 2nd Half	2012 1st Half	2012 2nd Half	2013 1st Half
Aluminum - Total	MW-98	0	0	0	0
Ammonia as N	MW-9S	0	0	0	0
Arsenic - Total	MW-9S	0	0	0	0
Benzene	MW-9S	0	0	0	0
Bicarbonate as CaCO3	MW-9S	0	0	0	0
Chloride	MW-9S	22	24	24	29
Chloromethane	MW-9S	0	0	0	0
cis-1,2-Dichloroethene	MW-9S	0	0	0	0
Dissolved Oxygen	MW-9S	0.76	0.49	0.42	0.46
Iron - Total	MW-9S	0	0	0	0
Copper - Total	MW-9S	0	0	0	4.03
Lead - Total	MW-9S	0	0	0	0
Mercury - Total	MW-9S	0.128	0.0393	0	0
Nickel - Total	MW-9S	0	0	0	0
Nitrate as N	MW-9S	0.46	0.75	0.48	0.2
Nitrate/Nitrite as N	MW-98	0	0	0	0
рН	MW-9S	6.73	6.56	6.6	6.78
Phenolics	MW-9S	0	0	0	0
Sodium - Total	MW-9S	13	10.6	15.1	11.8
Specific Conductance (EC)	MW-9S	901	961	743	907
Sulfate	MW-9S	74	78	0	93
Temperature	MW-98	21.76	23.01	20.59	23.48
Thallium - Total	MW-9S	0	0	0	0
Tetrachloroethene	MW-9S	0	0	0	0
Total Alkalinity	MW-9S	0	0	0	0
Total Dissolved Solids	MW-9S	560	590	600	620
Trichloroethene	MW-9S	0	0	0	0
Turbidity	MW-9S	2.5	2.4	2.9	1.6
Vanadium - Total	MW-9S	3.97	5.48	3.4	4.06
Water Elevation	MW-9S	39.92	39.54	41.87	41.66

