2010 ANNUAL REMEDIAL ACTION GROUNDWATER MONITORING REPORT ORMET CORPORATION SUPERFUND SITE

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TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

2010 ANNUAL REMEDIAL ACTION
GROUNDWATER MONITORING REPORT
ORMET CORPORATION SUPERFUND SITE
HANNIBAL, OHIO

BACKGROUND

Under the terms of a Consent Decree entered on December 18, 1995, and modified on March 11,2009, between the United States Environmental Protection Agency (USEPA) and the Ormet Primary Aluminum Corporation (Ormet), Ormet has undertaken Remedial Action (RA) at their Hannibal, Ohio Superfund site consisting of the following:

- Containment of the plume in the alluvial aquifer by pumping of groundwater at the Reduction Plant;
- Installation and operation of a soil-flushing system in the Former Spent Potliner Storage Area (FSPSA);
- Capping of the former construction material scrap dump (CMSD) with a multi-layer cap, including construction of a TSCA-compliant cell within the CMSD for disposal of backwater area sediment containing PCBs;
- Installation of a drain system along the toe of the former CMSD to collect seeps, with treatment of the collected seep water using activated carbon followed by treatment at the groundwater treatment plant;
- Excavation of carbon material from the former carbon runoff and deposition area and disposal of the material in the former CMSD;
- Excavation of sediment from the former Outfall 004 backwater area and disposal of the sediment in the CMSD; and
- Relocation of the Outfall 004 channel.

Areas of the site that were subject to remedial action are shown on Figure 1.

Remedial construction was initiated in April 1997 and was certified complete in August 1998. During the period from August 1998 through October 1998, the FSPSA soil-flushing system was operated on a trial basis, with flushing for a period of approximately three

hours per day. Beginning in April 1999, the soil-flushing system began full operation (i.e., flushing for eight hours per day). To reduce ponding of water that occurred over a portion of the FSPSA, the flushing schedule was modified during 2001. Under the modified schedule, the flushing system is on for 1.5 hours and off for 0.75 hours for about 14 hours each day. The flushing system is not operated during winter months when the ground may be frozen and freezing of the lines could occur, typically from November through March.

As specified in the Statement of Work (SOW) attached to the Consent Decree, Ormet began a program of routine groundwater monitoring in conjunction with the completion of remedial construction. The purpose of groundwater monitoring is to document and evaluate changes in the groundwater condition beneath the site associated with the remedial actions. To provide a baseline characterization of groundwater conditions prior to remedial activities, a sitewide groundwater monitoring event was conducted during May 5 to 9, 1997. Routine groundwater monitoring was initiated in May 1998, in accordance with the Remedial Action Groundwater Monitoring Plan (Revision 1 - April 28, 1997) that was submitted to the USEPA during Remedial Design.

SUMMARY OF GROUNDWATER MONITORING PROGRAM

The current system of groundwater monitoring wells and piezometers at the Ormet site is shown on Figure 1. Under the RA Groundwater Monitoring Plan, monitoring is conducted three times per year (approximately once every four months). During 2010, the first monitoring event was performed on January 26 and 27, the second from July 20 through 22, and the third on November 17 and 18.

Each monitoring event included measurement of water-level elevations at MW- and TH-series monitoring wells, PPB-series piezometers monitoring the alluvial aquifer, and Ohio River pool measuring points RP-1 and RP-2. Water-level elevation data collected in conjunction with the 2010 monitoring events are provided in Tables 1, 2, and 3, respectively, and a groundwater contour map based on July 2010 data is provided as Figure 2.

During each monitoring event, groundwater samples were collected from the following wells located within and downgradient of the FSPSA, and immediately downgradient of the CMSD (the latter wells denoted by "*"):

MW - 2	MW - 32
MW - 5	MW - 35
MW - 12*	MW - 36
MW - 16	MW - 37
MW - 18	MW - 39S
MW - 28	MW - 44S*
MW - 31	MW - 44D*

With the exception of MW-39S, these wells were identified in the RA Groundwater Monitoring Plan as Points of Compliance, as required under Section II.6. of the Consent Decree SOW. MW-39S was later added at the request of USEPA.

The RA Groundwater Monitoring Plan specifies that one monitoring event each year is to be an expanded monitoring event that includes sampling of selected wells not hydraulically downgradient from the potential source areas at the site (i.e., background wells) and additional wells located within and proximate to the plume. These wells include the following:

MW-1	MW-19 (background)
MW-7 (background)	MW-29S & D
MW-8	MW-30
MW-10	MW-34S & D
MW-11	MW-39D
MW-14	MW-40S & D
MW-15	MW-42S & D
MW-17	

Water Sampling Log forms for each of the three monitoring events conducted during 2010 are provided in Appendix A.

The primary purpose of the annual expanded monitoring event is to collect data to prepare plume isopleth maps. The isopleth maps are then used to estimate contaminant mass-in-place and the total area of the aquifer having fluoride concentrations greater than 4.0 mg/L and total cyanide concentrations greater than 0.2 mg/L. These estimates are then compared to previous year's estimates to document changes in groundwater quality during the remediation program.

Groundwater samples from all monitoring wells except MW-44S and MW-44D are analyzed for constituents for which cleanup goals were specified in the Record of Decision (ROD) for the site; i.e., arsenic, beryllium, cyanide, manganese, vanadium, and fluoride. Samples are also analyzed for pH, specific conductance, and sodium, which are additional indicators of the plume in the alluvial aquifer. Samples from MW-12 are also analyzed for PCBs, and samples from wells MW-44S and MW-44D are analyzed for PCBs only. Tetrachloroethene (PCE) is analyzed in samples from the MW-2, MW-5, MW-18, MW-30, and MW-31 monitoring wells, in which PCE was detected during the Remedial Investigation (RI).

Analyses of groundwater samples collected during the January 2010 monitoring event were performed by Pace Analytical Services, Inc. of Export, PA, and analyses of samples collected during the July and November monitoring events were performed by Microbac Laboratories, Inc. of Marietta, Ohio. The parameters analyzed and their corresponding groundwater clean-up goals are listed below.

Analytical Parameter	Groundwater Clean-Up Goal (mg/L)
Arsenic	0.01*
Beryllium	0.004
Manganese	0.23*
Vanadium	0.26
Cyanide (total)	N/A
Cyanide (amenable)	0.2
Fluoride	4
PCBs	N/A
Tetrachloroethene	0.005
pH	N/A
Specific Conductance	N/A
Sodium	N/A

N/A - Not Applicable

* - Final determination of cleanup goals for arsenic and manganese are pending. The USEPA and Ormet negotiated a Consent Decree and associated Statement of Work for implementation of the ROD. Because arsenic and manganese are common groundwater constituents in the Ohio River Valley and can occur naturally at concentrations above the cleanup goals presented in the ROD, the SOW specified that as part of the Remedial Design process, Ormet would conduct a statistical evaluation to determine background levels of arsenic and manganese in the alluvial aquifer. The resulting background levels would then be considered for use as cleanup goals in place of the levels presented in the ROD. The results of the statistical analyses, which were presented to USEPA in the August 28, 1996 HydroSystems Management, Inc. report titled, "Statistical Analyses of Background Levels of Manganese and Arsenic in Ground Water", indicated background levels of 40 ug/L for arsenic and 9,780 ug/L for manganese.

Laboratory data reports for the 2010 groundwater analyses are provided in Appendix B, and the analytical results are summarized in Table 4 and Table 6 (PCBs). For purposes of comparison, Table 4 also includes historical results for the parameters and wells being monitored. The data validation summary report for the 2010 analyses is provided in Appendix C.

RESULTS OF 2010 REMEDIAL ACTION GROUNDWATER MONITORING

GROUNDWATER FLOW

Water-level elevation data collected during the July 2010 monitoring event (Table 2) were used to construct the groundwater contour map presented as Figure 2. The groundwater elevation contours and associated groundwater flow patterns shown in Figure 2 are consistent with those previously mapped. As shown, the groundwater pumping component of the site remedy is effective in containing the plume in the alluvial aquifer beneath the Ormet Reduction Plant property. Groundwater flow in the alluvial aquifer is generally from northeast to southwest, toward the Ormet Reduction Plant Ranney well. Under the pumping conditions that exist at the Reduction Plant, a primary source of recharge to the alluvial aquifer is by inflow from the Ohio River.

Pumping of the former Ormet Rolling Mill Ranney well (located about 2000 feet west of the Reduction Plant Ranney well) was discontinued in late 2005 and the well was abandoned by Reynolds, Inc. of Middletown, Ohio in June 2009. By this change, the groundwater divide that in previous years existed roughly parallel to and west of the fenceline separating the two plants is no longer present in 2010, and groundwater beneath the former Rolling Mill property is now drawn toward the Reduction Plant Ranney well (see Figure 2).

GROUNDWATER QUALITY

Cleanup Goals

The following table compares the cleanup goals specified in the ROD and, in the case of arsenic and manganese, the background values calculated by HMI, with the most recent (i.e., November 2010) concentrations reported for samples collected from the compliance wells.

COMPARISON OF LATEST REPORTED CONCENTRATION TO CLEANUP GOALS/BACKGROUND(1)

	Amenable Cyanide	Arsenic	Beryllium	Manganese	Vanadium	Fluoride
Cleanup Goal/Background (mg/L)	0.2	0.01/ 0.04(1)	0.004	0.23/ 9.8(1)	0.26	4.0
Wells within FSPSA						
MW - 32	+	o	*	o	*	+
MW - 35	+	o	*	o	*	*
MW - 36	+	*	*	*	*	+
MW - 37	+	*	*	*	*	*
Downgradient Edge of FSPSA						
MW - 16	+	o	*	o	*	+
MW - 18	+	x	*	*	*	+
MW - 28	+	*	*	*	*	*
MW - 31	+	o	*	o	*	+
Mid-Plant Area						
MW - 2	+	o	*	o	*	+
MW - 5	+	*	*	o	*	+
Downgradient of CMSD						
MW - 12	*	*	*	o	*	*

* - Latest result at or below ROD cleanup goal.

0 - Latest result is above ROD cleanup goal, but below calculated background (arsenic and manganese only).

+ - Latest result is above ROD cleanup goal.

X – Latest result is above calculated background (arsenic and manganese only).

(1) Background values calculated by HMI (August, 1996). Arsenic background = 0.04 mg/L; manganese background = 9.78 mg/L.

Concentration vs. Time Trends

To evaluate changes in plume concentrations within the alluvial aquifer beneath the Ormet site, recent and historical results are used to prepare concentration versus time graphs for each monitoring parameter for which a cleanup goal was established in the ROD, with each parameter being graphed separately for each of the compliance point wells identified in the RA Groundwater Monitoring Plan (see Appendix D). Analytical results for sodium are also graphed, because it is an additional indicator of the plume.

Discussions of the concentration versus time trends for each parameter focus mainly on data collected since the pre-remediation monitoring event performed in 1997. In viewing the concentration versus time graphs, it should be noted that the construction and operation of the soil flushing system in the FSPSA altered site water-quality conditions for certain parameters (e.g., cyanide, fluoride) at certain wells. Construction activities (1997 to 1998) involved grading to establish desired surface slopes and trenching to install underground piping to route water to spray birds, both of which loosened the upper soil profile and predictably made contaminants present in the soil matrix more available to leaching. Operation of soil flushing (pilot tested in 1998 and fully operational in 1999) was specifically designed to accelerate the rate at which contaminants were leached from the soil to the ground water. The net result observed for certain wells was an initial increase in concentrations roughly corresponding to construction and operation of soil flushing, generally followed by a gradual decrease.

Cyanide

The cleanup goal for cyanide established in the ROD (0.2 mg/L) is the Safe Drinking Water Act Maximum Contaminant Level (MCL) for cyanide amenable to chlorination. Cyanide amenable to chlorination is that portion of total cyanide existing as free cyanide, cyanide salts, and weakly bound cyanide complexes apt to contribute to free cyanide. Cyanide amenable to chlorination is a more reactive form of cyanide than the more strongly bound metal-cyanide complexes (e.g., iron cyanide). Based on historical sampling results (Table 4), the form of

cyanide occurring in the groundwater beneath the Ormet site appears to be predominantly the more stable cyanide complexes, as the concentration of amenable or free cyanide reported for a given sample is typically much lower than the total cyanide concentration.

Concentration versus time graphs for total cyanide and amenable cyanide are presented in Appendix D-1 and D-2, respectively. Concentrations reported for amenable cyanide exhibit a substantial degree of analytical variability, in some cases several orders of magnitude difference in concentration from one monitoring event to the next and, in certain sample sets, amenable cyanide concentrations reported to equal total cyanide concentrations (Table 4). This variability is credited to the analytical method for determining cyanide amenable to chlorination (e.g., chlorination/oxidation of the sample followed by dechlorination, sample matrix interferences, lab failure to fully dechlorinate), and is not regarded to reflect actual changes in groundwater quality.

To verify the overall indication of historical data showing low concentrations of amenable cyanide relative to total cyanide, the November 2010 monitoring event included analysis for weak-acid dissociable (WAD) cyanide, which also quantifies concentrations of cyanide species including free cyanide, cyanide salts, and cyanide complexes apt to contribute to free cyanide. The comparison of results reported for total cyanide, amenable cyanide, and WAD cyanide presented in Table 5 indicates that the overall historical trend of amenable cyanide concentrations substantially lower than total cyanide concentrations is representative of the actual groundwater condition. Ormet will continue to include WAD cyanide in the analysis of groundwater samples collected during 2011 monitoring events.

For total cyanide concentration versus time trends (Appendix D-1), following increased concentrations in response to soil flushing, a trend of decreasing concentrations is apparent at compliance wells MW-2, MW-16, MW-18, MW-28, MW-31 and MW-37. At wells MW-5 and to a lesser extent MW-32, a trend of increasing total cyanide concentrations was observed but, at both wells, concentrations appear to have stabilized and begun to decrease in recent years. At MW-35 concentrations show a decreasing trend in recent years and at MW-36 no discernable trend in total cyanide concentrations is apparent. At MW-12 concentrations have typically been below detection limits. Overall, the total cyanide concentration data indicate that

soil flushing within the FSPSA, and/or the excavation/rearrangement of shallow soil during installation of the soil-flushing system, caused initial increases in leachate generation and groundwater concentrations, but, at most of the wells exhibiting these effects, there has been a subsequent decline.

Fluoride

Of the main plume indicators, fluoride is less prone to analytical variability than cyanide, and is potentially a more reliable/consistent indicator of changes in plume quality. *Concentration versus time graphs for fluoride for each of the compliance wells are provided in* Appendix D-3.

Fluoride concentrations have consistently been below the cleanup goal of 4 mg/L at compliance wells MW-12 and MW-28. Recently, fluoride concentrations have also typically been below the cleanup goal at MW-37. Following increases in fluoride concentrations attributed to soil flushing, a general decreasing concentration trend is observed at compliance wells MW-2, MW-16, MW-18, MW-31, MW-35, MW-36 and MW-37. At MW-5 and MW-32 increased concentrations of fluoride following soil flushing persisted longer than at other wells, and in recent years have stabilized.

Arsenic

Concentration versus time graphs for arsenic for each of the compliance point wells are provided in Appendix D-4. At wells MW-5, MW-12 and MW-28, concentrations of arsenic reported since 1997 have consistently been below the clean-up goal of 0.01 mg/L listed in the ROD, and at MW-36 and MW-37 concentrations reported since mid 2006 have typically been below the 0.01 mg/L clean-up goal. At MW-35, reported arsenic concentrations, though commonly exceeding the ROD-specified cleanup goal, have typically been below the calculated background value (i.e., $\leq$ 0.04 mg/L) during recent years. Data for wells MW-2, MW-18, MW-31, MW-36 and MW-37 show a general trend of decreasing concentrations, and data for MW-35 exhibit no consistent trend. At MW-16 and MW-32, arsenic concentrations increased relative to

historical values, possibly as a result of soil flushing, but in recent years have shown a downward trend.

As discussed earlier, the final cleanup goal for arsenic is pending. In the ROD, the cleanup goal for arsenic was set at 0.01 mg/L. However, because arsenic is a common constituent of groundwater in the Ohio River Valley for which naturally-occurring concentrations can exceed the cleanup goal presented in the ROD, the SOW specified that as part of the Remedial Design process, Ormet would conduct a statistical evaluation to determine the background level of arsenic in the alluvial aquifer. The resulting background level would then be considered for use as the cleanup goal in place of the level presented in the ROD. The results of the statistical analyses, which were presented to USEPA in the August 28, 1996 HydroSystems Management, Inc. report titled, "Statistical Analyses of Background Levels of Manganese and Arsenic in Ground Water", indicated a background level of 0.04 mg/L for arsenic. At seven of the eleven compliance wells (MW-5, MW-12, MW-16, MW-28, MW-35, MW-36, and MW-37), the recent results were typically below the 0.04 mg/L background level determined for arsenic.

Beryllium

Concentration versus time graphs for beryllium are provided in Appendix D-5. The cleanup goal for beryllium established in the ROD was the MCL, 0.004 mg/L. In all but three of the compliance wells (MW-18, MW-32, MW-37), there has never been a reported detection of beryllium that exceeded the cleanup goal; in some of the earlier samples, the analytical detection limit was higher than 0.004 mg/L. At MW-18, MW-32, and MW-37, detections of beryllium exceeding the cleanup goal have been few and isolated, giving no indication of groundwater quality impacts by this constituent. Beryllium concentrations were consistently below the cleanup goal in all samples from all of the compliance monitoring wells analyzed during each of the 2010 monitoring events.

Manganese

Concentration versus time graphs for manganese are provided in Appendix D-6. Manganese results for MW-28 have consistently been below the ROD-specified cleanup goal of 0.23 mg/L and, in recent samples, also typically below the cleanup goal at MW-36 and MW-37. At MW-2, MW-5, MW-16, MW-18, MW-31, MW-32, MW-35, MW-36, and MW-37, increased manganese concentrations that roughly coincided with soil flushing activities appear to have peaked and have since shown a general decreasing trend.

The final cleanup goal for manganese is pending. In the ROD, the cleanup goal for manganese was set at 0.230 mg/L. Because manganese is a common constituent of groundwater in the Ohio River Valley for which naturally-occurring concentrations can be well above the cleanup goal presented in the ROD, the SOW specified that as part of the Remedial Design process, Ormet would conduct a statistical evaluation to determine the background level of manganese in the alluvial aquifer. The resulting background level would then be considered for use as the cleanup goal in place of the level presented in the ROD. The results of the statistical analyses, which were presented to USEPA in the August 28, 1996 HydroSystems Management, Inc. report titled, "Statistical Analyses of Background Levels of Manganese and Arsenic in Ground Water", indicated a background level of 9.78 mg/L for manganese. Except for a few isolated detections, manganese concentrations have been below the background level at all of the compliance wells during recent and historical monitoring events.

Vanadium

Concentration versus time graphs for vanadium are provided in Appendix D-7. The cleanup goal for vanadium established in the ROD was 0.26 mg/L. With the exception of MW-18 and MW-37, vanadium concentrations have been below the cleanup goal at all compliance wells during all recent and historical monitoring events. For both MW-18 and MW-37, only two of the historically reported vanadium values exceeded the cleanup goal. These data do not indicate any substantive groundwater quality impacts by vanadium.

Tetrachloroethene (PCE)

Under the RA Groundwater Monitoring Plan, analyses for tetrachloroethene (PCE) were performed on samples from the five compliance wells where PCE was detected during the RI; MW-2, MW-5, MW-18, MW-30, and MW-31. Concentration versus time graphs for PCE for these five wells are provided in Appendix D-8. Since the Phase I RI, PCE concentrations have typically been below detection and the ROD-specified cleanup goal of *0.005* mg/L at MW-5 and, in recent samples, also at MW-18. PCE concentrations have shown increases at MW-2 and, to a lesser degree, at MW-30 and MW-31. At all three of these wells the increases appear to have stabilized and, at MW-30, subsequent decreases are apparent.

Sodium

Sodium is not a constituent for which a cleanup goal was specified in the ROD, but has been graphed (Appendix D-9) and is discussed because it is an indicator of changes in the overall condition of the plume. At compliance wells MW-2, MW-18, MW-31, MW-35, MW-36 and MW-37, data collected since 1997 show decreases in sodium concentrations, and at MW-5, MW-12 and MW-28 no clear trend of increasing or decreasing concentrations. At MW-16 and MW-32, sodium concentrations increased in 2001 and 2004, respectively, and have been stable since.

Contaminant Mass-in-Place

In accordance with Section II.3.C. of the Consent Decree SOW, data from the July 2010 expanded monitoring event were used to estimate the masses of fluoride and total cyanide (primary plume indicators) in the alluvial aquifer as a means of documenting changes in overall groundwater quality during the remediation. The procedure used for estimating the mass-in-place was as described in the RD Work Plan and the Hydrosystems Management, Inc. (HMI)

report titled, "Estimation of Dissolved Contaminant Mass in the Alluvial Aquifer, Ormet Primary Aluminum Corporation Superfund Site, Hannibal, Ohio" (August 28, 1996) that was submitted to the USEPA in conjunction with the 30% RD submittal. Results of the mass-in-place estimates for fluoride and cyanide are summarized in Table 7. For comparison, Table 7 also includes fluoride and cyanide mass-in-place estimates based on previous monitoring events. The mass-in-place estimates are based on the fluoride and total cyanide isopleth maps presented as Figures 3 and 4, respectively. Data and supporting calculations for the July 2010 mass-in-place estimates are provided in Appendix E. Data and supporting calculations for the previous mass-in-place estimates were submitted to the USEPA in prior annual reports.

Based on the estimates presented in Table 7, the mass of fluoride in the alluvial aquifer calculated for 1999 (about 30,416 pounds), after the start of full-time soil flushing in the FSPSA, increased by about 6,528 pounds relative to the 1998 value of 23,888 pounds. Between May 1999 and May 2001, the fluoride mass-in-place declined to an estimated 21,741 pounds. From May 2001 to May 2004, the estimated fluoride mass-in-place increased to 38,836 pounds. In 2005 the estimated fluoride mass-in-place decreased slightly to about 37,656 pounds, and in 2006 decreased further to about 32,725 pounds. For 2007, the estimated fluoride mass-in-place increased to about 35,219 pounds, and for 2008 and 2009 decreased to about 33,638 pounds and 29,510 pounds, respectively. For 2010, the estimated fluoride mass-in-place increased to about 37,466 pounds.

Similar to fluoride, the estimated total cyanide mass-in-place calculated for 1999, following the start of full-time soil flushing, increased by about 2,969 pounds relative to 1998 estimates (i.e., 2,597 pounds in 1998 vs. 5,566 pounds in 1999). Between 1999 and 2003, the estimated cyanide mass-in-place showed an overall decreasing trend, to a low of about 2,773 pounds. In 2004, the estimated cyanide mass-in-place increased to about 3,062 pounds, and continued to increase in 2005 (about 4,681 pounds) and 2006 (about 6,615 pounds). For 2007, the estimated total cyanide mass-in-place decreased slightly to about 6,438 pounds, and for 2008 and 2009 continued to decrease to about 5,997 pounds and 5,422 pounds, respectively. For 2010, the estimated total cyanide mass-in-place further decreased to about 3,441 pounds.

To assess the removal of cyanide and fluoride from the alluvial aquifer by pumping of groundwater at the Reduction Plant, the mass removals achieved from January through December 2010 were calculated and compared to changes in the estimated masses in the aquifer over the same period (see Table 8). The masses of cyanide and fluoride removed during 2010 were calculated using analytical data and flow data routinely collected by Ormet for the Reduction Plant pumping centers (i.e., the Ranney well and the interceptor well).

During the period from January through December 2010, approximately 10,436 pounds of fluoride and approximately 1,256 pounds of cyanide were removed from the alluvial aquifer by groundwater pumping. The mass removal of fluoride was about 3,472 pounds higher and of cyanide was about 320 pounds higher than mass removals achieved during 2009. During 2010, the estimated mass of fluoride in the aquifer increased by approximately 7,956 pounds relative to 2009, and the estimated mass of cyanide decreased by approximately 1,981 pounds. That changes in each year's mass removal by groundwater pumping are not mirrored by similar changes in the calculated mass-in-place may be due to one or more of the following types of factors:

- Localized differences in the alluvial aquifer matrix (affecting hydraulic conductivity) and/or differences in hydraulic gradients from one location to the next result in a range of flow velocities (and travel times), that potentially allow certain parts of the plume to travel to the pumping centers more quickly than other parts of the plume (i.e., the aquifer is not being uniformly flushed).

- Increases or decreases in total groundwater pumping rates for a given year directly affect mass removal calculations but, due to the one-year plus flow time from the source area to the pumping centers, have a less direct effect on mass-in-place calculations.

- Certain areas of the plume that are accounted for in the mass-in-place estimates may be subject to relatively limited mobility (for the reasons given above), and do not contribute proportionally to the flux of fluoride and cyanide moving toward the pumping centers.

- Concentration contour area estimates made from the isopleth maps and used in the mass-in-place calculations are strongly influenced by the placement of the contour lines, which is interpretative and will vary from year to year depending on the individual preparing the isopleth maps, analytical variability in the data, and the selection of contour intervals used to map a given data set.

- Natural attenuation of plume constituents within the aquifer matrix, which is likely variable and would be difficult to accurately quantify, may immobilize a portion of the constituent mass accounted for in the mass-in-place calculations.

- Variations in the soil flushing operation (e.g., duration of flushing, volumes of water applied, extent/duration frozen ground), variations in natural precipitation patterns, and differences in infiltration rates from one location to the next may result in relatively complex, non-uniform contaminant distributions that have more effect on the preparation of isopleth maps and calculation of mass-in-place, than on the actual flux of contaminants toward the pumping centers (for all of the reasons listed above).

For these reasons, long-term trends in the calculated mass-in-place and mass removals are more meaningful than year to year variations. Figure 7 shows estimated masses of fluoride and total cyanide in the alluvial aquifer versus time, and Figure 8 shows fluoride and total cyanide mass removal versus time.

Effected Aquifer Areas

As a further check on changes in groundwater quality during the remediation, the approximate areas of the aquifer containing fluoride and total cyanide at concentrations above 4.0 mg/L and 0.2 mg/L, respectively, were estimated using analytical results from the July 2010 sampling event. The results are summarized in Table 7. The estimates of aquifer areas are based on the fluoride and total cyanide isopleth maps shown as Figures 3 and 4, respectively. For

comparison, Table 7 also includes previous year's estimates of the aquifer areas containing fluoride and total cyanide concentrations above 4.0 mg/L and 0.2 mg/L, respectively.

As shown in Table 7, the area of the alluvial aquifer containing fluoride above 4.0 mg/L has been relatively consistent since 1997, ranging from 36.9 acres to 45.4 acres. For 2010, the aquifer area with fluoride concentrations above 4.0 mg/L was slightly higher than the historical range, at about 47.5 acres.

A gradual increase in the area of the aquifer with concentrations of total cyanide above 0.2 mg/L has been apparent since 1999, increasing from 27.5 acres in 1999 to 51.5 acres in 2010. Soil flushing in the FSPSA is the probable cause of the increased area of aquifer containing total cyanide above 0.2 mg/L.

As discussed previously, historical analytical results for total cyanide and cyanide amenable to chlorination indicate that the form of cyanide occurring in the groundwater beneath the Ormet site is predominantly the relatively stable cyanide complexes. This interpretation is supported by analysis of weak acid dissociable (WAD) cyanide on groundwater samples collected during the November 2010 sampling event. As shown on Table 5, WAD cyanide results are consistently substantially lower than the total cyanide results for a given sample. Given the degree of analytical variability that has been observed for the amenable cyanide analyses over past years, WAD cyanide is regarded to be a more reliable indicator of free cyanide and weak cyanide complexes that are potential contributors to free cyanide. Analyses for WAD cyanide in addition to total cyanide and amenable cyanide will continue to be performed during 2011 monitoring events.

Analytical Results for PCBs

During each of the three 2010 sampling events, groundwater samples from monitoring wells MW-12, MW-44S, and MW-44D were analyzed for PCBs. Analytical results for these samples, and all previous samples (i.e., since 2002) reported no detections of PCBs (see Table 6). These data give no indication of groundwater quality impacts by PCBs.

SUMMARY/CONCLUSIONS

- Pumping of ground water at the Ormet Reduction Plant continues to provide containment of the plume beneath the Ormet property and removes contaminant mass from the alluvial aquifer. Along the river/plant boundary, the flow of ground water continues to be from the river to the aquifer.

- Pumping of groundwater removed approximately 10,436 pounds of fluoride and approximately 1,256 pounds of cyanide from the alluvial aquifer during the period from January through December 2010. During the same period, the estimated mass of fluoride in the aquifer increased by about 7,956 pounds relative to 2009, and the estimated mass of cyanide in the aquifer decreased by about 1,981 pounds.

- Between 2009 and 2010, the estimated area of the alluvial aquifer with fluoride concentrations above 4.0 mg/L increased by about 13.9% and the estimated area of the aquifer with total cyanide concentrations above the 0.2 mg/L increased by about 3.0%.

- Reductions in contaminant mass-in-place were occurring prior to the completion of Remedial Construction and full-time operation of the FSPSA soil-flushing system. These decreases are attributed to the passage of time and natural flushing by infiltrating precipitation, and to operations and changes in waste management practices undertaken by Ormet prior to the Superfund project, including pumping of groundwater that removes contaminant mass and discontinued use of the disposal ponds and the spent potliner storage area. Increases in the fluoride and cyanide mass-in-place since initiation of soil flushing are attributed to the flushing itself, and also the excavation/ rearrangement of shallow soil during the installation of the flushing system.

- Analyses of groundwater samples for PCBs during 2010 and previous monitoring events reported no detections of PCBs. These data give no indication of groundwater quality impacts by PCBs.

- Analyses of WAD cyanide during the November 2010 monitoring event suggest that WAD cyanide is a more reliable indicator and less subject to analytical variability than analyses for cyanide amenable to chlorination.

TABLE 1
WATER-LEVEL ELEVATION DATA
ORMET CORPORATION
HANNIBAL, OHIO
DATE: JANUARY 26, 2010

WATER-LEVEL MEASURING POINT	MEASURING POINT ELEVATION (ft. MSL)	DEPTH TO WATER (feet)	GROUND-WATER ELEVATION (ft. MSL)
MW-1	667.80	47.62	620.18
MW-2	667.52	48.34	619.18
MW-3	645.17	22.64	622.53
MW-4	661.07	43.94	617.13
MW-5	668.16	50.67	617.49
MW-7	667.94	49.70	618.24
MW-8	667.71	52.07	615.64
MW-9	666.59	50.22	616.37
MW-10	667.16	51.39	615.77
MW-11	667.31	50.10	617.21
MW-12	635.82	15.15	620.67
MW-13	661.44	37.85	623.59
MW-14	653.59	31.52	622.07
MW-15	657.31	34.03	623.28
MW-16	662.72	41.31	621.41
MW-17	655.03	32.33	622.70
MW-18	660.91	37.91	623.00
MW-19	662.03	38.30	623.73
MW-20	632.79	9.15	623.64
MW-21s	663.47	47.38	616.09
MW-21d	663.60	46.98	616.62
MW-22s	667.47	51.03	616.44
MW-22d	667.21	50.80	616.41
MW-23s	663.18	46.33	616.85
MW-23d	663.41	46.67	616.74
MW-24s	667.88	51.85	616.03
MW-24d	667.75	51.73	616.02
MW-25	667.30	51.05	616.25
MW-26s	665.54		
MW-26d	665.59		
MW-27	667.31	51.06	616.25
MW-28	663.27	23.25	640.02
MW-29s	653.40	32.14	621.26
MW-29d	653.07	31.84	621.23
MW-30	667.58	45.11	622.47
MW-31	661.59	39.76	621.83
MW-32	656.12	34.23	621.89
MW-34s	655.67	33.49	622.18
MW-34d	654.67	31.42	623.25
MW-35	661.90	36.05	625.85
MW-36	655.14	33.85	621.29
MW-37	661.14	23.77	637.37
MW-38	666.64	20.99	645.65
MW-39s	657.30	34.99	622.31
MW-39d	657.18	34.80	622.38
MW-40s	663.90	44.55	619.35
MW-40d	663.75	44.44	619.31

TABLE 1 (cont.)
WATER-LEVEL ELEVATION DATA
ORMET CORPORATION
HANNIBAL, OHIO
DATE: JANUARY 26, 2010

WATER-LEVEL MEASURING POINT	MEASURING POINT ELEVATION (ft. MSL)	DEPTH TO WATER (feet)	GROUND-WATER ELEVATION (ft. MSL)
MW-41	637.67		
MW-42s	654.37	33.02	621.35
MW-42d	654.34	32.92	621.42
MW-44s	662.01	42.13	619.88
MW-44d	661.76	42.65	619.11
PPB-01*	663.24		
PPB-02s*	663.14		
PPB-02d+	662.78	39.75	623.03
PPB-04+	661.57		
PPB-05*	661.62		
PPB-06+	663.04		
PPB-07*	661.71		
PPB-09+	664.30	40.45	623.85
PPB-10*	663.45		
PPB-14*	660.64		
TH-3	667.81	48.47	619.34
TH-10	658.17	34.55	623.62
TH-11	659.08	35.37	623.71
TH-15	663.62	47.45	616.17
TH-16	664.62	48.05	616.57
TH-17	663.93	47.22	616.71
RP-1	643.17	18.73	624.44
RP-2	643.05	19.05	624.00

NOTE:

All MW-series wells are measured from the top of the PVC casing.
All TH-series wells are measured from the top of steel casing.
River pool measuring point RP-2 is located on the walkway below the dry scrubbers and RP-1 is located on the walkway at the barge unloading dock.

* - Designates a perched zone piezometer
+ - Designates an alluvial aquifer piezometer.
NM = Not measured.

TABLE 2
WATER-LEVEL ELEVATION DATA
ORMET CORPORATION
HANNIBAL, OHIO
DATE: JULY 20, 2010

WATER-LEVEL MEASURING POINT	MEASURING POINT ELEVATION (ft. MSL)	DEPTH TO WATER (feet)	GROUND-WATER ELEVATION (ft. MSL)
MW-1	667.80	45.02	622.78
MW-2	667.52	45.55	621.97
MW-3	645.17	21.83	623.34
MW-4	661.07	40.63	620.44
MW-5	668.16	47.36	620.80
MW-7	667.94	46.55	621.39
MW-8	667.71	48.47	619.24
MW-9	666.59	46.68	619.91
MW-10	667.16	47.76	619.40
MW-11	667.31	46.76	620.55
MW-12	635.82	12.97	622.85
MW-13	661.44	37.02	624.42
MW-14	653.59	29.53	624.06
MW-15	657.31	31.62	625.69
MW-16	662.72	38.91	623.81
MW-17	655.03	30.07	624.96
MW-18	660.91	35.40	625.51
MW-19	662.03	36.95	625.08
MW-20	632.79	8.52	624.27
MW-21s	663.47	43.87	619.60
MW-21d	663.60	43.46	620.14
MW-22s	667.47	47.48	619.99
MW-22d	667.21	47.24	619.97
MW-23s	663.18	42.89	620.29
MW-23d	663.41	43.20	620.21
MW-24s	667.88	48.23	619.65
MW-24d	667.75	48.14	619.61
MW-25	667.30	47.52	619.78
MW-26s	665.54		
MW-26d	665.59		
MW-27	667.31	47.55	619.76
MW-28	663.27	20.72	642.55
MW-29s	653.40	29.80	623.60
MW-29d	653.07	29.50	623.57
MW-30	667.58	42.80	624.78
MW-31	661.59	37.23	624.36
MW-32	656.12	31.48	624.64
MW-34s	655.67	31.10	624.57
MW-34d	654.67	29.62	625.05
MW-35	661.90	33.70	628.20
MW-36	655.14	30.98	624.16
MW-37	661.14	19.35	641.79
MW-38	666.64	19.50	647.14
MW-39s	657.30	32.78	624.52
MW-39d	657.18	32.71	624.47
MW-40s	663.90	41.89	622.01
MW-40d	663.75	41.80	621.95

TABLE 2 (cont.)
WATER-LEVEL ELEVATION DATA
ORMET CORPORATION
HANNIBAL, OHIO
DATE: JULY 20, 2010

WATER-LEVEL MEASURING POINT	MEASURING POINT ELEVATION (ft. MSL)	DEPTH TO WATER (feet)	GROUND-WATER ELEVATION (ft. MSL)
MW-41	637.67		
MW-42s	654.37	30.82	623.55
MW-42d	654.34	30.78	623.56
MW-44s	662.01	39.47	622.54
MW-44d	661.76	40.03	621.73
PPB-01*	663.24		
PPB-02s*	663.14		
PPB-02d+	662.78	38.04	624.74
PPB-04+	661.57		
PPB-05*	661.62		
PPB-06+	663.04		
PPB-07*	661.71		
PPB-09+	664.30	39.07	625.23
PPB-10*	663.45		
PPB-14*	660.64		
TH-3	667.81	45.69	622.12
TH-10	658.17	32.59	625.58
TH-11	659.08	32.97	626.11
TH-15	663.62	43.88	619.74
TH-16	664.62	44.55	620.07
TH-17	663.93	43.72	620.21
RP-1	643.17	19.12	624.05
RP-2	643.05	18.90	624.15

NOTE:

All MW-series wells are measured from the top of the PVC casing.
All TH-series wells are measured from the top of steel casing.
River pool measuring point RP-2 is located on the walkway below the dry scrubbers and RP-1 is located on the walkway at the barge unloading dock.

* - Designates a perched zone piezometer
+ - Designates an alluvial aquifer piezometer.
NM = Not measured.

TABLE 3
WATER-LEVEL ELEVATION DATA
ORMET CORPORATION
HANNIBAL, OHIO
DATE: NOVEMBER 17, 2010

WATER-LEVEL MEASURING POINT	MEASURING POINT ELEVATION (ft. MSL)	DEPTH TO WATER (feet)	GROUND-WATER ELEVATION (ft. MSL)
MW-1	667.80	45.77	622.03
MW-2	667.52	46.52	621.00
MW-3	645.17	22.46	622.71
MW-4	661.07	41.92	619.15
MW-5	668.16	48.61	619.55
MW-7	667.94	47.81	620.13
MW-8	667.71	49.89	617.82
MW-9	666.59	47.80	618.79
MW-10	667.16	49.09	618.07
MW-11	667.31	48.04	619.27
MW-12	635.82	13.89	621.93
MW-13	661.44	37.49	623.95
MW-14	653.59	30.43	623.16
MW-15	657.31	33.04	624.27
MW-16	662.72	39.90	622.82
MW-17	655.03	31.32	623.71
MW-18	660.91	36.58	624.33
MW-19	662.03	37.82	624.21
MW-20	632.79	9.17	623.62
MW-21s	663.47	44.85	618.62
MW-21d	663.60	44.46	619.14
MW-22s	667.47	48.55	618.92
MW-22d	667.21	48.31	618.90
MW-23s	663.18	43.73	619.45
MW-23d	663.41	44.08	619.33
MW-24s	667.88	49.46	618.42
MW-24d	667.75	49.35	618.40
MW-25	667.30	48.50	618.80
MW-26s	665.54		
MW-26d	665.59		
MW-27	667.31	48.62	618.69
MW-28	663.27	22.71	640.56
MW-29s	653.40	30.80	622.60
MW-29d	653.07	30.51	622.56
MW-30	667.58	43.40	624.18
MW-31	661.59	38.29	623.30
MW-32	656.12	32.92	623.20
MW-34s	655.67	32.49	623.18
MW-34d	654.67	30.73	623.94
MW-35	661.90	35.33	626.57
MW-36	655.14	32.70	622.44
MW-37	661.14	21.85	639.29
MW-38	666.64	20.80	645.84
MW-39s	657.30	33.83	623.47
MW-39d	657.18	33.73	623.45
MW-40s	663.90	42.92	620.98
MW-40d	663.75	42.82	620.93

TABLE 3 (cont.)
WATER-LEVEL ELEVATION DATA
ORMET CORPORATION
HANNIBAL, OHIO
DATE: NOVEMBER 17, 2010

WATER-LEVEL MEASURING POINT	MEASURING POINT ELEVATION (ft. MSL)	DEPTH TO WATER (feet)	GROUND-WATER ELEVATION (ft. MSL)
MW-41	637.67		
MW-42s	654.37	31.80	622.57
MW-42d	654.34	31.72	622.62
MW-44s	662.01	40.51	621.50
MW-44d	661.76	41.10	620.66
PPB-01*	663.24		
PPB-02s*	663.14		
PPB-02d+	662.78	39.05	623.73
PPB-04+	661.57		
PPB-05*	661.62		
PPB-06+	663.04		
PPB-07*	661.71		
PPB-09+	664.30	40.41	623.89
PPB-10*	663.45		
PPB-14*	660.64		
TH-3	667.81	46.80	621.01
TH-10	658.17	33.05	625.12
TH-11	659.08	34.25	624.83
TH-15	663.62	45.15	618.47
TH-16	664.62	45.60	619.02
TH-17	663.93		
RP-1	643.17	19.25	623.92
RP-2	643.05	19.00	624.05

NOTE:

All MW-series wells are measured from the top of the PVC casing.
All TH-series wells are measured from the top of steel casing.
River pool measuring point RP-2 is located on the walkway below the dry scrubbers and RP-1 is located on the walkway at the barge unloading dock.

* - Designates a perched zone piezometer
+ - Designates an alluvial aquifer piezometer.
NM = Not measured.

TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-1															
12/83	6.4	6.0	270	210	0.018	0.014		0.1			0.04	0.65	14.2		
2/84	6.1	6.1	270	215	0.04			0.1			0.01	0.54	14.9		
9/84	6.1	5.7	195	210	<0.01	<0.01		<0.2			0.02	0.33	13.8		
5/85	6.4	6.0	200	210	0.13	0.13		<0.2			0.04	0.15	16.2		
6/88	6.2	6.4	670	540	<0.01		<0.01	0.2	0.0024	<0.0015	6.21	0.379	20.3	0.006	
1/95	6.2	4.7	370	550	0.02		<0.01	0.1	<0.004	<0.01	<0.04	0.39	21	<0.01	
5/97	5.9	6.32	470	385	<0.01			0.1	<0.004	<0.0005		0.13	19	<0.01	
5/98	6.01	5.65	480	505	<0.01			0.20	<0.004	<0.0005		0.10	20	<0.01	
5/01	5.95	6.35	450	392	<0.01			0.13	<0.004	<0.0005		0.098	19	<0.01	
5/02	6.62	6.76	470	343	<0.01			0.67	<0.004	<0.0005		0.0298	24.6	<0.01	
5/03	6.32	6.39	570	416	<0.01			0.25	<0.004	<0.0005		0.048	24	<0.01	
5/04	6.66	6.46	690	701	<0.01			2.1	<0.004	<0.0005		0.47	50	<0.01	
5/05	6.66	6.46	660	591	<0.01			1.8 J	<0.004	<0.0005		0.40	47	<0.01	
5/06	6.87	6.75	800	650	<0.01			<2.0B	<0.004	<0.0005		0.43	46	<0.01	
5/07	6.61	6.52	660	516	<0.01			1.1	<0.004	<0.0005		0.66	49	<0.01	
6/08	6.29		590	360	<0.01			0.5	<0.004	<0.0005		0.43	40	<0.01	
5/09	6.0	6.16	562	551	0.09		0.087	0.26	<0.0050	<0.0010		0.47	51.2	<0.0050	
7/10	5.94	6.42	603	506	<0.0050		<0.0050	0.116	<0.0005	<0.0005		0.759	38.6	<0.0050	

Note: All results in mg/L unless otherwise noted. J = One or more quality control criteria not met. Value considered estimated.

TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-2															
12/83	10.3	10.3	6,000	6,000	56.0	0.27		400			55.2	1.98	1,950		
2/84	10.3	10.3	7,752	2,750	48.0			420			58	2.46	2,290		
9/84	10.5	9.9	6,308	6,900	40.8	0.095		480			59.3	2.1	2,460		
5/85	10.4	10.4	13,200	5,800	95	0.10		400			54.0	1.74	2150		
10/85	10.5		7,100		140	12		390		<0.01	54.0	1.82	2,060		
7/88	10.4	10.4	6,200	6,000	22		12	330	0.394	<0.0015	34.2	1.00	1,450	0.251	0.011
2/90	10.34	10.2	4,800	3,900	36.2		29.6	200			31.0		1,200		
1/95	10.0	9.6	2,400	>2,000	7.1		<0.01	93	0.085	<0.01	8.6	0.82	520	0.09	
5/97	10.1	10.07	2,100	1,865	17		<1.0	63	0.092	0.001		1	470	0.06	0.008
5/98	9.98	10.24	1,900	1,880	13		<0.01	68	0.082	0.001		0.93	450	0.06	0.0053
9/98	9.96	9.96	1,900	1,991	21		0.30	69	0.086	0.00089		0.90	440	0.051	<0.005
1/99	9.98	10.27	2,000	2,000	21		5.3	65	0.085	0.00064		1.1	440	0.054	<0.005
1/99 (Dup.)	9.98	10.27	1,900	2,000	22		<0.1	66	0.087	0.00064		1.0	440	0.053	<0.005
5/99	10.1	9.94	1,900	1,940	25		3.5	67	0.095	0.00088		0.96	400	0.046	<0.005
9/99	9.88	10.60	1,600	1,830	22		2.6	59	0.077	<0.0005		0.85	430	0.032	<0.005
9/99 (Dup.)	9.88	10.60	1,900	1,830	22		2.5	60	0.079	<0.0005		0.95	460	0.039	<0.005
1/00	9.88	9.65	2,000	1,825	23		2.4	66	0.086	0.0006		0.99	360	0.041	<0.005
5/00	9.92	9.84	2,000	1,863	18		<0.5	66	0.0809	0.00075	13	1.0	430	0.045	<0.005
5/00 (Dup.)	9.97	9.84	1,900	1,863	18		11	67	0.081	0.00076	13	1.1	410	0.045	<0.005
10/00	9.92	9.95	1,800	1,518	17		0.73	61	0.077	0.00051		1.0	270	0.039	<0.005
1/01	9.91	11.34	1,900	1,708	18		3.4	68	0.082	0.00073		1.1	450	0.045	<0.005
5/01	9.88	10.66	1,900	1,621	15		13	67	0.087	0.00078		0.96	360	0.048	<0.005
5/01 (Dup.)	9.87	10.66	1,800	1,621	15		15	68	0.076	0.00071		0.89	360	0.045	<0.005
9/01	9.80	10.14	1,800	1,635	17		2.5	63	0.089	0.00088		1.1	400	0.056	<0.005
1/02	9.90	10.10	2,000	1,767	16		2.7	58	0.0858	0.000866		0.998	354	0.0531	<0.005
5/02	9.91	9.99	1,700	1,458	15		2.1	63	0.103	0.000873		0.845	347	0.0489	<0.005
5/02 (Dup.)	9.90	9.99	1,800	1,458	15		<0.50	66	0.107	0.000980		0.870	368	0.0531	<0.005
9/02	9.73	10.04	1,740	1,637	14.8		1.5	55.4	0.0989	0.000717		0.845	298	0.0474	0.00684
1/03	9.99	9.97	1,680	1,748	14.6		1.05	56.8	0.123	0.001140		0.978	324	0.0575	0.00644
5/03	9.80	10.08	1,700	1,246	14.0		5.1	74	0.088	<0.0005		0.94	310	0.057	0.009
5/03 (Dup.)	9.76	10.08	1,700	1,246	14.0		0.76	82	0.089	0.000850		0.95	310	0.058	0.0075
9/03	9.77	9.90	1,700	1,428	16		0.93	76	0.089	<0.0005		0.73	330	0.048	0.012
1/04	9.67	9.97	1,600	1,354	14		3.4	50	0.080	<0.0005		0.89	310	0.053	0.014
5/04	9.72	9.82	1,500	1,148	14		1.2	47	0.071	0.00088		0.91	490	0.056	0.017
5/04 (Dup.)	9.72	9.82	1,500	1,148	12		1.4	59	0.067	0.0008		0.85	490	0.053	0.018
9/04	9.55	9.79	1,600	1,099	13		4.6	54	0.069	0.00081		0.88	350	0.049	0.02
1/05	9.74	9.74	1,500	1,340	10		4.0	73	0.066	0.0011		1.1	330	0.053	0.023
5/05	6.66	9.64	1,500	1,387	14		7.1	44 J	0.066	0.00081		0.96	360	0.05	0.024
5/05 (Dup.)	9.61	9.64	1,500	1,387	15		2.1	35 J	0.066	0.00093		0.98	370	0.051	0.024
10/05	9.57	9.63	1,500	1,414	16		<0.01	43	0.067	0.00061		0.95	370	0.046	0.026
1/06	9.63	7.62	1,000	1,401	12		0.43	58J	0.064	0.00099		1.1	350	0.052	0.024
5/06	9.70	9.80	1,700	1,390	6.5		<0.01	46J	0.066	0.00084		1.0	370	0.05	0.024

Note: All results in mg/L unless otherwise noted.

J = One or more quality control criteria not met. Value considered estimated.

TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-2 (cont.)															
5/06 (Dup.)	9.69	9.80	1,700	1,390	11		<0.01	52J	0.064	0.00083		1.0	380	0.049	0.024
9/06	9.75	9.81	1,700	1,356	19		5.70	48	0.061	<0.00050		0.63	350	0.032	0.021
2/07	9.54		1,600		15	0.046	2.50	32	0.046	<.0005		0.49	330	0.028	0.037
5/07	9.50	9.55	1,300	1,183	11		<0.01	47	0.050	0.00050		0.56	330	0.032	0.036
9/07	9.49	9.89	1,400	1,103	12		0.56	45	0.049	<0.00050		0.59	310	0.034	0.054
3/08	9.52	9.33	1,400	842	9		<0.01	42	0.046	<0.0005		0.52	310	0.03	0.041
6/08	9.48		1,400	910	12(J)		0.75	37	0.046	0.00083		0.52	280	0.032	0.062
6/08 (Dup.)	9.49		1,400	910	12		0.93	41	0.045	0.00060		0.52	290	0.031	0.065
9/08	9.43	9.58	1,200	1,318	7		<0.01	36	0.044	<0.0005		0.51	290	0.027	0.042
1/09	9.30	9.55	1,270	1,283	9.5		9.50	33.5	0.043	<0.0010		0.39	174	0.022	0.048
5/09	9.20	9.58	1,180	1,212	8.8		<0.0050	33.6	0.038	<0.0010		0.53	359	0.027	0.056
9/09	9.40	9.79	1,310	1,243	11.1		0.40	43.7	0.045	<0.0010		0.59	332	0.026	0.037
1/10	9.50	9.64	1,680	1,088	7.2		<0.0050	35.9	0.033	<0.0010		0.36	277	0.018	0.042
7/10	9.40	9.74	1,230	1,142	6.43		6.43	36.3	0.177	<0.0005		0.370	192	0.02	0.034
11/10	9.13	9.65	1,150	735	7.31		4.25	25.5	0.028	<0.0005		0.288	175	0.0122	0.037

Note: All results in mg/L unless otherwise noted.

J = One or more quality control criteria not met. Value considered estimated.

TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-5															
12/83	9.7	9.5	3,058	2,825	18.8	0.064		130			17.5	1.61	880		
2/84	9.6	9.6	3,636	2,700	14.5			120			18.0	1.39	1,030		
9/84	9.8	9.3	2,278	3,100	4.94	0.032		140			19.4	1.7	850		
5/85	9.8	9.9	4,800	2,400	25.0	0.037		91			15.8	1.01	710		
10/85	9.8		2,550		22.0	2.0		70		<0.01	13.0	0.93	650		
7/88	9.5	9.6	2,000	2,050	5.5		0.10	90	0.076	<0.0015	7.05	0.514	449	0.025	0.012
1/95	8.6	8.5	1,500	1,250	3.1		<0.01	32	0.008	<0.01	1.3	0.27	270	<0.01	
5/97	9.0	9.2	1,500	1,318	3.5		<0.25	18	0.015	<0.0005		0.4	310	<0.01	<0.005
5/98	8.83	8.84	1,400	1,340	2.1		<0.01	18	0.007	<0.0005		0.17	300	<0.01	<0.005
5/98 (Dup.)	8.83	8.84	1,400	1,340	1.3		<0.01	18	0.007	<0.0005		0.18	300	<0.01	<0.005
9/98	8.92	8.66	1,200	1,219	2.0		0.02	18	0.0089	<0.0005		0.16	240	<0.01	<0.005
1/99	8.95	8.93	1,100	1,175	1.8		0.14	17	0.0086	<0.0005		0.16	240	<0.01	<0.005
5/99	8.97	8.60	1,200	1,260	1.9		<0.01	16	0.0094	<0.0005		0.27	250	<0.01	<0.005
5/99 (Dup.)	8.97	8.60	1,200	1,260	2.2		2.2	16	0.0097	<0.0005		0.25	240	<0.01	<0.005
9/99	8.78	9.10	1,100	1,030	2.4		0.10	17	0.0074	<0.0005		0.23	230	<0.01	<0.005
1/00	8.76	8.30	1,200	1,040	2.0		2.0	15	0.0063	<0.0005		0.24	180	<0.01	<0.005
1/00 (Dup.)	8.77	8.30	1,100	1,040	1.9		1.9	16	0.006	<0.005		0.23	180	<0.01	<0.005
5/00	8.81	8.59	1,100	1,020	2.3		2.3	16	0.0082	<0.0005	1.8	0.37	110	<0.01	<0.005
10/00	8.71	8.59	1,000	817	2.6		2.6	11	0.006	<0.0005		0.35	120	<0.01	<0.005
10/00 (Dup.)	8.71	9	1,000	817	2.5		2.5	11	0.0061	<0.0005		0.35	110	<0.01	<0.005
1/01	8.65	9.27	1,000	863	2.7		0.13	13	<0.004	<0.0005		0.72	190	<0.01	<0.005
1/01 (Dup.)	8.65	9.27	1,000	863	2.8		0.33	14	<0.004	<0.0005		0.58	210	<0.01	<0.005
5/01	8.51	8.99	960	791	2.9		2.9	13	<0.004	<0.0005		0.66	170	<0.01	<0.005
9/01	8.42	8.69	708	970	3.6		0.34	11	<0.004	<0.0005		0.80	160	<0.01	<0.005
9/01 (Dup.)	8.46	8.69	708	950	3.6		0.22	13	<0.004	<0.0005		0.80	170	<0.01	<0.005
1/02	8.53	8.75	908	793	3.1		3.1	13	0.00445	<0.0005		0.59	162	<0.01	<0.005
5/02	7.80	8.51	930	600	2.9		<0.20	14	<0.004	<0.0005		0.67	171	<0.01	<0.005
10/02	8.28	8.59	1,090	1,013	4.13		0.66	15.3	<0.004	<0.0005		0.708	165	<0.01	<0.005
1/03	7.81	7.39	1,190	1,208	1.83		0.17	18.4	<0.004	<0.0005		0.303	246	<0.01	<0.005
5/03	8.35	8.55	1,100	797	3.8		0.093	25	<0.004	<0.0005		0.66	160	<0.01	<0.005
9/03	7.76	7.53	1,300	1,045	4.8		0.15	33	0.0073	<0.0005		0.61	210	<0.01	0.006
9/03 (Dup.)	7.74	7.53	1,300	1,045	4.8		0.34	37	0.0065	<0.0005		0.60	210	<0.01	0.0055
1/04	7.94	8.00	1,200	854	3.9		3.80	23	<0.004	<0.0005		0.41	190	<0.01	
5/04	8.00	8.03	1,200	907	3.6		0.59	25	<0.004	<0.0005		0.42	310	<0.01	<0.005
9/04	7.88	7.94	1,300	838	3.7		0.34	19	0.0046	<0.0005		0.52	210	<0.01	<0.005
1/05	8.19	8.13	1,200	1,093	3.6		0.67	16	0.0046	<0.0005		0.82	220	<0.01	<0.005
5/05	7.87	7.79	1,200	1,070	4.7		0.55	20 J	<0.004	<0.0005		0.57	250	<0.01	<0.005
10/05	7.83	7.79	1,400	1,211	6.4		0.51	17	<0.004	<0.0005		0.61	250	<0.01	<0.005
1/06	8.10	7.28	1,400	1,206	1.3		<0.01	17J	0.0048	<0.0005		0.80	250	<0.01	<0.005
5/06	8.05	8.04	1,400	1,150	5.2		0.38	16J	<0.004	<0.0005		0.70	250	<0.01	<0.005
9/06	7.97	7.98	1,400	1,075	5.4		1.60	17	<0.004	<0.0005		0.44	240	,0.010	<0.005
2/07	8.27		1,400		6.2		0.90	21	<.004	<.0005		0.36	230	<.01	<0.005
5/07	8.00	7.92	1,200	857	5.9		<0.010	23	<0.004	<0.0005		0.40	230	<0.010	<0.005
5/07 (Dup.)	7.87	7.92	1,200	857	6.2		<0.01	23	<0.004	<0.0005		0.38	230	<0.01	<0.005
9/07	8.03	8.50	1,300	856	5.8		0.15	26	0.0046	<0.0005		0.45	240	<0.010	<0.0050
9/08	8.06	7.90	1,300	618	4.5		4.50	27	<0.0040	<0.0005		0.39	250	<0.010	<0.005
6/08	8.06		1,300	730	4.9(J)		0.40	27	0.0054	<0.0005		0.48	230	<0.01	<0.005
9/08	8.11	8.17	1,100	1,178	4.7		0.74	24	<0.004	<0.0005		0.44	240	<0.01	<0.005
1/09	7.90	8.13	1,230	1,210	4.3		4.30	30.2	<0.0050	<0.0010		0.40	153	<0.0050	<0.0050
5/09	7.90	8.22	1,170	1,220	6.0		<0.0050	26.2	<0.0050	<0.0010		0.52	332	<0.0050	<0.0050
9/09	8.00	8.26	1,340	1,153	4.8		0.51	23.7	0.0076	<0.0010		0.46	307	<0.0050	<0.0050
1/10	8.20	8.43	1,270	1,134	3.5		<0.0050	25.4	<0.0050	<0.0010		0.44	309	<0.0050	<0.0050
7/10	7.89	8.36	1,130	834	1.38		1.38	18.2	0.00281	<0.0005		0.368	218	<0.0050	0.00135
11/10	7.71	8.24	1,200	701	2.86		2.86	23.7	0.00257	<0.0005		0.264	240	<0.0050	0.00179

Note: All results in mg/L unless otherwise noted.

J = One or more quality control criteria not met. Value considered estimated.

TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-7															
12/83	6.8	6.2	613	700	0.019	0.020		0.1			1.01	7.88	49.0		
2/84	5.9	5.9	581	750	<0.01			0.1			9.0	4.72	49.2		
9/84	5.8	5.7	410	680	<0.01	<0.01		<0.2			11.6	4.65	58.0		
5/85	6.1	5.6	720	890	0.023	0.021		<0.2			24.7	3.70	61.0		
6/88	5.7	5.8	740	760	0.02		0.01	0.2	0.012	<0.0015	17.6	3.05	64.2	0.0032	
1/95	5.5	5.3	850	1,500	<0.01		<0.01	0.2	0.040	<0.01	22	2.3	72	<0.01	
5/97	5.6	6.04	790	670	<0.01			0.10	0.038	<0.0005		2.2	89	<0.01	
5/97 (Dup.)	5.7		800	670	<0.01			0.20	0.038	<0.0005		2.2	84	<0.01	
5/98	5.71	5.69	770	900	<0.01			0.20	0.051	<0.0005		2.2	78	<0.01	
5/99	5.81	6.00	780	700	<0.01			0.16	0.042	<0.0005		2.0	78	<0.01	
5/00	5.74	5.96	810	777	<0.01			0.14	0.041	<0.0005	18	2.0	93	<0.01	
5/01	5.69	5.27	770	771	<0.01			0.13	0.033	<0.0005		2.0	75	<0.01	
5/02	5.73	5.79	750	515	<0.01			0.16	0.0343	<0.0005		2.01	75.9	<0.01	
5/03	5.70	5.85	810	627	0.098		0.09	<0.10	0.025	<0.0005		2.3	84	<0.01	
5/04	6.12	5.81	840	631	<0.01			2.7	0.041	<0.0005		2.3	120	<0.01	
5/05	5.87	5.84	770	718	<0.01			1.6 J	0.051	<0.0005		2.4	86	<0.01	
5/06	5.99	5.86	790	672	0.019		0.019	<2.0B	0.044	<0.0005		2.1	79	<0.01	
5/07	6.04	5.68	660	509	<0.010			0.1	0.038	<0.0005		2.4	89	<0.010	
6/08	6.1	6.8	640	403	0.011		<0.01	0.17	0.031	<0.0005		2.3	63	<0.01	
5/09	5.70	6.01	728	614	<0.0050		<0.0050	0.10	0.03	<0.0010		2.2	82.4	<0.0050	
7/10	5.96	6.39	586	489	0.00693		0.00693	0.10	0.0259	<0.0005		2.28	63.1	<0.0050	

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TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-8															
12/83	9.5	9.2	820	700	0.32	0.017		18			0.20	0.01	202		
2/84	9.5	9.5	820	700	0.14			18			0.23	0.04	199		
9/84	9.5	9.0	661	800	0.35	0.013		22			1.00	0.04	216		
5/85	9.2	9.2	830	550	0.11	0.024		7.9			0.21	0.01	151		
5/86	8.8		550		0.04						<0.01	<0.01	111		
6/88	8.4	8.3	560	550	0.06		<0.01	2.8	0.0018	<0.0015	0.044	0.023	67.8	<0.0026	<0.005
1/95	7.8	7.8	610	930	0.09		<0.01	3.1	<0.004	<0.01	<0.04	0.08	50	<0.01	
5/97	7.8	8.02	560	442	0.040		<0.01	2.2	<0.004	<0.0005		0.12	44	<0.01	
5/98	7.81	7.60	490	514	0.02		<0.01	2.3	<0.004	<0.0005		0.14	30	<0.01	
5/99	8.00	8.10	530	455	0.028		0.028	2.4	<0.004	<0.0005		0.15	34	<0.01	
5/00	7.91	8.01	600	533	0.026		0.026	2.2	<0.004	<0.0005	0.054	0.24	36	<0.01	
5/01	8.24	7.48	560	482	0.024		0.024	1.9	<0.004	<0.0005		0.26	34	<0.01	
5/02	7.81	7.76	530	374	0.019		<0.01	1.9	<0.004	<0.0005		0.268	33.9	<0.01	
5/03	7.74	7.90	580	440	0.023		<0.01	2.4	<0.004	<0.0005		0.36	42	<0.01	
5/04	7.79	7.80	670	487	0.068		<0.01	3.2	<0.004	<0.0005		0.46	77	<0.01	
5/05	7.40	7.28	680	607	0.034		<0.01	2.5 J	<0.004	<0.0005		0.16	61	<0.01	
5/06	7.80	7.71	1000	856	0.094		<0.01	<2.0B	<0.004	<0.0005		0.57	140	<0.01	
5/07	7.56	7.51	890	622	0.59		<0.01	3.1	<0.004	<0.0005		0.19	120	<0.01	
6/08	7.53		1000	546	0.73		0.64	6.1	<0.004	<0.0005		0.19	140	<0.01	
5/09	7.40	7.67	1100	1035	0.83		<0.0050	7.0	<0.0050	<0.0010		0.16	198	<0.0050	
7/10	7.42	7.87	918	668	0.173		0.173	5.77	0.000762	<0.0005		0.151	143	<0.0050	

Note: All results in mg/L unless otherwise noted. J = One or more quality control criteria not met. Value considered estimated.

TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-10															
12/83	7.7	7.6	1,205	1,280	1.36	0.083		6.9			0.60	0.26	195		
2/84	7.6	7.5	820	800	0.79			5.5			0.30	0.26	106		
9/84	7.6	6.5	547	675	0.22	0.14		4.3			0.13	0.34	88		
5/85	7.7	7.0	800	710	0.33	0.060		2.9			0.07	0.05	53		
6/88	7.3	7.2	770	750	<0.01		<0.01	2.1	0.0038	<0.0015	0.081	<0.001	28.7	<0.0026	
1/95	7.0	6.8	800	560	0.02		0.02	0.5	<0.004	<0.01	<0.04	<0.01	26	<0.01	
5/97	7.2	7.4	670	510	<0.01			0.70	<0.004	<0.0005		<0.01	25	<0.01	
5/98	7.22	7.23	970	1,110	0.15		0.01	0.60	<0.008	<0.0005		<0.01	120	<0.01	
5/99	7.40	7.32	750	545	<0.01			0.41	<0.004	<0.0005		0.012	30	<0.01	
5/00	7.45	7.51	650	549	<0.01			0.48	<0.004	<0.0005	0.079	<0.01	21	<0.01	
5/01	8.19	7.21	610	502	0.013		0.013	0.47	<0.004	<0.0005		<0.01	27	<0.01	
5/02	7.27	7.13	990	805	0.19		<0.01	0.77	<0.004	<0.0005		0.0499	117	<0.01	
5/03	7.17	7.23	1200	897	0.13		0.019	1.0	<0.004	<0.0005		<0.01	120	<0.01	
5/04	7.81	7.25	740	542	<0.01			0.46	<0.004	<0.0005		0.011	31	<0.01	
5/05	7.27	7.28	520	607	<0.01			0.51 J	<0.004	<0.0005		0.011	24	<0.01	
5/06	7.36	7.21	820	669	<0.01			<2.0B	<0.004	<0.0005		<0.01	27	<0.01	
5/07	7.17	7.18	750	521	<0.01			0.2	<0.004	<0.0005		<0.01	20	<0.01	
6/08	7.19		740	400	<0.01			0.4	<0.004	<0.0005		<0.01	23	<0.01	
5/09	7.00	7.29	721	696	<0.0050		<0.0050	0.23	<0.0050	<0.0010		<0.0050	19.7	<0.0050	
7/10	7.03	7.54	731	514	<0.0050		<0.0050	0.205	<0.0005	<0.0005		<0.0050	19.6	<0.0050	

Note: All results in mg/L unless otherwise noted. J = One or more quality control criteria not met. *Value considered estimated.*

TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-11															
12/83	9.6	9.4	980	825	0.52	0.021		33			0.48	0.06	238		
2/84	9.6	9.5	962	775	0.25			27			7.9	0.37	232		
9/84	9.7	9.1	656	800	0.20	0.015		22			4.90	0.21	213		
5/85	9.4	9.5	750	650	0.30	0.026		13			2.68	0.13	181		
6/88	8.5	8.4	570	565	0.12		<0.01	4.9	0.0043	<0.0015	0.071	0.227	78.5	<0.0026	<0.005
1/95	7.6	7.9	540	680	0.02		<0.01	2.3	<0.004	<0.01	<0.04	0.40	30	<0.01	
5/97	7.8	7.84	530	404	0.09		<0.01	1.8	<0.004	<0.0005		0.42	33	<0.01	
5/98	7.84	7.57	490	507	0.02		<0.01	1.7	<0.004	<0.0005		0.45	31	<0.01	
5/98 (Dup.)	7.85	7.57	500	507	0.02		<0.01	1.7	<0.004	<0.0005		0.43	29	<0.01	
5/99	8.07	8.39	490	425	0.024		0.011	1.7	<0.004	<0.0005		0.45	28	<0.01	
5/00	7.96	7.58	580	500	0.013		0.013	1.4	<0.004	<0.0005	0.046	0.54	32	<0.01	
5/01	7.84	7.26	550	458	<0.01			1.6	<0.004	<0.0005		0.52	35	<0.01	
5/02	8.42	7.87	510	352	0.017		0.017	1.8	<0.004	<0.0005		0.488	34	<0.01	
5/03	7.87	7.99	540	405	0.016		<0.01	2.1	<0.004	<0.0005		0.57	37	<0.01	
5/04	7.83	7.86	530	394	<0.01		<0.01	1.9	<0.004	<0.0005		0.53	47	<0.01	
5/05	7.79	7.64	480	439	<0.01			1.7 J	<0.004	<0.0005		0.52	36	<0.01	
5/06	7.85	7.84	620	518	0.013		<0.01	<2.0B	<0.004	<0.0005		0.59	29	<0.01	
5/07	7.8	7.8	700	527	0.066		<0.010	1.0	<0.004	<0.0005		0.62	69	<0.01	
6/08	7.84		900	509	0.19(J)		<0.01	1.1	0.0042	<0.0005		0.63	100	<0.01	
5/09	7.6	7.8	1130	1168	0.74		<0.0050	0.99	<0.0050	<0.0010		0.83	238	<0.0050	
7/10	7.67	8.12	1180	845	0.365		0.365	2.68	0.00118	<0.0005		0.592	205	<0.0050	

Note: All results in mg/L unless otherwise noted.

J = One or more quality control criteria not met. Value considered estimated.

TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-12															
12/83	7.5	7.3	476	400	0.074	0.021		2.1			<0.01	0.94	24.3		
2/84	7.5	7.2	476	385	0.02			2.0			0.02	0.71	23.8		
9/84	7.7	6.3	366	375	<0.01	<0.01		2.2			<0.01	0.61	29.0		
5/85	7.7	7.4	540	390	0.024	0.022		1.6			<0.01	1.00	27.7		
5/86	7.5		494		<0.01						<0.01	1.23	27		
6/88	7.2	7.5	510	515	<0.01		<0.01	1.3	<0.0015	<0.0015	0.066	1.09	24.4	<0.0026	<0.005
1/95	7.4	7.6	530	350	<0.01		<0.01	1.1	<0.004	<0.01	<0.04	1.5	23	<0.01	
5/97	7.5	7.7	540	422	<0.01			0.90	<0.004	<0.0005		1.7	19	<0.01	
5/98	7.43	7.43	470	550	<0.01			0.80	<0.008	<0.0005		1.9	23	<0.01	
9/98	7.57	7.38	470	481	<0.01			0.92	<0.004	<0.0005		1.6	20	<0.01	
1/99	7.53	7.04	470	440	<0.01			0.89	<0.004	<0.0005		1.8	22	<0.01	
5/99	7.42	7.39	630	515	0.026		0.026	0.73	<0.004	<0.0005		2.5	29	<0.01	
9/99	7.54	7.25	530	565	0.017		0.012	0.68	<0.004	<0.0005		1.9	27	<0.01	
1/00	7.44	6.65	570	495	<0.01			0.74	<0.004	<0.0005		1.8	22	<0.01	
5/00	7.53	7.57	600	558	<0.01			0.73	<0.004	<0.0005	0.043	2.0	29	<0.01	
10/00	7.64	7.33	530	429	<0.01			0.83	<0.004	<0.0005		1.6	22	<0.01	
1/01	7.56	7.69	530	484	<0.01			0.92	<0.004	<0.0005		1.8	28	<0.01	
5/01	7.48	7.13	530	442	<0.01			0.82	<0.004	<0.0005		1.6	23	<0.01	
9/01	7.46	7.96	520	460	<0.01			0.83	<0.004	<0.0005		1.8	28	<0.01	
1/02	7.43	7.66	560	436	<0.01			1.1	<0.004	<0.0005		1.75	27	<0.01	
5/02	7.58	7.6	540	322	<0.01			1.1	<0.004	<0.0005		1.82	27.5	<0.01	
9/02	7.48	7.65	572	540	<0.01			0.629	<0.004	<0.0005		1.72	27.1	<0.01	
1/03	7.70	7.48	536	564	<0.01			0.884	<0.004	<0.0005		1.80	32.2	<0.01	
5/03	7.55	7.21	560	421	<0.01			0.76	<0.004	<0.0005		2.0	31	<0.01	
9/03	7.57	7.44	560	477	<0.01		<0.01	<3.2 B	<0.004	<0.0005		2.0	32	<0.01	
9/03 (Dup.)	7.60	7.44	560	477	<0.01		<0.01	<3.2 B	<0.004	<0.0005		2.0	33	<0.01	
1/04	7.58	7.66	510	400	<0.01			0.69	<0.004	<0.0005		1.9	28	<0.01	
1/04 (Dup.)	7.58	7.66	510	400	<0.01			0.60	<0.004	<0.0005		1.9	28	<0.01	
5/04	7.65	7.55	520	596	<0.01			0.61	<0.004	<0.0005		1.9	31	<0.01	
9/04	7.52	7.55	540	361	<0.01			<1.25 B	<0.004	<0.0005		1.9	30	<0.01	
9/04 (Dup.)	7.53	7.55	540	361	<0.01			<1.25 B	<0.004	<0.0005		1.9	30	<0.01	
1/05	7.67	7.40	520	466	<0.01			0.51	0.0042	<0.0005		1.9	29	<0.01	
1/05 (Dup.)	7.60	7.40	520	466	<0.01			0.50	<0.004	<0.0005		2.0	29	<0.01	
5/05	7.71	7.30	520	443	<0.01			0.87 J	<0.004	<0.0005		2.0	32	<0.01	
10/05	7.55	7.49	520	491	<0.01			2.3	<0.004	<0.0005		1.9	27	<0.01	
10/05 (Dup.)	7.59	7.49	540	491	<0.01			1.4	<0.004	<0.0005		1.9	27	<0.01	
1/06	7.67	7.14	550	480	<0.01			0.61J	<0.004	<0.0005		1.8	25	<0.01	
1/06 (Dup.)	7.65	7.14	550	480	<0.01			0.48J	<0.004	<0.0005		1.8	25	<0.01	
5/06	7.55	7.57	510	473	<0.01			<2.0B	<0.004	<0.0005		1.9	23	<0.01	
9/06	7.61	7.57	610	508	<0.01			0.57	<0.004	<0.0005		2.2	26	<0.01	
9/06 (Dup.)	7.60		610		<0.01			0.62	<0.004	<0.0005		2.2	26	<0.01	
2/07	7.68		620		<.01			0.63	<.004	<.0005		2.0	25	<.01	
5/07	7.61	7.50	560	413	<0.01			1.40	<0.004	<0.0005		2.1	26	<0.01	
3/08	7.52	7.25	540	356	<0.01			0.74	<0.004	<0.0005		2.0	29	<0.01	
6/08	7.76		480	369	<0.01			0.58	<0.004	0.0019		2.0	28	<0.01	
9/08	7.63	7.67	470	545	<0.01			0.60	0.004	<0.0005		1.9	27	<0.01	
1/09	7.40	7.54	558	567	<0.0050			0.68	<0.0050	<0.0010		2.2	29.8	<0.0050	
5/09	7.40	7.61	579	559	[7.1]		[0.052]	0.57	<0.0050	<0.0010		2.2	27.5	<0.0050	
7/09		7.73		541	<0.005		<0.005								
7/09 (Dup.)					<0.005		<0.005								
9/09	7.50	7.66	590	531	<0.0050		<0.0050	0.71	0.0051	<0.0010		2.1	26.2	<0.0050	
1/10	7.50	7.56	539	485	<0.0050		<0.0050	0.62	<0.0050	<0.0010		2.1	27.1	<0.0050	
7/10	7.38	7.89	565	437	0.0107		0.0107	0.616	<0.0005	<0.0005		2.24	32	<0.0050	
11/10	7.46	7.79	550	372	0.0192		0.0192	0.816	<0.005	<0.0005		1.87	34.6	<0.0050	

Note: All results in mg/L unless otherwise noted. J = One or more quality control criteria not met. Value considered estimated.

TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-14															
5/02	7.64	7.61	*500*	*309*	*0.018*		*<0.01*	*1.9*	*<0.004*	*<0.0005*		1.05	29.5	<0.01	
5/03	7.59	7.20	530	398	0.014		<0.01	2.1	<0.004	<0.0005		1.2	34	<0.01	
5/04	7.67	7.64	560	633	0.022		<0.01	2.0	<0.004	<0.0005		1.2	51	<0.01	
5/05	7.75	7.50	520	469	0.025		<0.01	2.5	<0.004	<0.0005		1.2	44	<0.01	
5/06	7.80	7.70	530	503	0.014		<0.01	2.2J	<0.004	<0.0005		1.2	38	<0.01	
5/07	7.55	7.33	520	423	0.031		<0.01	2.5	<0.004	<0.0005		1.1	44	<0.01	
6/08	7.60		520	365	0.029		<0.01	2.5	<0.004	<0.0005		1.1	39	<0.01	
5/09	7.40	7.59	581	559	5.6		0.087	2.3	<0.0050	<0.0010		1.2	56.3	<0.0050	
7/09		7.89		544	0.025		<0.005								
7/09 (Dup.)					*0.026*		<0.005								
7/10	7.60	8.07	556	436	0.0157		0.0157	3.73	<0.0005	<0.0005		0.953	49.7	<0.0050	

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TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-15															
12/83	6.9	6.7	568	435	0.44	0.018		0.1			0.14	0.03	28.8		
2/84	6.9	6.7	550	435	0.51			0.1			0.13	<0.01	29.4		
5/85	7.4	6.8	590	445	0.44	0.034		0.3			0.18	<0.01	32.5		
5/86	7.1		550		0.39						0.15	<0.01	34		
7/88	7.0/7.1	7.1/7.1	610/630	600/600	0.43/0.32		0.10/<0.01	0.2/0.2	0.0045	0.0025	10.8	0.117	34.4	0.0059	<0.005
1/95	7.0	7.1	720	420	0.49		0.12	1.4	<0.004	<0.01	0.26	<0.01	45	<0.01	
7/96	6.8	7.07	570	613	1.0	<0.020		2.1	<0.004	<0.0005		<0.01		<0.01	
5/97	7.4	7.44	800	731	2.8		0.20	11	<0.004	<0.0005		0.02	140	<0.01	
5/97 (Dup.)	7.4	7.44	800	731	3.3		0.40	8.9	<0.004	<0.0005		0.05	140	<0.01	
5/98	6.99	6.78	610	625	0.49		0.02	0.40	<0.004	<0.0005		<0.01	40	<0.01	
5/99	7.49	7.70	980	785	8.5		<0.01	15	<0.004	<0.0005		0.017	150	<0.01	
5/00	7.53	7.56	1,200	1,169	12		<0.01	25	<0.004	<0.0005	10	0.17	120	<0.01	
5/01	7.03	6.83	600	501	0.49		0.32	2.0	<0.004	<0.0005		0.017	51	<0.01	
5/02	7.29	7.21	590	333	1.1		<0.10	2.5	0.0222	<0.0005		0.0686	56.8	<0.01	
5/03	7.23	7.47	610	469	0.80		0.11	1.6	<0.004	<0.0005		<0.010	49	<0.01	
5/04	7.53	7.54	1,300	982	4.60		<0.01	13	<0.004	<0.0005		0.024	360	<0.01	
5/05	8.17	8.01	1,200	1,105	8.2		6.6	49 J	0.023	0.0024		0.69	290	0.074	
5/06	8.22	8.34	1,300	1,100	16.0		5.9	35J	0.020	0.0024		0.75	280	0.069	
5/07	8.07	7.91	930	727	6.7		0.8	23	0.007	<0.0005		0.14	210	0.014	
5/07 (Dup.)	8.04	7.91	930	727	6.5		0.8	23	0.009	<0.0005		0.14	210	0.015	
6/08	7.91		790		7.2		1.4(J)	20	0.0046	<0.0005		0.1	180	<0.01	
6/08 (Dup.)	7.93		790	554	8.1		0.79(J)	20	<0.004	<0.0005		0.096	170	<0.01	
5/09	7.7	7.91	946	918	5.6		0.012	17.1	<0.0050	<0.0010		0.072	232	<0.0050	
7/10	7.97	8.24	1060	767	3.39		2.14	22.2	0.1	<0.0005		0.182	155	0.0143	
7/10 Dup.)	7.97	8.24	1060	767	2.54		1.46	24.2	0.132	<0.0005		0.177	158	0.0141	

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GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-16															
12/83	9.8	9.9	2,092	1,800	7.35	0.034		110			12.4	0.91	530		
2/84	9.7	9.7	2,049	1,550	5.5			98			13.9	1.41	570		
9/84	9.8	9.2	1,390	10,500	2.11	<0.01		80			9.5	0.5	475		
5/85	9.4	9.0	2,300	1,400	10.0	0.11		72			10.3	1.09	443		
10/85	8.4		1,540		3.9	0.0		30		<0.01	2.10	0.41	186		
7/88	9.4	9.7	1,400	1,410	4.6		<0.01	61	0.063	<0.0015	6.57	0.22	300	0.018	0.006
1/95	7.7	9.0	850	930	1.4		0.13	7.9	<0.004	<0.01	0.52	1.1	81	<0.01	
7/96	7.3	7.75	990	941	1.6	<0.020		7.9	<0.004	<0.0005		1		<0.01	
5/97	7.6	7.6	980	801	1.3		0.3	11	<0.004	<0.0005		0.43	130	<0.01	
5/98	7.72	7.70	750	760	2.0		0.40	11	<0.004	<0.0005		1.2	80	<0.01	
9/98	7.70	7.50	860	790	1.4		1.4	9.5	<0.004	<0.0005		1.3	75	<0.01	
1/99	7.70	7.12	740	665	1.4		<0.04	9.8	<0.004	<0.0005		1.5	85	<0.01	
5/99	7.88	7.90	750	600	2.8		0.16	9.0	<0.004	<0.0005		1.5	82	<0.01	
9/99	7.62	8.15	730	745	2.9		0.88	8.2	<0.004	<0.0005		1.7	78	<0.01	
1/00	7.76	6.95	950	810	5.5		5.5	7.6	<0.004	<0.0005		2.2	68	<0.01	
1/00 (Dup.)	7.77	6.95	940	810	5.8		5.8	7.8	<0.004	<0.005		2.2	70	<0.01	
5/00	7.69	7.53	1,100	945	12		12	7.9	<0.004	<0.0005	4.3	2.3	91	<0.01	
5/00 (Dup.)	7.72	7.53	1,000	945	12		12	8.1	<0.004	<0.0005	4.4	2.4	91	<0.01	
10/00	7.74	7.67	1,000	774	16		<0.01	13	<0.004	<0.0005		1.6	130	<0.01	
10/00 (Dup.)	7.77	7.67	1,000	774	15		<0.01	13	<0.004	<0.0005		1.7	130	<0.01	
1/01	7.84	7.42	1,200	939	16		3.2	24	<0.004	<0.0005		1.6	250	<0.01	
1/01 (Dup.)	7.85	7.42	1,200	939	17		2.5	24	<0.004	<0.0005		1.6	250	<0.01	
5/01	7.89	8.04	1,100	920	12		12	39	<0.004	<0.0005		1.2	200	<0.01	
5/01 (Dup.)	7.90	8.04	1,100	920	11		11	40	<0.004	<0.0005		1.2	210	<0.01	
9/01	7.91	7.86	1,300	754	9.7		0.85	43	<0.004	0.00058		0.89	270	0.013	
9/01 (Dup.)	7.90	7.86	1,200	754	9.0		0.65	43	0.019	0.00096		1.1	260	0.021	
1/02	8.03	8.11	1,300	913	9.5		<0.5	57	0.0102	0.00211		1.46	237	0.055	
1/02 (Dup.)	8.05	8.11	1,300	913	10		0.58	59	0.00816	0.00171		1.33	211	0.0422	
5/02	7.92	7.92	1,300	695	7.9		<0.20	57	0.0332	0.0015		1.12	254	0.0469	
5/02 (Dup.)	8.06	7.92	1,300	695	7.4		<0.20	59	0.0269	0.0016		1.10	242	0.0500	
9/02	8.17	8.33	1,280	1176	9.75		0.56	50.1	0.0263	0.00155		1.12	208	0.0426	
9/02 (Dup.)	8.16	8.33	1,260	1176	10.9		1.56	49	0.0222	0.00198		1.4	211	0.0535	
1/03	8.31	7.78	1,310	1,299	7.03		0.77	27.5	0.0449	0.00136		0.792	235	0.0308	
1/03 (Dup.)	8.28	7.78	1,290	1,299	6.48		1.20	54	0.0381	0.00175		1.0	242	0.0441	
5/03	8.00	8.17	1,300	933	5.5		<0.01	58	0.012	0.0012		1.1	220	0.052	
5/03 (Dup.)	8.05	8.17	1,300	933	5.9		<0.01	52	0.0099	0.00093		1.0	220	0.044	
9/03	8.21	8.17	1,200	1,036	3.9		0.062	74	0.011	<0.0005		0.61	240	0.023	
1/04	7.89	8.07	1,300	883	6.0		1.5	52	<0.004	<0.0005		0.83	220	0.017	
5/04	8.18	8.22	1,300	1,410	5.3		0.35	71	0.0071	0.0014		1.1	390	0.037	
5/04 (Dup.)	8.15	8.22	1,300	1,410	5.9		0.35	71	0.016	0.0014		1.1	390	0.04	
9/04	8.10	8.15	1,400	914	12		3.1	56	0.0053	0.0011		1.2	270	0.027	
1/05	8.46	8.38	1,200	1,048	5.2		0.67	65	0.0085	0.00089		0.86	250	0.021	
5/05	8.46	8.57	1,200	998	6.7		0.14	64 J	0.023	0.0018		1.7	260	0.061	
5/05 (Dup.)	8.61	8.57	1,200	998	7.3		0.14	55 J	0.025	0.0018		1.7	280	0.064	
10/05	9.05	9.18	1,200	1,095	12		0.88	29	0.057	0.0029		2.7	280	0.12	
1/06	9.17	7.51	1,100	972	2.8		<0.01	62J	0.067	0.0021J		2.1	220	0.10	
5/06	9.34	9.45	1,200	963	4.9		<0.01	49J	0.082	0.0019		1.4	250	0.12	
5/06 (Dup.)	9.35	9.45	1,200	963	5.9		<0.01	44J	0.078	0.0019		1.5	250	0.12	
9/06	9.39	9.44	1,200	1002	6.6		2.4	41	0.058	<0.0005		0.48	240	0.051	

Note: All results in mg/L unless otherwise noted. J = One or more quality control criteria not met. Value considered estimated.

TABLE 4

GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-16 (cont.)															
2/07	9.3		1,300		7.4		<.01	38	0.045	<.0005		0.62	240	0.045	
5/07	9.19	9.22	1,100	854	59		<0.01	59	0.042	0.00083		1	240	0.056	
9/07	9.24	9.62	1,100	816	8.4		0.83	52	0.047	0.00076		1.3	240	0.058	
3/08	9.05	8.97	1,100	633	3.4		0.098	39	0.037	0.00056		1	220	0.046	
6/08	9.14		1,000	613	3.3		0.13	33	0.039	0.00071		0.89	200	0.041	
9/08	9.14	9.22	880	991	3.5		<0.01	26	0.033	<0.0005		0.79	210	0.038	
1/09	8.8	9.07	921	908	3.7		3.7	107	0.02	<0.0010		0.54	118	0.02	
5/09	9.0	9.28	1,040	986	<0.0050		<0.0050	35.8	0.045	<0.0010		0.85	266	0.049	
5/09 (Dup.)	9.0	9.28	1,040	986	1.2		0.077	35.7	0.048	<0.0010		0.85	268	0.049	
9/09	9.0	9.35	1,040	899	5.0		0.38	31.9	0.028	<0.0010		0.67	232	0.028	
1/10	9.1	9.24	883	836	3.2		<0.0050	32.1	0.023	<0.0010		0.69	219	0.025	
1/10 (Dup.)	9.1		972		3.4		<0.0050	33.6	0.025	<0.0005		0.65	219	0.026	
7/10	9.07	9.39	971	733	1.87		1.87	37.6	0.127	<0.0005		0.578	155	0.0293	
11/10	9.13	9.48	1,020	680	4.61		3.03	30.7	0.0236	<0.0005		0.458	149	0.0193	

Note: All results in mg/L unless otherwise noted. J = One or more quality control criteria not met. Value considered estimated.

TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-17															
12/83	7.9	7.6	613	475	0.99	0.021		5.6			0.44	1.38	78		
2/84	7.6	7.4	581	470	1.03			4.4			0.39	1.77	52		
9/84	8.0	8.7	485	550	0.17	<0.01		9.1			0.28	1.27	99		
5/85	7.9	7.9	610	470	0.76	0.045		4.1			0.28	1.80	45.3		
10/85	7.9		564		0.56	0.43		4.2		<0.01	6.80	1.93	43.4		
6/88	7.7	7.5	590	475	1.3		0.46	5.2	0.0054	<0.0015	0.973	1.72	39.7	<0.0026	<0.005
2/90	7.7	7.55	680	640	0.582		<0.005	4.1			18		40		
1/95	7.5	7.7	710	420	0.64		<0.01	3.9	<0.004	<0.01	0.26	1.9	36	<0.01	
5/97	7.5	7.67	870	488	0.54		<0.01	3.1	<0.004	<0.0005		1.9	30	<0.01	
5/98	7.8	7.40	570	580	0.72		0.09	3.4	<0.004	<0.0005		1.8	34	<0.01	
5/99	7.50	7.40	550	470	0.46		0.46	3.2	<0.004	<0.0005		1.8	31	<0.01	
5/99 (Dup.)	7.37	7.40	550	470	0.49		0.49	3.2	<0.004	<0.0005		1.8	30	<0.01	
5/00	7.57	7.61	610	523	0.53		0.31	2.9	<0.004	<0.0005	0.34	1.8	24	<0.01	
5/01	7.87	7.36	570	460	0.50		0.50	3.0	<0.004	<0.0005		1.7	28	<0.01	
5/02	7.64	7.62	550	328	0.35		0.35	5.4	<0.004	<0.0005		1.42	40.3	<0.01	
5/03	7.65	7.80	580	435	0.41		0.096	9.8	<0.004	<0.0005		1.6	44	<0.01	
5/04	7.71	7.83	670	511	0.41		<0.01	23	0.0044	<0.0005		1.1	130	<0.01	
5/05	7.66	7.55	910	819	6.2		3.1	17 J	0.0044	<0.0005		1.1	170	<0.01	
5/06	7.73	7.76	910	759	4.2		2.1	13J	<0.004	<0.0005		1.4	130	<0.01	
5/06 (Dup.)	7.85	7.76	910	759	3.5		0.64	22J	<0.004	<0.0005		1.4	130	<0.01	
5/07	7.58	7.56	740	544	2.2		<0.01	11	<0.004	<0.0005		1.6	87	<0.01	
6/08	7.72		770	505	2.9		0.32	17	<0.004	<0.0005		1.4	120	<0.01	
5/09	7.5	7.71	712	679	2.0		0.19	6.4	<0.0050	<0.0010		1.6	93.2	<0.0050	
5/09 (Dup.)	7.4		650		2.0		0.19	6.2	<0.0050	<0.0010		1.6	92.9	<0.0050	
7/10	7.89	8.10	849	626	2.89		1.89	18.4	0.101	<0.0005		0.752	107	0.00796	
7/10 (Dup.)	7.89	8.10	850	626	3.01		2.40	16.2	0.0975	<0.0005		0.85	117	0.00899	

Note: All results in mg/L unless otherwise noted.

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TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-18															
12/83	9.9	10.0	10,526	8,750	110.0	0.45		460			58.7	0.26	3,150		
2/84	9.8	9.8	9,615	7,500	52.0			350			61	0.50	2,750		
9/84	10.1	9.5	9,111	10,000	194	0.19		690			103	0.3	4,130		
5/85	9.8	9.9		7,000	35.2	0.091		410			64.2	0.35	2,540		
10/85	9.9		6,300		120	12		350		<0.01	71.4	1.06	1,940		
7/88	10.0	10.1	9,700	10,000	29		25	820	0.159	0.0071	144	1.75	2,640	0.191	0.022
2/90	10.0	10.1	8,000	11,400	67.0		10.5	710			110		3,500		
1/95	9.6	11.1	5,900	>2,000	15		6.6	290	0.062	<0.01	56	0.22	1,500	0.02	
7/96	9.1	8.67	4,300	4,200	7.2	<0.020		180	0.065	0.0006	56	0.19	1,500	0.01	0.006
5/97	9.7	9.58	4,000	4,110	8.7		<0.50	200	0.078	0.0009		0.29	1,100	0.02	
5/98	9.76	10.06	4200	4,300	9.8		0.40	260	0.094	0.0014		0.49	1100	0.05	0.024
9/98	9.70	9.88	3,600	3,590	5.9		<0.01	210	0.085	0.00084		0.29	800	0.022	0.014
1/99	9.67	10.04	3,600	3,450	79		3.0	210	0.088	0.00063		0.29	830	0.028	0.0219
5/99	9.72	9.80	3,000	3,000	95		81	370	0.088	0.0014		0.92	650	0.045	0.017
9/99	9.62	10.26	3,000	2,870	90		14	170	0.074	<0.0005		0.24	700	0.011	0.016
1/00	9.56	9.15	3,000	2,700	27		19	180	0.078	0.00059		0.26	680	0.017	0.020
5/00	9.59	9.73	2,800	2,270	84		75	160	0.075	0.00089	25	0.56	620	0.035	0.019
5/00 (Dup.)	9.60	9.73	2,800	2,270	64		50	160	0.073	0.00062	20	0.33	620	0.023	0.016
10/00	9.54	9.67	2,400	1,948	29		<0.01	130	0.074	0.0024		2.1	400	0.08	0.012
1/01	9.62	10.82	2,500	1,980	53		9.2	170	0.067	0.0006		0.3	580	0.019	0.043
5/01	9.52	10.36	2,100	1,780	15		<0.50	100	0.065	0.0014		0.97	380	0.042	0.040
5/01 (Dup.)	9.52	10.36	2,000	1,780	49		49	110	0.079	0.0037		3.1	380	0.140	0.046
9/01	9.61	9.75	2,100	1,668	91		11	180	0.12	0.00099		0.3	520	0.024	0.027
1/02	9.44	9.65	2,400	1,680	36		<0.01	150	0.15	0.0125		16.8	436	0.360	0.024
5/02	9.48	9.55	2,300	1,693	110		40	150	0.0716	0.00105		0.432	517	0.0269	0.020
5/02 (Dup.)	9.49	9.55	2,300	1,693	72		8.3	150	0.0703	0.00104		0.401	510	0.0248	0.052
9/02	9.49	9.77	1,720	1,599	74		<0.01	108	0.0906	0.00141		0.927	303	0.0525	0.0172
1/03	9.48	9.57	2,010	2,160	62.1		<2.5	163	0.0932	0.00133		0.285	452	0.0220	0.058
5/03	9.34	9.58	1,400	1,257	15		3.0	88	0.061	<0.0005		0.20	240	0.021	0.027
5/03 (Dup.)	9.39	9.58	1,400	1,257	20		<0.01	83	0.066	0.00068		0.30	230	0.034	0.047
9/03	9.42	9.61	1,800	1,424	4		<0.01	97	0.12	0.0044		5.60	380	0.17	0.018
1/04	9.33	9.62	2,400	1,237	17		5.5	77	0.061	0.00066		0.43	290	0.028	0.012
5/04	9.51	9.66	2,300	1,546	1.8		0.33	150	0.081	0.00095		0.35	680	0.037	0.012
5/04 (Dup.)	9.49	9.66	2,200	1,546	2		<0.01	140	0.079	0.00092		0.35	680	0.035	0.014
9/04	9.30	9.48	1,800	1,145	35		22	42	0.17	0.012		13	380	0.43	0.0097
1/05	9.40	9.45	3,000	2,920	81		4.7	130	0.056	0.0014		0.55	570	0.021	0.0071
5/05	9.44	9.45	1,700	1,056	13		0.34	97 J	0.07	0.0014		0.78	430	0.049	0.0057
5/05 (Dup.)	9.49	9.45	1,600	1,056	8.2		0.14	94 J	0.073	0.0012		0.75	440	0.037	0.0056
10/05	9.35	9.47	2,300	1,937	6.8		0.24	52	0.05	0.0015		0.68	510	0.033	0.0071
1/06	9.55	7.60	2,900	2,990	4.6		<0.01	210J	0.049	0.0022J		0.78	650	0.034	0.0088
5/06	9.77	10.07	3,400	2,830	7.7		<0.01	380J	0.13	0.0013		0.54	700	0.043	0.0078
9/06	9.61	9.79	1,900	1,720	36.0		36	100	0.11	0.0026		1.80	380	0.099	<0.005
2/07	9.47		2,000		2.2		<.01	84	0.058	0.0012		1.20	300	0.056	<.005
5/07	9.39	9.45	1,700	1,471	3.0		<0.01	140	0.065	0.00091		0.43	350	0.039	<0.005
9/07	9.53	9.83	1,300	1,087	9.0		<0.010	75	0.067	0.00067		0.32	300	0.037	<0.0050
3/08	9.42	9.35	1,700	981	12.0		<0.01	92	0.069	<0.0005		0.24	370	0.021	<0.005
6/08	9.43		1,500	1,118	3.9		<0.01	88	0.066	0.00088		0.40	310	0.038	<0.005
9/08	9.40	9.48	1,100	1,260	5.4		<0.01	59	0.049	<0.0005		0.18	270	0.017	<0.005
1/09	9.30	9.47	1,710	1,704	36.7		36.6	117	0.05	0.0014		0.78	242	0.034	<0.0050
5/09	9.50	9.76	3,580	2,580	[0.88]		0.033	206	0.06	0.0014		0.56	805	0.021	<0.0050
7/09		9.94		1,750	7.40		<0.005								
9/09	9.60	9.90	1,480	1,439	26.5		10.7	98.6	0.065	<0.0010		0.13	384	0.016	<0.0050
1/10	9.60	9.74	1,460	1,451	18.9		<0.005	83.7	0.05	<0.0010		0.51	434	0.026	<0.0050
7/10	9.67	9.94	1,480	1,307	4.35		4.35	110	0.187	<0.0005		0.122	272	0.014	0.00167
7/10 (Dup.)	9.67	9.94	1,600	1,307	3.96		3.96	125	0.168	<0.0005		0.112	250	0.013	0.00167
11/10	9.58	9.93	1,320	1,099	8.20		<0.25	76	0.0451	<0.0005		0.133	211	0.007	0.00146

Note: All results in mg/L unless otherwise noted.

J = One or more quality control criteria not met. Value considered estimated.

TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-19															
12/83	7.2	7.1	581	435	0.068	0.013		0.3			<0.01	0.54	22.9		
2/84	7.1	6.8	575	405	0.04			0.5			0.05	0.26	20.2		
9/84	7.2	6.3	451	460	0.01	<0.01		0.4			0.02	0.04	23.5		
5/85	7.6	7.0	640	460	0.019	0.014		0.5			0.12	0.02	23.6		
7/88	7.3	7.3	630	600	<0.01		<0.01	0.5	0.0067	<0.0015	17.6	0.23	32.2	0.015	<0.005
2/90	7.3	7.27	520	560	0.2		<0.005	0.7					21.0		
1/95	7.3	7.2	630	410	<0.01		<0.01	1.0	<0.004	<0.01	0.09	<0.01	24	<0.01	
5/97	7.4	7.5	520	431	<0.01		<0.01	2.0	<0.004	<0.0005		<0.01	18	<0.01	
5/98	7.23	6.95	560	575	<0.01			1.4	<0.008	<0.0005		<0.01	23	<0.01	
5/99	7.47	7.40	570	460	<0.01			1.3	<0.004	<0.0005		<0.01	22	<0.01	
5/00	7.33	7.20	580	538	<0.01			1.2	<0.004	<0.0005	0.13	<0.01	16	<0.01	
5/01	7.18	6.98	580	494	<0.01			1.1	<0.004	<0.0005		<0.01	20	<0.01	
5/02	7.39	7.38	530	324	<0.01			1.2	<0.004	<0.0005		<0.005	23.4	<0.01	
5/03	7.53	7.38	550	420	<0.01			2.2	<0.004	<0.0005		<0.01	20	<0.01	
5/04	7.87	7.59	460	342	<0.01			3.8	<0.004	<0.0005		<0.01	16	<0.01	
5/05	7.27	7.10	780	700	0.012		<0.01	2.8 J	<0.004	<0.0005		<0.01	38	<0.01	
5/06	7.48	7.46	590	541	<0.01			3.5J	<0.004	<0.0005		0.014	15	<0.01	
5/07	7.33	7.03	810	583	<0.01			1.1	0.0042	<0.0005		<0.01	49	<0.01	
6/08	7.27		680	432	<0.01			1.1	<0.004	<0.0005		<0.01	28	<0.01	
6/08 (Dup.)	7.28		680	432	<0.01			1.1	<0.004	<0.0005		<0.01	30	<0.01	
5/09	7.1	7.32	695	602	<0.0050		<0.0050	1.4	<0.0050	<0.0010		<0.0050	13.4	<0.0050	
7/10	7.39	7.57	827	605	<0.0050		<0.0050	0.671	<0.0050	<0.0005		<0.0050	46.5	<0.0050	

Note: All results in mg/L unless otherwise noted.

J = One or more quality control criteria not met. Value considered estimated.

TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-28															
5/86	5.5		382		0.89	0.08		<0.1			0.36	0.02	41		
6/88	5.7	5.8	640	665	7.4		0.6	<0.1	<0.0015	<0.0015	2.41	0.035	83.3	<0.0026	<0.005
1/95	6.2	7.4	500	700	0.74		0.26	2.7	<0.004	<0.01	0.38	0.02	79	<0.01	
7/96	5.7	5.92	440	429	0.26	<0.020		0.50	<0.004	<0.0005		0.01		<0.01	
5/97	5.6	6.4	590	453	0.11		<0.02	0.2	<0.004	<0.0005		0.01	62	<0.01	
5/98	5.74	5.32	500	550	0.12		<0.01	0.20	<0.004	<0.0005		0.01	65	<0.01	
9/98	5.81	5.28	540	527	0.11		0.11	0.27	<0.004	<0.0005		0.011	64	<0.01	
9/98 (Dup.)	5.83	5.28	540	527	0.11		0.11	0.24	<0.004	<0.0005		0.01	65	<0.01	
1/99	5.72	5.17	470	450	0.087		0.027	0.38	<0.004	<0.0005		0.013	67	<0.01	
5/99	5.72	5.43	460	405	0.13		0.13	0.35	<0.004	<0.0005		0.011	70	<0.01	
9/99	5.95	6.15	480	480	0.12		0.016	0.26	<0.004	<0.0005		<0.01	57	<0.01	
1/00	6.04	5.25	460	410	0.23		0.22	0.35	<0.004	<0.0005		<0.01	58	<0.01	
5/00	5.89	5.90	470	464	1.0		1.0	0.30	<0.004	<0.0005	0.69	0.014	77	<0.01	
10/00	5.85	5.47	460	384	0.96		0.28	0.27	<0.004	<0.0005		0.014	52	<0.01	
1/01	5.75	5.45	460	412	0.9		0.9	0.32	<0.004	<0.0005		0.015	64	<0.01	
5/01	5.65	5.20	420	391	1.1		0.36	0.22	<0.004	<0.0005		0.014	54	<0.01	
9/01	5.70	6.01	430	415	1.3		<0.1	0.56	<0.004	<0.0005		0.015	64	<0.01	
1/02	5.73	5.77	450	396	0.9		0.9	0.37	<0.004	<0.0005		0.0196	60.5	<0.01	
5/02	5.63	5.71	400	311	0.60		<0.04	0.22	<0.004	<0.0005		0.0146	62.1	<0.01	
9/02	5.65	6.00	449	443	0.975		0.13	0.164	<0.004	<0.0005		0.0265	59.1	<0.01	
1/03	5.72	5.99	412	462	0.65		<0.02	0.305	<0.004	<0.0005		0.0192	70.4	<0.01	
5/03	5.73	6.09	390	305	0.38		0.068	0.13	<0.004	<0.0005		0.017	47	<0.01	
9/03	5.93	6.25	440	377	0.35		0.016	<3.2 B	0.0068	<0.0005		0.018	61	<0.01	
1/04	6.01	7.24	400	341	0.40		0.40	0.53	<0.004	<0.0005		0.021	54	<0.01	
5/04	6.48	5.77	410	306	0.15		0.01	0.21	<0.004	<0.0005		0.024	81	<0.01	
9/04	5.84	5.65	410	276	0.25		0.12	<1.25 B	<0.004	<0.0005		0.03	53	<0.01	
1/05	6.23	5.47	360	293	0.29		0.01	0.19	<0.004	<0.0005		0.018	51	<0.01	
5/05	6.06	5.54	380	336	0.15		0.14	0.27 J	<0.004	<0.0005		0.023	56	<0.01	
10/05	6.08	5.58	380	289	0.54		0.017	2.1	<0.004	<0.0005		0.024	47	<0.01	
1/06	6.03	5.69	420	372	0.38		<0.01	1.5J	<0.004	<0.0005		<0.10B	72	<0.01	
5/06	6.12	5.70	380	316	0.48		<0.01	<2.0B	<0.004	<0.0005		0.032	51	<0.01	
9/06	6.06	5.77	380	345	0.23		0.230	<0.55B	<0.004	<0.0005		<0.01	52	<0.01	
2/07	6.24		470		0.47		0.020	0.78	<.004	<.0005		<.01	65	<.01	
5/07	6.04	5.68	380	341	0.26		<0.01	0.14	<0.004	<0.0005		0.018	61	<0.01	
5/07 (Dup.)	6.13	5.68	380	341	0.26		<0.01	<0.1	0.0044	<0.0005		0.010	61	<0.01	
9/07	6.69	6.59	360	295	0.26		<0.010	0.17	<0.0040	<0.00050		0.120	59	<0.010	
3/08	6.01	5.67	360	275	0.20		<0.01	0.15	<0.004	<0.0005		<0.010	56	<0.010	
6/08	6.07		380	276	0.24		<0.01	0.27	<0.004	<0.0005		0.069	63	<0.01	
9/08	6.39	6.23	310	354	0.17		<0.01	0.16	<0.004	<0.0005		<0.01	58	<0.01	
1/09	6.00	6.21	339	348	<0.0050			0.15	<0.0050	<0.0010		0.090	53	<0.0050	
5/09	5.90	6.17	383	385	4.10		0.062	0.15	<0.0050	<0.0010		0.018	74.0	<0.0050	
9/09	6.30	6.33	400	372	0.14		0.021	0.24	<0.0050	<0.0010		0.0079	74.9	<0.0050	
9/09 (Dup)	6.20		448		0.13		<0.0050	0.21	<0.0050	<0.0010		0.020	76.0	<0.0050	
1/10	6.10	6.24	333	341	0.013		<0.0050	0.20	<0.0050	<0.0010		0.061	64.1	<0.0050	
7/10	5.97	6.43	404	359	0.0933		0.0933	0.321	0.112	<0.0005		0.0534	48.5	0.00746	
11/10	6.25	6.28	375	313	0.2480		0.2480	0.248	<0.0025	<0.0005		<0.005	61.1	<0.005	
11/10 (Dup.)	5.90		367		0.0997		0.0997	0.236	<0.0025	<0.0005		0.0073	61.1	<0.005	

Note: All results in mg/L unless otherwise noted.

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TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-29S															
5/86	8.4		2,350		1.5	0.02		28			0.64	0.08	590		
6/88	9.0	9.0	1,100	1,090	0.99		0.37	44	0.0052	<0.0015	1.52	0.094	224	0.0044	<0.005
1/95	8.3	10.0	2,900	1,750	0.79		0.07	56	<0.004	<0.01	0.37	0.12	590	<0.01	
5/97	8.3	8.43	2,200	1,735	0.6		<0.1	44	<0.004	<0.0005		0.14	410	<0.01	
5/98	8.64	8.70	1,700	1,665	0.18			26	<0.004	<0.0005		0.09	370	<0.01	
5/99	8.35	8.37	1,300	1,090	0.22			16	<0.004	<0.0005		0.30	230	<0.01	
5/00	8.11	8.11	1,200	1,023	0.17			16	0.0057	<0.0005	0.14	0.41	130	<0.01	
5/01	7.89	7.54	1,000	828	0.16			16	<0.004	<0.0005		0.42	160	<0.01	
5/02	7.73	7.71	700	408	0.08			10	<0.004	<0.0005		0.563	79.6	<0.01	
5/03	7.68	7.81	1,000	759	0.21			9.1	<0.004	<0.0005		0.78	110	<0.01	
5/04	7.48	7.56	1,700	1,760	0.93			8.7	<0.004	<0.0005		1.2	380	<0.01	
5/05	7.82	7.37	1,200	950	1.3			9.7 J	<0.004	<0.0005		0.78	170	<0.01	
5/06	7.47	7.32	2,000	1,510	1.7			15J	<0.004	<0.0005		1.7	300	<0.01	
5/07	7.56	7.63	1,000	769	6.2			20	<0.004	<0.0005		0.5	180	<0.01	
6/08	7.73		1,100	621	4.8(J)			31	<0.004	<0.0005		0.4	200	<0.01	
5/09	7.6	7.73	1,230	1,188	<0.0050			22.8	<0.0050	<0.0010		0.50	300	<0.0050	
7/10	7.58	7.93	1,120	818	1.12		1.12	29.0	0.164	<0.0005		0.287	165	0.0121	

Note: All results in mg/L unless otherwise noted. J = One or more quality control criteria not met. Value considered estimated.

TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-29D															
5/86	8.6		648		0.31	0.01		9.7			0.18	0.26	139		
6/88	8.1	8.0	590	570	0.25		<0.01	4.2	0.002	<0.0015	0.082	1.16	60.4	<0.0026	<0.005
1/95	7.5	8.9	650	770	0.22		0.03	3.7	<0.004	<0.01	0.09	2.0	33	<0.01	
5/97	7.7	7.9	600	479	0.18		<0.02	3.3	<0.004	<0.0005		2	31	<0.01	
5/98	7.65	7.53	550	560	0.17		<0.01	3.5	<0.004	<0.0005		1.8	28	<0.01	
5/99	7.82	7.60	550	465	0.19		0.19	3.4	<0.004	<0.0005		1.8	28	<0.01	
5/00	7.75	7.66	590	503	0.15		0.15	3.1	<0.004	<0.0005	0.12	1.9	24	<0.01	
5/01	7.55	6.82	570	489	0.15		0.15	3.1	<0.004	<0.0005		1.8	27	<0.01	
5/02	7.56	7.42	540	342	0.13		<0.01	3.6	<0.004	<0.0005		1.7	30.3	<0.01	
5/03	7.64	7.74	590	449	0.13		<0.01	3.6	<0.004	<0.0005		2.0	32	<0.01	
5/04	8.03	7.68	610	682	0.16		0.16	2.4	<0.004	<0.0005		2.0	33	<0.01	
5/05	7.77	7.47	600	530	0.15		0.14	3.9 J	<0.004	<0.0005		2.1	38	<0.01	
5/06	7.78	7.55	680	560	0.23		<0.01	2.4J	<0.004	<0.0005		2.1	39	<0.01	
5/07	7.54	7.58	660	509	0.23		<0.01	3.1	<0.004	<0.0005		2.0	45	<0.01	
6/08	7.56		670	393	0.3		0.086	3.9	<0.004	<0.0005		1.8	51	<0.01	
5/09	7.7	7.51	1010	970	0.21		<0.0050	3.9	<0.0050	<0.0010		2.4	153	<0.0050	
7/10	7.64	8.01	738	553	1.63		1.63	11.4	<0.0005	<0.0005		1.08	123	<0.0050	

Note: All results in mg/L unless otherwise noted.

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TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-30															
5/86	6.6		342		0.01	<0.01		0.5			<0.01	2.10	20		
6/88	6.3	6.3	340	400	0.01		<0.01	<0.1	0.0018	<0.0015	4.42	0.753	18.7	0.0044	0.005
1/95	6.2	6.0	430	570	0.01		<0.01	<0.1	<0.004	<0.01	0.78	0.60	19	<0.01	
5/97	6.2	6.47	420	334	<0.01			<0.1	<0.004	<0.005		0.6	18	<0.01	0.012
5/98	6.19	5.70	390	418	<0.01			0.10	<0.004	<0.0005		0.68	21	<0.01	0.013
5/99	6.43	6.10	400	390	0.016		0.013	0.19	<0.004	<0.0005		0.71	21	<0.01	0.02
5/00	6.34	5.91	430	380	0.026		0.026	0.12	<0.004	<0.0005	1.5	0.70	21	<0.01	0.017
5/01	6.14	6.21	420	409	0.79		0.79	0.17	<0.004	<0.0005		0.54	19	<0.01	0.015
5/02	6.27	6.27	430	282	0.051		0.05	0.18	<0.004	<0.0005		0.434	31.2	<0.01	0.024
5/03	6.27	6.70	440	342	0.019		<0.01	0.16	<0.004	<0.0005		0.81	23	<0.01	0.028
5/04	6.61	6.27	450	512	<0.01			2.1	<0.004	<0.0005		0.50	25	<0.01	0.0065
5/05	7.16	6.16	470	427	4.5		0.96	3.1 J	<0.004	<0.0005		0.90	37	<0.01	0.012
5/06	6.66	6.13	500	428	<0.01			<2.0B	<0.004	<0.0005		0.51	26	<0.01	0.009
5/07	6.56	6.22	540	435	2.7		<0.01	7.6	0.0057	<0.0005		0.74	53	<0.01	0.016
6/08	6.49		600	339	6.8		1.8	11.0	0.0061	<0.0005		0.76	61	<0.01	0.017
5/09	6.4	6.49	593	518	4.2		<0.0050	12.6	<0.0050	<0.0010		0.62	81.9	<0.0050	0.0096
7/10	6.48	6.97	560	447	1.62		1.62	18.0	0.131	<0.0005		0.332	65.2	0.00758	0.0697

Note: All results in mg/L unless otherwise noted.

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TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-31															
5/86	9.1		1,250		12	1.5		46			84.5	3.67	380		
6/88	10.2	10.5	3,400	3,500	39		<0.01	140	0.048	<0.0015	20.3	1.93	703	0.184	0.040
2/90	10.0	9.95	2,300	2,700	4.80		3.94	110			49		660		
1/95	9.6	10.4	1,900	1,600	7.1		<0.01	89	0.027	<0.01	4.6	0.66	420	<0.02	
7/96	9.5	9.52	2,300	2,100	12	<0.020		91	0.042	0.0007		0.62		0.04	0.041
5/97	9.9	9.69	2,500	2,100	12		<0.50	110	0.04	0.0007		0.68	480	0.05	0.028
5/97 (Dup.)	9.9	9.69	2,500	2,100	8.2			93	0.038	0.0008		0.74	480	0.05	0.029
5/98	9.63	9.80	2,400	2,350	9.3		<0.01	100	0.036	0.0013		1.1	490	0.04	0.022
9/98	9.67	9.86	2,600	2,520	9.8		<0.01	120	0.044	0.0014		1.1	620	0.045	0.017
9/98 (Dup.)	9.67	9.86	2,700	2,520	9.5		<0.01	130	0.045	0.0013		1.1	600	0.043	0.020
1/99	9.72	9.97	2,500	2,240	22		0.63	120	0.047	0.0012		1.3	620	0.065	0.019
5/99	9.91	10.02	2,600	2,510	29		6.5	130	0.06	0.0014		1.2	600	0.07	0.034
9/99	9.83	10.03	2,600	2,810	30		4.3	150	0.063	0.0011		1.6	750	0.088	<0.005
1/00	9.98	9.80	2,900	2,600	24		6.3	150	0.072	0.001		1.4	650	0.120	0.028
5/00	10.1	10.10	2,900	2,400	21		1.7	140	0.096	0.0011	13	1.6	820	0.12	0.020
10/00	9.99	10.18	2,800	2,550	20		0.54	140	0.056	0.00076		1.1	480	0.079	0.043
1/01	10.1	11.21	2,100	1,900	13		1.5	110	0.056	0.001		1.3	560	0.11	0.020
5/01	9.93	10.85	2,100	1,866	12		12	77	0.046	0.0012		1.4	430	0.081	0.027
9/01	9.95	9.98	2,300	1,877	16		1.2	110	0.054	0.0014		1.4	590	0.09	0.032
1/02	9.96	10.17	2,400	1,720	13		1.6	110	0.0493	0.00116		1.46	406	0.0968	0.017
1/02 (Dup.)	9.97	10.17	2,400	1,720	13		2.8	110	0.0519	0.00148		1.98	400	0.106	0.020
5/02	9.91	9.95	1,900	1,651	14		<0.50	91	0.0628	0.00105		1.0	395	0.0691	0.017
9/02	9.80	10.02	1,520	1,991	11.3		3.55	91	0.056	0.000982		1.21	357	0.0698	0.0234
9/02 (Dup.)	9.79	10.02	2,150	1,991	14.7		2.70	92.6	0.0592	0.00106		1.30	356	0.0694	0.0232
1/03	9.87	9.93	2,090	2,270	13.6		<0.5	99.5	0.0745	0.00181		1.47	472	0.0797	0.0323
1/03 (Dup.)	9.88	9.93	2,140	2,270	14		1.41	102	0.0706	0.00146		1.16	438	0.0664	0.029
5/03	9.69	10.00	1,800	1,310	15		4.1	80	0.038	0.001		0.99	330	0.064	0.022
9/03	9.69	9.81	1,800	1,648	12		7.7	91	0.046	0.001		1.3	410	0.074	0.032
1/04	9.55	9.83	2,300	1,375	12		1.3	85	0.033	0.00084		1.2	380	0.062	0.045
1/04 (Dup.)	9.55	9.83	2,300	1,375	13		1.3	62	0.027	0.00097		1.2	380	0.063	0.043
5/04	9.72	9.85	1,700	1,281	15		1.6	71	0.044	0.0015		1.5	570	0.078	0.025
9/04	9.50	9.81	1,800	1,215	15		<0.01	81	0.044	0.0018		1.6	400	0.087	0.041
9/04 (Dup.)	9.52	9.81	1,800	1,215	15		<0.01	95	0.044	0.0019		1.7	410	0.093	0.043
1/05	9.73	9.79	1,600	1,383	12		1.7	88	0.054	0.0018		1.8	350	0.099	0.034
1/05 (Dup.)	9.76	9.79	1,600	1,383	13		1.8	82	0.054	0.0017		1.8	340	0.096	0.029
5/05	9.65	9.68	1,700	1,519	16		0.21	86 J	0.057	0.0024		2.3	430	0.12	0.036
10/05	9.68	9.78	2,100	1,674	22		3.9	86	0.07	0.0031		3.1	440	0.16	0.038
10/05 (Dup.)	9.68	9.78	1,900	1,674	23		8.6	90	0.066	0.003		3.0	440	0.16	0.039
1/06	9.77	7.64	1,700	1,427	8.3		1.2	70J	0.06	0.0022J		2.3	370	0.12	0.030
1/06 (Dup.)	9.81	7.64	1,700	1,427	7.8		2.5	66J	0.061	0.0038J		2.2	360	0.12	0.028
5/06	9.82	9.98	1,600	1,291	9.7		<0.01	84J	0.05	0.0018		2.2	350	0.1	0.025
9/06	9.82	9.91	1,700	1,417	12		3.4	63	0.045	0.0006		0.6	360	0.048	0.026

Note: All results in mg/L unless otherwise noted.

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TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-31 (cont.)															
9/06 (Dup.)	9.82	9.91	1,700	1,417	12		12	55	0.05	0.0013		1	390	0.071	0.027
2/07	9.72		1,600		8.8		1.5	42	0.034	<.0005		0.59	330	0.036	0.046
5/07	9.59	9.56	1,400	1,120	11		0.066	81	0.049	0.0016		1.5	320	0.062	0.083
9/07	9.62	9.93	1,300	1,104	8.6		0.16	62	0.043	0.00089		1.2	310	0.063	0.090
9/07 (Dup.)	9.62		1,400		8.1		<0.010	61	0.044	0.00086		1.2	310	0.064	0.089
3/08	9.52	9.26	1,500	1,022	6.9		<0.010	63	0.047	0.0014		1.6	330	0.077	0.036
6/08	9.61		1,400	999	8.4		<0.01	62	0.05	0.0013		1.8	310	0.062	0.067
9/08	9.57	9.68	1,100	1,299	4.4		<0.01	52	0.041	0.0012		1.2	300	0.069	0.042
1/09	9.5	9.64	1,350	1,341	7.4		7.3	63.4	0.039	<0.0010		0.74	195	0.043	0.038
5/09	9.5	9.74	1,350	1,314	5.1		0.016	50	0.045	<0.0010		1.4	406	0.065	0.030
5/09 (Dup.)	9.5	9.74	1,360	1,314	0.13		<0.0050	49.7	0.043	<0.0010		1.4	407	0.065	0.029
9/09	9.6	9.93	1,430	1,335	7.4		0.10	56.5	0.039	0.0013		0.89	393	0.056	0.040
9/09 (Dup)	9.6		1,480		7.6		0.85	53.6	0.038	0.0013		0.92	409	0.058	0.047
1/10	9.7	9.74	1,280	1,305	5.9		<0.0050	56.3	0.031	<0.0010		1.1	386	0.049	0.032
7/10	9.54	9.83	1,400	1,230	5.8		5.8	48.5	0.147	0.000718		0.909	203	0.0437	0.021
11/10	9.51	9.84	1,340	917	2.08		0.967	41.9	0.0256	<0.0005		0.427	187	0.0222	0.025
11/10 (Dup.)	9.49		1,350		4.82		4.82	39.7	0.0222	<0.0005		0.465	215	0.0246	0.026

Note: All results in mg/L unless otherwise noted.

J = One or more quality control criteria not met. Value considered estimated.

TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-32															
5/86	10.5		6430		97	18		369			27.4	0.69	2120		
7/88	9.2	9.3	890	1,040	7.2		0.30	39	0.014	<0.0015	4.05	0.513	234	0.024	<0.005
1/95	9.4	9.4	1,300	630	12		3.6	47	0.014	<0.01	2.7	0.37	230	0.03	
7/96	8.6	8.89	1,000	1,038	6.9	<0.020		29	0.011	<0.0005		0.84		0.01	
5/97	8.7	8.71	930	697	4.4		1.3	19	0.008	<0.0005		1.1	110	<0.01	
5/98	8.03	8.10	630	697	2.5		0.34	7.7	<0.004	<0.0005		1.9	61	<0.01	
5/98 (Dup.)	8.05	8.10	690	697	2.5		0.09	8.0	<0.004	<0.0005		2.0	68	<0.01	
9/98	8.30	8.26	760	760	4.5		1.0	13	<0.004	<0.0005		1.8	78	<0.01	
1/99	8.39	8.00	710	650	3.1		<0.02	13	<0.004	<0.0005		1.7	77	<0.01	
1/99 (Dup.)	8.39	8.00	720	650	3.7		<0.02	13	<0.004	<0.0005		1.7	76	<0.01	
5/99	8.38	8.50	690	555	4.4		0.59	12	<0.004	<0.0005		2.0	78	<0.01	
9/99	9.84	10.01	2,200	2,300	18		1.8	120	0.057	0.0014		2.2	520	0.093	
1/00	8.93	8.28	950	770	4.8		0.57	27	0.017	<0.0005		1.9	97	0.024	
5/00	8.80	8.95	830	858	3.9		<0.01	19	0.013	<0.0005	3.1	1.6	70	<0.01	
10/00	9.75	9.98	1,500	1,227	8.3		0.76	70	0.051	0.00099		1.6	290	0.058	
1/01	8.46	9.24	740	675	4.3		0.82	13	0.004	<0.0005		2.0	95	<0.01	
5/01	8.51	8.84	790	624	4.9		4.9	17	0.0054	<0.0005		2.1	94	0.012	
9/01	8.69	8.74	720	606	4.9		0.53	99	0.0088	<0.0005		1.9	110	0.011	
1/02	8.45	8.69	770	627	4.3		2.4	14	0.0047	<0.0005		1.68	98.1	<0.01	
5/02	8.75	8.72	850	543	6.9		<0.25	28	0.0293	<0.0005		1.83	134	0.0107	
9/02	8.73	9.02	940	889	6.13		0.55	25.4	0.0299	<0.0005		1.60	101	0.0122	
1/03	8.35	7.70	747	768	4.41		0.11	13	0.00403	<0.0005		1.91	93.1	<0.01	
5/03	8.31	8.47	820	616	3.6		<0.01	21	0.010	<0.0005		2.2	82	<0.01	
9/03	8.67	8.88	920	745	5.9		1.4	32	0.013	<0.0005		1.7	130	0.011	
1/04	8.54	8.77	790	588	5.2		2.0	21	0.0082	<0.0005		1.7	99	<0.01	
5/04	9.43	9.76	1,200	872	5.2		0.38	49	0.034	0.00084		1.1	360	0.054	
9/04	9.72	10.03	1,600	1,100	13		<0.01	90	0.091	0.0026		2.6	360	0.16	
1/05	9.96	9.96	1,600	1,372	17		2.1	70	0.1	0.0028		3.8	330	0.17	
5/05	9.98	9.76	1,600	1,474	15		1.0	95 J	0.11	0.0027		4.3	370	0.19	
10/05	9.99	10.05	1,600	1,444	14		1.1	83	0.1	0.0042		4.9	380	0.24	
1/06	9.97	7.68	1,600	1,332	9.4		1.1	52J	0.065	0.003J		3.2	330	0.14	
5/06	9.93	10.16	1,500	1,300	16		1.4	50J	0.049	0.0021		3.3	350	0.11	
9/06	10.03	10.08	1,700	1,395	12		12.0	60	0.059	0.0012		1.5	350	0.1	
2/07	10.03		1,700		9.7		0.3	69	0.059	0.00078		1.8	340	0.095	
5/07	9.93	9.96	1,400	1,211	11		11.0	69	0.063	0.0018		3.1	340	0.12	
9/07	10.00		1,500		6.5		0.0	64	0.060	0.00096		1.9	341	0.1	
9/07 (Dup.)	10.01		1,500		7		0.3	63	0.053	0.00095		1.8	330	0.1	
3/08	9.88	9.75	1,500	973	6.1		<0.01	60	0.054	0.0012		2.4	330	0.1	
3/08 (Dup)	9.88		1,500	1,041	7.3		0.7	55	0.058	0.0013		2.4	330	0.11	
6/08	9.90		1,400	1,041	12		1.6	55	0.047	0.0016		2.6	340	0.097	
9/08	9.86	9.97	1,400	1,514	9.2		<0.01	65	0.048	0.001		1.7	350	0.085	
1/09	9.80	9.94	1,380	1,392	5.9		5.9	70	0.051	0.001		1.7	198	0.085	
5/09	9.70	9.97	1,330	1,305	5.8		0.16	43.6	0.047	<0.0010		1.5	398	0.075	
9/09	9.80	10.15	1,600	1,433	8.0		0.28	66.2	0.045	0.0016		1.7	443	0.085	
1/10	10.00	9.97	1,230	1,290	4.7		<0.0050	61.4	0.037	<0.0010		1.4	358	0.07	
1/10 (Dup.)	9.90		1,420		6.1		<0.0050	62.8	0.036	<0.0005		1.3	360	0.062	
7/10	9.83	10.14	1,260	1,174	6.31		6.31	30.7	0.131	0.000919		1.12	216	0.0561	
11/10	9.90	10.17	1,400	945	3.76		3.24	51.8	0.035	0.000837		1.18	212	0.0533	

Note: All results in mg/L unless otherwise noted.

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TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-34S															
5/86	7.4		668		0.13	<0.01		9.4			0.07	0.42	64		
7/88	7.2	7.2	690	670	40		38	7.3	0.0087	<0.0015	14.6	0.416	33.1	0.018	<0.005
2/90	7.4	6.93	690	740	0.113		0.26	6.5			21		49		
1/95	7.2	7.1	700	430	0.03		<0.01	7.3	<0.004	<0.01	0.18	0.01	35	<0.01	
5/97	7.4	7.43	710	579	0.18		0.04	8.1	<0.004	<0.0005		0.04	69	<0.01	
5/98	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
5/99	7.34	7.55	650	505	0.19		<0.01	6.8	<0.004	<0.0005		0.014	46	<0.01	
5/00	7.60	7.46	740	607	1.1		1.1	11	<0.004	<0.0005	1.2	0.044	83	<0.01	
5/01	7.71	7.34	670	537	0.12		0.12	8.6	0.025	0.0019		2.9	50	0.054	
5/02	7.90	7.98	920	457	0.064		<0.01	49	0.0367	0.00246		2.12	172	0.072	
5/03	7.36	7.63	700	520	0.14		0.012	13	<0.004	<0.0005		0.055	52	<0.01	
5/04	8.08	8.21	950	729	0.38		0.26	41	0.0043	<0.0005		0.068	270	0.01	
5/05	8.63	8.51	1,700	1,673	9.1		0.21	130 J	0.028	0.0038		0.8	520	0.074	
5/06	8.59	8.75	1,600	1,358	6.4		0.47	68J	0.012	0.0021		0.51	380	0.036	
5/07	8.26	8.14	1,100	831	5.8		0.37	32	0.011	0.0007		0.38	250	0.02	
6/08	8.62		1,200	824	2.2		0.18	42	0.012	0.00091		0.24	300	0.018	
5/09	8.00	8.25	982	911	3.1		0.12	21.1	0.011	<0.0010		0.29	269	0.014	
7/10	7.95	8.94	1,390	1,070	3.47		2.19	45.2	0.150	0.00148		0.422	211	0.0185	

Note: All results in mg/L unless otherwise noted.

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TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-34D															
5/86	7.3		802		0.05	<0.01		10.2			0.02	0.55	42		
7/88	7.4	7.4	560	580	0.07		<0.01	4.4	0.0031	<0.0015	0.538	0.762	32.4	<0.0026	<0.005
1/95	7.3	7.4	640	400	0.07		0.07	4.2	<0.004	<0.01	<0.04	0.82	34	<0.01	
5/97	7.4	7.43	630	492	0.05		<0.01	3.6	<0.004	<0.0005		0.79	31	<0.01	
5/98	7.37	7.23	590	595	0.09		0.01	3.9	<0.004	<0.0005		0.68	35	<0.01	
5/99	7.40	7.52	470	475	0.062		<0.01	3.6	<0.004	<0.0005		0.72	29	<0.01	
5/00	7.55	7.37	620	519	0.063		0.063	4.2	<0.004	<0.0005	0.14	0.76	28	<0.01	
5/01	8.00	7.16	600	453	0.13		0.13	3.9	<0.004	<0.0005		0.70	30	<0.01	
5/02	7.38	7.37	560	298	0.059		0.022	4.6	<0.004	<0.0005		0.68	32.9	<0.01	
5/03	7.38	7.52	630	470	0.047		<0.01	4.4	0.0041	<0.0005		0.58	31	<0.01	
5/04	7.44	7.35	660	505	0.45		0.37	6.0	<0.004	<0.0005		<0.01	83	<0.01	
5/05	7.83	7.36	1000	653	10		0.14	24 J	<0.004	<0.0005		0.12	190	<0.01	
5/06	7.80	7.77	910	760	7.5		1.8	23J	<0.004	<0.0005		0.26	170	<0.01	
5/07	8.10	7.95	1,000	799	2.6		<0.01	31	0.0066	0.00055		0.34	230	0.018	
6/08	8.13		800	572	4.8		0.64	26	0.012	0.0013		0.52	190	0.038	
5/09	7.70	7.99	829	767	1.4		0.29	17.0	0.0056	<0.0010		0.20	198	<0.0050	
7/10	8.67	8.59	832	658	2.26		1.29	39.9	0.141	0.000829		0.316	123	0.0219	

Note: All results in mg/L unless otherwise noted.