GRAPHS

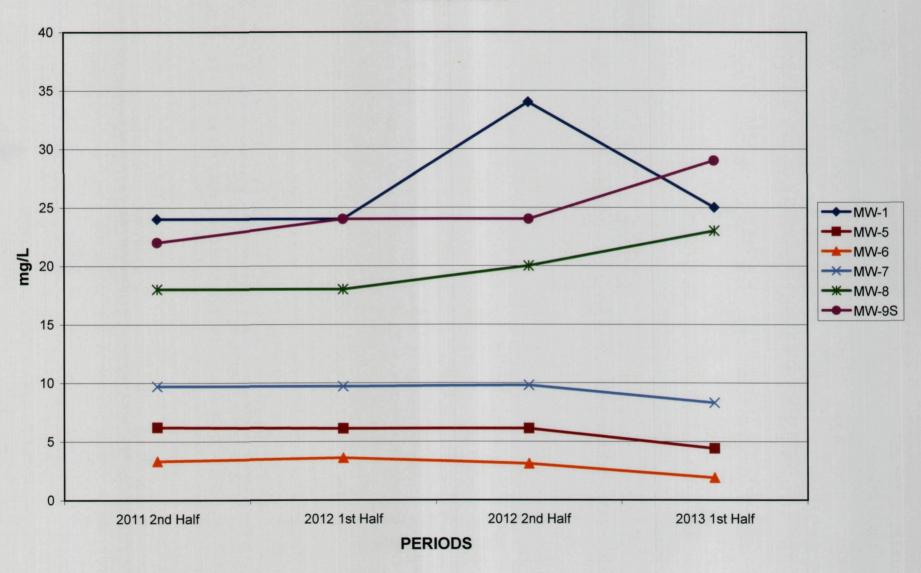
Ammonia as N



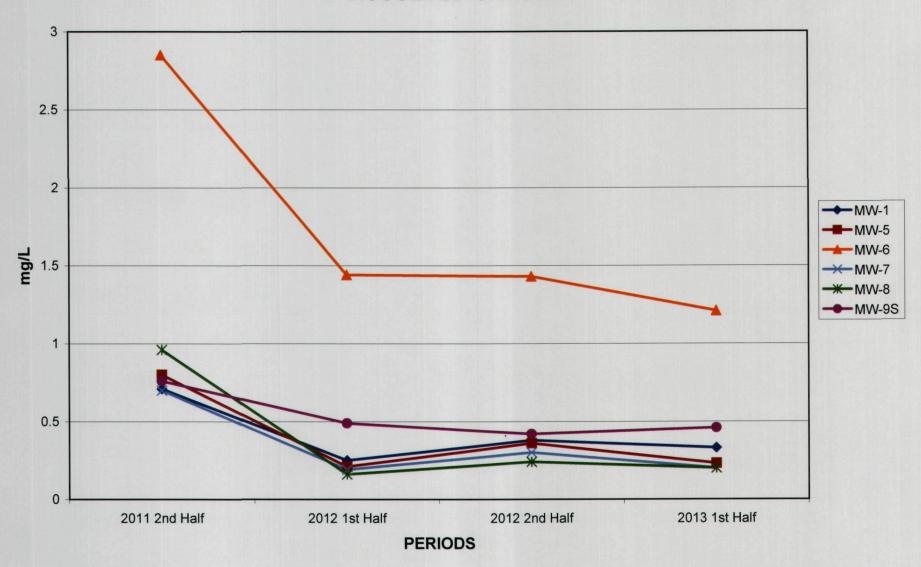
ARSENIC - TOTAL



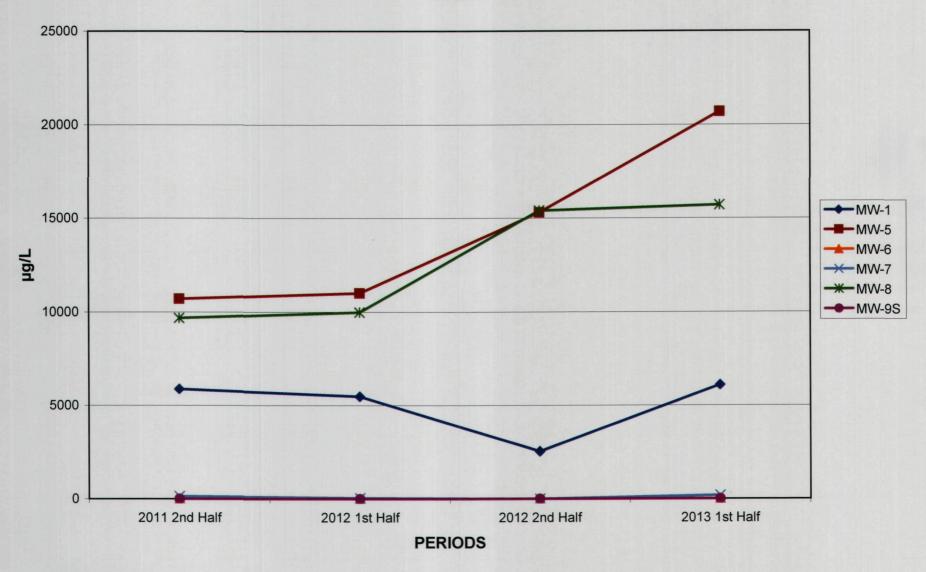