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TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-35															
5/86	10.2		6,430		240	38		358			125	1.76	2,070		
7/88	10.2	10.4	6,100	6,150	43		41	400	0.147	0.002	56.5	0.337	1,630	0.053	<0.005
2/90	9.6	9.7	1,500	1,540	8.0		<0.005	71			20		350		
1/95	9.5	9.7	1,200	562	16		<0.01	35	0.018	<0.01	11	0.43	220	<0.01	
7/96	9.5	9.5	1,700	1,851	6.0	0.040		71	0.028	0.0006		0.5		0.03	
5/97	9.4	9.47	1,000	900	16		<1.0	40	0.02	0.0006		0.68	220	0.02	
5/98	8.93	9.10	710	766	15		2.9	27	0.012	<0.0005		0.92	140	0.01	
9/98	8.97	8.90	550	778	16		0.99	26	0.01	<0.0005		0.88	130	<0.01	
1/99	9.28	9.15	820	925	23		2.9	40	0.019	<0.0005		0.81	190	0.016	
5/99	9.35	9.70	830	870	28		10	38	0.013	<0.0005		0.88	160	0.015	
9/99	9.18	9.60	790	930	18		2.0	34	0.012	<0.0005		0.53	170	0.05	
1/00	8.91	8.15	610	500	13		3.3	21	0.0077	<0.0005		0.47	94	0.068	
5/00	9.07	9.24	690	693	27		20	28	0.081	<0.0005	5.2	0.48	69	0.077	
10/00	8.78	8.84	520	470	7.3		0.59	17	0.0076	<0.0005		0.57	81	0.11	
1/01	8.86	9.59	530	549	10		3.1	19	0.008	<0.0005		0.50	89	0.075	
5/01	9.17	9.43	800	790	17		2.6	35	0.013	<0.0005		0.48	130	0.04	
9/01	9.26	9.03	820	749	15		<0.5	41	0.0097	<0.0005		0.46	120	0.062	
1/02	9.24	9.44	850	662	14		2.1	41	0.0108	<0.0005		0.511	129	0.0659	
5/02	9.03	9.21	600	528	24		7.4	27	0.0347	0.000537		0.576	172	0.0365	
9/02	8.60	9.33	542	733	8.96		1.21	17.5	0.0254	<0.0005		0.435	70.3	0.0259	
1/03	8.85	8.94	579	621	10.8		<0.5	23.6	0.00733	<0.0005		0.449	72.4	0.0255	
5/03	8.87	9.05	660	466	6.6		<0.01	31	0.0099	<0.0005		0.52	76	0.025	
9/03	8.46	8.57	540	437	6.4		1.1	23	0.0098	<0.0005		0.52	53	0.016	
1/04	8.12	8.32	480	335	5.5		2.4	15	0.0046	<0.0005		0.68	49	0.015	
5/04	8.50	8.60	550	401	6.6		<0.01	22	0.011	<0.0005		0.63	120	0.017	
9/04	8.04	8.20	430	305	5.5		2.9	7.5	0.0096	<0.0005		0.61	48	<0.01	
1/05	8.66	8.65	540	529	12		2.3	18	0.011	<0.0005		0.72	76	0.011	
5/05	8.45	8.08	480	467	7.9		4.1	15 J	0.012	<0.0005		0.86	75	0.014	
10/05	8.54	8.62	610	514	15		2.4	33	0.011	<0.0005		0.88	81	0.015	
1/06	8.18	7.25	530	453	7.9		1.6	12J	0.0096	<0.0005		0.92	62	0.01	
5/06	9.51	9.78	1,300	1,222	16		<0.01	90J	0.028	0.0008		0.71	230	0.028	
9/06	9.16	8.78	860	568	32		32.00	27	0.013	<0.0005		0.82	100	0.015	
2/07	9.49		1,200		22		<.01	45	0.014	<.0005		0.61	120	<.01	
5/07	8.81	7.79	700	369	22		0.86	22	0.027	0.00059		0.74	180	0.023	
9/07	9.18	9.39	800	592	14		<0.010	32	0.016	<0.00050		0.79	150	<0.010	
3/08	8.97	8.74	760	485	21		0.56	23	0.017	<0.0005		1.10	130	0.021	
6/08	8.37		540	381	15		0.45	15	0.013	0.00061		1.20	86	0.013	
9/08	8.54	8.56	530	589	17		1.50	15	0.013	<0.0005		0.86	92	<0.01	
1/09	8.70	8.76	635	615	19.3		19.30	24	0.016	<0.0010		1.10	72.1	0.012	
5/09	7.80	7.89	520	481	12.25		<0.0050	10.7	0.011	<0.0010		1.10	88.4	0.0076	
9/09	7.60	7.67	402	354	3.9		0.13	3.3	0.0092	<0.0010		0.93	52.0	0.0052	
1/10	7.70	7.68	409	392	5.6		<0.0050	7.0	0.012	<0.0010		0.99	79.5	0.0097	
7/10	7.55	7.36	368	276	2.12		1.34	2.95	0.108	<0.0005		0.70	26.8	0.00866	
11/10	7.33	7.84	372	286	2.56		2.56	3.45	0.0114	<0.0005		0.56	36.2	<0.005	

Note: All results in mg/L unless otherwise noted.

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SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-36															
5/86	9.7		2,700		25	1.4		97			39.5	1.13	760		
7/88	8.9	9.6	940	1,255	8.6		1.3	18	0.0078	<0.0015	3.52	0.332	161	0.0063	<0.005
1/95	9.8	9.7	3,500	1,350	18		<0.01	160	0.034	<0.01	8.7	0.83	770	0.07	
7/96	9.6	9.55	3,300	3,280	8.1	<0.020		160	0.058	0.0021		0.67		0.07	
5/97	9.8	9.64	3,600	3,290	9.2		3.5	180	0.084	0.0035		1.7	850	0.1	
5/98	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
9/98	9.90	10.10	4,500	4,380	6.5		0.03	230	0.11	0.0036		1.4	990	0.074	
1/99	9.76	10.20	3,500	3,300	41		1.2	190	0.076	0.0036		1.5	820	0.072	
5/99	10.10	10.40	2,500	2,260	19		4.4	150	0.12	0.0019		1.3	600	0.12	
9/99	10.10	10.10	1,800	1,790	6.2		0.69	93	0.059	0.00055		1.2	420	0.067	
9/99 (Dup.)	10.10	10.10	1,800	1,790	6.3		<0.5	96	0.061	0.00062		1.2	450	0.07	
1/00	10.2	9.80	1,600	1,450	3.9		0.51	80	0.072	<0.0005		0.70	290	0.082	
5/00	10.2	10.42	1,200	1,272	1.6		<0.01	50	0.03	<0.0005	4.0	0.54	150	0.03	
10/00	9.84	10.05	1,200	1,043	4.9		<0.01	41	0.024	0.00061		1.6	210	0.033	
1/01	9.79	11.00	1,700	1,567	12		2.0	89	0.027	0.0018		1.4	450	0.049	
5/01	9.87	10.28	1,100	1,109	3.0		3.0	49	0.029	0.00054		0.68	220	0.045	
9/01	9.80	9.75	1,100	960	2.7		<0.25	44	0.018	0.00053		0.59	210	0.026	
1/02	9.57	9.83	1,800	1,691	14		<0.01	120	0.0209	0.00205		1.0	310	0.0413	
5/02	9.61	9.61	1,800	1,286	16		4.6	98	0.0336	0.0018		1.15	381	0.0216	
9/02	9.55	9.80	1,400	1,304	4.14		<0.01	52	0.0217	0.000709		1.07	219	<0.01	
1/03	9.65	9.65	2,120	2,130	23.7		1.35	119	0.0711	0.0033		1.37	446	0.0791	
5/03	9.51	9.80	2,000	1,422	9.3		<0.01	120	0.049	0.0027		1.7	380	0.091	
9/03	9.50	9.56	1,500	1,252	6.2		0.74	110	0.046	<0.0005		0.75	290	0.038	
1/04	9.54	9.79	2,000	1,350	9.5		2.7	93	0.048	0.0013		0.81	350	0.077	
5/04	9.39	9.64	2,000	1,393	13		<0.01	120	0.043	0.0022		0.96	610	0.05	
9/04	9.63	9.82	1,000	701	4.9		2.3	52	0.047	0.00077		0.56	220	0.05	
1/05	9.69	9.61	860	750	3.4		0.69	33	0.026	0.00066		0.44	170	0.03	
5/05	9.66	9.44	800	774	1.8		0.53	30 J	0.02	0.0007		0.41	180	0.029	
10/05	9.44	9.50	1,000	764	12		2.3	28	0.02	<0.0005		0.28	180	0.02	
1/06	9.32	7.52	1,100	970	12		4.4	36J	0.02	0.0018		0.81	230	0.058	
5/06	9.17	9.31	1,000	878	3.8		0.15	38J	0.0068	<0.0005		0.41	220	0.016	
9/06	9.32	9.25	870	737	9.7		9.6	22	0.0059	<0.0005		0.026	170	<0.010	
2/07	9.07		940		12		<.01	22	<.004	<.0005		0.082	180	<.01	
5/07	8.9	8.8	790	666	10		0.86	32	0.0071	<0.0005		0.18	180	<0.01	
9/07	9.07		560		0.55		<0.010	20	0.0085	<0.00050		0.16	120	0.013	
3/08	8.63	8.4	850	543	7.8		<0.01	18	<0.004	<0.0005		0.2	170	<0.01	
6/08	8.56		710	516	2.1		<0.01	33	0.0057	<0.0005		0.22	160	<0.01	
9/08	8.69		640		4.6		0.14(J)	17	0.0044	<0.0005		0.094	120	<0.01	
9/08 (Dup.)	8.58	8.68	640	724	4.4		2.1(J)	19	0.0072	<0.0005		0.1	150	<0.01	
1/09	8.4		625		3.3		3.3	19	0.0059	<0.0010		0.16	75.8	<0.0050	
1/09 (Dup.)	8.4	8.44	629	622	<0.0050			20.4	0.0053	<0.0010		0.15	75.5	<0.0050	
5/09	8.3	8.57	699	677	13.5		0.10	26.2	<0.0050	<0.0010		0.20	163	<0.0050	
9/09	8.6	8.81	908	792	1.2		0.021	21.8	0.0057	<0.0010		0.18	199	0.0064	
1/10	8.5	8.69	877	761	10.8		1.6	28.9	0.0064	<0.0010		0.21	181	<0.0050	
7/10	8.75	8.98	597	487	1.04		0.486	17	0.107	<0.0005		0.0962	92.4	0.0085	
7/10 (Dup.)	8.77	8.98	600	487	1.05		0.434	19	0.114	<0.0005		0.0900	88.6	0.00737	
11/10	8.43	8.7	741	507	1.21		1.210	14.3	0.00454	<0.0005		0.1590	140	<0.005	

Note: All results in mg/L unless otherwise noted.

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TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-37															
5/86	10.1		7,340		97	8.2		890			498	46.3	1,800		
7/88	9.9	9.8	5,600	5,500	0.30		<0.01	1000	0.169	0.035	115	15.4	1,470	0.369	<0.005
2/90	9.6	9.65	2,700	3,100	4.6		22.7	360			1000		970		
1/95	9.1	9.2	1,200	970	18		<0.01	87	0.033	<0.01	8.5	0.58	280	0.01	
7/96	9.1	8.89	570	832	14	<0.020		45	0.042	0.0005		0.51		0.03	
5/97	9.2	9.07	1,100	846	13		1.7	53	0.027	<0.0005		0.56	210	0.02	
5/98	8.57	8.30	530	505	6.4		<0.01	6.8	0.018	<0.0005		0.28	120	0.02	
9/98	8.90	8.26	670	682	15		5.5	52	0.020	<0.0005		0.53	140	0.017	
1/99	9.02	9.25	660	750	19		<0.10	25	0.02	<0.0005		0.68	140	0.029	
5/99	9.39	9.45	610	540	11		3.6	22	0.023	<0.0005		0.23	130	0.016	
9/99	8.78	8.91	760	753	7.9		0.91	31	0.01	<0.0005		0.33	170	<0.01	
1/00	8.83	8.40	880	822	10		2.2	32	0.011	<0.0005		0.49	110	<0.01	
5/00	8.51	8.89	770	765	5.2		0.93	32	0.015	<0.0005	9.0	0.72	92	<0.01	
10/00	8.39	8.46	750	630	6.6		<0.01	17	0.0089	<0.0005		0.61	79	<0.01	
1/01	8.42	8.99	780	678	8.8		2.7	29	0.02	0.00088		1.5	160	0.035	
5/01	7.89	7.97	650	528	7.9		<0.01	10	0.018	0.00075		2.0	110	0.026	
9/01	7.84	7.54	680	590	5.6		<0.5	21	0.0042	<0.0005		3.0	110	0.011	
1/02	7.83	8.06	700	570	5.9		0.58	20	0.014	0.00113		3.12	129	0.0355	
5/02	8.15	8.05	610	406	5.0		<0.20	18	0.139	0.0169		14.8	141	0.273	
9/02	7.87	7.59	679	601	5.09		0.65	16.7	<0.004	<0.0005		<0.005	0.975	<0.01	
1/03	7.63	7.89	569	608	5.52		0.83	14.4	<0.004	<0.0005		2.48	107	<0.01	
5/03	7.25	7.50	440	342	6.3		0.093	9.8	0.0061	<0.0005		4.2	53	0.014	
9/03	6.89	7.31	520	444	2.4		0.093	14	0.01	0.0005		4.8	83	0.028	
1/04	7.06	7.34	570	422	1.7		0.72	17	<0.004	<0.0005		3.2	82	0.012	
5/04	7.34	7.01	460	365	2.5		0.66	14	0.0055	<0.0005		2.8	110	0.012	
9/04	6.58	6.60	520	387	4.1		2.0	8.8	0.0055	<0.0005		2.1	85	<0.01	
1/05	6.90	6.39	420	370	2.6		1.0	8.7	<0.004	<0.0005		1.9	59	<0.01	
5/05	6.92	6.51	420	374	3.0		0.068	9.5 J	0.012	0.0016		1.7	72	0.045	
10/05	6.82	6.60	630	512	5.8		0.58	17	0.013	0.0014		0.88	100	0.042	
1/06	7.98	7.14	550	463	7.7		2.8	6.3J	0.016	0.0015J		1.6	80	0.043	
5/06	7.00	6.56	570	476	4.0		0.9	8.4J	0.0088	0.00081		0.56	94	0.025	
9/06	6.91	6.53	490	414	2.4		2.4	7.3	<0.004	0.0005		0.60	74	<0.010	
2/07	7.22		500		2.1		<.01	12	0.0090	0.00085		1.70	54	0.03	
5/07	6.85	6.24	310	275	0.9		0.0	3.9	0.0087	<0.0005		0.19	40	0.011	
9/07	7.09	6.88	310	267	1.6		0.2	3.9	<0.0040	<0.00050		0.22	46	0.012	
3/08	6.46	5.93	310	237	<0.05			3.6	<0.004	<0.0005		0.08	47	<0.01	
6/08	6.34		260	183	0.9		0.2	3.4	0.0085	0.00073		0.20	37	0.015	
9/08	6.45	6.60	240	275	0.7		<0.01	3.5	<0.004	<0.0005		0.05	33	<0.01	
1/09	6.30	6.47	332	343	0.7		0.7	4.1	<0.0050	<0.0010		0.05	43.8	<0.0050	
5/09	6.30	6.46	337	327	7.1		0.27	3.3	<0.0050	<0.0010		0.21	53.8	0.0084	
9/09	6.40	6.54	361	307	0.37		0.31	2.8	<0.0050	<0.0010		0.11	55.3	0.012	
1/10	6.60	7.16	396	365	0.096		<0.0050	5.0	0.015	0.0012		0.66	62.3	0.040	
7/10	6.43	6.73	271	235	0.114		0.112	2.75	0.128	0.000595		0.166	24.9	0.0162	
11/10	6.22	7.47	279	185	0.257		0.257	2.83	0.00559	0.000564		0.127	22.9	0.0131	

Note: All results in mg/L unless otherwise noted.

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TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-39S															
5/86	9.5		8,360		11	2.9		244			25.0	1.35	2780		
6/88	9.3	9.1	3,500	2,550	3.8		0.10	110	0.016	<0.0015	36.6	1.63	828	0.053	<0.005
1/95	8.9	8.7	2,700	900	0.64		<0.01	59	<0.004	<0.01	0.36	0.22	520	<0.01	
5/97	8.9	9.2	5,500	5,500	3.6		<0.2	150	0.009	<0.0005		0.15	1300	<0.01	
5/98	9.04	9.09	4,000	4,000	2.3		<0.01	98	0.008	<0.0005		0.11	700	<0.01	
5/99	9.05	9.30	4,300	3,620	3.4		0.24	120	0.0096	<0.0005		0.12	950	<0.01	
5/99 (Dup.)	9.05	9.30	4,200	3,620	3.6		0.89	120	0.009	<0.0005		0.11	1,100	<0.01	
5/00	9.18	9.19	4,500	3,870	3.5		3.5	110	0.013	<0.0005	2.3	0.097	1,100	<0.01	
5/01	8.91	9.38	3,700	2,820	2.0		0.86	97	0.011	<0.005		0.22	880	0.015	
5/02	9.06	9.01	4,200	2,420	4.6		0.55	130	0.0311	0.000659		0.269	1,070	0.0244	
5/03	8.95	9.20	3,800	4,120	3.1		<0.01	140	0.012	<0.0005		0.15	800	0.013	
5/04	9.28	9.46	3,400	5,040	8.5		0.76	150	0.016	<0.0005		0.19	2,000	0.015	
5/05	9.24	9.14	4,800	4,440	7.9		0.025	190 J	0.014	<0.0005		0.15	1,200	<0.01	
5/06	8.96	9.24	4,400	3,530	7.2		2.4	130J	0.011	<0.0005		0.21	940	0.017	
5/07	9.08	9.22	4,000	3,380	5.7		0.069	180	0.012	<0.0005		0.11	950	<0.01	
9/07	9.12	8.55	3,300	2,810	3.2		<0.010	120	0.015	<0.00050		0.16	750	0.01	
3/08	9.03	8.93	3,300	1,881	3.1		<0.01	93	0.013	<0.0005		0.14	830	0.01	
3/08 (Dup)	9.03		3,400		3.9		<0.01	100	0.013	<0.0005		0.15	830	0.01	
6/08	9.06		3,700	1,211	5.7		0.820	140	0.013	<0.0005		0.11	860	<0.01	
9/08	9.08	9.19	3,400	4,120	5.4		<0.01	150	0.014	<0.0005		0.094	960	<0.01	
1/09	8.9	9.04	3,300	3,510	4.0		4	162	0.014	<0.0010		0.083	585	0.0051	
5/09	8.9	9.13	2,980	3,840	3.6		0.11	115	0.016	<0.0010		0.12	1,200	0.0094	
9/09	9.0	9.38	3,050	3,030	3.5		<0.0050	109	0.011	<0.0010		0.13	982	0.013	
1/10	9.1	9.22	3,440	3,050	3.6		0.99	127	0.015	<0.0010		0.14	918	0.011	
7/10	9.0	9.38	3,160	3,460	3.18		3.18	106	0.00873	<0.0005		0.0795	641	0.0117	
11/10	9.06	9.38	3,160	1,675	3.09		3.09	153	0.00922	<0.0005		0.0748	540	<0.005	

Note: All results in mg/L unless otherwise noted.

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GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-39D															
5/86	8.1		627		0.21	0.02		7.4			0.14	0.54	103		
6/88	7.9	7.8	590	595	0.17		0.03	6.1	0.0021	<0.0015	0.36	0.681	53.9	<0.0026	<0.005
1/95	7.5	7.6	630	410	0.07		<0.01	3.9	<0.004	<0.01	0.06	0.87	36	<0.01	
5/97	7.5	7.66	630	457	0.06		0.06	3.8	<0.004	<0.0005		0.87	32	<0.01	
5/98	7.52	7.35	590	560	0.04		<0.01	3.6	<0.004	<0.0005		0.77	34	<0.01	
5/99	7.59	7.64	540	447	0.037		<0.01	3.4	<0.004	<0.0005		0.87	33	<0.01	
5/00	7.66	7.80	580	503	0.027		0.027	3.2	<0.004	<0.0005	0.13	0.90	29	<0.01	
5/01	7.50	7.83	550	423	0.024		0.024	3.1	<0.004	<0.0005		0.78	32	<0.01	
5/02	7.61	7.56	510	301	0.026		<0.01	3.7	<0.004	<0.0005		0.785	32.3	<0.01	
5/03	7.60	7.78	580	430	0.033		<0.01	4.0	<0.004	<0.0005		0.93	33	<0.01	
5/04	7.57	7.66	590	649	0.024		0.024	4.2	<0.004	<0.0005		1.0	33	<0.01	
5/05	7.63	7.25	2,600	2,510	4.2		0.017	15 J	<0.004	<0.0005		2.6	650	<0.01	
5/06	7.63	7.62	860	720	0.32		<0.01	9.0J	<0.004	<0.0005		0.94	110	<0.01	
5/07	7.42	7.27	1,200	829	0.74		0.012	4.3	<0.004	<0.0005		1.90	150	<0.01	
6/08	7.42		2,400	338	3.7		0.28	12	<0.004	<0.0005		2	520	<0.01	
5/09	7.4	7.65	1,350	1,120	1.1		<0.0050	6.5	<0.0050	<0.0010		1.1	230	<0.0050	
7/10	7.45	7.92	1,410	1,033	1.06		1.06	14	0.000605	<0.0005		0.886	282	<0.0050	

Note: All results in mg/L unless otherwise noted.

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GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-40S															
5/86	8.9		2,550		1.7	0.03		28			12.8	0.49	650		
6/88	9.2	9.2	2,100	2,200	1.5		<0.01	5.9	0.018	<0.0015	1.89	0.139	445	0.0056	<0.005
1/95	7.9	7.9	2,500	1,600	0.87		<0.01	40	<0.004	<0.01	0.36	0.33	470	<0.01	
5/97	7.9	8.07	1,900	1,417	0.72		0.40	21	<0.004	<0.0005		0.66	380	<0.01	
5/98	8.2	8.18	1,400	1,335	0.36		<0.01	39	<0.004	<0.0005		0.13	270	<0.01	
5/99	8.50	8.83	1,300	1,100	0.32		<0.01	30	<0.004	<0.0005		0.11	250	<0.01	
5/00	8.08	8.04	1,100	900	0.25		0.25	14	<0.004	<0.0005	0.19	0.42	110	<0.01	
5/01	8.10	7.61	950	693	0.25		0.25	13	<0.004	<0.0005		0.57	140	<0.01	
5/02	7.89	7.91	720	543	0.20		0.17	14	<0.004	<0.0005		0.0577	147	<0.01	
5/03	7.85	7.98	1,400	1,042	0.58		0.02	21	<0.004	<0.0005		0.64	200	<0.01	
5/04	7.86	7.83	1,200	855	0.61		0.017	9.2	<0.004	<0.0005		0.64	220	<0.01	
5/05	7.76	7.51	960	804	0.24		<0.01	7.3 J	<0.004	<0.0005		1.1	160	<0.01	
5/06	7.95	7.82	1,000	831	10		2.9	21J	<0.004	<0.0005		0.4	170	<0.01	
5/07	7.95	8.01	1,100	823	7		<0.01	44	0.0074	0.00086		0.57	230	0.016	
6/08	8.15		1,100	655	7.1		1	58	0.0072	0.00097		0.64	220	0.026	
5/09	8.0	8.26	1,020	1002	8.9		0.019	37.5	<0.0050	0.0012		0.65	280	0.029	
7/10	8.16	8.42	993	781	2.27		2.27	38.4	0.133	0.000766		0.495	175	0.0234	

Note: All results in mg/L unless otherwise noted.

J = One or more quality control criteria not met. Value considered estimated.

TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-40D															
5/86	9.4		1,120		7.4	0.06		20			11.7	0.62	280		
6/88	9.4	9.4	1,200	1,290	7.0		<0.01	36	0.018	<0.0015	7.81	0.454	258	0.012	<0.005
1/95	7.6	7.7	2,000	1,375	0.70		<0.01	18	<0.004	<0.01	0.29	0.74	340	<0.01	
5/97	7.6	7.9	1,800	1,350	0.59		<0.1	7.6	<0.004	<0.0005		1.3	340	<0.01	
5/98	7.85	7.73	1,300	1,250	0.49		0.47	19	<0.004	<0.0005		0.36	250	<0.01	
5/99	7.99	8.25	920	745	0.16		0.16	12	<0.004	<0.0005		0.42	150	<0.01	
5/00	7.88	7.84	960	810	0.25		0.25	11	<0.004	<0.0005	0.16	0.69	97	<0.01	
5/01	8.01	7.45	790	611	0.15		0.15	8.8	<0.004	<0.0005		0.90	78	<0.01	
5/02	7.88	7.73	600	450	0.10		<0.01	7.7	<0.004	<0.0005		1.14	79.4	<0.01	
5/03	7.85	7.9	1,000	739	0.13		<0.01	9.6	<0.004	<0.0005		1.2	86	<0.01	
5/04	7.89	7.79	820	595	0.11		0.012	11	<0.004	<0.0005		0.9	120	<0.01	
5/05	7.89	7.56	1,000	849	0.68		0.034	4.9 J	<0.004	<0.0005		0.73	140	<0.01	
5/06	7.91	7.82	1,100	915	6.6		0.15	11J	<0.004	<0.0005		0.98	180	<0.01	
5/07	7.76	7.76	1,000	736	4.1		<0.01	17	<0.004	<0.0005		0.94	180	<0.01	
6/08	7.88		990	579	6.8(J)		0.47	29	0.0045	<0.0005		0.77	180	<0.01	
5/09	7.70	8.00	975	964	7.8		<0.0050	19.8	<0.0050	<0.0010		0.82	225	0.0061	
7/10	8.00	8.34	954	753	5.38		5.38	36.2	0.117	0.000581		0.467	158	0.0158	

Note: All results in mg/L unless otherwise noted.

J = One or more quality control criteria not met. Value considered estimated.

TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-41															
1/95	6.6	8.2	490	600	0.04		0.02	0.2	0.017	<0.01	8.9	1.3	22	<0.01	
5/97	6.8	6.98	490	357	<0.01			0.20	0.022	<0.0005		1.6	21	<0.01	
5/98	6.67	6.74	420	449	<0.01			0.30	0.016	<0.0005		1.3	21	<0.01	
5/99	6.79	6.80	420	370	<0.01			0.33	0.014	<0.0005		1.1	20	<0.01	
5/00	6.79	6.98	430	424	<0.01			0.25	0.018	<0.0005	9.2	1.1	17	<0.01	
5/01	6.70	7.00	450	421	<0.01			0.34	0.015	<0.0005		1.0	19	<0.01	
5/02	7.01	7.10	430	377	<0.01			0.24	0.0135	<0.0005		0.938	22.9	<0.01	
5/03	6.87	6.83	460	372	<0.01			0.28	0.016	<0.0005		1.1	23	<0.01	
5/04	6.85	6.85	450	361	<0.01			0.45	0.017	<0.0005		1.1	26	<0.01	
5/07	6.79	6.89	430	339	<0.01			0.23	0.015	<0.0005		1.3	22	<0.01	

Note: All results in mg/L unless otherwise noted.

J = One or more quality control criteria not met. Value considered estimated.

TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-42S															
6/88	8.0	8.4	930	870	0.70		0.25	14.0	0.002	<0.0015	0.232	0.237	143	0.0027	<0.005
2/90	8.4	8.25	2,100	2,400	0.266		0.079	35.0			0.88		520		
1/95	8.2	8.4	1,600	765	0.45		<0.01	22	<0.004	<0.01	0.2	0.35	280	<0.01	
5/97	8.2	8.57	1,700	1,350	0.56		<0.02	29	<0.004	<0.0005		0.33	300	<0.01	
5/98	8.26	8.46	1,400	1,460	0.52		<0.01	27	<0.004	<0.0005		0.37	270	<0.01	
5/99	8.19	8.54	1,500	1,100	0.54		0.033	26	<0.004	<0.0005		0.49	260	<0.01	
5/00	8.19	8.18	1,900	1,530	0.66		0.66	28	<0.004	<0.0005	0.39	0.65	280	<0.01	
5/01	8.03	8.03	1,700	1,208	0.51		0.062	23	<0.004	<0.0005		0.84	300	<0.01	
5/02	8.20	8.15	1,900	859	0.52		<0.02	37	<0.004	<0.0005		0.603	475	<0.01	
5/03	8.25	7.32	2,300	1,721	0.94		0.14	51	<0.004	<0.0005		0.41	430	<0.01	
5/04	8.29	8.37	4,500	4,040	3.1		<0.01	74	0.0068	<0.0005		0.38	1,500	<0.01	
5/05	8.30	8.10	2,700	3,110	4.0		0.068	69 J	<0.004	<0.0005		1.2	580	<0.01	
5/06	8.58	7.80	4,400	1,737	3.8		0.13	100J	0.0065	<0.0005		0.23	930	<0.01	
5/07	8.36	8.49	2,600	1,601	1.8		<0.01	39	<0.004	<0.0005		0.2	560	<0.01	
6/08	7.97		2,900	1,224	2.3		0.22	37	<0.004	<0.0005		0.37	570	<0.01	
5/09	7.90	8.10	3,280	3,380	[7.9]		[0.033]	60.1	0.0053	<0.0010		0.25	1,010	<0.0050	
7/09		8.45		2,630	3.1		<0.005								
7/10	8.06	8.07	2,520	1,446	1.39		0.701	36.4	0.115	<0.0005		0.215	391	<0.0050	

Note: All results in mg/L unless otherwise noted. *J = One or more quality control criteria not met. Value considered estimated.*

TABLE 4
SUMMARY OF ANALYTICAL RESULTS FOR REMEDIAL ACTION
GROUNDWATER MONITORING WELLS AND PARAMETERS
ORMET CORPORATION
HANNIBAL, OHIO

	pH (lab)	pH (field)	Specific Cond. (lab)	Specific Cond. (field)	Cyanide Total	Cyanide Free	Cyanide Amenable	Fluoride	Arsenic	Beryllium	Iron	Manganese	Sodium	Vanadium	PCE
MW-42D															
6/88	7.9	8.1	550	600	0.16		<0.01	6.0	0.0028	<0.0015	1.11	0.636	68.6	0.0028	<0.005
1/95	7.5	7.7	640	410	0.04		<0.01	3.6	<0.004	<0.01	0.08	1.5	31	<0.01	
5/97	7.6	7.99	580	468	0.04		<0.01	3.2	<0.004	<0.0005		1.3	27	<0.01	
5/98	7.54	7.84	550	535	0.07		0.01	3.3	<0.008	<0.0005		1.2	26	<0.01	
5/99	7.56	7.83	530	435	0.03		<0.01	3.4	<0.004	<0.0005		1.3	26	<0.01	
5/00	7.73	7.74	580	490	0.027		0.027	3.0	<0.004	<0.0005	0.053	1.3	24	<0.01	
5/01	7.53	7.68	550	462	0.023		0.023	3.1	<0.004	<0.0005		1.3	32	<0.01	
5/02	7.57	7.60	530	316	0.021		<0.01	3.0	<0.004	<0.0005		1.17	29.5	<0.01	
5/03	7.57	7.21	600	461	0.017		0.017	4.0	<0.004	<0.0005		1.4	34	<0.01	
5/04	7.66	7.70	1,700	1,899	0.65		0.65	9.6	<0.004	<0.0005		1.6	430	<0.01	
5/05	7.87	7.53	2,100	1,844	1.6		0.017	11 J	0.0073	<0.0005		0.35	810	<0.01	
5/06	7.73	7.80	2,000	1,737	2.7		0.92	10.0J	<0.004	<0.0005		1.2	450	<0.01	
5/07	7.81	7.68	1,200	832	0.63		<0.01	9.2	<0.004	<0.0005		0.9	220	<0.01	
6/08	7.64		2,900	1,320	4.6		0.81	14.0	<0.004	<0.0005		1.1	650	<0.01	
5/09	7.7	7.87	2,660	2,260	[5.8]		<0.0050	24.1	0.0058	<0.0010		0.84	877	<0.0050	
7/09		8.10		3,320	4.7		<0.005								
7/10	8.04	8.11	2,510	1,667	1.69		1.17	27.4	0.00108	<0.0005		0.697	634	<0.0050	

Note: All results in mg/L unless otherwise noted.

J = One or more quality control criteria not met. Value considered estimated.

TABLE 5
TOTAL, AMENABLE, and WAD
CYANIDE COMPARISON
NOVEMBER 2010 DATA
ORMET PRIMARY ALUMINUM CORPORATION
HANNIBAL, OHIO

	Total Cyanide	Amenable Cyanide	WAD Cyanide
MW-2	7.31	4.25	0.0794
MW-5	2.86	2.86	0.0412
MW-12	0.0192	0.0192	0.0101
MW-16	4.61	3.03	0.0698
MW-18	8.2	<0.25	0.118
MW-28	0.248	0.248	0.00875
MW-31	2.08	0.967	0.0609
MW-32	3.76	3.24	0.0728
MW-35	2.56	2.56	0.0108
MW-36	1.21	1.21	0.0225
MW-37	0.257	0.257	0.0138
MW-39S	3.09	3.09	0.0406
FB-1	<0.005	<0.005	<0.005

Amenable Cyanide = Cyanide Amenable to Chlorination

WAD Cyanide = Weak Acid Dissociable Cyanide

TABLE 6

SUMMARY OF ANALYTICAL RESULTS FOR PCBS

ORMET CORPORATION

HANNIBAL, OHIO

	MW-12													
	5/15/02	10/01/02	1/15/03	5/22/03	9/11/03	1/13/04	5/11/04	9/28/04	1/18/05	5/19/05	10/6/05	1/18/06	5/18/06	9/18/06
Aroclor-1016	<0.52	<0.521	<0.5	<0.5	<0.5/<0.5	<0.52/<0.52	<0.5	<0.51/<0.53	<0.51/<0.5	<0.5	<0.5/<0.5	<0.5/<0.5	<0.5	---
Aroclor-1221	<0.52	<0.521	<0.5	<0.5	<0.5/<0.5	<0.52/<0.52	<0.5	<0.51/<0.53	<0.51/<0.5	<0.5	<0.5/<0.5	<0.5/<0.5	<0.5	---
Aroclor-1232	<0.52	<0.521	<0.5	<0.5	<0.5/<0.5	<0.52/<0.52	<0.5	<0.51/<0.53	<0.51/<0.5	<0.5	<0.5/<0.5	<0.5/<0.5	<0.5	---
Aroclor-1242	<0.52	<0.521	<0.5	<0.5	<0.5/<0.5	<0.52/<0.52	<0.5	<0.51/<0.53	<0.51/<0.5	<0.5	<0.5/<0.5	<0.5/<0.5	<0.5	---
Aroclor-1248	<0.52	<0.521	<0.5	<0.5	<0.5/<0.5	<0.52/<0.52	<0.5	<0.51/<0.53	<0.51/<0.5	<0.5	<0.5/<0.5	<0.5/<0.5	<0.5	---
Aroclor-1254	<0.52	<0.521	<0.5	<0.5	<0.5/<0.5	<0.52/<0.52	<0.5	<0.51/<0.53	<0.51/<0.5	<0.5	<0.5/<0.5	<0.5/<0.5	<0.5	---
Aroclor-1260	<0.52	<0.521	<0.5	<0.5	<0.5/<0.5	<0.52/<0.52	<0.5	<0.51/<0.53	<0.51/<0.5	<0.5	<0.5/<0.5	<0.5/<0.5	<0.5	---

	MW-12											
	2/26/07	5/17/07	9/6/07	3/12/08	6/12/08	9/11/08	1/28/09	5/20/09	9/24/09	1/27/10	7/21/10	11/17/10
Aroclor-1016	<0.5	<0.5	---	<0.5	<0.5	<0.5	<0.52	<0.51/<0.52	<0.52	<0.52	<0.50	<0.50
Aroclor-1221	<0.5	<0.5	---	<0.5	<0.5	<0.5	<0.52	<0.51/<0.52	<0.52	<0.52	<0.50	<0.50
Aroclor-1232	<0.5	<0.5	---	<0.5	<0.5	<0.5	<0.52	<0.51/<0.52	<0.52	<0.52	<0.50	<0.50
Aroclor-1242	<0.5	<0.5	---	<0.5	<0.5	<0.5	<0.52	<0.51/<0.52	<0.52	<0.52	<0.50	<0.50
Aroclor-1248	<0.5	<0.5	---	<0.5	<0.5	<0.5	<0.52	<0.51/<0.52	<0.52	<0.52	<0.50	<0.50
Aroclor-1254	<0.5	<0.5	---	<0.5	<0.5	<0.5	<0.52	<0.51/<0.52	<0.52	<0.52	<0.50	<0.50
Aroclor-1260	<0.5	<0.5	---	<0.5	<0.5	<0.5	<0.52	<0.51/<0.52	<0.52	<0.52	<0.50	<0.50

All results in ug/L. --- Not Analyzed

TABLE 6

SUMMARY OF ANALYTICAL RESULTS FOR PCBS

ORMET CORPORATION

HANNIBAL, OHIO

	MW-44S													
	5/15/02	10/01/02	1/15/03	5/22/03	9/11/03	1/14/04	5/14/04	9/28/04	1/18/05	5/18/05	10/5/05	1/17/06	5/16/06	9/18/06
Aroclor-1016	<0.52	<0.5	<0.5	<0.5	<0.5	<0.52	<0.5	<0.52	<0.51	<0.5	<0.5	<0.5	<0.5	<0.52
Aroclor-1221	<0.52	<0.5	<0.5	<0.5	<0.5	<0.52	<0.5	<0.52	<0.51	<0.5	<0.5	<0.5	<0.5	<0.52
Aroclor-1232	<0.52	<0.5	<0.5	<0.5	<0.5	<0.52	<0.5	<0.52	<0.51	<0.5	<0.5	<0.5	<0.5	<0.52
Aroclor-1242	<0.52	<0.5	<0.5	<0.5	<0.5	<0.52	<0.5	<0.52	<0.51	<0.5	<0.5	<0.5	<0.5	<0.52
Aroclor-1248	<0.52	<0.5	<0.5	<0.5	<0.5	<0.52	<0.5	<0.52	<0.51	<0.5	<0.5	<0.5	<0.5	<0.52
Aroclor-1254	<0.52	<0.5	<0.5	<0.5	<0.5	<0.52	<0.5	<0.52	<0.51	<0.5	<0.5	<0.5	<0.5	<0.52
Aroclor-1260	<0.52	<0.5	<0.5	<0.5	<0.5	<0.52	<0.5	<0.52	<0.51	<0.5	<0.5	<0.5	<0.5	<0.52

	MW-44S										
	2/26/07	5/17/07	9/6/07	3/12/08	6/11/08	9/11/08	1/28/09	5/19/09	9/23/09	1/26/10	7/21/10	11/18/10
Aroclor-1016	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.53	<0.52	<0.51	<0.51	<0.5	<0.5
Aroclor-1221	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.53	<0.52	<0.51	<0.51	<0.5	<0.5
Aroclor-1232	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.53	<0.52	<0.51	<0.51	<0.5	<0.5
Aroclor-1242	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.53	<0.52	<0.51	<0.51	<0.5	<0.5
Aroclor-1248	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.53	<0.52	<0.51	<0.51	<0.5	<0.5
Aroclor-1254	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.53	<0.52	<0.51	<0.51	<0.5	<0.5
Aroclor-1260	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.53	<0.52	<0.51	<0.51	<0.5	<0.5

All results in ug/L. --- Not Analyzed

TABLE 6

SUMMARY OF ANALYTICAL RESULTS FOR PCBS

ORMET CORPORATION

HANNIBAL, OHIO

	MW-44D													
	5/15/02	10/01/02	1/15/03	5/22/03	9/11/03	1/14/04	5/14/04	9/28/04	1/18/05	5/18/05	10/5/05	1/17/06	5/16/06	9/18/06
Aroclor-1016	<0.5	<0.51	<0.5	<0.5	<0.5	<0.51	<0.5	<0.51	<0.51	<0.5	<0.5	<0.5	<0.5	<0.53
Aroclor-1221	<0.5	<0.51	<0.5	<0.5	<0.5	<0.51	<0.5	<0.51	<0.51	<0.5	<0.5	<0.5	<0.5	<0.53
Aroclor-1232	<0.5	<0.51	<0.5	<0.5	<0.5	<0.51	<0.5	<0.51	<0.51	<0.5	<0.5	<0.5	<0.5	<0.53
Aroclor-1242	<0.5	<0.51	<0.5	<0.5	<0.5	<0.51	<0.5	<0.51	<0.51	<0.5	<0.5	<0.5	<0.5	<0.53
Aroclor-1248	<0.5	<0.51	<0.5	<0.5	<0.5	<0.51	<0.5	<0.51	<0.51	<0.5	<0.5	<0.5	<0.5	<0.53
Aroclor-1254	<0.5	<0.51	<0.5	<0.5	<0.5	<0.51	<0.5	<0.51	<0.51	<0.5	<0.5	<0.5	<0.5	<0.53
Aroclor-1260	<0.5	<0.51	<0.5	<0.5	<0.5	<0.51	<0.5	<0.51	<0.51	<0.5	<0.5	<0.5	<0.5	<0.53

	MW-44D											
	2/26/07	5/17/07	9/6/07	3/12/08	6/11/08	9/11/08	1/28/09	5/19/09	9/23/09	1/26/10	7/21/10	11/18/10
Aroclor-1016	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.52	<0.51	<0.52	<0.52	<0.5	<0.5
Aroclor-1221	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.52	<0.51	<0.52	<0.52	<0.5	<0.5
Aroclor-1232	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.52	<0.51	<0.52	<0.52	<0.5	<0.5
Aroclor-1242	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.52	<0.51	<0.52	<0.52	<0.5	<0.5
Aroclor-1248	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.52	<0.51	<0.52	<0.52	<0.5	<0.5
Aroclor-1254	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.52	<0.51	<0.52	<0.52	<0.5	<0.5
Aroclor-1260	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.52	<0.51	<0.52	<0.52	<0.5	<0.5

All results in ug/L. --- Not Analyzed

TABLE 7
SUMMARY OF ESTIMATED AQUIFER AREAS ABOVE CLEANUP GOALS
AND CONTAMINANT MASS-IN-PLACE
ORMET CORPORATION
HANNIBAL REDUCTION DIVISION
HANNIBAL, OHIO

Sampling Date	Estimated Area of Aquifer Above 4 mg/L Fluoride	% Change	Estimated Area of Aquifer Above 0.2 mg/L Total CN	% Change
6/88	43.3 a.		24.5 a.	
1/95	48.4 a.	+11.6	5.9 a.	-75.8
5/97	43.7 a.	-9.7	21.3 a.	+259
5/98	36.9 a.	-15.6	10.5 a.	-50.6
5/99	43.7 a.*	+18.4	27.5 a.	+161
5/00	41.6 a.	-4.8	36.5 a.	+32.7
5/01	41.4 a.	-0.5	36.7 a.	+0.5
5/02	37.9 a.	-8.5	37.2 a.	+1.3
5/03	38.8 a.	+2.3	37.2 a.	0.0
5/04	42.1 a.	+7.8	38.1 a.	+2.4
5/05	39.5 a.	-6.2	43.7 a.	+12.8
5/06	45.4 a.	+14.9	44.8 a.	+2.5
5/07	42.1 a.	-7.3	46.6 a.	+4.0
6/08	44.0 a.	+4.5	49.9 a.	+7.1
5/09	41.7 a.	-5.2	50.0 a.	+0.2
7/10	47.5 a.	+13.9	51.5 a.	+3.0

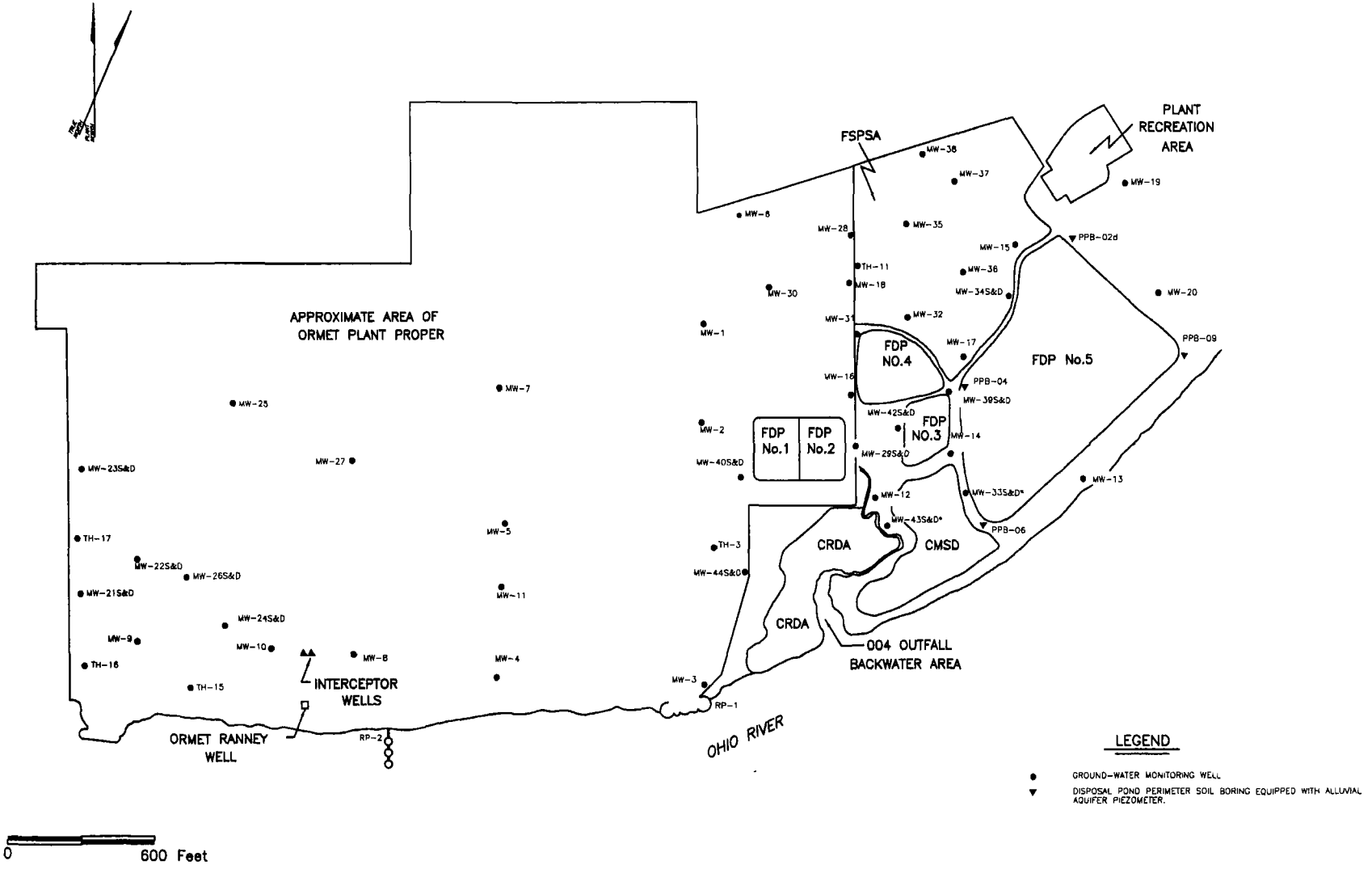
Sampling Date	Estimated Fluoride Mass-in-Place	% Change	Estimated Total CN Mass-in-Place	% Change
6/88	85,702 lbs.		6,821 lbs.	
1/95	28,168 lbs.	-67.1	4,271 lbs.	-37.4
5/97	29,033 lbs.	+3.1	2,943 lbs.	-31.1
5/98	23,888 lbs.	-17.7	2,597 lbs.	-11.8
5/99	30,416 lbs.*	+27.3	5,566 lbs.	+114
5/00	27,071 lbs.	-11.0	4,679 lbs.	-15.9
5/01	21,741 lbs.	-19.7	4,300 lbs.	-8.1
5/02	28,789 lbs.	+24.5	4,530 lbs.	+5.1
5/03	32,127 lbs.	+10.4	2,773 lbs.	-38.8
5/04	38,836 lbs.	+17.3	3,062 lbs.	+9.4
5/05	37,656 lbs.	-3.0	4,681 lbs.	+34.6
5/06	32,725 lbs.	-13.1	6,615 lbs.	+41.3
5/07	35,219 lbs.	+7.6	6,438 lbs.	-2.7
6/08	33,638 lbs.	-4.5	5,997 lbs.	-6.8
5/09	29,510 lbs.	-12.3	5,422 lbs.	-9.6
7/10	37,466 lbs.	+27.0	3,441 lbs.	-36.5

* - Value corrected due to omission during 1999 calculation.

TABLE 8
COMPARISON OF CALCULATED MASS REMOVAL TO CHANGES IN ESTIMATED MASS-IN-PLACE

	FLUORIDE			TOTAL CYANIDE		
SAMPLE DATE	ESTIMATED MASS-IN-PLACE	POUNDS CHANGE	MASS REMOVED	ESTIMATED MASS-IN-PLACE	POUNDS CHANGE	MASS REMOVED
5/97	29,033			2,943		
5/98	23,888	-5,145	26,383	2,597	-346	3,462
5/99	30,416	+6,528	29,516	5,566	+2,969	3,248
5/00	27,071	-3,345	18,934	4,679	-887	2,884
5/01	21,741	-5,330	19,653	4,300	-379	2,897
5/02	28,789	+7,048	16,470	4,530	+230	2,321
5/03	32,127	+3,338	12,042	2,773	-1,757	1,726
5/04	38,836	+6,709	9,845	3,062	+289	1,597
5/05	37,656	-1,180	8,802	4,681	+1,619	1,075
5/06	32,735	-4,921	8,607	6,615	+1,934	1,392
5/07	35,219	+2,484	6,085	6,438	-177	1,151
6/08	33,638	-1,581	6,320	5,997	-441	1,000
5/09	29,510	-4,128	6,964	5,422	-575	936
7/10	37,466	+7,956	10,436	3,441	-1,981	1,256
	TOTAL MASS REMOVED		180,057	TOTAL MASS REMOVED		24,945

All values given in pounds.



HMI Environmental Consulting Services

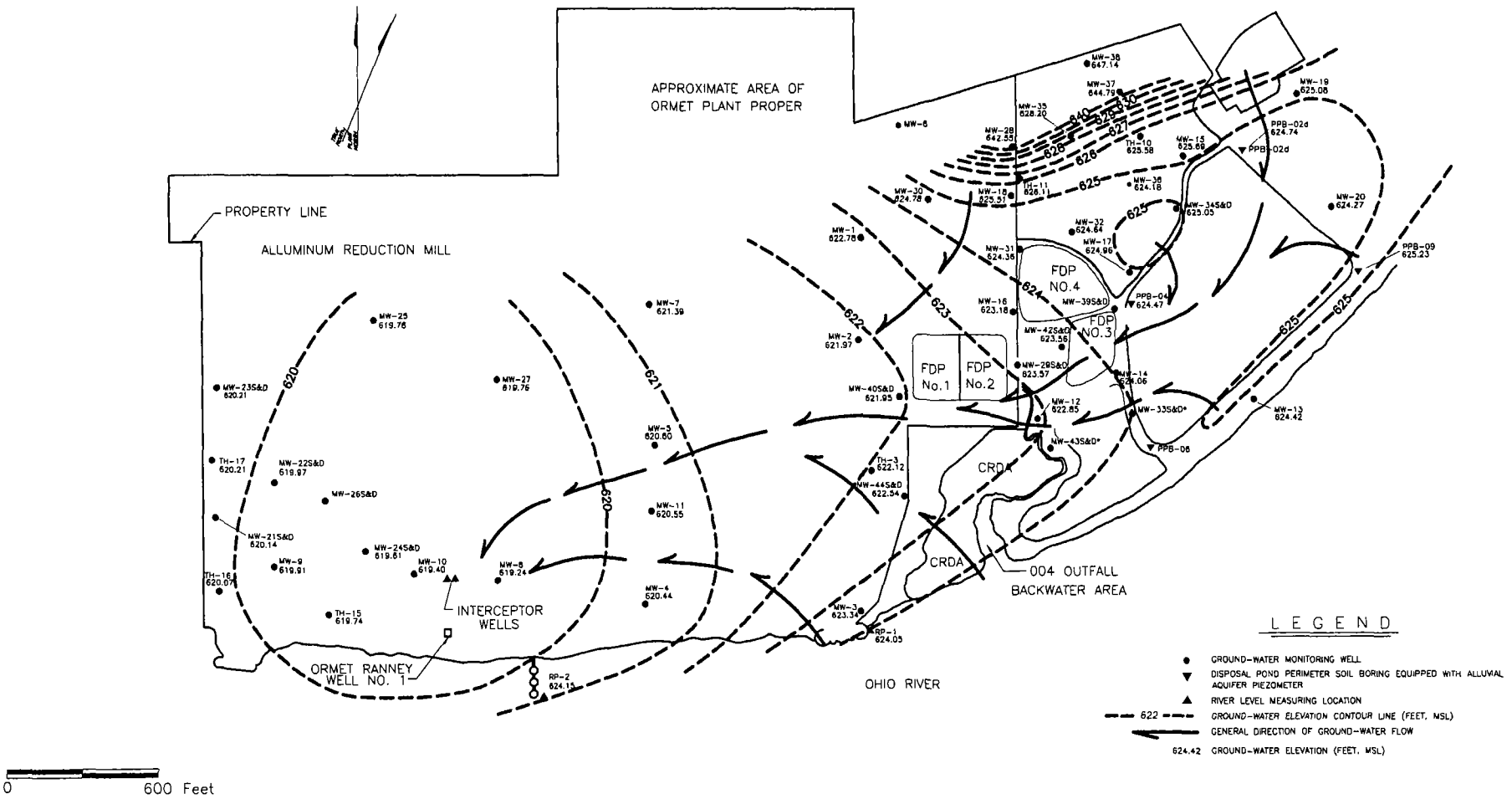
HydroSystems Management, Inc.
P.O. Box 789
Washington, Pennsylvania 15301

PROJECT NO: HM00319	FILE NO:
DRAWING: 012308CL	PLOT SIZE=1"=600'
DRAFTED BY: CL	DATE: 05/20/2008
CHECKED BY: CPS	DATE: 05/20/2008
APPROVED BY: CPS	DATE: 05/20/2008
REVISION NO:	DATE:

LOCATION OF GROUND-WATER MONITORING WELLS

ORMET PRIMARY ALUMINUM CORPORATION — HANNIBAL, OHIO

FIGURE 1



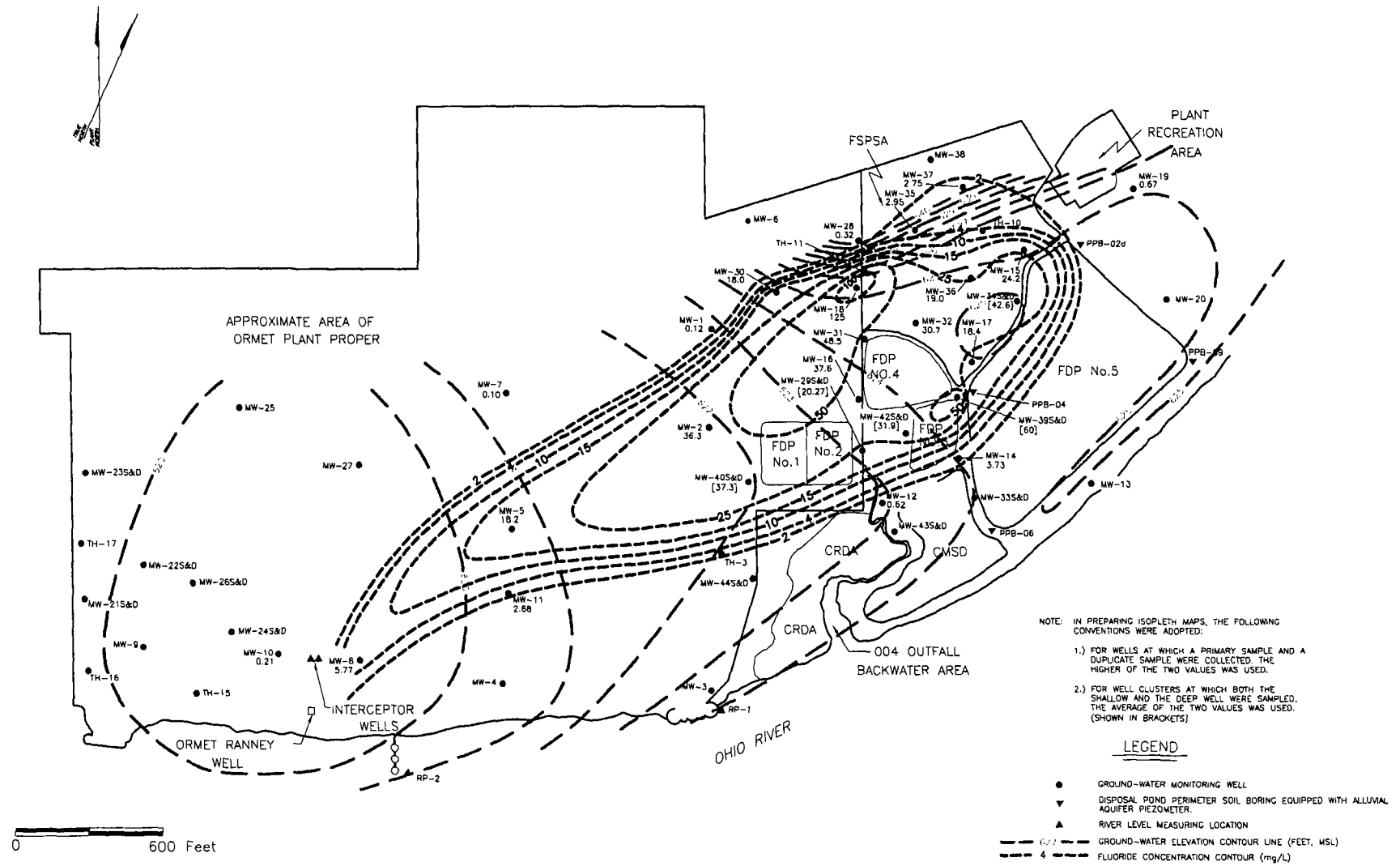
HMI Environmental Consulting Services

HydroSystems Management, Inc.
86 West Main Street
West Middletown, Pennsylvania 15379

PROJECT NO: HM00319	FILE NO:
DRAWING: 021511CL	PLOT SIZE=1"=600'
DRAFTED BY: CL	DATE: 02/15/2011
CHECKED BY: CPS	DATE: 02/15/2011
APPROVED BY: CPS	DATE: 03/28/2011
REVISION NO:	DATE:

GROUND-WATER ELEVATIONS AND FLOW PATTERNS
WITHIN THE ALLUVIAL AQUIFER
BASED ON JULY 20, 2010 WATER-LEVEL DATA
ORMET PRIMARY ALUMINUM CORPORATION HANNIBAL, OHIO

FIGURE
2



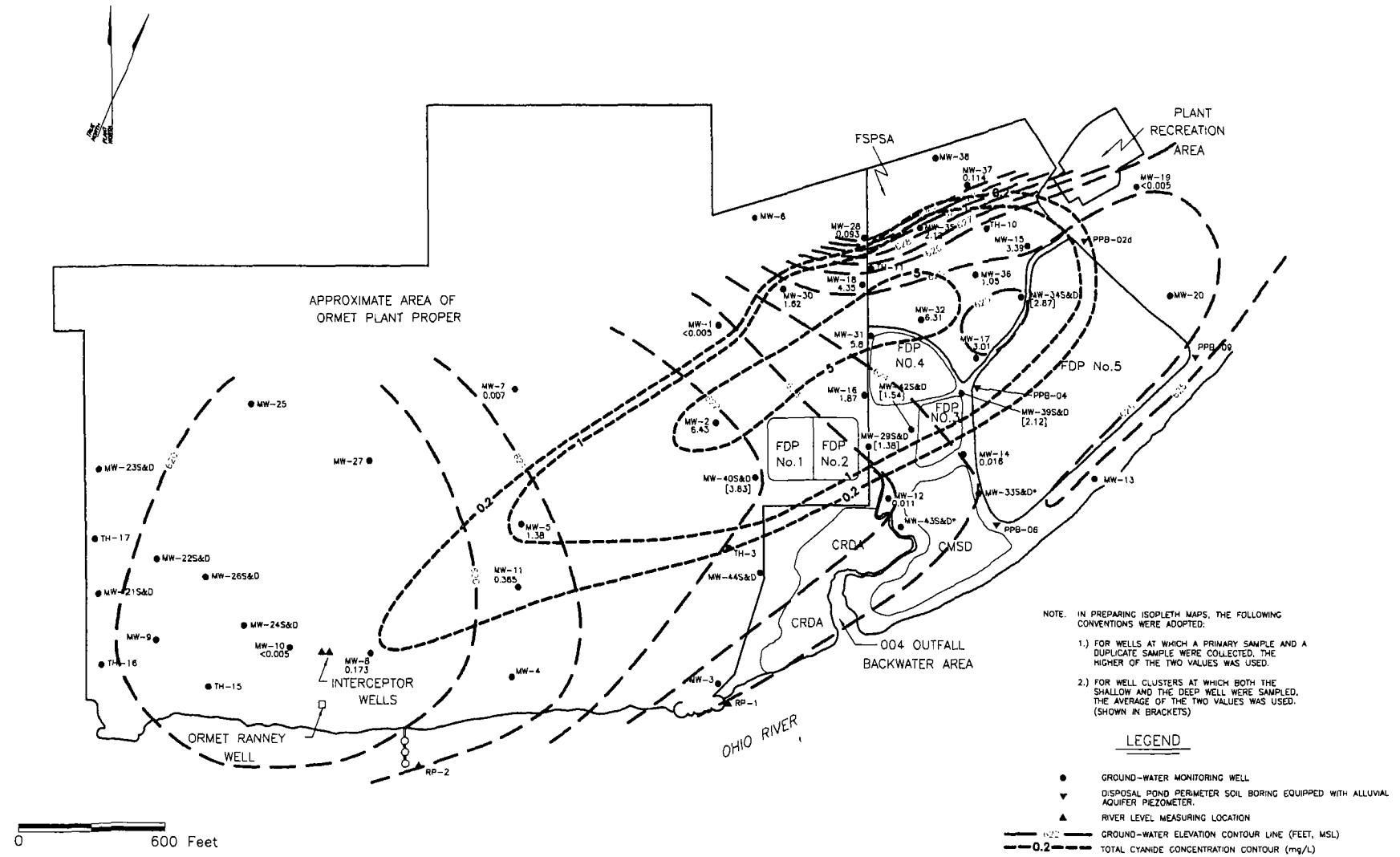
HMI Environmental Consulting Services
HydroSystems Management, Inc.
86 West Main Street
West Middletown, Pennsylvania 15379

PROJECT NO: HM00319	FILE NO:
DRAWING: 021511A	PLOT SIZE=1"=600'
DRAFTED BY: CL	DATE: 02/15/2011
CHECKED BY: CPS	DATE: 02/15/2011
APPROVED BY: CPS	DATE: 03/28/2011
REVISION NO:	DATE:

FLUORIDE ISOPLETH MAP FOR THE ALLUVIAL AQUIFER (BASED ON SAMPLES COLLECTED IN JULY, 2010)

ORMET PRIMARY ALUMINUM CORPORATION — HANNIBAL, OHIO

FIGURE 3



HMI Environmental Consulting Services

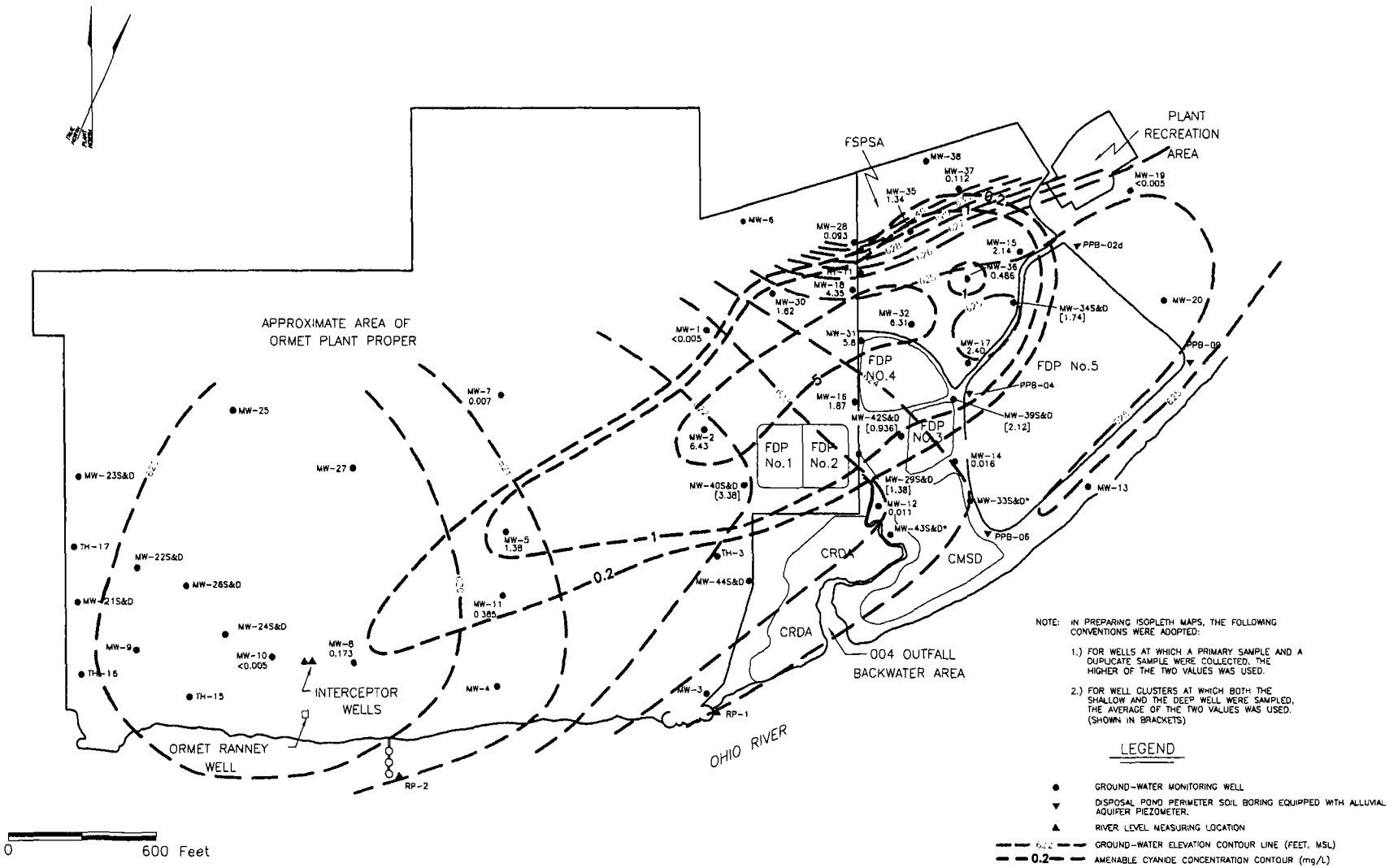
HydroSystems Management, Inc.
86 West Main Stret
West Middletown, Pennsylvania 15379

PROJECT NO: HM00319	FILE NO:
DRAWING: 021511BCL	PLOT SIZE=1"=600'
DRAFTED BY: CL	DATE: 02/15/2011
CHECKED BY: CPS	DATE: 02/15/2011
APPROVED BY: CPS	DATE: 03/28/2011
REVISION NO:	DATE:

TOTAL CYANIDE ISOPLETH MAP FOR THE ALLUVIAL AQUIFER (BASED ON SAMPLES COLLECTED IN JULY 2010)

ORMET PRIMARY ALUMINUM CORPORATION — HANNIBAL, OHIO

FIGURE 4



HMI Environmental Consulting Services

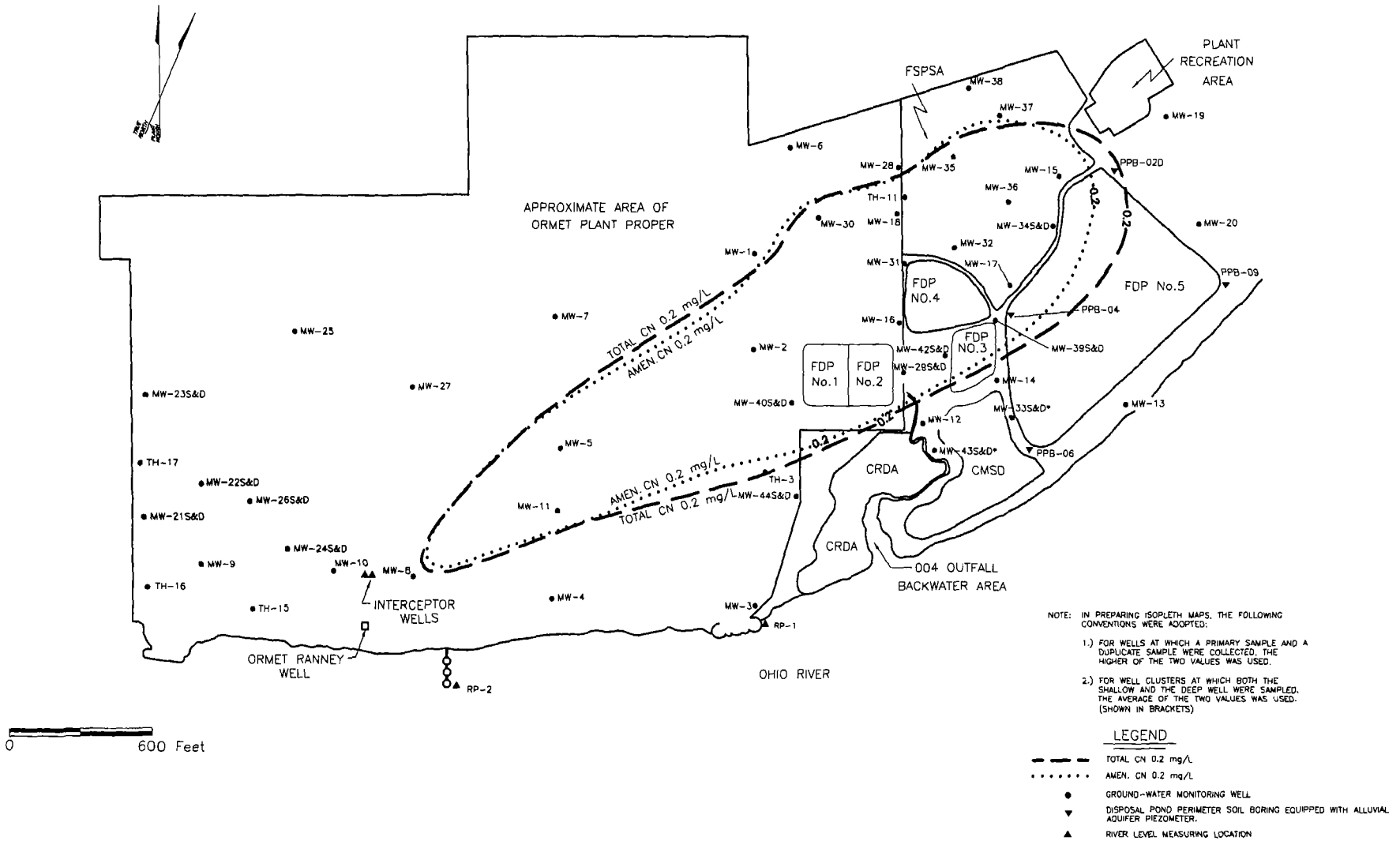
HydroSystems Management, Inc.
89 West Main Street
West Middletown, Pennsylvania 15379

PROJECT NO: HM00319	FILE NO:
DRAWING: 030811CL	PLOT SIZE=1"=600'
DRAFTED BY: CL	DATE: 03/8/2011
CHECKED BY: CPS	DATE: 03/11/2011
APPROVED BY: CPS	DATE: 03/11/2011
REVISION NO:	DATE:

AMENABLE CYANIDE ISOPLETH MAP FOR THE ALLUVIAL AQUIFER (BASED ON SAMPLES COLLECTED IN JULY, 2010)

ORMET PRIMARY ALUMINUM CORPORATION — HANNIBAL, OHIO

FIGURE 5



0 600 Feet

NOTE: IN PREPARING ISOPLETH MAPS, THE FOLLOWING CONVENTIONS WERE ADOPTED:

1.) FOR WELLS AT WHICH A PRIMARY SAMPLE AND A DUPLICATE SAMPLE WERE COLLECTED, THE HIGHER OF THE TWO VALUES WAS USED.

2.) FOR WELL CLUSTERS AT WHICH BOTH THE SHALLOW AND THE DEEP WELL WERE SAMPLED, THE AVERAGE OF THE TWO VALUES WAS USED. (SHOWN IN BRACKETS)

LEGEND

- TOTAL CN 0.2 mg/L
- AMEN. CN 0.2 mg/L
- GROUND-WATER MONITORING WELL
- DISPOSAL POND PERIMETER SOIL BORING EQUIPPED WITH ALLUVIAL AQUIFER PIEZOMETER.
- RIVER LEVEL MEASURING LOCATION

HMI Environmental Consulting Services
HydroSystems Management, Inc.
86 West Main Street
West Middletown, Pennsylvania 15379

PROJECT NO: HM00319	FILE NO.
DRAWING: 032811CL	PLOT SIZE=1"=600'
DRAFTED BY: CL	DATE: 03/28/2011
CHECKED BY: CPS	DATE: 03/28/2011
APPROVED BY: CPS	DATE: 03/28/2011
REVISION NO.:	DATE:

2009 COMPARISON OF TOTAL VS. AMENABLE CYANIDE DISTRIBUTION IN GROUND WATER

(BASED ON 0.2 mg/L CONCENTRATION CONTOURS)

ORMET PRIMARY ALUMINUM CORPORATION HANNIBAL, OHIO

FIGURE 6

FIGURE 7
FLUORIDE AND TOTAL CYANIDE MASS-IN-PLACE VS. TIME
ORMET PRIMARY ALUMINUM CORPORATION
HANNIBAL, OHIO

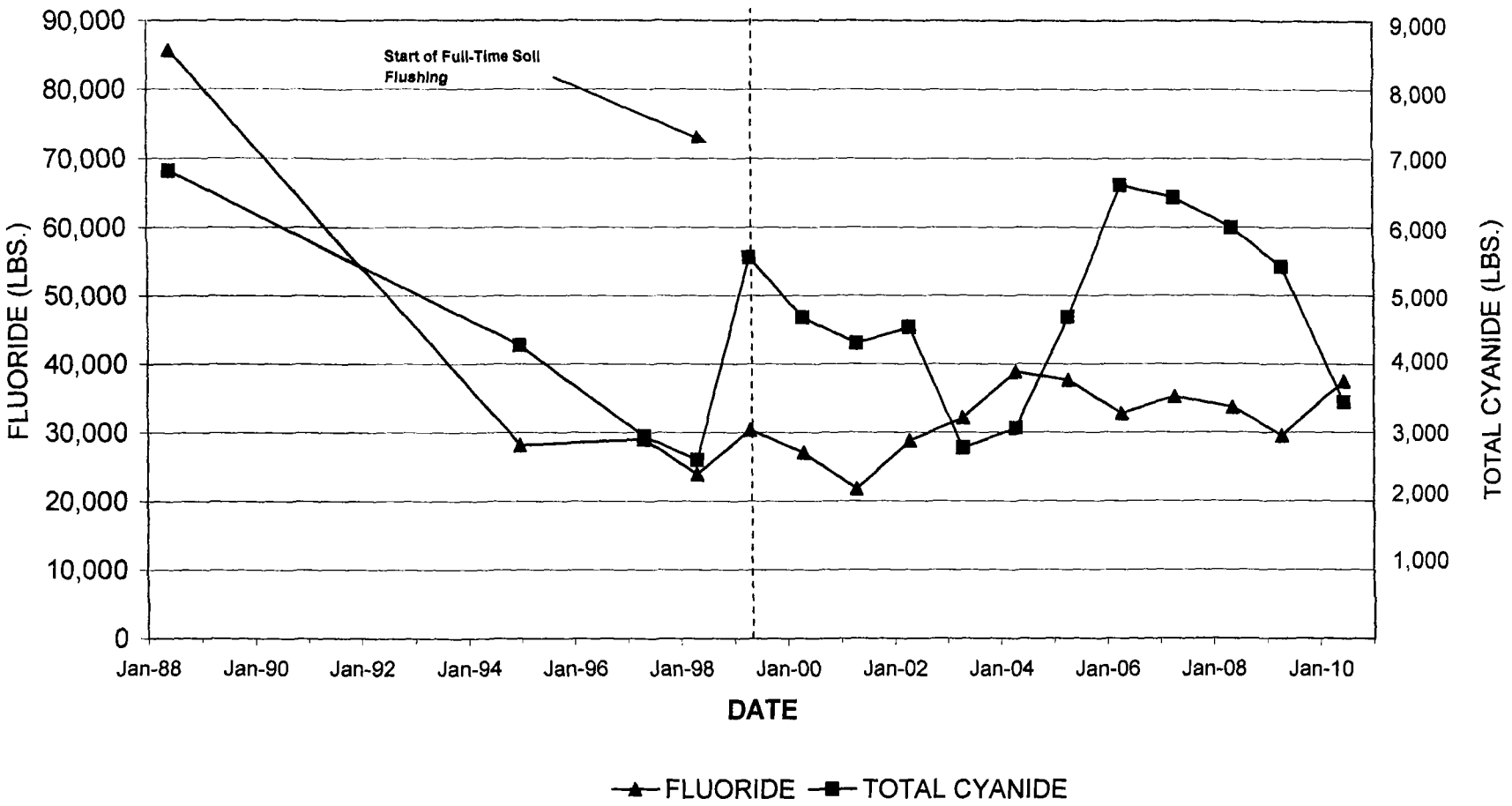
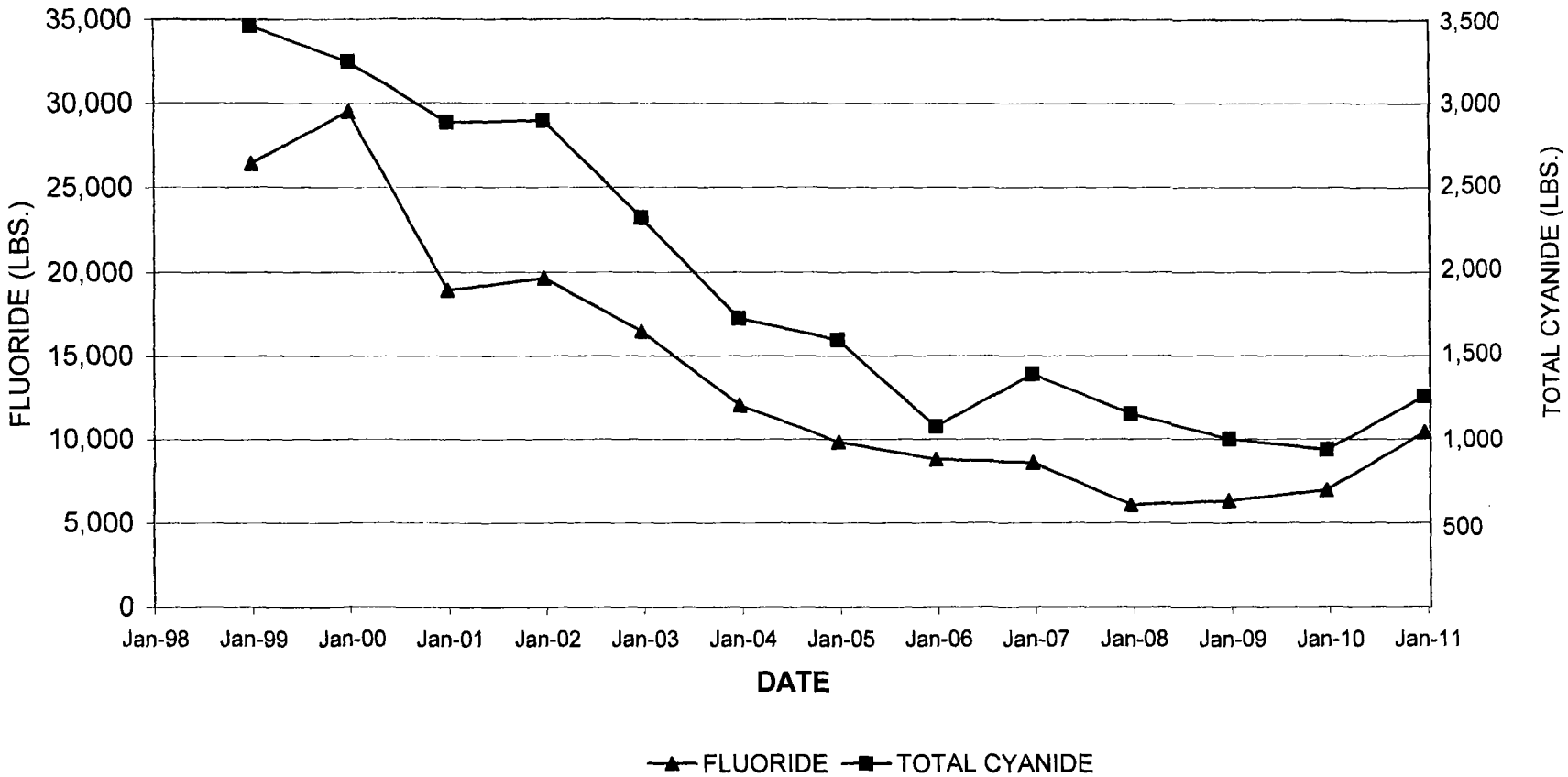


FIGURE 8
FLUORIDE AND TOTAL CYANIDE MASS REMOVAL VS. TIME
ORMET PRIMARY ALUMINUM CORPORATION
HANNIBAL, OHIO



APPENDIX A

WATER SAMPLING LOG FORMS

Appendix A-1	Water Sampling Log Forms for January 2010 Monitoring Event
Appendix A-2	Water Sampling Log Forms for July 2010 Monitoring Event
Appendix A-3	Water Sampling Log Forms for November 2010 Monitoring Event

APPENDIX A-1

WATER SAMPLING LOG FORMS FOR JANUARY 2010 MONITORING EVENT

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-2
Project #:	HM00326	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1645
Date:	1-26-10	Time Sampling Complete:	1715

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 667.52

Depth of Well Below MP (TD): 82.25

Depth to Water Below MP (DTW): 48.34

Water Column (WC) in Well (TD - DTW): 33.91

Casing Diameter: 2"

Gallons in Well (WC x GPF): 5.4

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 16+

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: BROWN Odor: NONE Turbidity: CLOUDY

Well Volumes:	8 Gal.	14 Gal.	20 Gal.			
pH:	9.57	9.66	9.64			
Spec. Cond.:	1178	1082	1088			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	14.1	14.4	14.4			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 v. submersible pump

Parameters to be Analyzed	Container Description	Preservative
pH, Spec. Cond., F	500 ml. PLASTIC	4 degrees C
DISS. As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (1 MICRON)
TOTAL & AMENABLE CN	250 ml. PLASTIC	NaOH
PCE	3 x 40 ml. GLASS	HCl

Sampline Personnel: C. SMITH, R. FARGO

Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-5
Project #:	HM00326	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1540
Date:	1-26-10	Time Sampling Complete:	1610

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC
MP Elevation: 668.16
Depth of Well Below MP (TD): 92.00
Depth to Water Below MP (DTW): 50.67
Water Column (WC) in Well (TD - DTW): 39.33
Casing Diameter: 2"
Gallons in Well (WC x GPF): 6.3

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 19

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: LT. BROWN Odor: NONE Turbidity: CLEAR

Well Volumes:	6 Gal.	14 Gal.	20 Gal.			
pH:	8.77	8.47	8.43			
Spec. Cond.:	1129	1136	1134			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	14.1	14.4	14.5			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 v. submersible pump

Parameters to be Analyzed	Container Description	Preservative
pH, Spec. Cond., F	500 ml. PLASTIC	4 degrees C
DISS. As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (1 MICRON)
TOTAL & AMENABLE CN	250 ml. PLASTIC	NaOH
PCE	3 x 40 ml. GLASS	HCl

Sampline Personnel: C. SMITH, R. FARGO
Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-12
Project #:	HM00326	*Duplicate I.D.:*	~~MW-12D~~
Location:	HANNIBAL, OHIO	Time Sampling Began:	1050
Date:	1-27-10	Time Sampling Complete:	1115

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 635.82

Depth of Well Below MP (TD): 68.42

Depth to Water Below MP (DTW): 15.15

Water Column (WC) in Well (TD - DTW): 53.27

Casing Diameter: 2"

Gallons in Well (WC x GPF): 8.5

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 25+

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: NONE Odor: NONE Turbidity: CLEAR

Well Volumes:	8 Gal.	16 Gal.	24+			
pH:	7.28	7.50	7.56			
Spec. Cond.:	475	482	485			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	14.0	14.1	14.1			

Sampling Method and Materials: *VOCs-disposable polypropylene bailer and rope; All others 12 v. submersible pump*

Parameters to be Analyzed	Container Description	Preservative
pH, Spec. Cond., F	500 ml. PLASTIC	4 degrees C
DISS. As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (1 MICRON)
TOTAL & AMENABLE CN	250 ml. PLASTIC	NaOH
PCBs	1 LITER AMBER GLASS	4 degrees C

Sampline Personnel: C. SMITH, R. FARGO

Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-16
Project #:	HM00326	Duplicate I.D.:	MW-46 (1545)
Location:	HANNIBAL, OHIO	Time Sampling Began:	1500
Date:	1-26-10	Time Sampling Complete:	1530

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation:	662.72
Depth of Well Below MP (TD):	83.12
Depth to Water Below MP (DTW):	41.31
Water Column (WC) in Well (TD - DTW):	41.81
Casing Diameter:	2"
Gallons in Well (WC x GPF):	6.7

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 20+

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: DK. BROWN Odor: NONE Turbidity: CLOUDY

Well Volumes:	8 GAL.	16 GAL.	25 GAL.			
pH:	9.34	9.24	9.24			
Spec. Cond.:	850	835	836			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	13.8	14.6	14.6			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 v. submersible pump

Parameters to be Analyzed	Container Description	Preservative
pH, Spec. Cond., F	500 ml. PLASTIC	4 degrees C
DISS. As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (1 MICRON)
TOTAL & AMENABLE CN	250 ml. PLASTIC	NaOH

Sampline Personnel: C. SMITH, R. FARGO

Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-18
Project #:	HM00326	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1430
Date:	1-26-10	Time Sampling Complete:	1500

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 660.91

Depth of Well Below MP (TD): 61.16

Depth to Water Below MP (DTW): 37.91

Water Column (WC) in Well (TD - DTW): 23.25

Casing Diameter: 2"

Gallons in Well (WC x GPF): 3.7

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 12

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: DK. BROWN Odor: NONE Turbidity: SILTY

Well Volumes:	4 Gal.	5 Gal.	6 GAL.	7 GAL.		
pH:	9.64	9.74	9.76	9.74		
Spec. Cond.:	1566	1598	1527	1451		
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	13.7	13.0	12.6	13.8		

Pumps to sputter @ ± 4 gal. continues at low rate.

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 v. submersible pump

Parameters to be Analyzed	Container Description	Preservative
pH, Spec. Cond., F	500 ml. PLASTIC	4 degrees C
DISS. As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (1 MICRON)
TOTAL & AMENABLE CN	250 ml. PLASTIC	NaOH
PCE	3 x 40 ml. GLASS	HCl

Sampline Personnel: C. SMITH, R. FARGO

Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-28
Project #:	HM00326	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1400
Date:	1-26-10	Time Sampling Complete:	1430

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC
MP Elevation: 663.27
Depth of Well Below MP (TD): 46.20
Depth to Water Below MP (DTW): 23.25
Water Column (WC) in Well (TD - DTW): 22.95
Casing Diameter: 2"
Gallons in Well (WC x GPF): 3.7

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 11+

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: BROWN Odor: NONE Turbidity: CLOUDY / SILTY

Well Volumes:	4 gal.	8 gal.	12+			
pH:	6.91	6.39	6.24			
Spec. Cond.:	441	346	341			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	14.2	14.6	14.5			

Pumped @ 2 gpm

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 v. submersible pump

Parameters to be Analyzed	Container Description	Preservative
pH, Spec. Cond., F	500 ml. PLASTIC	4 degrees C
DISS. As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (1 MICRON)
TOTAL & AMENABLE CN	250 ml. PLASTIC	NaOH

Sampline Personnel: C. SMITH, R. FARGO
Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-31
Project #:	HM00326	Duplicate I.D.:	~~MW-31D~~
Location:	HANNIBAL, OHIO	Time Sampling Began:	1140
Date:	1-27-10	Time Sampling Complete:	1200

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 661.59

Depth of Well Below MP (TD): 67.58

Depth to Water Below MP (DTW): 39.76

Water Column (WC) in Well (TD - DTW): 27.82

Casing Diameter: 2"

Gallons in Well (WC x GPF): 4.5

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 14

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: DK. BROWN Odor: NONE Turbidity: CLOUDY

Well Volumes:	6 Gal.	12 Gal.	14 Gal.			
pH:	9.69	9.73	9.74			
Spec. Cond.:	1316	1304	1305			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	14.1	14.2	14.2			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 v. submersible pump

Parameters to be Analyzed	Container Description	Preservative
pH, Spec. Cond., F	500 ml. PLASTIC	4 degrees C
DISS. As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (1 MICRON)
TOTAL & AMENABLE CN	250 ml. PLASTIC	NaOH
PCE	3 x 40 ml. GLASS	HCl

Sampline Personnel: C. SMITH, R. FARGO

Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-32
Project #:	HM00326	Duplicate I.D.:	MW-52 (1330)
Location:	HANNIBAL, OHIO	Time Sampling Began:	1250
Date:	1-27-10	Time Sampling Complete:	1315

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation:	656.12
Depth of Well Below MP (TD):	57.36
Depth to Water Below MP (DTW):	34.23
Water Column (WC) in Well (TD - DTW):	23.13
Casing Diameter:	2"
Gallons in Well (WC x GPF):	3.7

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 11+

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: DK. BROWN Odor: NONE Turbidity: CLOUDY

Well Volumes:	8 Gal.	12 Gal.	18 Gal.			
pH:	9.63	9.95	9.97			
Spec. Cond.:	1262	1293	1290			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	17.1	17.1	17.1			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 v. submersible pump

Parameters to be Analyzed	Container Description	Preservative
pH, Spec. Cond., F	500 ml. PLASTIC	4 degrees C
DISS. As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (1 MICRON)
TOTAL & AMENABLE CN	250 ml. PLASTIC	NaOH

Sampline Personnel: C. SMITH, R. FARGO

Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-35
Project #:	HM00326	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1230
Date:	1-27-01	Time Sampling Complete:	1250

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC
MP Elevation: 661.90
Depth of Well Below MP (TD): 46.94
Depth to Water Below MP (DTW): 36.05
Water Column (WC) in Well (TD - DTW): 10.89
Casing Diameter: 2"
Gallons in Well (WC x GPF): 1.7

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 5+

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: BROWN Odor: NONE Turbidity: CLOUDY

Well Volumes:	2 Gal.	2+				
pH:	7.62	7.68				
Spec. Cond.:	350	392				
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	14.1	14.5				

Pumped dry @ ± 2 gal. Pumped in 0.5L slugs thereafter.