CHLORIDE



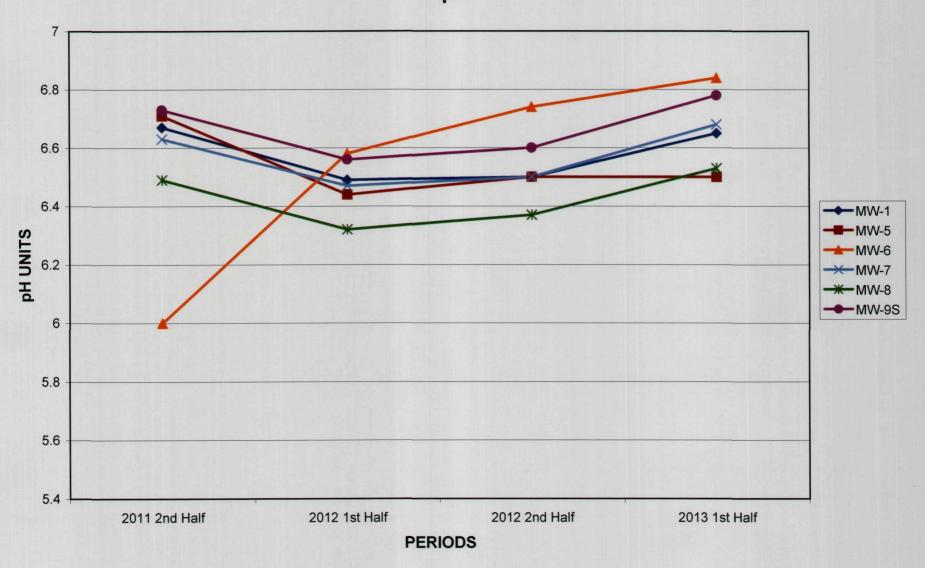
DISSOLVED OXYGEN



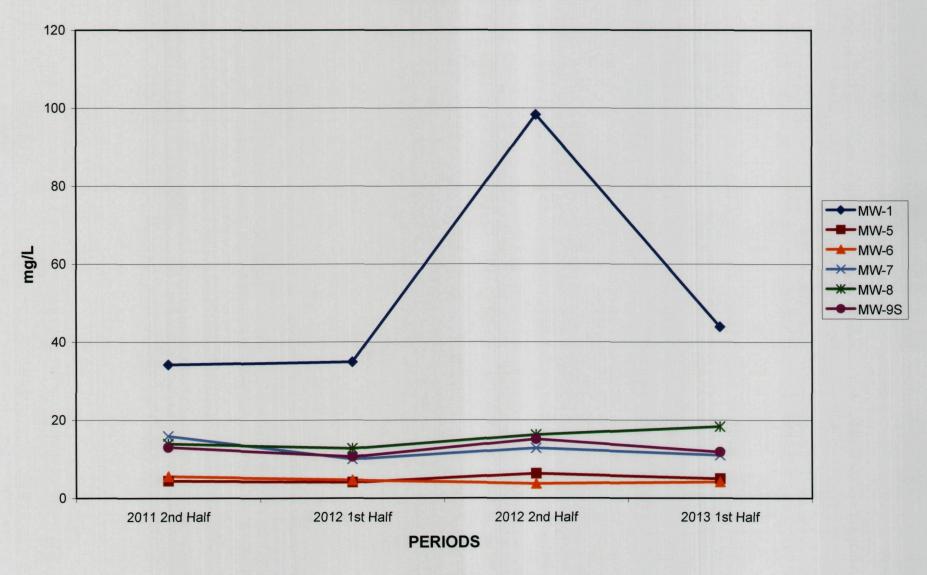
IRON



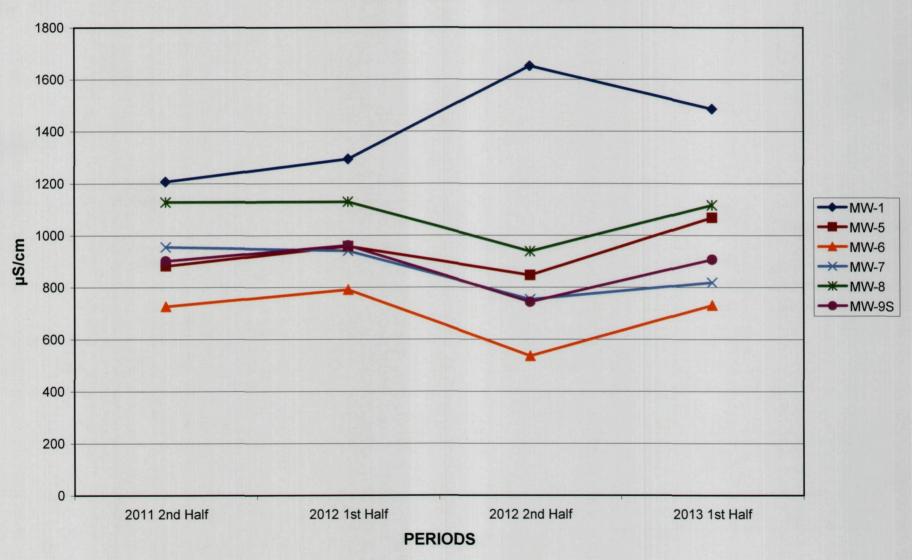




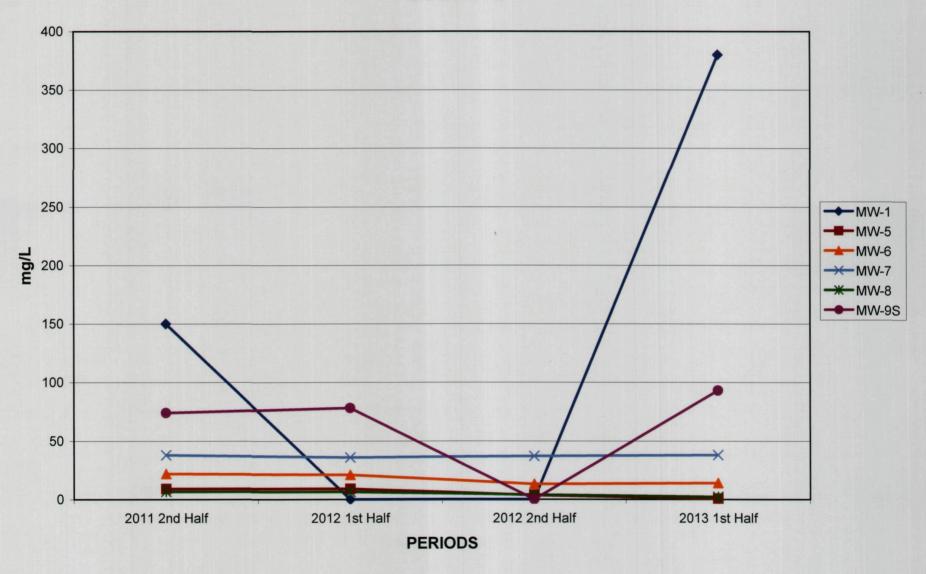
SODIUM - TOTAL



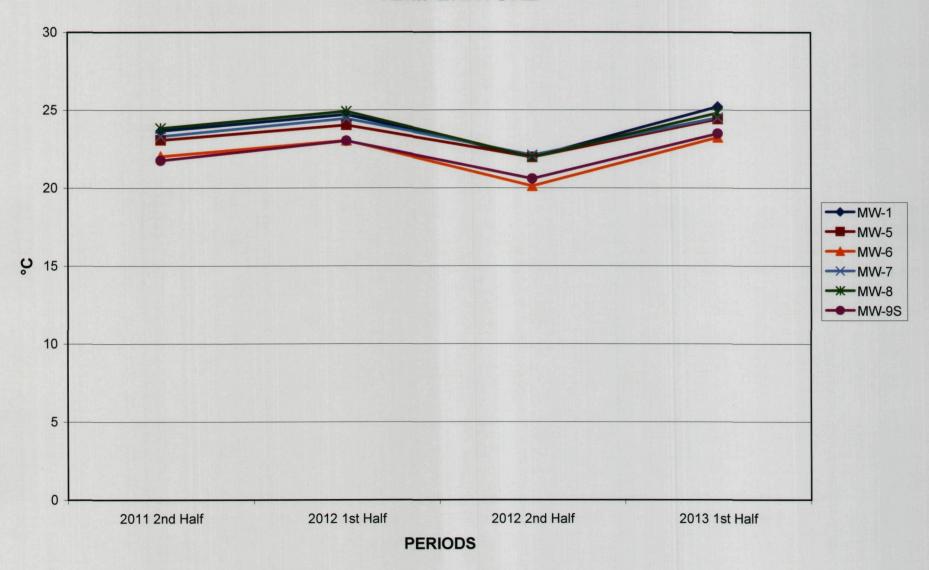
SPECIFIC CONDUCTANCE (EC)