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
pH, Spec. Cond., F	500 ml. PLASTIC	4 degrees C
DISS. As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (1 MICRON)
TOTAL & AMENABLE CN	250 ml. PLASTIC	NaOH

Sampline Personnel: C. SMITH, R. FARGO
Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-36
Project #:	HM00326	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1315
Date:	1-27-10	Time Sampling Complete:	1345

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 655.14

Depth of Well Below MP (TD): 52.08

Depth to Water Below MP (DTW): 33.85

Water Column (WC) in Well (TD - DTW): 18.23

Casing Diameter: 2"

Gallons in Well (WC x GPF): 2.9

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 9

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: LT. BROWN Odor: NONE Turbidity: CLEAR

Well Volumes:	6 Gal.	9 Gal.	12 Gal.			
pH:	8.92	8.73	8.69			
Spec. Cond.:	768	759	761			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	16.6	16.7	16.8			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
pH, Spec. Cond., F	500 ml. PLASTIC	4 degrees C
DISS. As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (1 MICRON)
TOTAL & AMENABLE CN	250 ml. PLASTIC	NaOH

Sampline Personnel: C. SMITH, R. FARGO

Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-37
Project #:	HM00326	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1210
Date:	1-27-10	Time Sampling Complete:	1230

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC
MP Elevation: 661.14
Depth of Well Below MP (TD): 36.90
Depth to Water Below MP (DTW): 23.77
Water Column (WC) in Well (TD - DTW): 13.13
Casing Diameter: 2"
Gallons in Well (WC x GPF): 2.1

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 6+

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: LT. BROWN Odor: NONE Turbidity: SILTY

Well Volumes:	~~2~~ Gal.	3 Gal.	~4 Gal.			
pH:	~~9.35~~	7.60	7.16			
Spec. Cond.:	~~396~~	375	365			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	13.6	13.5	13.7			

→ Probe cap on.

Pumped dry @ 2.3 gal.
Pumped add'l slugs of 0.5 to 1L.

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
pH, Spec. Cond., F	500 ml. PLASTIC	4 degrees C
DISS. As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (1 MICRON)
TOTAL & AMENABLE CN	250 ml. PLASTIC	NaOH

Sampline Personnel: C. SMITH, R. FARGO
Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-44s
Project #:	HM00326	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1630
Date:	1-26-10	Time Sampling Complete:	1645

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 662.01

Depth of Well Below MP (TD): 69.05

Depth to Water Below MP (DTW): 42.13

Water Column (WC) in Well (TD - DTW): 25.92

Casing Diameter: 2"

Gallons in Well (WC x GPF): 4.1

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 12+

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: NONE Odor: NONE Turbidity: CLEAR.

Well Volumes:	4 Gal.	8 Gal.	12 Gal.			
pH:	7.57	7.37	7.33			
Spec. Cond.:	549	553	553			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	14.2	14.1	14.2			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
PCBs	1 LITER AMBER GLASS	4 degrees C

Sampline Personnel: C. SMITH, R. FARGO

Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-44D
Project #:	HM00326	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1610
Date:	1-26-10	Time Sampling Complete:	1630

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC
MP Elevation: 661.76
Depth of Well Below MP (TD): 93.97
Depth to Water Below MP (DTW): 42.65
Water Column (WC) in Well (TD - DTW): 51.32
Casing Diameter: 2"
Gallons in Well (WC x GPF): 8.2

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 25

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: NONE Odor: NONE Turbidity: CLEAR

Well Volumes:	6 Gal.	16 Gal.	24 Gal.			
pH:	8.38	8.11	8.05			
Spec. Cond.:	420	420	426			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	14.5	14.6	14.2			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
PCBs	1 LITER AMBER GLASS	4 degrees C

Sampline Personnel: C. SMITH, R. FARGO
Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-39S
Project #:	HM00326	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1120
Date:	1-27-10	Time Sampling Complete:	1145

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC
MP Elevation: 657.30
Depth of Well Below MP (TD): 60.23
Depth to Water Below MP (DTW): ~~42.18~~ 34.99
Water Column (WC) in Well (TD - DTW): ~~17.82~~ 25.24
Casing Diameter: 2"
Gallons in Well (WC x GPF): 4.0

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 12

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: LT. BROWN Odor: NONE Turbidity: CLEAR

Well Volumes:	6 Gal.	10 Gal.	14 Gal.			
pH:	9.07	9.22	9.22			
Spec. Cond.:	3200	3130	3050			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	13.4	13.6	13.5			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius

Sampline Personnel: C. SMITH, R. FARGO
Comments:

APPENDIX A-2

WATER SAMPLING LOG FORMS FOR JULY 2010 MONITORING EVENT

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-1
Project #:	HM00324	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1720
Date:	7-20-10	Time Sampling Complete:	1745

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 667.80

Depth of Well Below MP (TD): 71.11

Depth to Water Below MP (DTW): 45.02

ater Column (WC) in Well (TD - DTW): 26.09

Casing Diameter: 2"

Gallons in Well (WC x GPF): 4.1

Gallons to be Purged: 12+

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: VERY SLIGHT BROWN Odor: NONE Turbidity: SLIGHTLY CLOUDY

Well Volumes:	6 gal.	18 gal.	22 gal.			
pH:	6.37	6.40	6.42			
Spec. Cond.:	500	501	506			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	15.7	15.3	15.5			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius

Sampline Personnel: C. SMITH, R. FARGO

Comments:

26.09 .16 / 15654 / 15609

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-2
Project #:	HM00324	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1740
Date:	7-20-10	Time Sampling Complete:	1810

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC
MP Elevation: 667.52
Depth of Well Below MP (TD): 85.23
Depth to Water Below MP (DTW): 45.55
ater Column (WC) in Well (TD - DTW): 39.68
Casing Diameter: 2"
Gallons in Well (WC x GPF): 6.4

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 19+

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: Odor: Turbidity:

Well Volumes:	6 gal.	14 gal.	METER	BATTERIES DEAD		
pH:	9.73	9.74	20+ gallons purged.			
Spec. Cond.:	1142					
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	15.6	15.6				

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius
TETRACHLOROETHENE	3 x 40ml. GLASS	HCL

Sampline Personnel: C. SMITH, R. FARGO
Comments:

39.68
.16
23808
39680
6.4488

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-5
Project #:	HM00324	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1630
Date:	7-20-10	Time Sampling Complete:	1700

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC
MP Elevation: 668.16
Depth of Well Below MP (TD): 91.88
Depth to Water Below MP (DTW): 47.36
ater Column (WC) in Well (TD - DTW): 44.52
Casing Diameter: 2"
Gallons in Well (WC x GPF): 7.1

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 21+

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: VERY LT. TEA COLOR Odor: NONE Turbidity: CLEAR

Well Volumes:	8 gal.	16 gal.	22 gal.			
pH:	8.32	8.36	8.36			
Spec. Cond.:	848	834	834			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	15.3	15.3	15.3			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius
TETRACHLOROETHENE	3 x 40ml. GLASS	HCL

Sampline Personnel: C. SMITH, R. FARGO
Comments:

44.52
.16
7 1 2
2 6 7 2
4 4 5 2 0
7 1 2 3 2

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-7
Project #:	HM00324	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1700
Date:	7-20-10	Time Sampling Complete:	1730

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 667.94

Depth of Well Below MP (TD): 79.7

Depth to Water Below MP (DTW): 46.55

ater Column (WC) in Well (TD - DTW): 33.15

Casing Diameter: 2"

Gallons in Well (WC x GPF): 5.3

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 16

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: LT. BROWN Odor: NONE Turbidity: SILTY

Well Volumes:	6 gal.	14 gal.	20 gal.			
pH:	6.60	6.42	6.39			
Spec. Cond.:	446	473	489			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	28.1	28.7	28.7			

Sampling Method and Materials: ~~VOCs disposable polypropylene bailer and rope~~; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius

Sampline Personnel: C. SMITH, R. FARGO

Comments:

33.15
.16
19890
33150
5304 0

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-8
Project #:	HM00324	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1540
Date:	7-20-10	Time Sampling Complete:	1615

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation:	667.71
Depth of Well Below MP (TD):	99.78
Depth to Water Below MP (DTW):	48.47
ater Column (WC) in Well (TD - DTW):	51.31
Casing Diameter:	2"
Gallons in Well (WC x GPF):	8.2

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 25

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: NONE Odor: NONE Turbidity: CLEAR

Well Volumes:	6 gal.	15 gal.	26+			
pH:	7.66	7.79	7.87			
Spec. Cond.:	509	665	668			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	16.9	16.5	16.4			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius

Sampline Personnel: C. SMITH, R. FARGO

Comments:

51.31
.16
30786
51310
8.2096

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-10
Project #:	HM00324	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1515
Date:	7-20-10	Time Sampling Complete:	1600

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 667.16

Depth of Well Below MP (TD): 100.72

Depth to Water Below MP (DTW): 47.76

ater Column (WC) in Well (TD - DTW): 52.96

Casing Diameter: 2"

Gallons in Well (WC x GPF): 8.5

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 25+

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: NONE Odor: NONE Turbidity: CLEAR

Well Volumes:	6 gal.	14 gal.	20 gal.	26+		
pH:	7.35	7.30	7.49	7.54		
Spec. Cond.:	700	522	515	514		
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	17.7	17.3	17.2	17.1		

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius

Sampline Personnel: C. SMITH, R. FARGO

Comments:

52.96
.16
31776
5296
8.4736

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-11
Project #:	HM00324	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1600
Date:	7-20-10	Time Sampling Complete:	1630

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC
MP Elevation: 667.31
Depth of Well Below MP (TD): 97.35
Depth to Water Below MP (DTW): 46.76
ater Column (WC) in Well (TD - DTW): 50.59
Casing Diameter: 2"
Gallons in Well (WC x GPF): 8.1

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 24+

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: VERY SLIGHT YELLOW-BROWN Odor: NONE Turbidity: CLEAR

Well Volumes:	8 gal.	12 gal.	24 gal.	28 gal.		
pH:	8.01	8.09	8.11	8.12		
Spec. Cond.:	770	902	852	845		
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	15.4	15.2	15.1	15.2		

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius

Sampline Personnel: C. SMITH, R. FARGO
Comments:

50.59
.16
30354
50590
80944

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-12
Project #:	HM00324	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1700
Date:	7-21-10	Time Sampling Complete:	1730

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 635.82

Depth of Well Below MP (TD): 68.24

Depth to Water Below MP (DTW): 12.97

ater Column (WC) in Well (TD - DTW): 55.27

Casing Diameter: 2"

Gallons in Well (WC x GPF): 8.8

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 26+

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: NONE Odor: NONE Turbidity: CLEAR

Well Volumes:	6 gal.	12 gal.	24+			
pH:	7.94	7.90	7.89			
Spec. Cond.:	433	439	437			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	14.9	15.0	15.0			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius
PCB's	1 LITER GLASS	4 degrees celsius

Sampline Personnel: C. SMITH, R. FARGO

Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-14
Project #:	HM00324	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1635
Date:	7-21-10	Time Sampling Complete:	1700

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 653.59
Depth of Well Below MP (TD): 86.9
Depth to Water Below MP (DTW): 29.53
ater Column (WC) in Well (TD - DTW): 57.37
Casing Diameter: 2"
Gallons in Well (WC x GPF): 9.2

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 28

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: NONE Odor: NONE Turbidity: CLEAR

Well Volumes:	4 gal.	10 gal.	20 gal.	30 gal.		
pH:	8.83	8.28	8.10	8.07		
Spec. Cond.:	501	436	435	436		
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	14.9	15.0	15.1	15.0		

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius

Sampline Personnel: C. SMITH, R. FARGO
Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-15
Project #:	HM00324	Duplicate I.D.:	MW-55 (1145)
Location:	HANNIBAL, OHIO	Time Sampling Began:	1106
Date:	7-22-10	Time Sampling Complete:	1130

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation:	657.31
Depth of Well Below MP (TD):	57.86
Depth to Water Below MP (DTW):	31.62
ater Column (WC) in Well (TD - DTW):	26.24
Casing Diameter:	2"
Gallons in Well (WC x GPF):	4.2

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 13

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: AMBER Odor: NONE Turbidity: CLOUDY

Well Volumes:	4 gal.	10 gal.	14 gal.			
pH:	8.37	8.26	8.24			
Spec. Cond.:	799	774	767			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	15.1	15.1	15.1			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius

Sampline Personnel: C. SMITH, R. FARGO

Comments:

26.24
.16
15744
26240
41984

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-16
Project #:	HM00324	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1150
Date:	7-21-10	Time Sampling Complete:	1220

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 662.72

Depth of Well Below MP (TD): 83.11

Depth to Water Below MP (DTW): 38.91

ater Column (WC) in Well (TD - DTW): 44.20

Casing Diameter: 2"

Gallons in Well (WC x GPF): 7.0

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 21

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: DARK BROWN/AMBER Odor: NONE Turbidity: CLOUDY

Well Volumes:	6 gal.	16 gal.	24 gal.			
pH:	9.30	9.40	9.39			
Spec. Cond.:	786	742	733			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	15.6	15.6	15.5			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius

Sampline Personnel: C. SMITH, R. FARGO

Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-17
Project #:	HM00324	Duplicate I.D.:	MW-57 (1045)
Location:	HANNIBAL, OHIO	Time Sampling Began:	1006
Date:	7-22-10	Time Sampling Complete:	1030

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC
MP Elevation: 655.03
Depth of Well Below MP (TD): 77.91
Depth to Water Below MP (DTW): 30.07
ater Column (WC) in Well (TD - DTW): 47.84
Casing Diameter: 2"
Gallons in Well (WC x GPF): 7.6

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 23

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: AMBER Odor: NONE Turbidity: CLOUDY

Well Volumes:	6 gal.	16 gal.	26 gal.			
pH:	8.13	8.10	8.10			
Spec. Cond.:	667	634	626			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	[illegible]	16.3	16.2			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius

Sampline Personnel: C. SMITH, R. FARGO
Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-18
Project #:	HM00324	Duplicate I.D.:	MW-58 (1345)
Location:	HANNIBAL, OHIO	Time Sampling Began:	1300
Date:	7-21-10	Time Sampling Complete:	1330

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation:	660.91
Depth of Well Below MP (TD):	57.00
Depth to Water Below MP (DTW):	35.40
ater Column (WC) in Well (TD - DTW):	21.60
Casing Diameter:	2"
Gallons in Well (WC x GPF):	3.5

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 8

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: TEA Odor: NONE Turbidity: CLOUDY

Well Volumes:	4 gal.	6 gal.	8 gal.+			
pH:	9.99	9.91	9.94			
Spec. Cond.:	1497	1910	1307			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	15.0	16.0	15.4			

Pumps dry @ 2pm

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius
TETRACHLOROETHENE	3 x 40ml. GLASS	HCL

Sampline Personnel: C. SMITH, R. FARGO

Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-19
Project #:	HM00324	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1355
Date:	7-22-10	Time Sampling Complete:	1430

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 662.03

Depth of Well Below MP (TD): 65.20

Depth to Water Below MP (DTW): 36.95

Water Column (WC) in Well (TD - DTW): 28.25

Casing Diameter: 2"

Gallons in Well (WC x GPF): 4.5

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 15

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: VERY LT. GREY (NO COLOR AFTER PURGE) Odor: NONE Turbidity: CLOUDY (CLEAR AFTER PURGE)

Well Volumes:	4 gal.	10 gal.	16 gal			
pH:	7.03	7.54	7.57			
Spec. Cond.:	606	606	605			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	14.3	14.4	14.3			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius

Sampline Personnel: C. SMITH, R. FARGO FB-1 1445

Comments:

28.25 .16 4.5 3 13.5 2 27

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-28
Project #:	HM00324	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1240
Date:	7-21-10	Time Sampling Complete:	1300

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 663.27

Depth of Well Below MP (TD): 46.06

Depth to Water Below MP (DTW): 20.72

ater Column (WC) in Well (TD - DTW): 25.34

Casing Diameter: 2"

Gallons in Well (WC x GPF): 4.0

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 12.0

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: LT. TEA COLOR Odor: NONE Turbidity: CLOUDY

Well Volumes:	8 gal.	10 gal.	16 gal.			
pH:	6.61	6.51	6.43			
Spec. Cond.:	358	358	359			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	14.1	14.1	14.2			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	500 ~~250~~ ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC x 2	NAOH
pH, SPEC. COND., F	250 ~~500~~ ml. PLASTIC	4 degrees celsius

Sampline Personnel: C. SMITH, R. FARGO

Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-29S
Project #:	HM00324	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1145
Date:	7-21-10	Time Sampling Complete:	1200

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 653.4

Depth of Well Below MP (TD): 61.35

Depth to Water Below MP (DTW): 29.80

ater Column (WC) in Well (TD - DTW): 31.55

Casing Diameter: 2"

Gallons in Well (WC x GPF): 5.0

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 15

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: TEA Odor: NONE Turbidity: CLOUDY

Well Volumes:	4 gal.	8 gal.	16 gal.			
pH:	7.87	7.89	7.93			
Spec. Cond.:	854	841	818			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	14.8	14.7	14.8			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius

Sampline Personnel: C. SMITH, R. FARGO

Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-29D
Project #:	HM00324	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1115
Date:	7-21-10	Time Sampling Complete:	1145

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 653.07

Depth of Well Below MP (TD): 81.98

Depth to Water Below MP (DTW): 29.50

ater Column (WC) in Well (TD - DTW): 52.48

Casing Diameter: 2"

Gallons in Well (WC x GPF): 8.4

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 25

Evacuation Method: *12 Volt submersible purge pump*

SAMPLING DATA AND FIELD PARAMETERS

Color: VERY PALE YELLOW/BROWN Odor: NONE Turbidity: CLEAR

Well Volumes:	6 gal.	14 gal.	24 gal.			
pH:	8.00	8.00	8.01			
Spec. Cond.:	538	556	553			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	14.8	14.7	14.8			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius

Sampline Personnel: C. SMITH, R. FARGO

Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-30
Project #:	HM00324	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1214
Date:	7-21-10	Time Sampling Complete:	1245

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 667.58

Depth of Well Below MP (TD): 60.41

Depth to Water Below MP (DTW): 42.80

ater Column (WC) in Well (TD - DTW): 17.61

Casing Diameter: 2"

Gallons in Well (WC x GPF): 2.8

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 9

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: BROWN Odor: NONE Turbidity: SILTY

Well Volumes:	6 gal.	10 gal.	16 gal.			
pH:	7.70	7.09	6.97			
Spec. Cond.:	644	459	447			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	14.6	14.5	14.6			

LT. TEA COLOR AFTER FILTERING.

PUMPED NEARLY DRY @ 2 gpm.

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius
TETRACHLOROETHENE	3 x 40ml. GLASS	HCL

Sampline Personnel: C. SMITH, R. FARGO

Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-31
Project #:	HM00324	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1538
Date:	7-21-10	Time Sampling Complete:	1610

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation:	661.59
Depth of Well Below MP (TD):	67.51
Depth to Water Below MP (DTW):	37.23
ater Column (WC) in Well (TD - DTW):	30.28
Casing Diameter:	2"
Gallons in Well (WC x GPF):	4.8

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 15

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: DK. BROWN/COFFEE Odor: NONE Turbidity: CLOUDY

Well Volumes:	10 gal.	16 gal.	20 gal.			
pH:	9.76	9.81	9.83			
Spec. Cond.:	1228	1237	1230			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	15.9	15.7	15.6			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	500 ~~250~~ ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC X 2	NAOH
pH, SPEC. COND., F	250 ~~500~~ ml. PLASTIC	4 degrees celsius
TETRACHLOROETHENE	2 ~~3~~ X 40ml. GLASS	HCL

Sampline Personnel: C. SMITH, R. FARGO

Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-32
Project #:	HM00324	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1723
Date:	7-21-10	Time Sampling Complete:	1745

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 656.12

Depth of Well Below MP (TD): 57.18

Depth to Water Below MP (DTW): 31.48

ater Column (WC) in Well (TD - DTW): 25.70

Casing Diameter: 2"

Gallons in Well (WC x GPF): 4.1

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 12+

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: DK. BROWN (COFFEE) Odor: NONE Turbidity: CLOUDY

Well Volumes:	5 gal.	8 gal.	12 gal.			
pH:	10.04	10.13	10.14			
Spec. Cond.:	1140	1173	1174			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	16.5	16.5	16.7			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius

Sampline Personnel: C. SMITH, R. FARGO

Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-34S
Project #:	HM00324	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1050
Date:		Time Sampling Complete:	1115

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 655.67

Depth of Well Below MP (TD): 49.35

Depth to Water Below MP (DTW): 31.10

Water Column (WC) in Well (TD - DTW): 18.25

Casing Diameter: 2"

Gallons in Well (WC x GPF): 5.0

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 15

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: DARK AMBER Odor: NONE Turbidity: CLOUDY

Well Volumes:	4 gal.	10 gal.	18 gal.			
pH:	8.83	8.92	8.94			
Spec. Cond.:	1065	1080	1070			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	15.1	15.0	14.9			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius

Sampline Personnel: C. SMITH, R. FARGO

Comments:

31.1
.16
1866
3110
4.976

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-34D
Project #:	HM00324	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1030
Date:	7-22-10	Time Sampling Complete:	1050

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 654.67

Depth of Well Below MP (TD): 68.24

Depth to Water Below MP (DTW): 29.62

ater Column (WC) in Well (TD - DTW): 38.62

Casing Diameter: 2"

Gallons in Well (WC x GPF): 6.2

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 19

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: AMBER Odor: NONE Turbidity: CLOUDY

Well Volumes:	6 gal.	12 gal.	20 gal.			
pH:	8.43	8.54	8.59			
Spec. Cond.:	610	656	656			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	15.1	15.2	15.3			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius

Sampline Personnel: C. SMITH, R. FARGO

Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-35
Project #:	*HM00324*	*Duplicate I.D.:*	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1318
Date:	7-22-10	Time Sampling Complete:	1345

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 661.9

Depth of Well Below MP (TD): 46.7

Depth to Water Below MP (DTW): 33.70

ater Column (WC) in Well (TD - DTW): 13.00

Casing Diameter: 2"

Gallons in Well (WC x GPF): 2.0

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 6+

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: AMBER Odor: NONE Turbidity: CLOUDY

Well Volumes:	2 gal.					
pH:	7.36					
Spec. Cond.:	276					
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	16.7					

Pumped dry @ 1 well vol. Allowed to re-charge, then sampled

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius

Sampline Personnel: C. SMITH, R. FARGO

Comments:

13
.16
78
13
208

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-36
Project #:	HM00324	Duplicate I.D.:	MW-56 (1200)
Location:	HANNIBAL, OHIO	Time Sampling Began:	1124
Date:	7-22-10	Time Sampling Complete:	1150

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 655.14

Depth of Well Below MP (TD): 52.08

Depth to Water Below MP (DTW): 30.98

ater Column (WC) in Well (TD - DTW): 21.10

Casing Diameter: 2"

Gallons in Well (WC x GPF): 3.4

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 10+

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: LT. AMBER Odor: NONE Turbidity: SLIGHTLY CLOUDY

Well Volumes:	6 gal.	12 gal.	16 gal.			
pH:	8.88	8.96	8.98			
Spec. Cond.:	505	489	487			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	18.0	18.1	18.0			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius

Sampline Personnel: C. SMITH, R. FARGO

Comments:

21.1
.16
1266
1 1 0
2 1
3376

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-37
Project #:	HM00324	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1335
Date:	7-22-10	Time Sampling Complete:	1400

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation:	661.14
Depth of Well Below MP (TD):	36.98
Depth to Water Below MP (DTW):	19.35
ater Column (WC) in Well (TD - DTW):	17.63
Casing Diameter:	2"
Gallons in Well (WC x GPF):	2.8

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 8+

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: LT. BROWN Odor: NONE Turbidity: SILTY

Well Volumes:	3 gal.	6 gal.				
pH:	6.77	6.73				
Spec. Cond.:	236	235				
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	14.4	14.6				

Pumped dry after 1+ well volume. ~~Sampled after recharge.~~ Sampled after 2 well vols. Very Lt. Amber after filtering.

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius

Sampline Personnel: C. SMITH, R. FARGO

Comments:

17.63
.16
10578
17630
2.8208

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-39S
Project #:	HM00324	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1620
Date:	7-21-10	Time Sampling Complete:	1650

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC
MP Elevation: 657.3
Depth of Well Below MP (TD): 60.23
Depth to Water Below MP (DTW): 32.78
ater Column (WC) in Well (TD - DTW): 27.45
Casing Diameter: 2"
Gallons in Well (WC x GPF): 4.4

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 13+

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: TEA Odor: NONE Turbidity: CLEAR

Well Volumes:	4 Gal.	10 gal.	16 gal.			
pH:	9.34	9.39	9.38			
Spec. Cond.:	3560	3570	3460			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	14.6	14.6	14.6			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius

Sampline Personnel: C. SMITH, R. FARGO
Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-39D
Project #:	HM00324	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1605
Date:	7-21-10	Time Sampling Complete:	1630

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 657.18

Depth of Well Below MP (TD): 80.21

Depth to Water Below MP (DTW): 32.71

ater Column (WC) in Well (TD - DTW): 47.50

Casing Diameter: 2"

Gallons in Well (WC x GPF): 7.6

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 23

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: NONE Odor: NONE Turbidity: CLEAR

Well Volumes:	6 gal.	14 gal.	24 gal			
pH:	8.03	7.89	7.92			
Spec. Cond.:	683	1011	1033			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	14.9	14.6	14.7			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius
	~~3 X 40ml. GLASS~~	

Sampline Personnel: C. SMITH, R. FARGO

Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-40S
Project #:	HM00324	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1015
Date:	7-21-10	Time Sampling Complete:	1045

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 663.9

Depth of Well Below MP (TD): 70.4

Depth to Water Below MP (DTW): 41.89

ater Column (WC) in Well (TD - DTW): 28.51

Casing Diameter: 2"

Gallons in Well (WC x GPF): 4.6

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 14

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: TEA Odor: NONE Turbidity: CLOUDY

Well Volumes:	3 gal.	8 gal.	14 gal.			
pH:	8.38	8.41	8.42			
Spec. Cond.:	783	784	781			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	15.4	15.4	15.4			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius

Sampline Personnel: C. SMITH, R. FARGO

Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-40D
Project #:	HM00324	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	950
Date:	7-21-10	Time Sampling Complete:	1015

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC
MP Elevation: 663.75
Depth of Well Below MP (TD): 90.4
Depth to Water Below MP (DTW): 41.80
ater Column (WC) in Well (TD - DTW): 48.60
Casing Diameter: 2"
Gallons in Well (WC x GPF): 7.8

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 23+

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: TEA Odor: NONE Turbidity: CLOUDY

Well Volumes:	9 gal.	12 gal.	20 gal.	24 gal.		
pH:	7.74	8.17	8.32	8.34		
Spec. Cond.:	783	763	752	753		
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	15.5	15.4	15.3	15.3		

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius

Sampline Personnel: C. SMITH, R. FARGO
Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name: ORMET-REDUCTION MILL
Project #: HM00324
Location: HANNIBAL, OHIO
Date:

Sample I.D.: MW-41
Duplicate I.D.:
Time Sampling Began:
Time Sampling Complete:

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC
MP Elevation: 637.67
Depth of Well Below MP (TD): 62.26
Depth to Water Below MP (DTW):
ater Column (WC) in Well (TD - DTW):
Casing Diameter: 2"
Gallons in Well (WC x GPF):

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged:

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: Odor: Turbidity:

Well Volumes:						
pH:						
Spec. Cond.:						
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:						

far up-river background well - not sampled routinely.

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius

Sampline Personnel: C. SMITH, R. FARGO
Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-42S
Project #:	HM00324	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	945
Date:	7-22-10	Time Sampling Complete:	1000

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 654.37

Depth of Well Below MP (TD): 52.3

Depth to Water Below MP (DTW): 30.82

ater Column (WC) in Well (TD - DTW): 21.48

Casing Diameter: 2"

Gallons in Well (WC x GPF): 3.4

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 10.3

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: Pale Amber Odor: NONE Turbidity: SLIGHTLY CLOUDY

Well Volumes:	4 Gal.	8 gal.	12 gal.			
pH:	7.92	7.98	8.07			
Spec. Cond.:	1569	1467	1446			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	14.6	14.4	14.4			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius

Sampline Personnel: C. SMITH, R. FARGO

Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-42D
Project #:	HM00324	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	923
Date:	7-22-10	Time Sampling Complete:	945

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 654.34

Depth of Well Below MP (TD): 85.1

Depth to Water Below MP (DTW): 30.78

ater Column (WC) in Well (TD - DTW): 54.32

Casing Diameter: 2"

Gallons in Well (WC x GPF): 8.7

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 26

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: VERY SLIGHT YELLOW Odor: NONE Turbidity: CLEAR

Well Volumes:	6 gal.	16 gal.	20 gal.	28 gal.	32 gal.	
pH:	7.68	8.09	8.11	8.11	8.11	
Spec. Cond.:	3070	1786	1722	1680	1667	
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	14.9	14.6	14.6	14.6	14.6	

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius

Sampline Personnel: C. SMITH, R. FARGO

Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-44S
Project #:	HM00324	Duplicate I.D.:	MW-54S (1110)
Location:	HANNIBAL, OHIO	Time Sampling Began:	1045
Date:		Time Sampling Complete:	1100

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 662.01

Depth of Well Below MP (TD): 69.05

Depth to Water Below MP (DTW): 39.47

ater Column (WC) in Well (TD - DTW): 29.58

Casing Diameter: 2"

Gallons in Well (WC x GPF): 4.7

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 14

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: NONE Odor: NONE Turbidity: CLEAR

Well Volumes:	4 gal.	10 gal.	16 gal.			
pH:	7.44	7.26	7.25			
Spec. Cond.:	456	456	460			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	15.4	15.3	15.3			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
PCB's	1 LITER GLASS	4 degrees celsius

Sampline Personnel: C. SMITH, R. FARGO

Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-44D
Project #:	HM00324	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1028
Date:	7-21-10	Time Sampling Complete:	1048

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC
MP Elevation: 661.76
Depth of Well Below MP (TD): 93.97
Depth to Water Below MP (DTW): 40.03
ater Column (WC) in Well (TD - DTW): 8.6
Casing Diameter: 2"
Gallons in Well (WC x GPF):

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 26

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: NONE Odor: NONE Turbidity: CLEAR

Well Volumes:	8 gal.	20 gal.	30 gal.			
pH:	8.17	7.94	7.93			
Spec. Cond.:	387	377	378			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	15.5	15.5	15.6			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
PCB's	1 LITER GLASS	4 degrees celsius

Sampline Personnel: C. SMITH, R. FARGO
Comments:

APPENDIX A-3

WATER SAMPLING LOG FORMS FOR NOVEMBER 2010 MONITORING EVENT

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-2
Project #:	HM00326	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1210
Date:	11-18-10	Time Sampling Complete:	1230

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 667.52

Depth of Well Below MP (TD): 82.25

Depth to Water Below MP (DTW): 46.52

Water Column (WC) in Well (TD - DTW): 35.73

Casing Diameter: 2"

Gallons in Well (WC x GPF): 5.8

Gallons to be Purged: 18

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: DK. BROWN (COFFEE) Odor: NONE Turbidity: CLOUDY

Well Volumes:	8 gal.	18 gal.	20 gal.			
pH:	9.63	9.73	9.65			
Spec. Cond.:	749	758	735			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	14.8	14.8	14.7			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 v. submersible pump

Parameters to be Analyzed	Container Description	Preservative
pH, Spec. Cond., F	500 ml. PLASTIC	4 degrees C
DISS. As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (1 MICRON)
TOTAL & AMENABLE CN	250 ml. PLASTIC	NaOH
PCE	3 x 40 ml. GLASS	HCl

Sampline Personnel: C. SMITH, R. FARGO

Comments:

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-5
Project #:	HM00326	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1242
Date:	11-18-10	Time Sampling Complete:	1315

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC
MP Elevation: 668.16
Depth of Well Below MP (TD): 92.00
Depth to Water Below MP (DTW): 48.61
Water Column (WC) in Well (TD - DTW): 41.39
Casing Diameter: 2"
Gallons in Well (WC x GPF): 6.7

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 20

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: PALE YELLOW/BROWN Odor: NONE Turbidity: CLEAR

Well Volumes:	10 gal.	14 gal.	20 gal.			
pH:	8.45	8.31	8.24			
Spec. Cond.:	685	693	701			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	14.7	14.9	15.0			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 v. submersible pump

Parameters to be Analyzed	Container Description	Preservative
pH, Spec. Cond., F	500 ml. PLASTIC	4 degrees C
DISS. As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (1 MICRON)
TOTAL & AMENABLE CN	250 ml. PLASTIC	NaOH
PCE	3 x 40 ml. GLASS	HCl

Sampline Personnel: C. SMITH, R. FARGO
Comments:

42 .16 / 2520 / 4 3 / 672

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-12
Project #:	HM00326	Duplicate I.D.:	~~MW-12D~~
Location:	HANNIBAL, OHIO	Time Sampling Began:	1400
Date:	11-17-2010	Time Sampling Complete:	1430

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 635.82

Depth of Well Below MP (TD): 68.42

Depth to Water Below MP (DTW): 13.89

Water Column (WC) in Well (TD - DTW): 54.53

Casing Diameter: 2"

Gallons in Well (WC x GPF): 8.8

Gallons to be Purged: 26 +

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: NONE Odor: NONE Turbidity: CLEAR

Well Volumes:	7 Gal.	15 gal.	30 gal.			
pH:	7.18	7.61	7.79			
Spec. Cond.:	400	380	372			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	14.6	14.6	14.7			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 v. submersible pump

Parameters to be Analyzed	Container Description	Preservative
pH, Spec. Cond., F	500 ml. PLASTIC	4 degrees C
DISS. As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (1 MICRON)
TOTAL & AMENABLE CN	250 ml. PLASTIC	NaOH
PCBs	1 LITER AMBER GLASS	4 degrees C

Sampline Personnel: C. SMITH, R. FARGO

Comments:

54.53
.16
32718
54530
8.728

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-16
Project #:	HM00326	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1100
Date:	11-18-10	Time Sampling Complete:	1130

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC
MP Elevation: 662.72
Depth of Well Below MP (TD): 83.12
Depth to Water Below MP (DTW): 39.90
Water Column (WC) in Well (TD - DTW): 43.22
Casing Diameter: 2"
Gallons in Well (WC x GPF): 6.9

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 21

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: DK. BROWN (COFFEE) Odor: NONE Turbidity: CLOUDY

Well Volumes:	8 gal.	20 gal.	24 gal.			
pH:	9.32	9.47	9.48			
Spec. Cond.:	695	683	680			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	14.8	15.0	14.9			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 v. submersible pump

Parameters to be Analyzed	Container Description	Preservative
pH, Spec. Cond., F	500 ml. PLASTIC	4 degrees C
DISS. As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (1 MICRON)
TOTAL & AMENABLE CN	250 ml. PLASTIC	NaOH

Sampline Personnel: C. SMITH, R. FARGO
Comments:

43.22
.16
25932
43220.
69152

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-18
Project #:	HM00326	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1030
Date:	11-18-10	Time Sampling Complete:	1100

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 660.91

Depth of Well Below MP (TD): 61.16

Depth to Water Below MP (DTW): 36.58

Water Column (WC) in Well (TD - DTW): 24.58

Casing Diameter: 2"

Gallons in Well (WC x GPF): 3.9

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 12

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: BROWN Odor: NONE Turbidity: CLOUDY → SILTY

Well Volumes:	6 gal.	10 gal.	12+ gal.			
pH:	10.05	9.91	9.93			
Spec. Cond.:	1040	1181	1099			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	13.9	14.4	14.2			

PUMPED NEARLY DRY @ 8 gal. CONTINUED LOWER FLOW TO PURGE VOL.

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 v. submersible pump

Parameters to be Analyzed	Container Description	Preservative
pH, Spec. Cond., F	500 ml. PLASTIC	4 degrees C
DISS. As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (1 MICRON)
TOTAL & AMENABLE CN	250 ml. PLASTIC	NaOH
PCE	3 x 40 ml. GLASS	HCl

Sampline Personnel: C. SMITH, R. FARGO

Comments:

24.58
.16
14748
24580
3.938

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-28
Project #:	HM00326	Duplicate I.D.:	MW-58 (1040)
Location:	HANNIBAL, OHIO	Time Sampling Began:	1000
Date:	11-18-10	Time Sampling Complete:	1030

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 663.27

Depth of Well Below MP (TD): 46.20

Depth to Water Below MP (DTW): 22.71

Water Column (WC) in Well (TD - DTW): 23.49

Casing Diameter: 2"

Gallons in Well (WC x GPF): 3.8

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 11+

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: BROWN Odor: NONE Turbidity: CLOUDY → SILTY

Well Volumes:	6 gal.	10 gal.	18 gal.	20+ gal.		
pH:	5.58	6.14	6.30	6.28		
Spec. Cond.:	321	311	313	313		
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	15.4	15.4	15.2	15.3		

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 v. submersible pump

Parameters to be Analyzed	Container Description	Preservative
pH, Spec. Cond., F	500 ml. PLASTIC	4 degrees C
DISS. As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (1 MICRON)
TOTAL & AMENABLE CN	250 ml. PLASTIC	NaOH

Sampline Personnel: C. SMITH, R. FARGO

Comments:

23.49
.16
14094
23490
37584

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-31
Project #:	HM00326	Duplicate I.D.:	~~MW-31D~~ MW-51
Location:	HANNIBAL, OHIO	Time Sampling Began:	1539 (1710)
Date:	11-17-10	Time Sampling Complete:	1610

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC
MP Elevation: 661.59
Depth of Well Below MP (TD): 67.58
Depth to Water Below MP (DTW): 38.29
Water Column (WC) in Well (TD - DTW): 29.29
Casing Diameter: 2"
Gallons in Well (WC x GPF): 4.7

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 14+

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: DK. BROWN (COFFEE) Odor: NONE Turbidity: CLOUDY

Well Volumes:	4 gal.	12 gal.	20 gal.			
pH:	9.81	9.90	9.84			
Spec. Cond.:	909	910	917			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	14.6	14.8	14.9			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 v. submersible pump

Parameters to be Analyzed	Container Description	Preservative
pH, Spec. Cond., F	500 ml. PLASTIC	4 degrees C
DISS. As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (1 MICRON)
TOTAL & AMENABLE CN	250 ml. PLASTIC	NaOH
PCE	3 x 40 ml. GLASS	HCl

Sampline Personnel: C. SMITH, R. FARGO
Comments:

29.29 .16 1754 2929 2 4684

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-32
Project #:	HM00326	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1519
Date:	11-17-10	Time Sampling Complete:	1545

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 656.12

Depth of Well Below MP (TD): 57.36

Depth to Water Below MP (DTW): 32.92

Water Column (WC) in Well (TD - DTW): 24.44

Casing Diameter: 2"

Gallons in Well (WC x GPF): 3.9

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 12

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: DK. BROWN (COFFEE) Odor: NONE Turbidity: CLOUDY

Well Volumes:	3 gal.	12 gal.	14 gal.			
pH:	10.14	10.17	10.17			
Spec. Cond.:	898	933	945			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	16.5	16.3	16.2			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 v. submersible pump

Parameters to be Analyzed	*Container Description*	*Preservative*
pH, Spec. Cond., F	500 ml. PLASTIC	4 degrees C
DISS. As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (1 MICRON)
TOTAL & AMENABLE CN	250 ml. PLASTIC	NaOH

Sampline Personnel: C. SMITH, R. FARGO

Comments:

24.44
.16
14664
24440
391.04

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-35
Project #:	HM00326	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1610
Date:	11-17-10	Time Sampling Complete:	1640

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 661.90

Depth of Well Below MP (TD): 46.94

Depth to Water Below MP (DTW): 35.33

Water Column (WC) in Well (TD - DTW): 11.61

Casing Diameter: 2"

Gallons in Well (WC x GPF): 1.9

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 6.0

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: DK. BROWN Odor: NONE Turbidity: CLOUDY

Well Volumes:	2 gal.	3 gal.				
pH:	8.40	7.84				
Spec. Cond.:	263	286				
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	15.0	15.5				

DRY AFTER 1 VOL.

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
pH, Spec. Cond., F	500 ml. PLASTIC	4 degrees C
DISS. As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (1 MICRON)
TOTAL & AMENABLE CN	250 ml. PLASTIC	NaOH

Sampline Personnel: C. SMITH, R. FARGO

Comments:

11.61
.16
6966
1161
18576

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-36
Project #:	HM00326	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1502
Date:	11-17-10	Time Sampling Complete:	1530

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC
MP Elevation: 655.14
Depth of Well Below MP (TD): 52.08
Depth to Water Below MP (DTW): 32.70
Water Column (WC) in Well (TD - DTW): 19.38
Casing Diameter: 2"
Gallons in Well (WC x GPF): 3.1
Gallons to be Purged: 9+

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: NONE Odor: NONE Turbidity: CLEAR

Well Volumes:	5 gal.	12 gal.	15 gal.			
pH:	8.88	8.70	8.70			
Spec. Cond.:	545	512	507			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	20.1	20.3	20.2			

Sampling Method and Materials: *VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump*

Parameters to be Analyzed	Container Description	Preservative
pH, Spec. Cond., F	500 ml. PLASTIC	4 degrees C
DISS. As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (1 MICRON)
TOTAL & AMENABLE CN	250 ml. PLASTIC	NaOH

Sampline Personnel: C. SMITH, R. FARGO
Comments:

19.38
.16
11628
19380
3 1 0 0 8

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-37
Project #:	HM00326	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1631
Date:	11-17-2010	Time Sampling Complete:	1700

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation:	661.14
Depth of Well Below MP (TD):	36.90
Depth to Water Below MP (DTW):	21.85
Water Column (WC) in Well (TD - DTW):	15.05
Casing Diameter:	2"
Gallons in Well (WC x GPF):	2.4

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 7+

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: BROWN Odor: NONE Turbidity: SILTY

Well Volumes:	3 Gal.					
pH:	7.47					
Spec. Cond.:	185					
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	15.0					

PUMPED DRY @ 1 VOL.