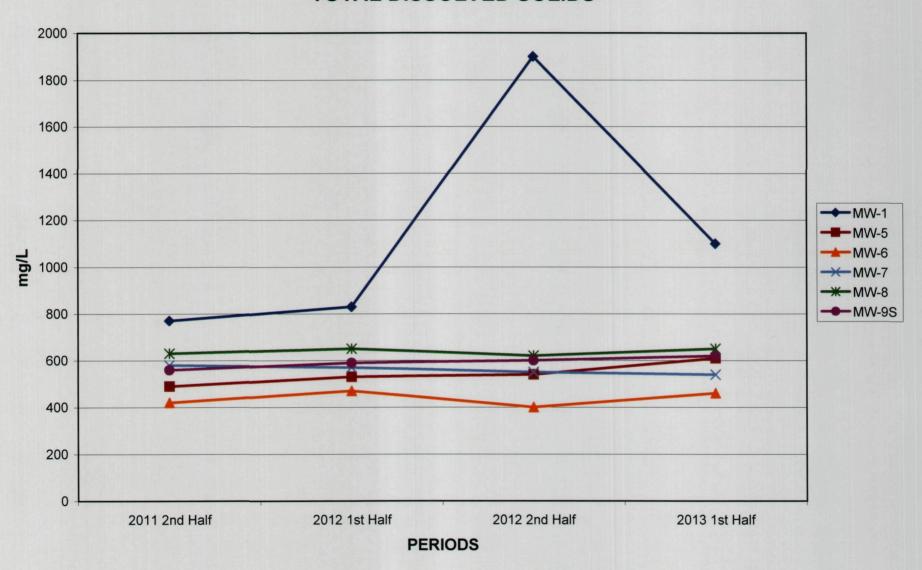
SULFATE



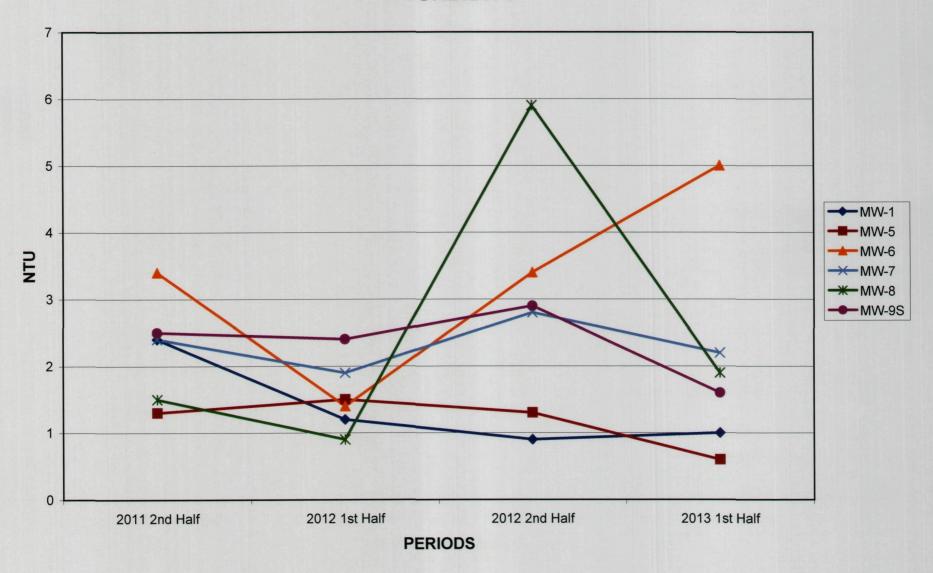
TEMPERATURE



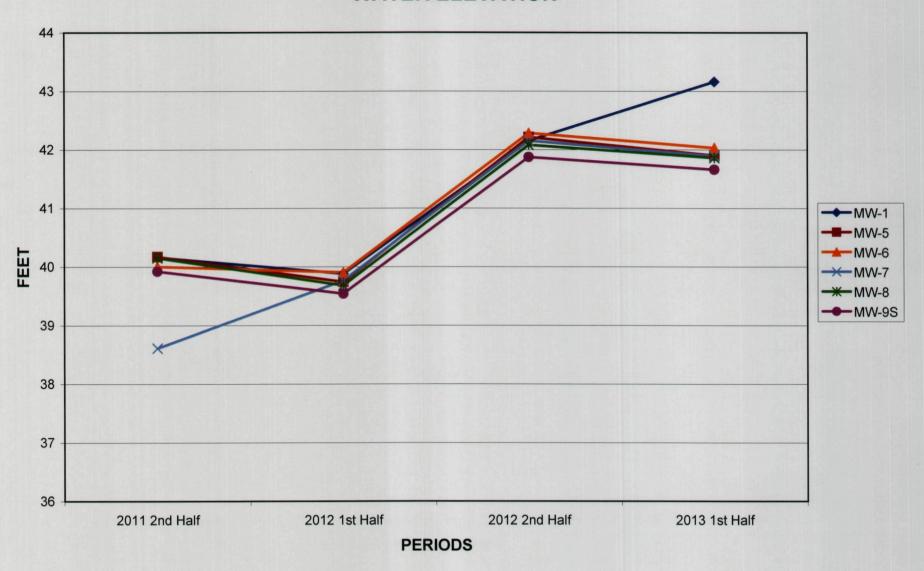
TOTAL DISSOLVED SOLIDS



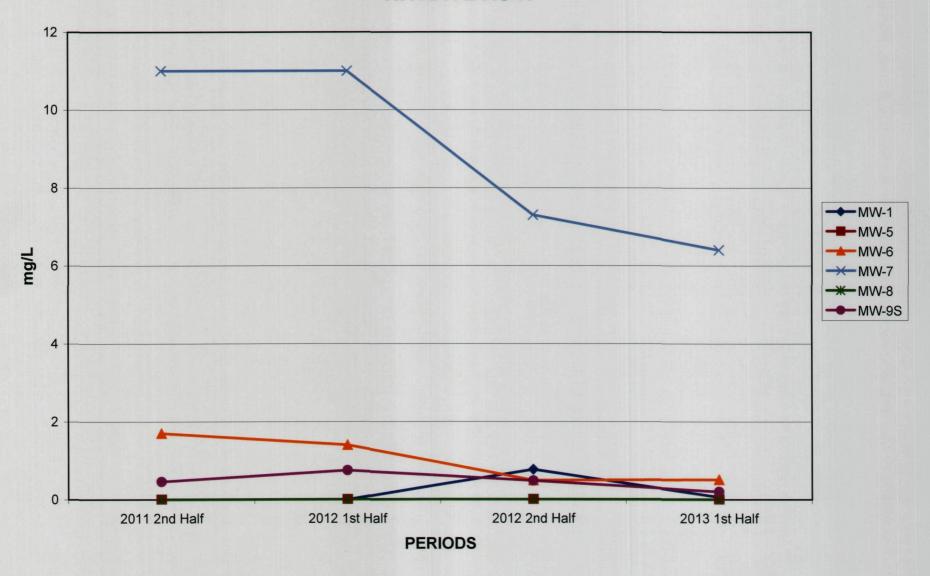
TURBIDITY



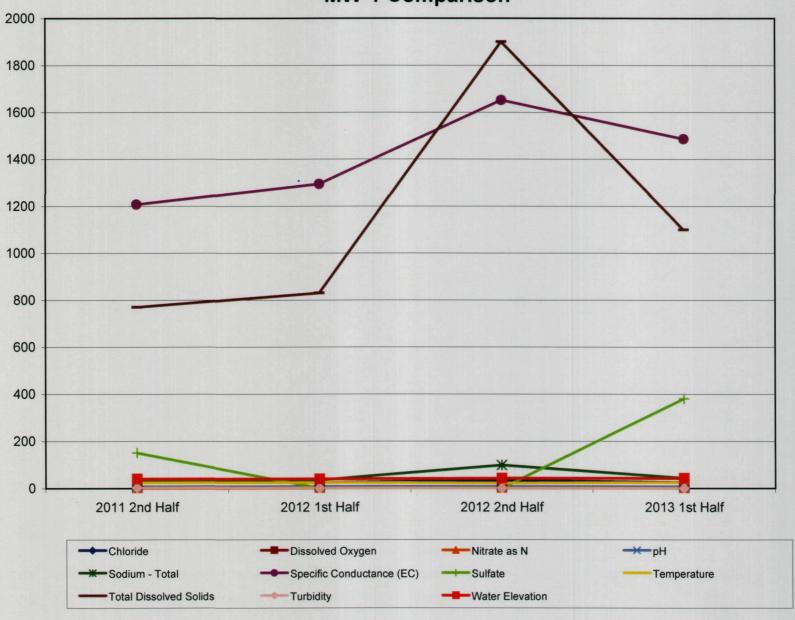
WATER ELEVATION