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
pH, Spec. Cond., F	500 ml. PLASTIC	4 degrees C
DISS. As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (1 MICRON)
TOTAL & AMENABLE CN	250 ml. PLASTIC	NaOH

Sampline Personnel: C. SMITH, R. FARGO

Comments:

15.05
.16
9030
15050
2.4

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-44s
Project #:	HM00326	Duplicate I.D.:	MW-54
Location:	HANNIBAL, OHIO	Time Sampling Began:	1130
Date:	11-18-10	Time Sampling Complete:	1200 (1300)

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation:	662.01
Depth of Well Below MP (TD):	69.05
Depth to Water Below MP (DTW):	40.51
Water Column (WC) in Well (TD - DTW):	19.54
Casing Diameter:	2"
Gallons in Well (WC x GPF):	3.2

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 10

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: NONE Odor: NONE Turbidity: CLEAR

Well Volumes:	2 gal.	10 gal.	12 gal.			
pH:	7.71	7.43	7.40			
Spec. Cond.:	413	415	417			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	14.4	14.5	14.5			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
PCBs	1 LITER AMBER GLASS	4 degrees C

Sampline Personnel: C. SMITH, R. FARGO

Comments:

20 .16 1200 1200 3.2

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-44D
Project #:	HM00326	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1130
Date:	11-18-10	Time Sampling Complete:	1145

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC

MP Elevation: 661.76

Depth of Well Below MP (TD): 93.97

Depth to Water Below MP (DTW): 41.10

Water Column (WC) in Well (TD - DTW): 52.87

Casing Diameter: 2"

Gallons in Well (WC x GPF): 8.5

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 25+

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: NONE Odor: NONE Turbidity: CLEAR

Well Volumes:	6 gal.	14 gal.	20 gal.			
pH:	8.50	8.22	8.15			
Spec. Cond.:	359	354	354			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	14.5	14.7	14.8			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
PCBs	1 LITER AMBER GLASS	4 degrees C

Sampline Personnel: C. SMITH, R. FARGO

Comments:

53
.16
318
330
8.48

HYDROSYSTEMS MANAGEMENT, INC.
WATER SAMPLING LOG FORM

Project Name:	ORMET-REDUCTION MILL	Sample I.D.:	MW-39S
Project #:	HM00326	Duplicate I.D.:	
Location:	HANNIBAL, OHIO	Time Sampling Began:	1430
Date:	11-17-10	Time Sampling Complete:	1500

WELL EVACUATION DATA

Description of Measuring Point (MP): TOP OF PVC
MP Elevation: 657.30
Depth of Well Below MP (TD): 60.23
Depth to Water Below MP (DTW): 33.83
Water Column (WC) in Well (TD - DTW): 26.40
Casing Diameter: 2"
Gallons in Well (WC x GPF): 4.2

GALLONS PER FOOT (GPF)				
1"=0.04	2"=0.16	3"=0.37	4"=0.65	6"=1.47

Gallons to be Purged: 13

Evacuation Method: 12 Volt submersible purge pump

SAMPLING DATA AND FIELD PARAMETERS

Color: LT. BROWN (TEA) Odor: NONE Turbidity: CLOUDY

Well Volumes:	4 gal.	8 gal.	12+			
pH:	9.40	9.41	9.38			
Spec. Cond.:	1550	1641	1675			
Diss. Oxygen:						
Turbidity:						
Redox:						
Temp.:	14.3	14.2	14.2			

Sampling Method and Materials: VOCs-disposable polypropylene bailer and rope; All others 12 volt submersible pump

Parameters to be Analyzed	Container Description	Preservative
DISSOLVED As, Be, Mn, Na, V	250 ml. PLASTIC	HNO_3 - FIELD FILTERED (IMICRON)
TOTAL CN, AMENABLE CN	250 ml. PLASTIC	NAOH
pH, SPEC. COND., F	500 ml. PLASTIC	4 degrees celsius

Sampline Personnel: C. SMITH, R. FARGO
Comments:

26.4
.16
1584
2640
4224

APPENDIX B

LABORATORY ANALYTICAL REPORTS
(provided on disc including the following:)

Laboratory Analytical Report for January 2010 Monitoring Event

Laboratory Analytical Report for July 2010 Monitoring Event

Laboratory Analytical Report for November 2010 Monitoring Event

APPENDIX C

DATA VALIDATION SUMMARY REPORT FOR 2010 MONITORING EVENTS

Appendix C
2010 Data Validation Summary
Ormet Primary Aluminum Corporation
Hannibal, Ohio

Laboratory Project Numbers: **January 2010**, Pace Analytical Services, Inc., Lab No. 3022005; **July 2010**, Microbac Laboratories, Lab No. L10070527 and L10076572; November **2010**, Microbac Laboratories, Lab No. L10110633.

The following apply to all samples collected during 2010 unless specific sampling events are indicated.

General

Holding Times: With the exception of pH, all holding times were met.

Field Duplicate Relative Percent Differences (RPDs): RPD values for field duplicate sample results within +/- 20% except for the following:

January 2010: (MW-16 and MW-32 duplicated) **MW-32** total cyanide, 4.7 mg/L vs. 6.1 mg/L (6.1 mg/L more consistent with previous data).

July 2010: (MW-15, MW-17, MW-18, MW-36 and MW-44S duplicated) **MW-15** total cyanide, 3.39 mg/L vs. 2.54 mg/L (either value within historical background range); **MW-15** amenable cyanide, 2.14 mg/L vs. 1.46 mg/L (both values higher than historical range); **MW-17** amenable cyanide, 1.89 mg/L vs. 2.40 mg/L (both values higher than typical historical range); **MW-32** total cyanide, 4.7 mg/L vs. 6.1 mg/L (either value within historical range).

November 2010: (MW-28 and MW-31 duplicated) **MW-28** total cyanide, 0.2480 mg/L vs. 0.0997 mg/L (either value within historical range); **MW-28** amenable cyanide, 0.2480 mg/L vs. 0.0997 mg/L (both values within historical range); **MW-28** manganese, <0.005 mg/L vs. 0.0073 mg/L (difference at such low concentrations not significant); **MW-31** total cyanide, 2.08 mg/L vs. 4.82 mg/L (4.82 mg/L more consistent with historical range); **MW-31** amenable cyanide, 0.967 mg/L vs. 4.82 mg/L (0.967 mg/L more consistent with typical historical range).

Field Blanks: Field Blank (also referred to as Equipment Blank) samples submitted with July and November 2010 samples; July FB-1 sample reported pH = 7.01 std. units, specific conductance = 7.14 umhos/cm, and fluoride = 0.354 mg/L – no other analytes detected; November FB-1 sample reported pH = 6.01 std. units, specific conductance = 12.4 umhos/cm, and sodium = 2.32 mg/L – no other analytes detected.

PCBs (SW-846 8082 or 8082A; all results below analytical reporting limit, <0.5 ug/L)

All laboratory acceptance criteria were met, with the exceptions noted below:

Matrix Spikes (MS)/Matrix Spike Duplicates (MSD): For all 2010 sample groups, MS/MSD not performed due to insufficient sample volume. For January 2010

samples, Method Blank recovery for decachlorobiphenyl (s) was 28% versus recovery limits of 30% to 150%.

Metals (SW-846 6010 and 6020)

All laboratory acceptance criteria were met, with the exceptions noted below:

Matrix Spikes (MS)/Matrix Spike Duplicates (MSD): For January 2010 samples, MS/MSD recovery exceeded QC limits (75% to 125%) for dissolved sodium; batch accepted based on laboratory control sample (LCS) recovery.

Dilution Factor (DF): A number of the groundwater samples required dilution analyses to obtain results for dissolved sodium within the linear range.

VOCs (PCE) (SW 846 8260/ SW846 8260B)

All laboratory acceptance criteria were met, with the exceptions noted below:

Matrix Spikes (MS)/Matrix Spike Duplicates (MSD): For July and November 2010 sample groups, MS/MSD not performed due to insufficient sample volume. The laboratory included a LCS and LCS duplicate in the preparation batch in lieu of MS/MSD.

Specific Conductance (EPA 120.1/ SM 2510B or EPA 9050)

All laboratory acceptance criteria were met.

pH (SW 846 9040C, 9045D/ EPA 150.1/ SM 4500-HB)

All laboratory acceptance criteria were met, with the exception of sample holding times; i.e., analyses initiated more than 15 minutes after sampling collection. pH also analyzed in field at time of sample collection.

Fluoride (SM 4500-FC)

All laboratory acceptance criteria were met.

Cyanide (SW 846 9014/ 9010C/ Sm 4500 – CN – C,E)

All laboratory acceptance criteria were met with the exceptions below:

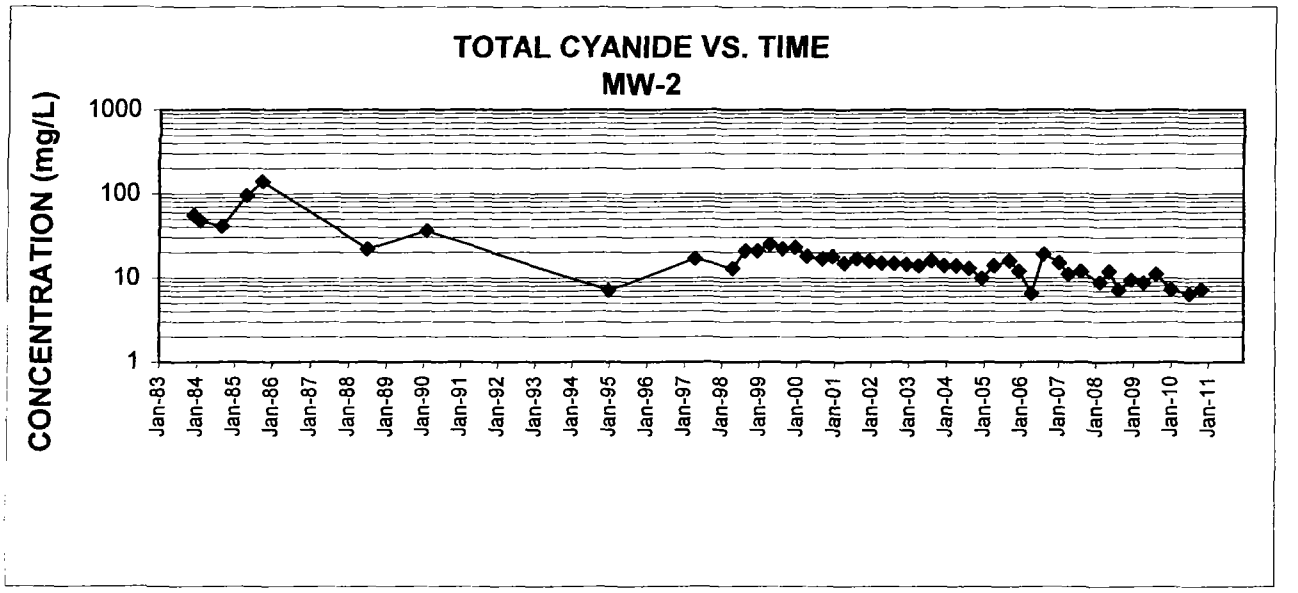
Matrix Spikes (MS)/Matrix Spike Duplicates (MSD): For the January 2010 sample group, MS recovery for total cyanide was outside of the laboratory control limits due to matrix interferences (MS sample 138940). For the November 2010 sample group, laboratory control sample (LCS) recoveries out of range were also observed for cyanide, amenable to chlorination (LCS ID WG349833-02 and 03). LCS recoveries for total cyanide and WAD cyanide within acceptance range (i.e., 90% to 110%).

APPENDIX D

CONCENTRATION VS. TIME GRAPHS FOR REMEDIAL ACTION MONITORING PARAMETERS

APPENDIX D-1

TOTAL CYANIDE


TOTAL CYANIDE VS. TIME
MW-2
CONCENTRATION (mg/L)
1000
100
10
1
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
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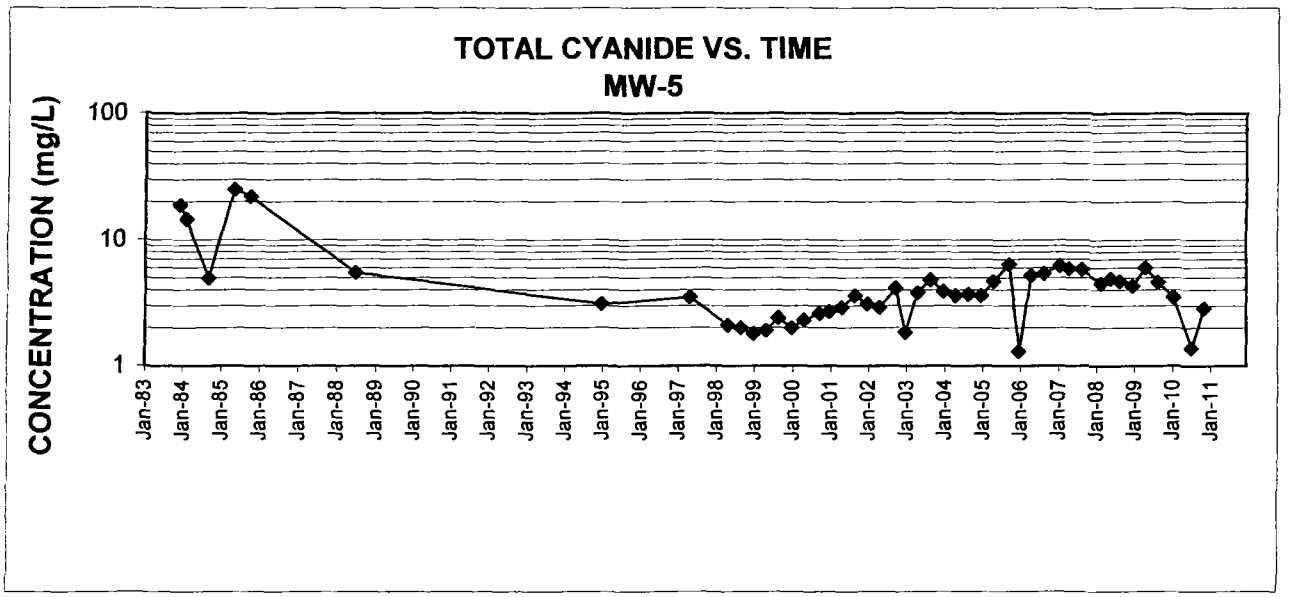
Jan-11


TOTAL CYANIDE VS. TIME
MW-5
CONCENTRATION (mg/L)
100
10
1
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
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Jan-99
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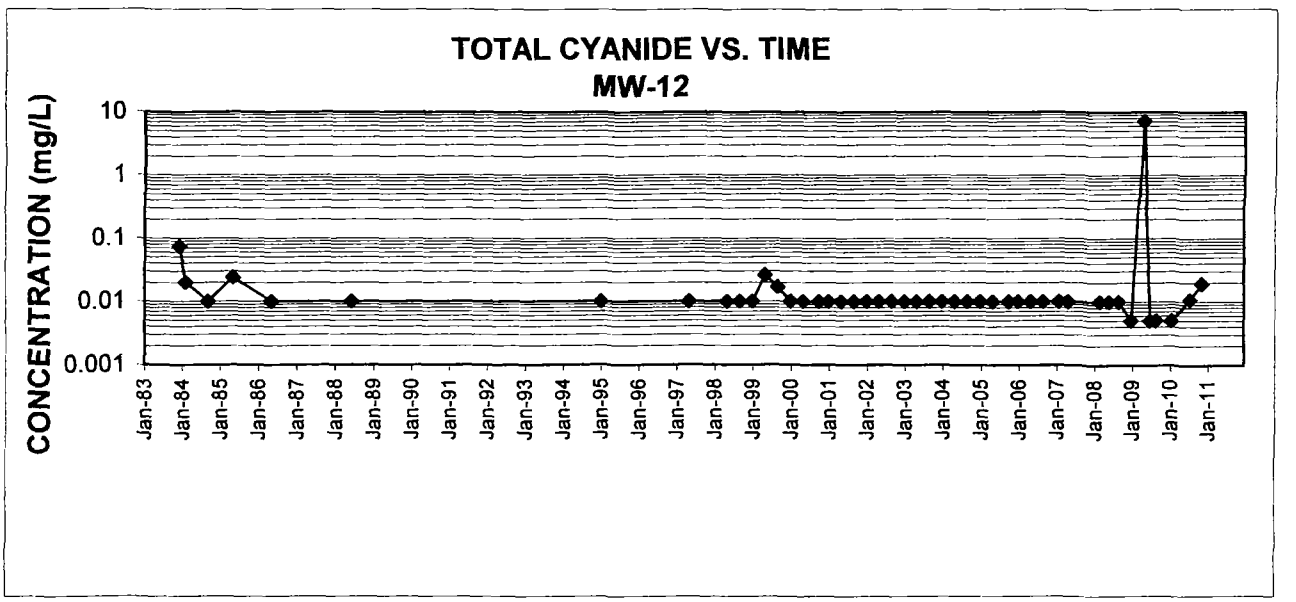
Jan-09
Jan-10
Jan-11


TOTAL CYANIDE VS. TIME
MW-12
CONCENTRATION (mg/L)
10
1
0.1
0.01
0.001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
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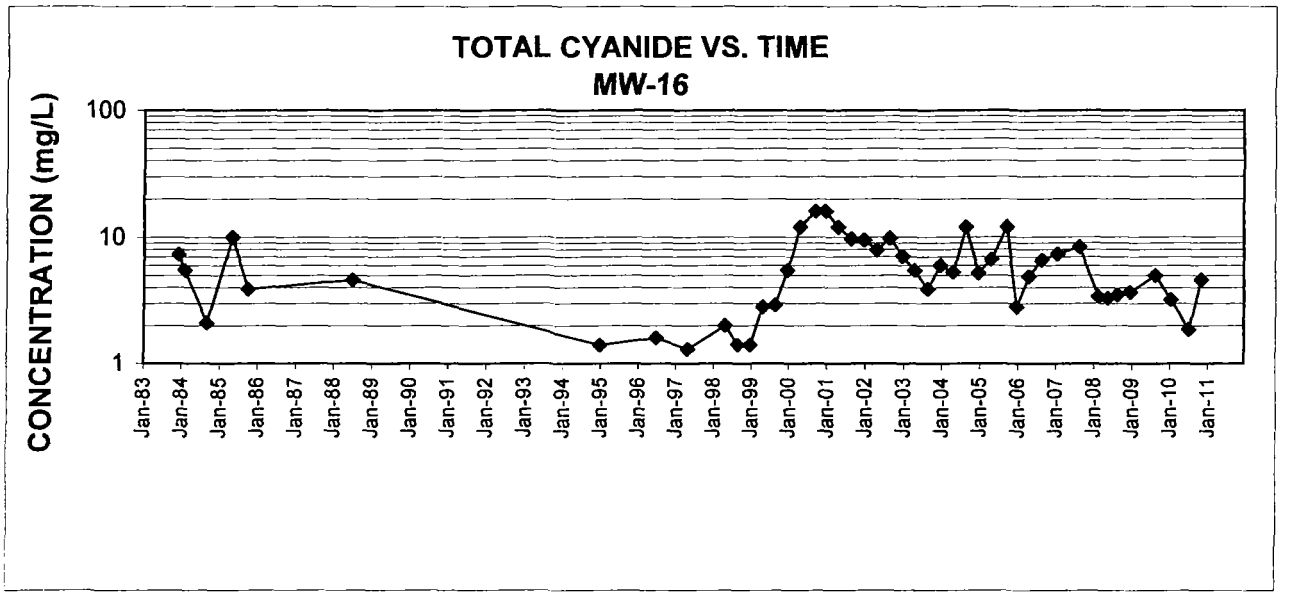
Jan-09
Jan-10
Jan-11


TOTAL CYANIDE VS. TIME
MW-16
CONCENTRATION (mg/L)
100
10
1
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
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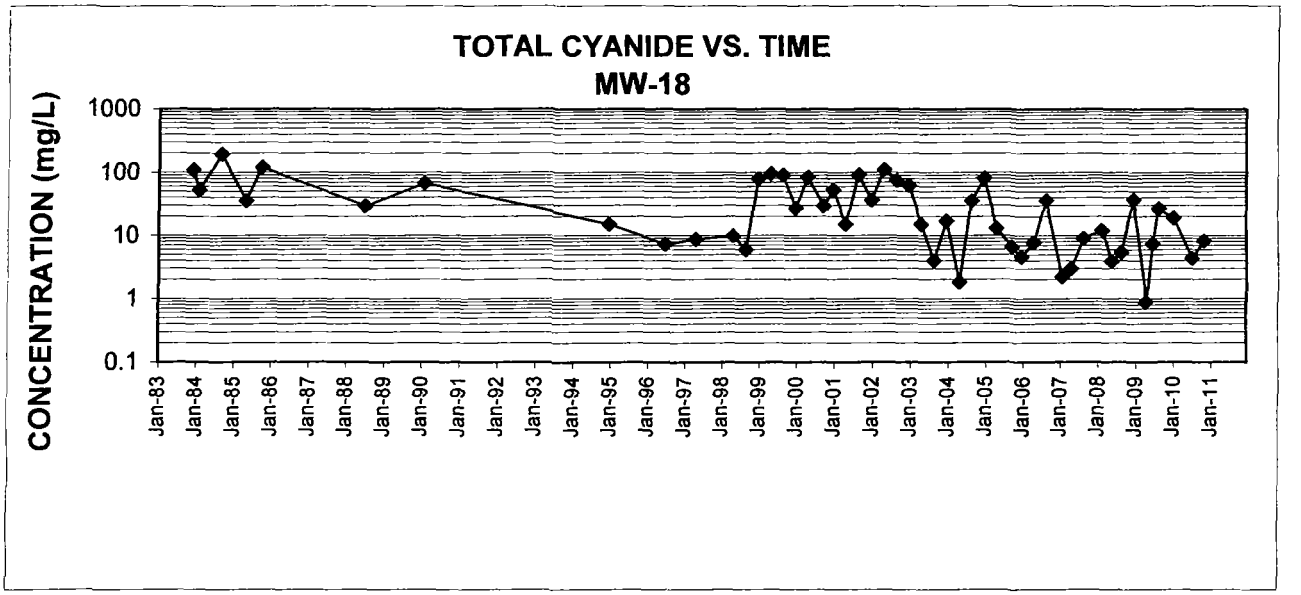
Jan-11


TOTAL CYANIDE VS. TIME
MW-18
CONCENTRATION (mg/L)
1000
100
10
1
0.1
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
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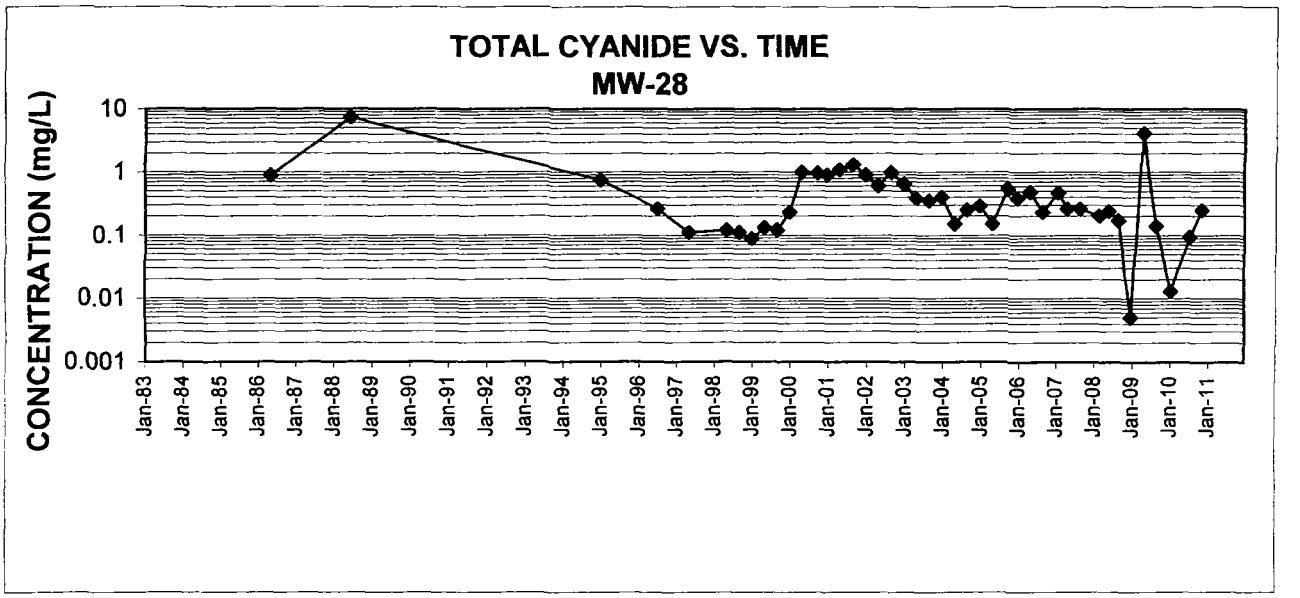
Jan-10
Jan-11


TOTAL CYANIDE VS. TIME
MW-28
CONCENTRATION (mg/L)
10
1
0.1
0.01
0.001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
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Jan-96
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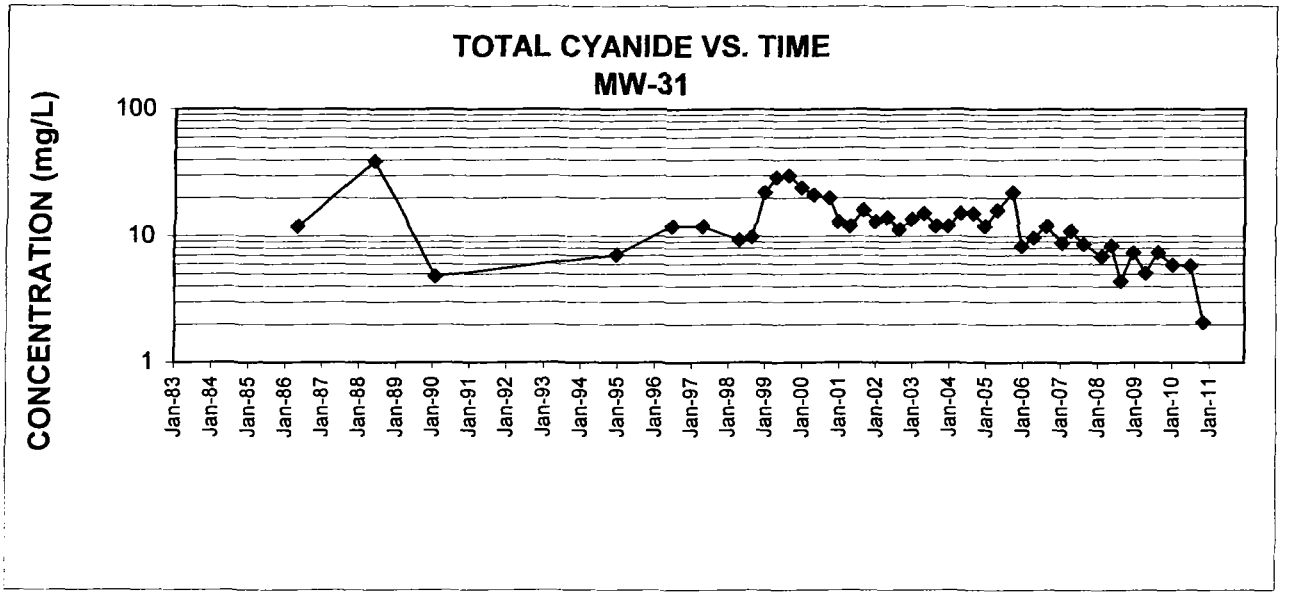
Jan-10
Jan-11


TOTAL CYANIDE VS. TIME
MW-31
CONCENTRATION (mg/L)
100
10
1
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
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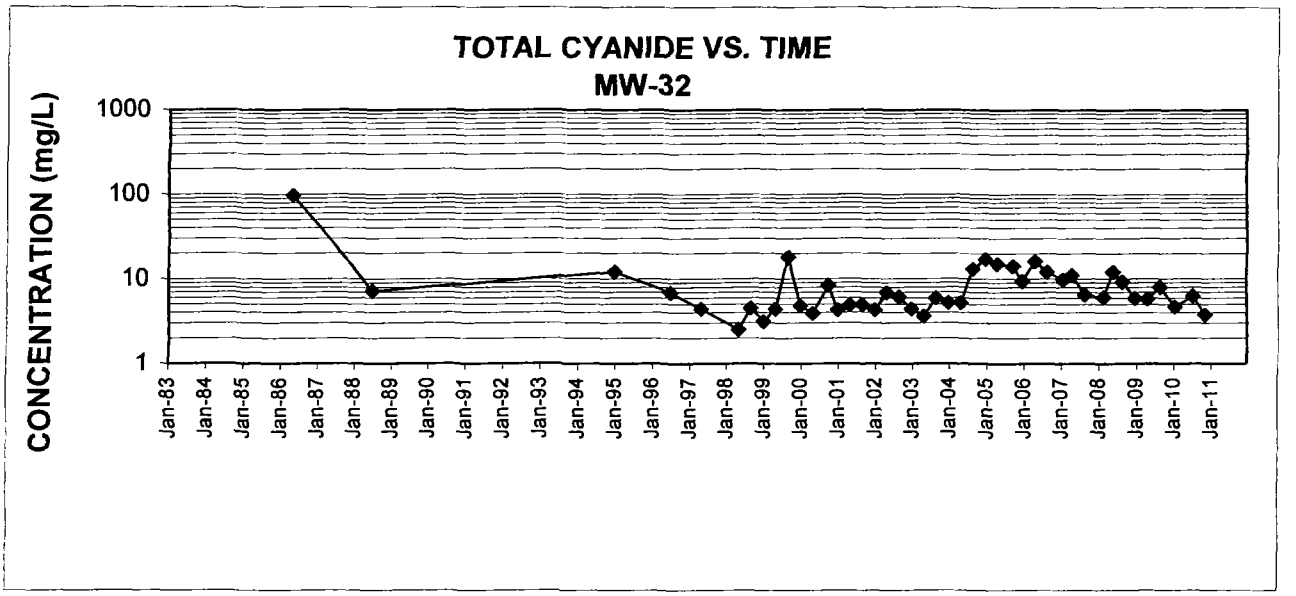
Jan-10
Jan-11


TOTAL CYANIDE VS. TIME
MW-32
CONCENTRATION (mg/L)
1000
100
10
1
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
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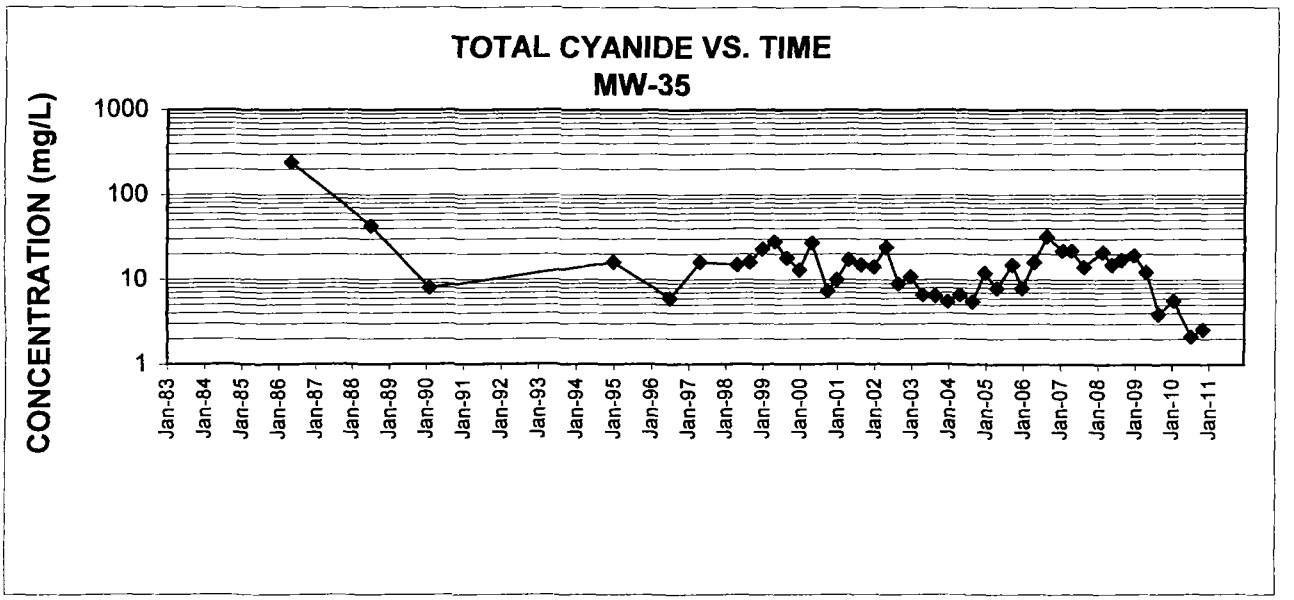
TOTAL CYANIDE VS. TIME
MW-35
CONCENTRATION (mg/L)
1000
100
10
1
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
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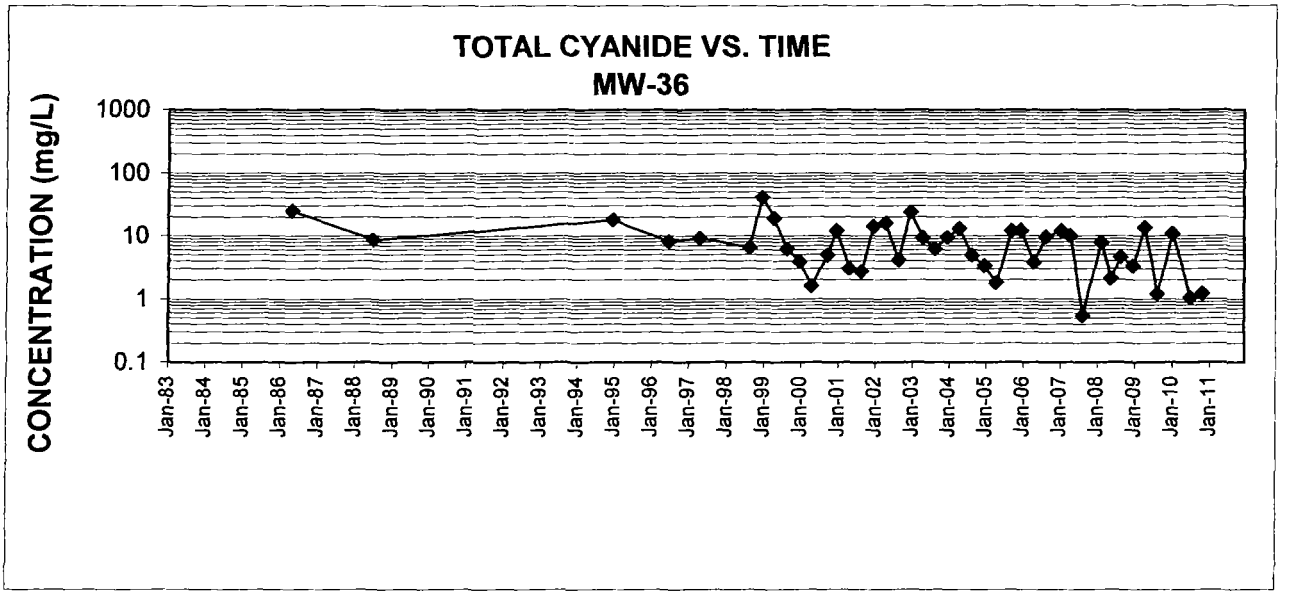
TOTAL CYANIDE VS. TIME
MW-36
CONCENTRATION (mg/L)
1000
100
10
1
0.1
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
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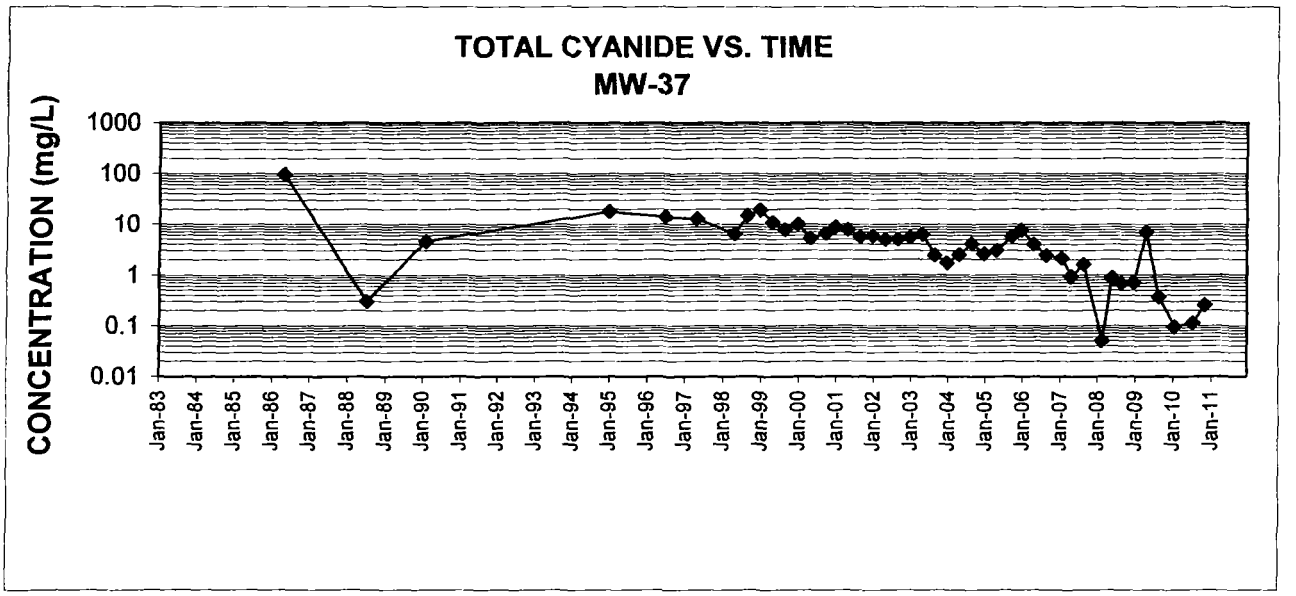
Jan-11


TOTAL CYANIDE VS. TIME
MW-37
CONCENTRATION (mg/L)
1000
100
10
1
0.1
0.01
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
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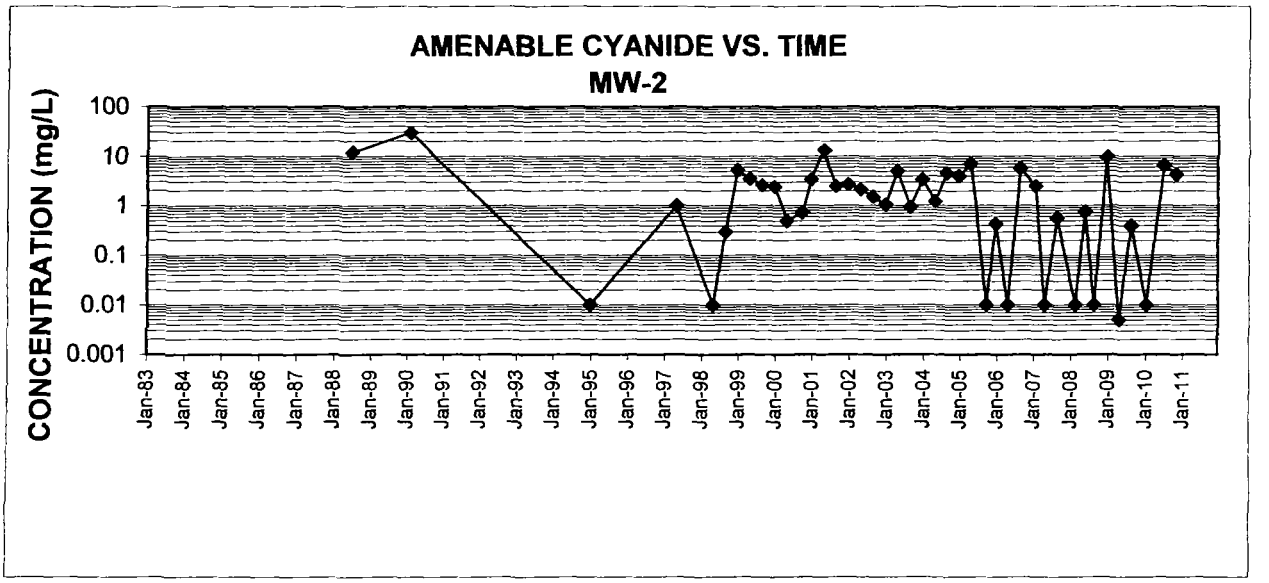
Jan-10
Jan-11

APPENDIX D-2

CYANIDE AMENABLE TO CHLORINATION


AMENABLE CYANIDE VS. TIME
MW-2
CONCENTRATION (mg/L)
100
10
1
0.1
0.01
0.001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
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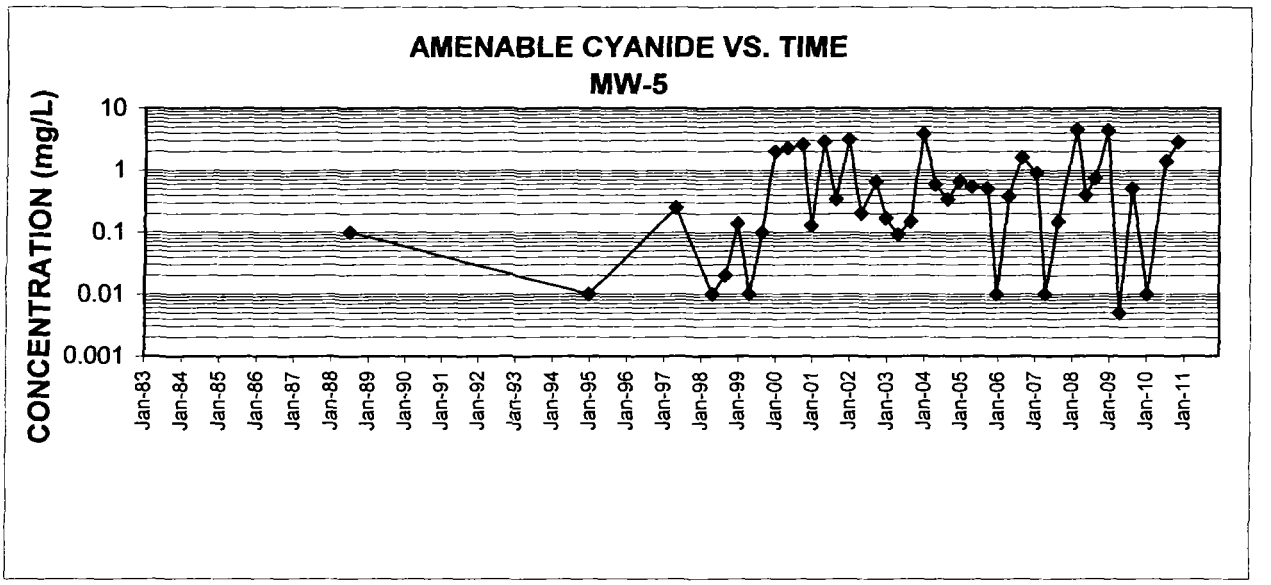
AMENABLE CYANIDE VS. TIME
MW-5
CONCENTRATION (mg/L)
10
1
0.1
0.01
0.001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
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Jan-96
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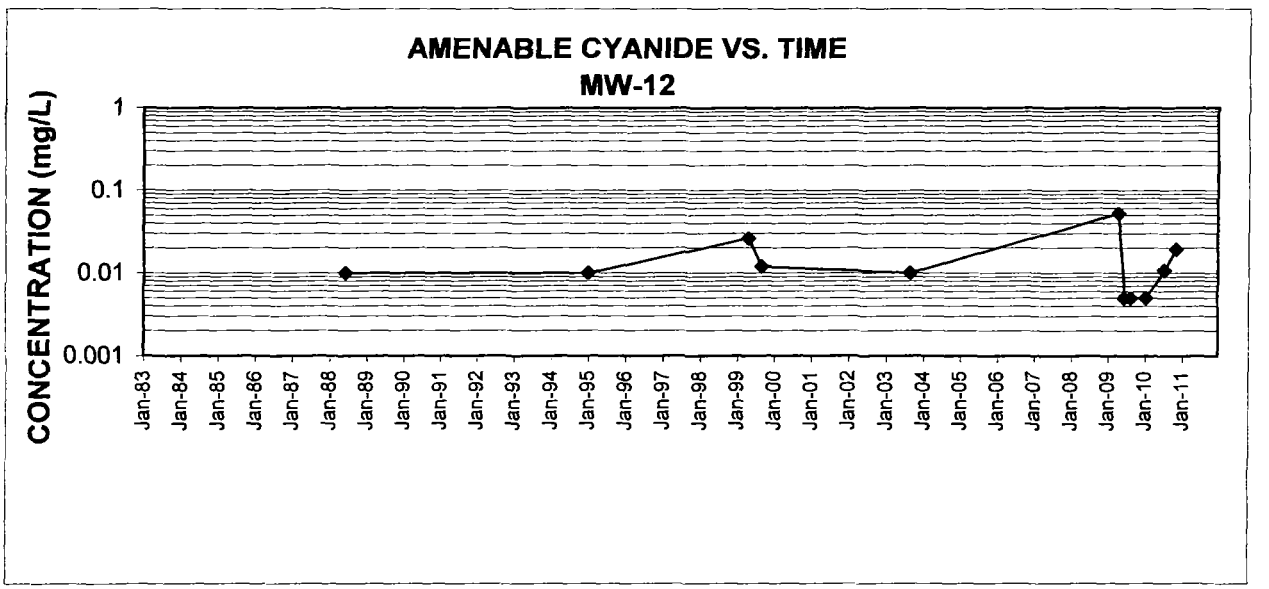
Jan-11