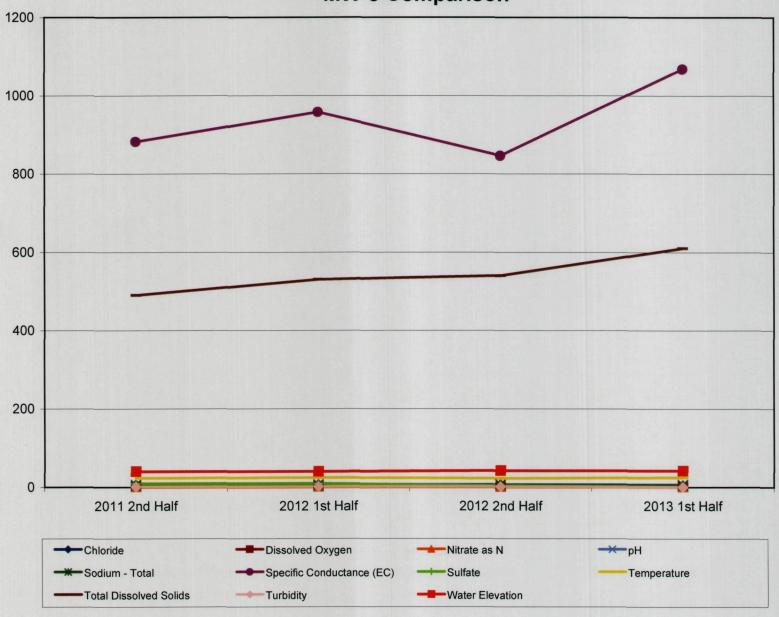
NITRATE AS N



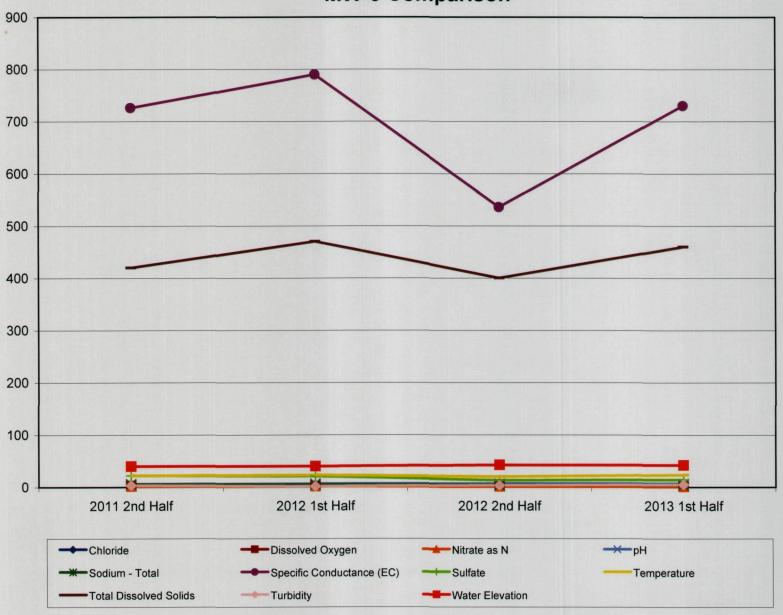
MW-1 Comparison



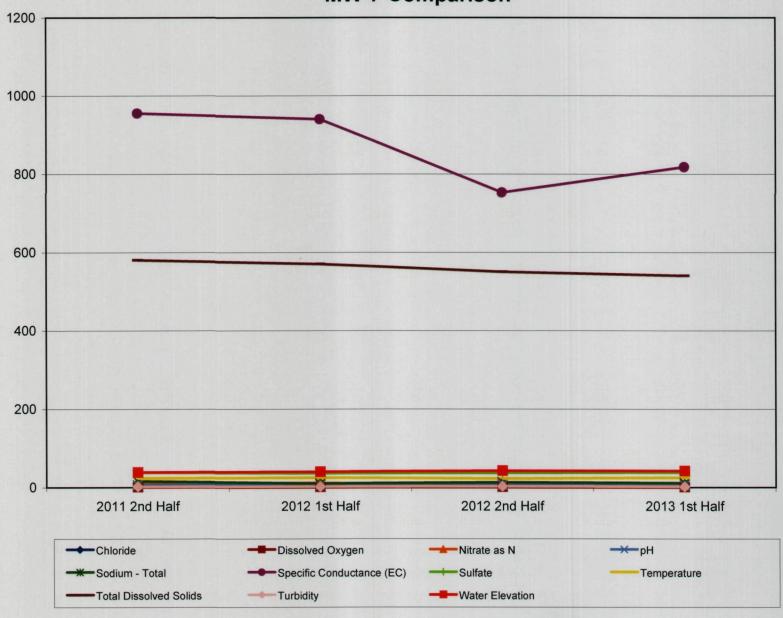
MW-5 Comparison

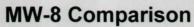


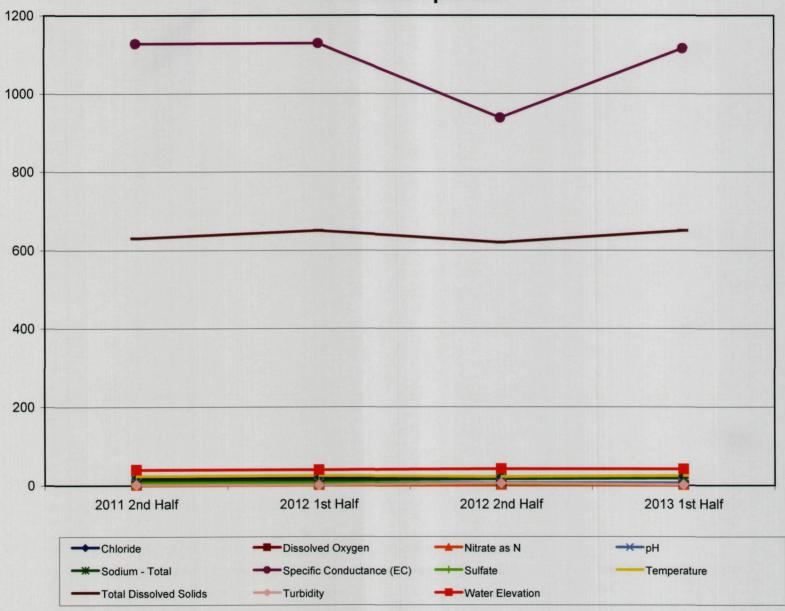
MW-6 Comparison



MW-7 Comparison







MW-9S Comparison