AMENABLE CYANIDE VS. TIME
MW-12
CONCENTRATION (mg/L)
1
0.1
0.01
0.001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
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Jan-96
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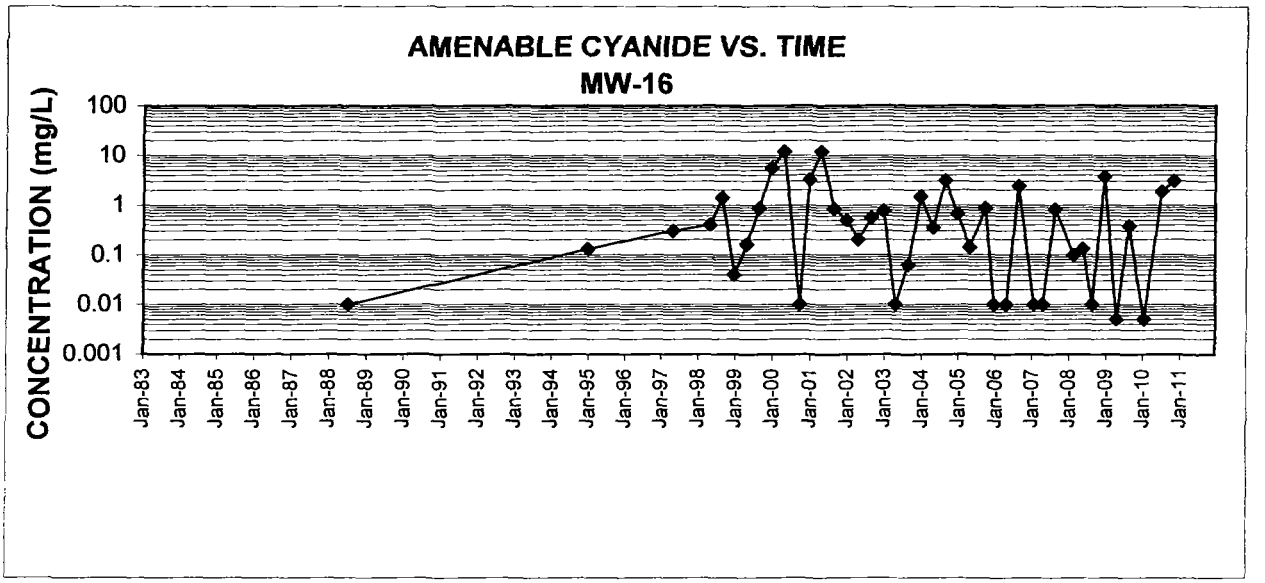
Jan-11


AMENABLE CYANIDE VS. TIME
MW-16
CONCENTRATION (mg/L)
100
10
1
0.1
0.01
0.001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
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Jan-96
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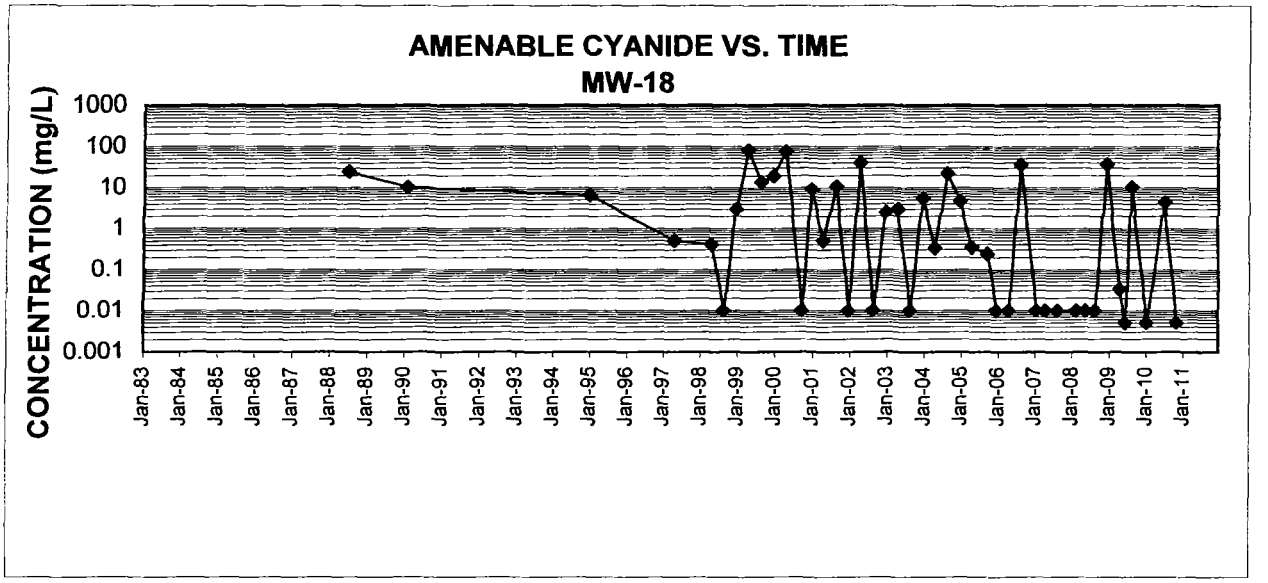
Jan-10
Jan-11


AMENABLE CYANIDE VS. TIME
MW-18
CONCENTRATION (mg/L)
1000
100
10
1
0.1
0.01
0.001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
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Jan-96
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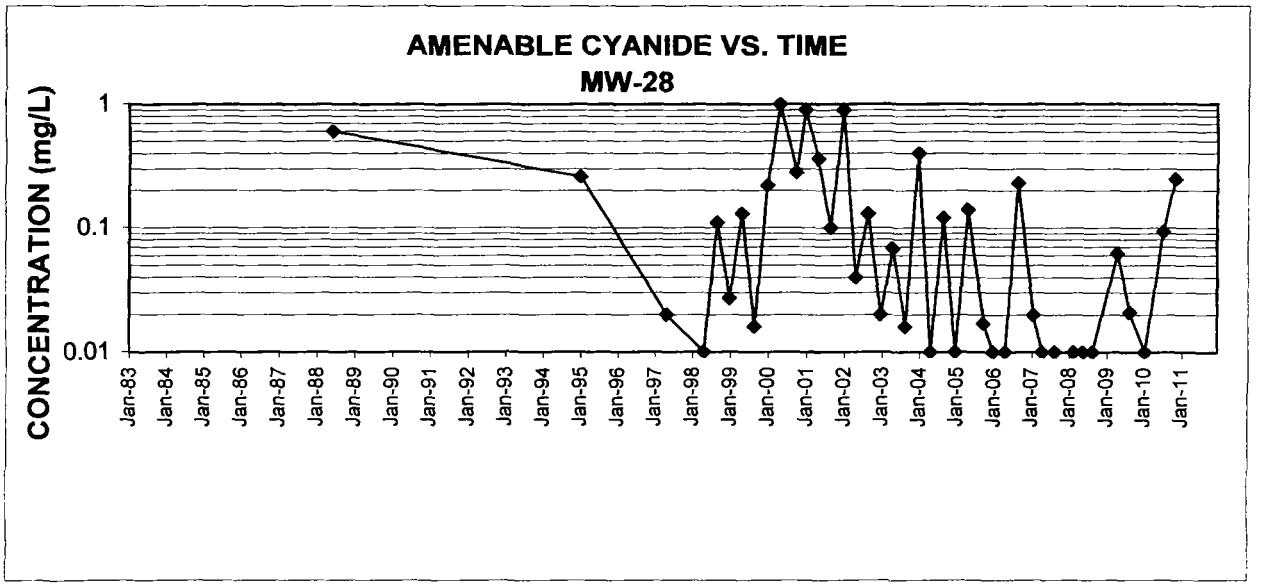
Jan-11


AMENABLE CYANIDE VS. TIME
MW-28
CONCENTRATION (mg/L)
1
0.1
0.01
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
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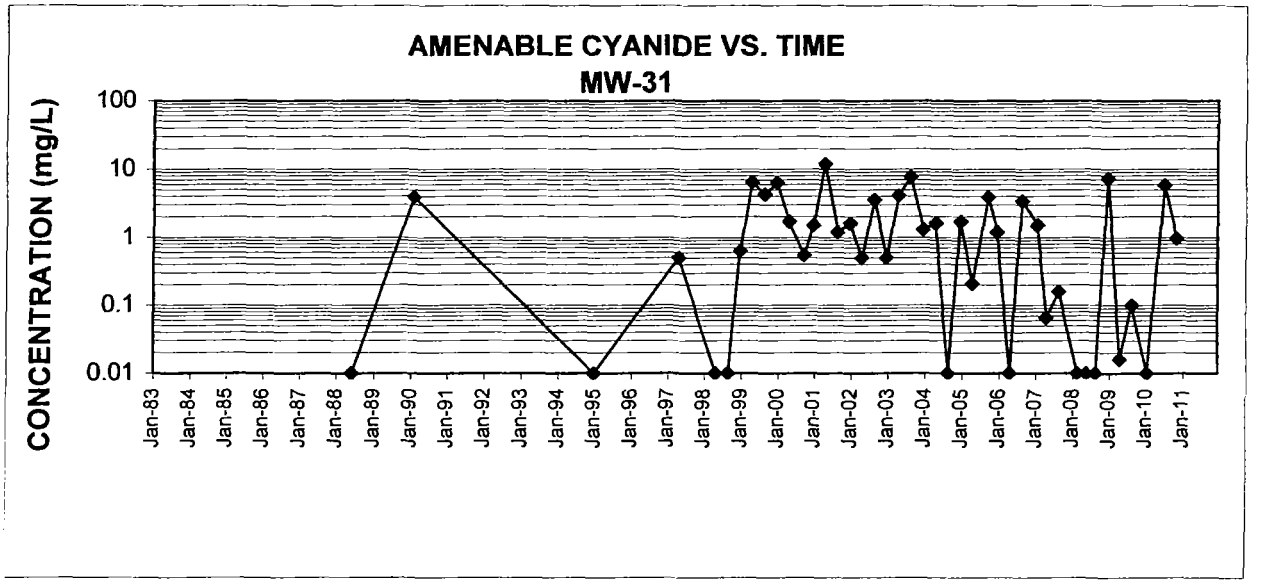
Jan-11


AMENABLE CYANIDE VS. TIME
MW-31
CONCENTRATION (mg/L)
100
10
1
0.1
0.01
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
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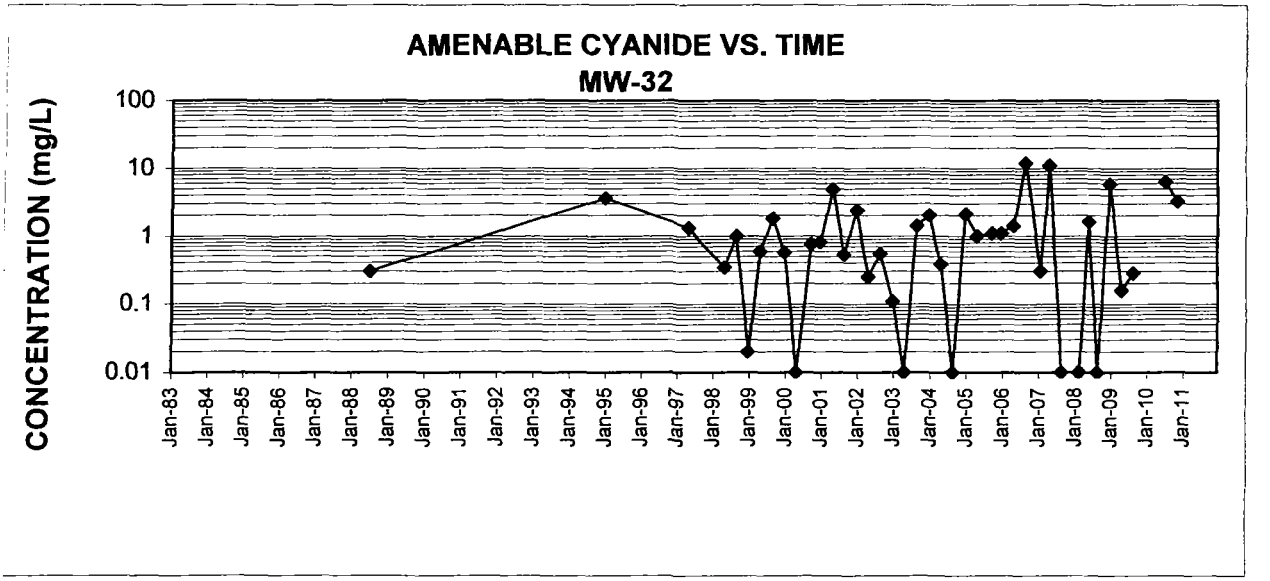
Jan-11


AMENABLE CYANIDE VS. TIME
MW-32
CONCENTRATION (mg/L)
100
10
1
0.1
0.01
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
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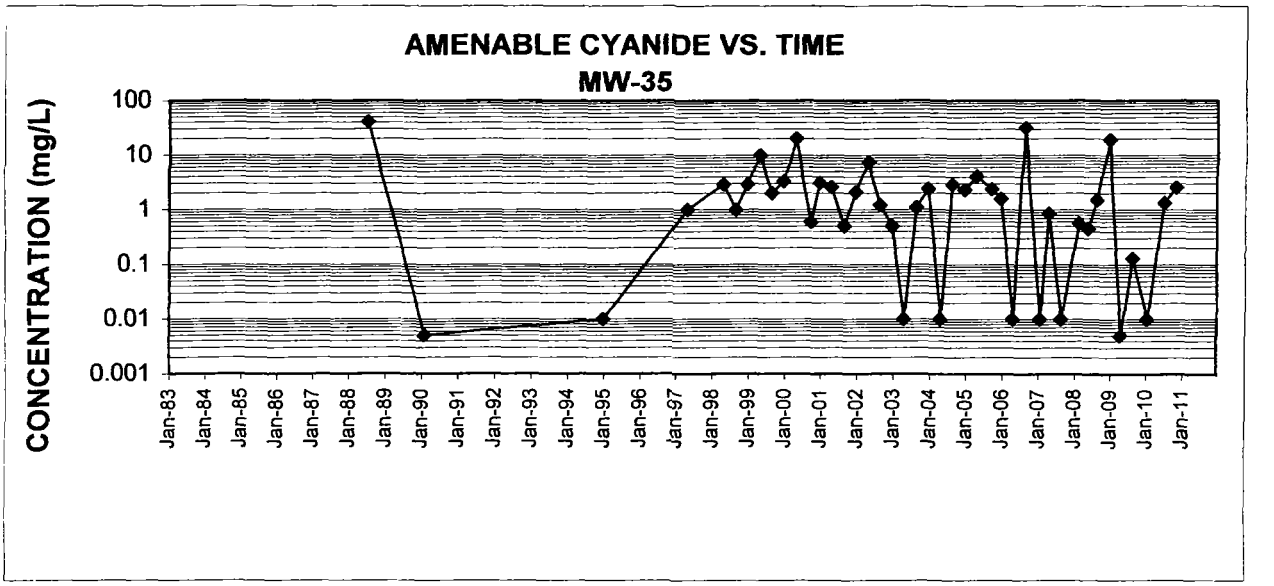
Jan-11


AMENABLE CYANIDE VS. TIME
MW-35
CONCENTRATION (mg/L)
100
10
1
0.1
0.01
0.001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
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Jan-95
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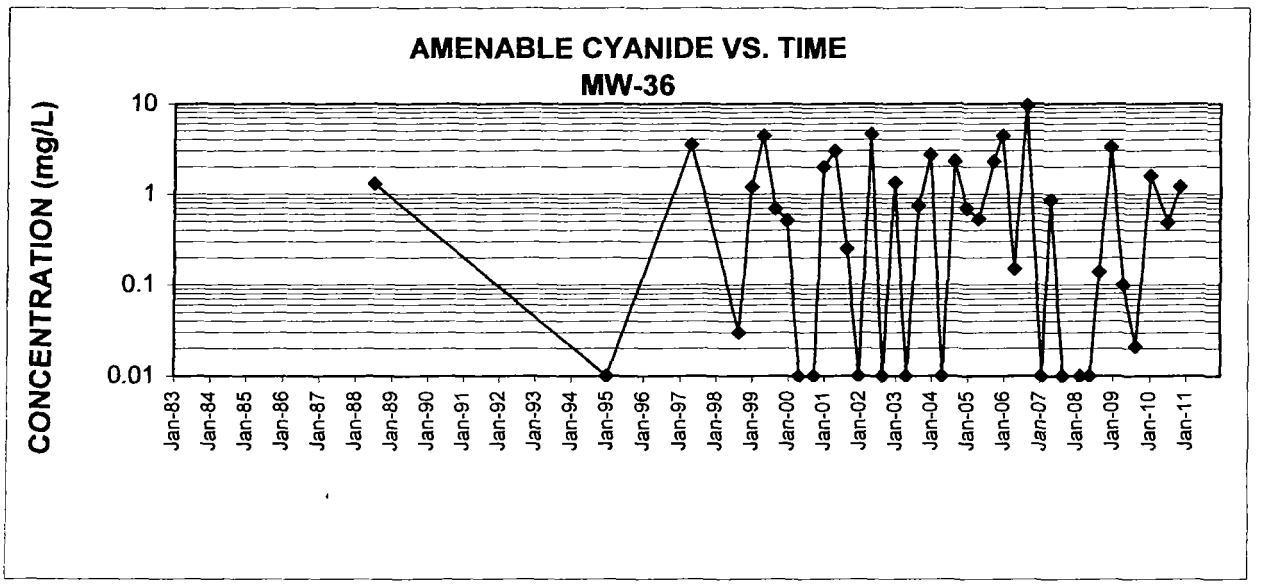
Jan-11


AMENABLE CYANIDE VS. TIME
MW-36
CONCENTRATION (mg/L)
10
1
0.1
0.01
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
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Jan-92
Jan-93
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Jan-96
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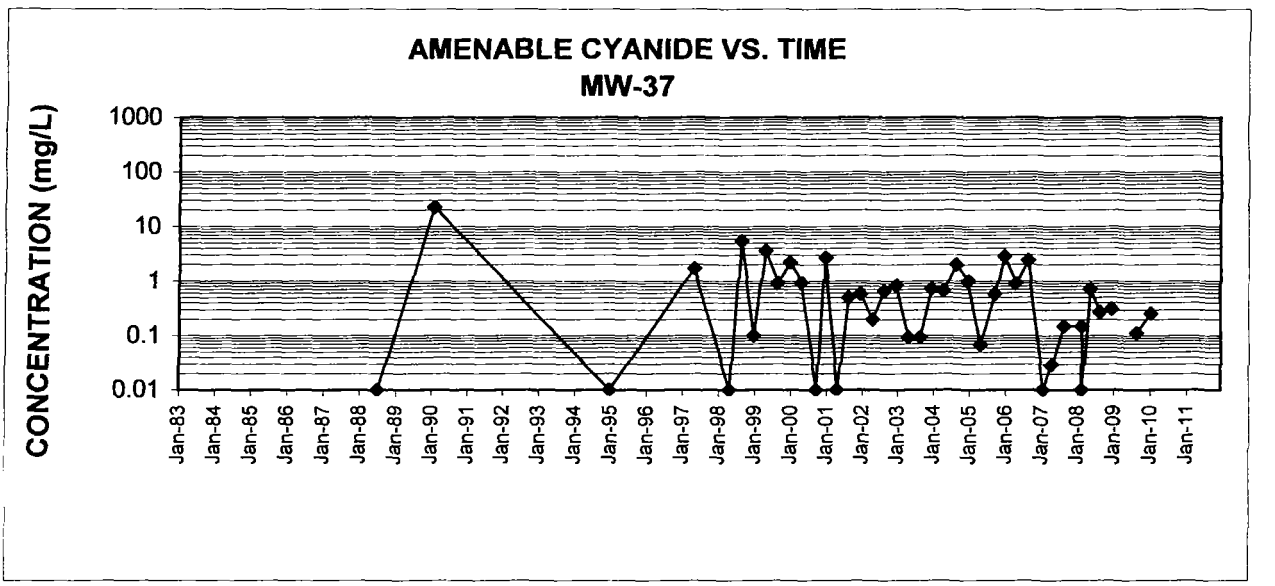
AMENABLE CYANIDE VS. TIME
MW-37
CONCENTRATION (mg/L)
1000
100
10
1
0.1
0.01
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
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Jan-96
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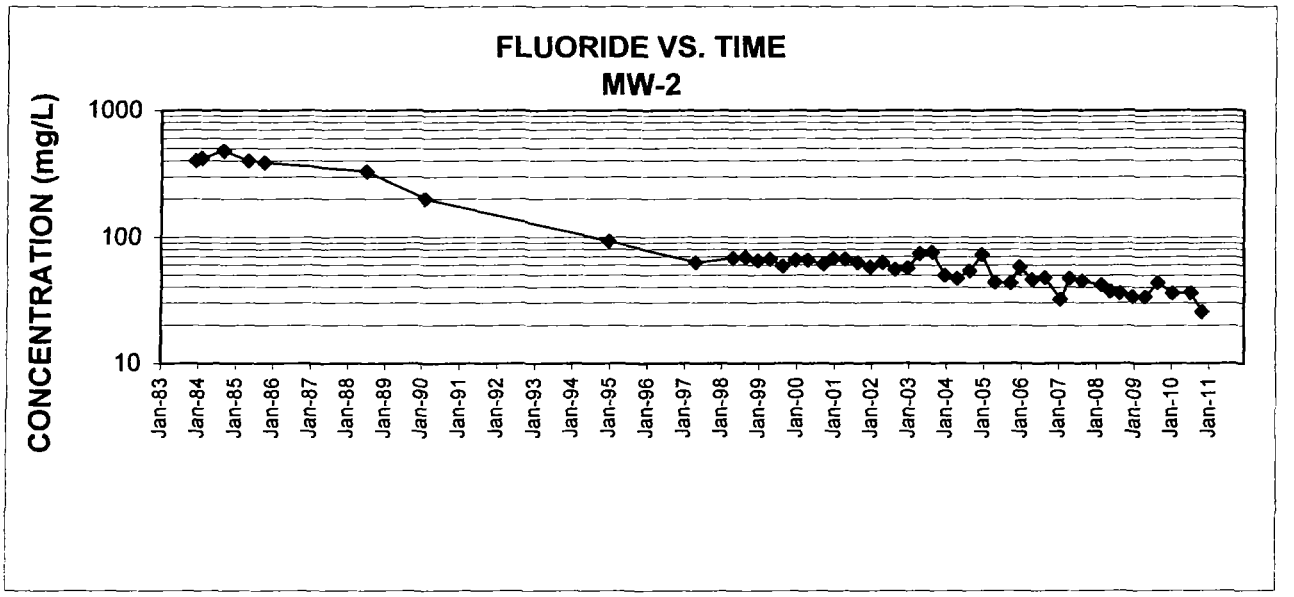
Jan-08
Jan-09
Jan-10
Jan-11

APPENDIX D-3

FLUORIDE


FLUORIDE VS. TIME
MW-2
CONCENTRATION (mg/L)
1000
100
10
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
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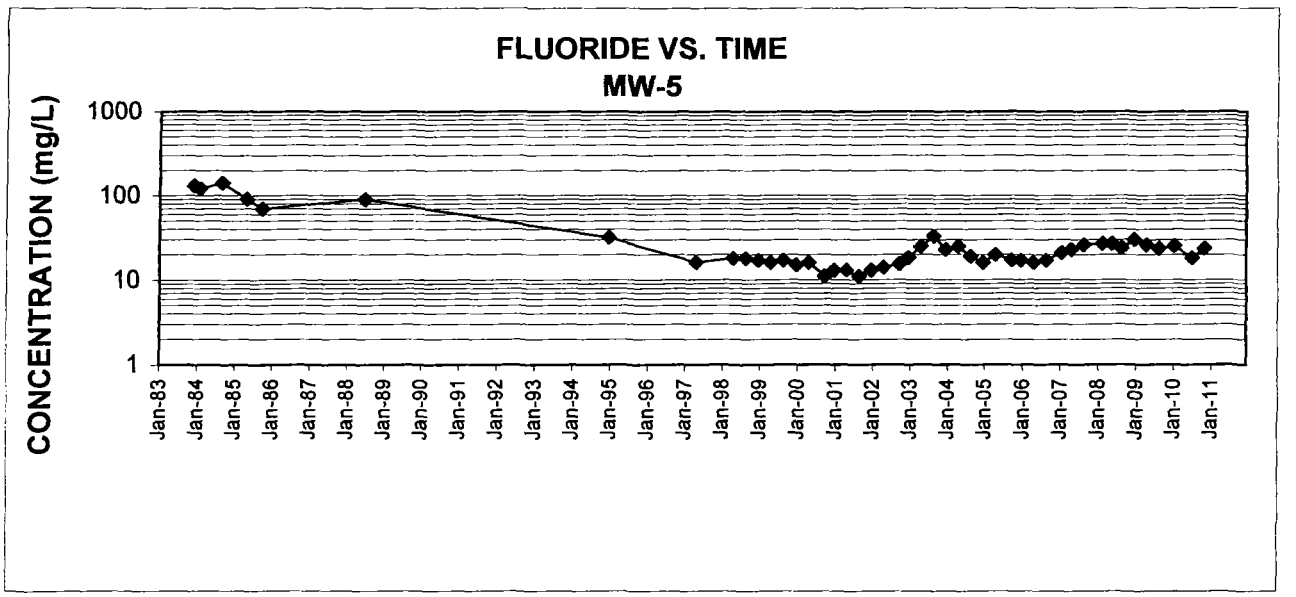
Jan-08
Jan-09
Jan-10
Jan-11


FLUORIDE VS. TIME
MW-5
CONCENTRATION (mg/L)
1000
100
10
1
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
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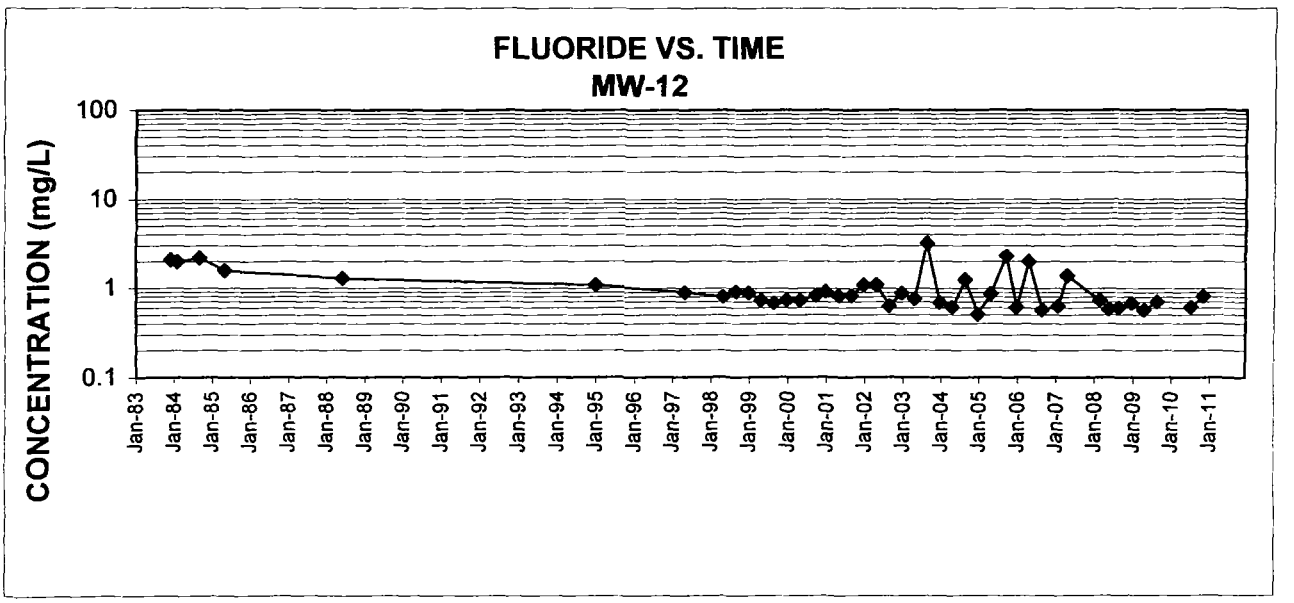
Jan-09
Jan-10
Jan-11


FLUORIDE VS. TIME
MW-12
CONCENTRATION (mg/L)
100
10
1
0.1
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
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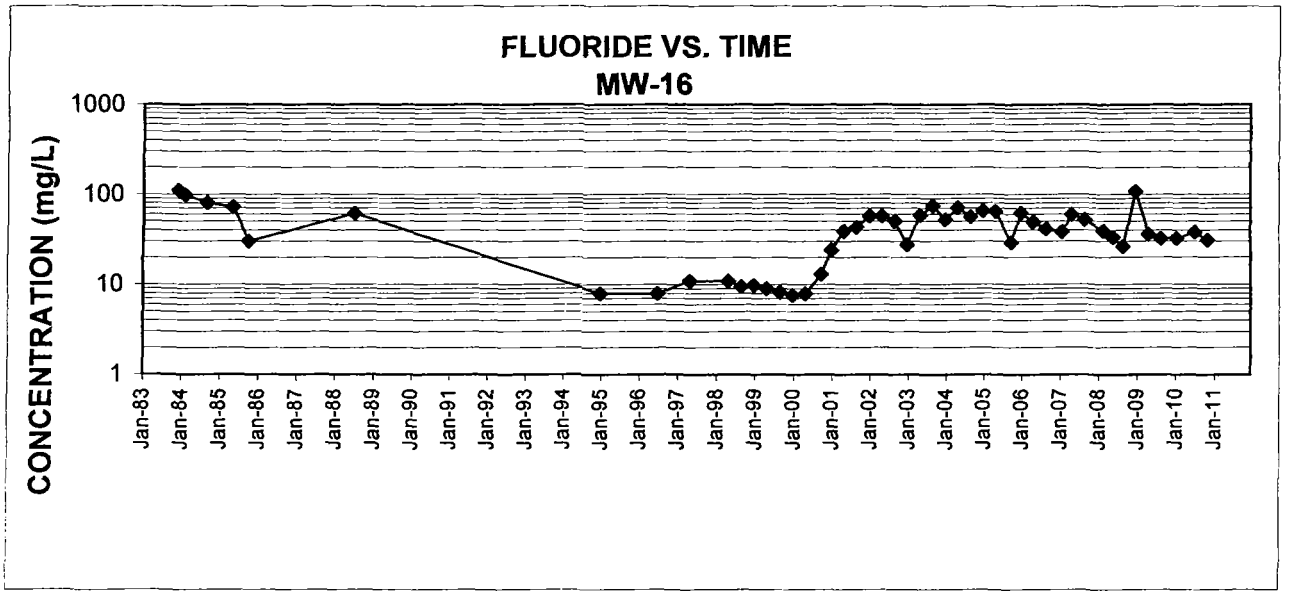
Jan-11


FLUORIDE VS. TIME
MW-16
CONCENTRATION (mg/L)
1000
100
10
1
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
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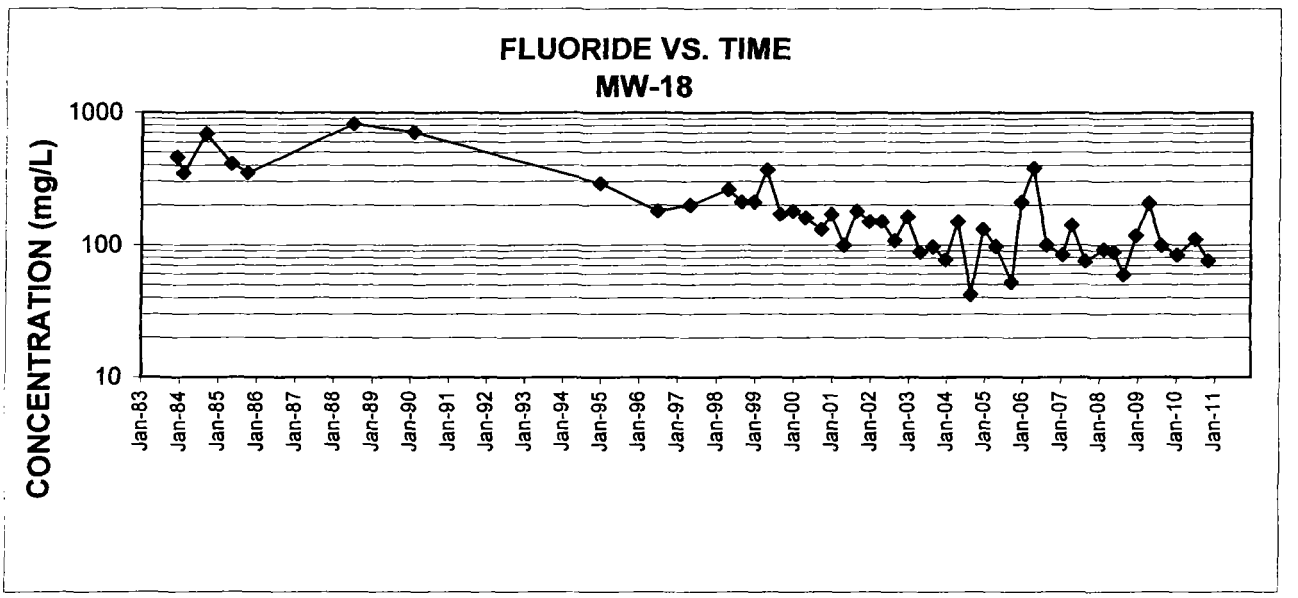
Jan-11


FLUORIDE VS. TIME
MW-18
CONCENTRATION (mg/L)
1000
100
10
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
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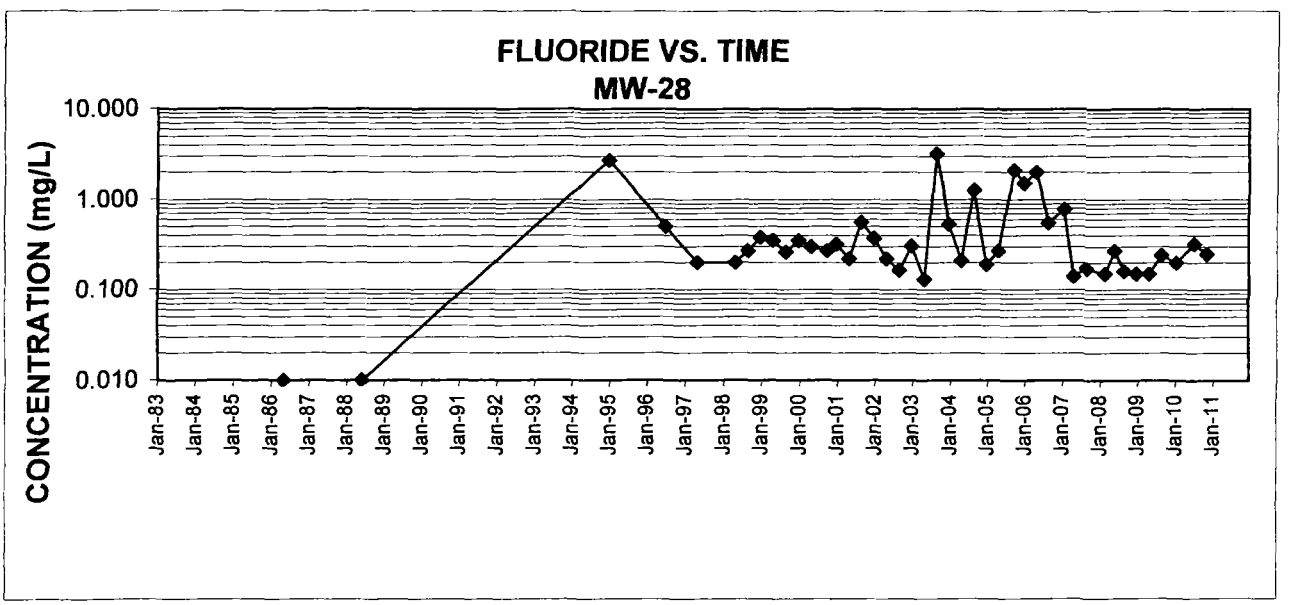
Jan-11


FLUORIDE VS. TIME
MW-28
CONCENTRATION (mg/L)
10.000
1.000
0.100
0.010
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
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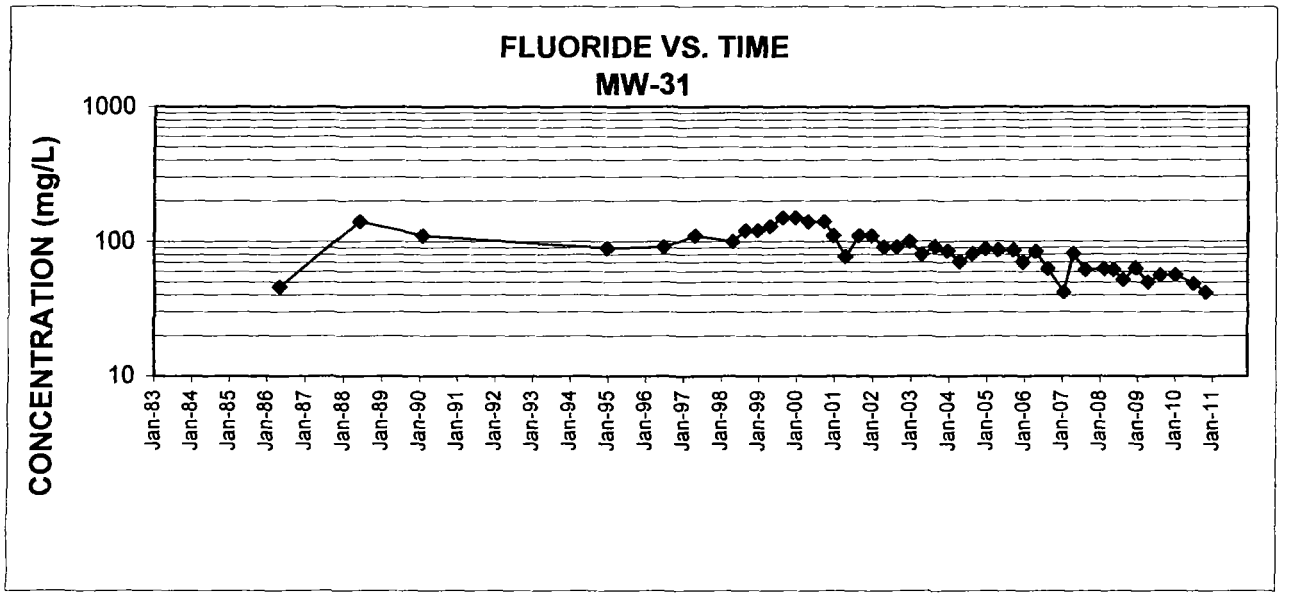
Jan-09
Jan-10
Jan-11


FLUORIDE VS. TIME
MW-31
CONCENTRATION (mg/L)
1000
100
10
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
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Jan-01
Jan-02
Jan-03
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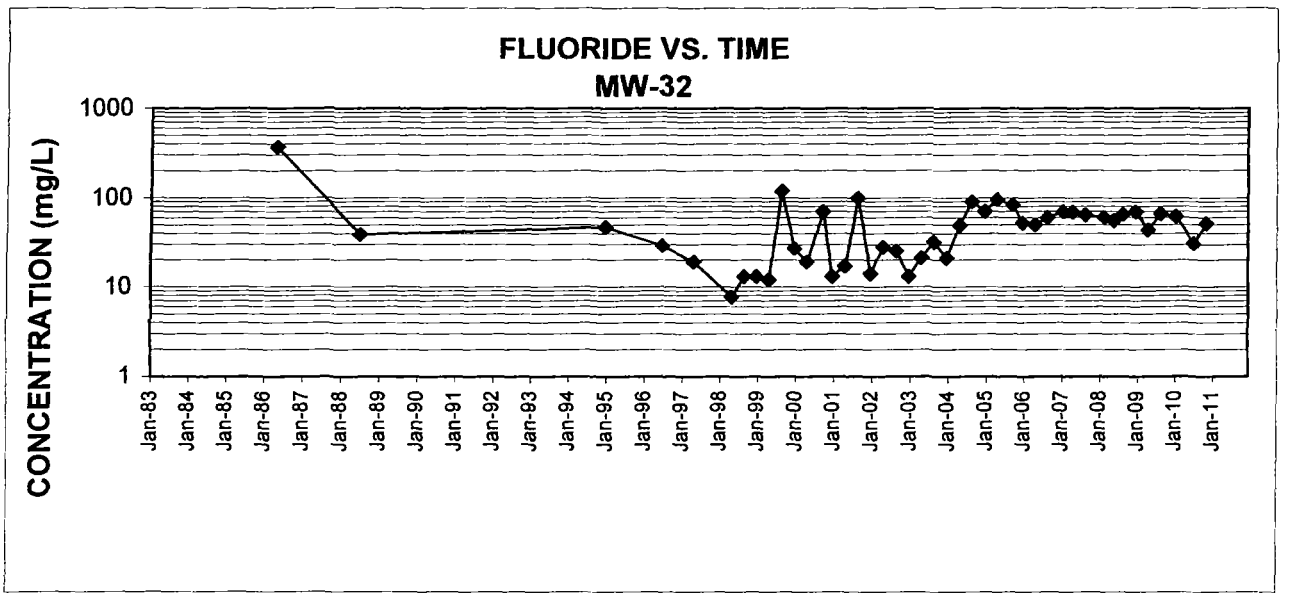
Jan-10
Jan-11


FLUORIDE VS. TIME
MW-32
CONCENTRATION (mg/L)
1000
100
10
1
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-83
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
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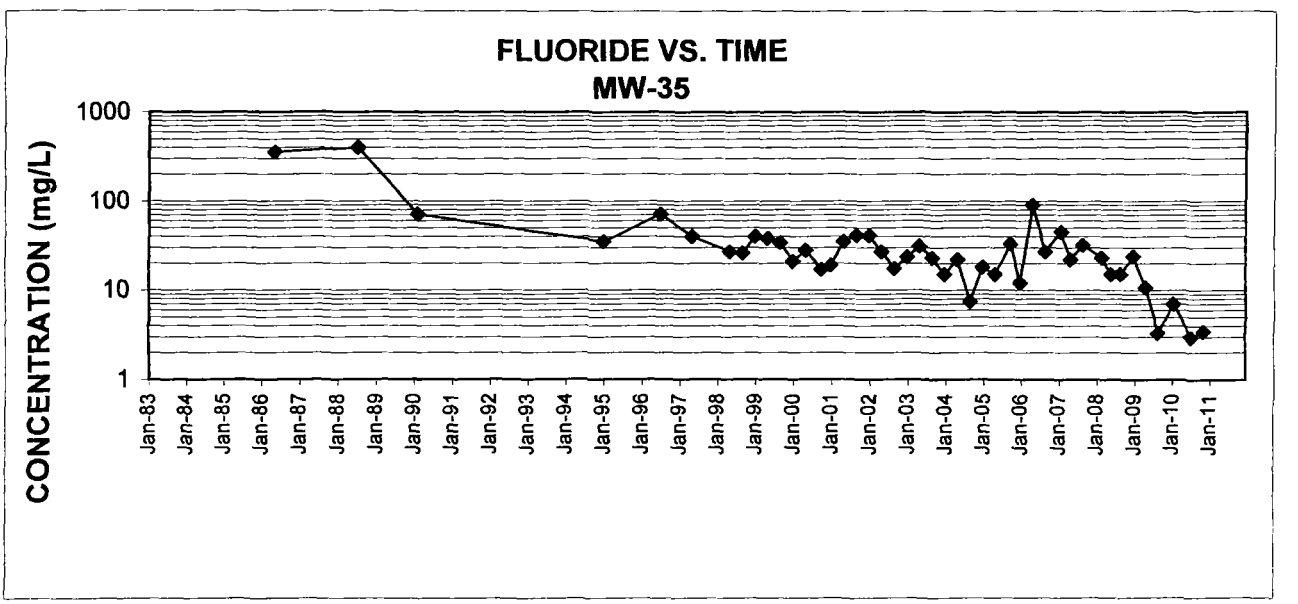
Jan-10
Jan-11


FLUORIDE VS. TIME
MW-35
CONCENTRATION (mg/L)
1000
100
10
1
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
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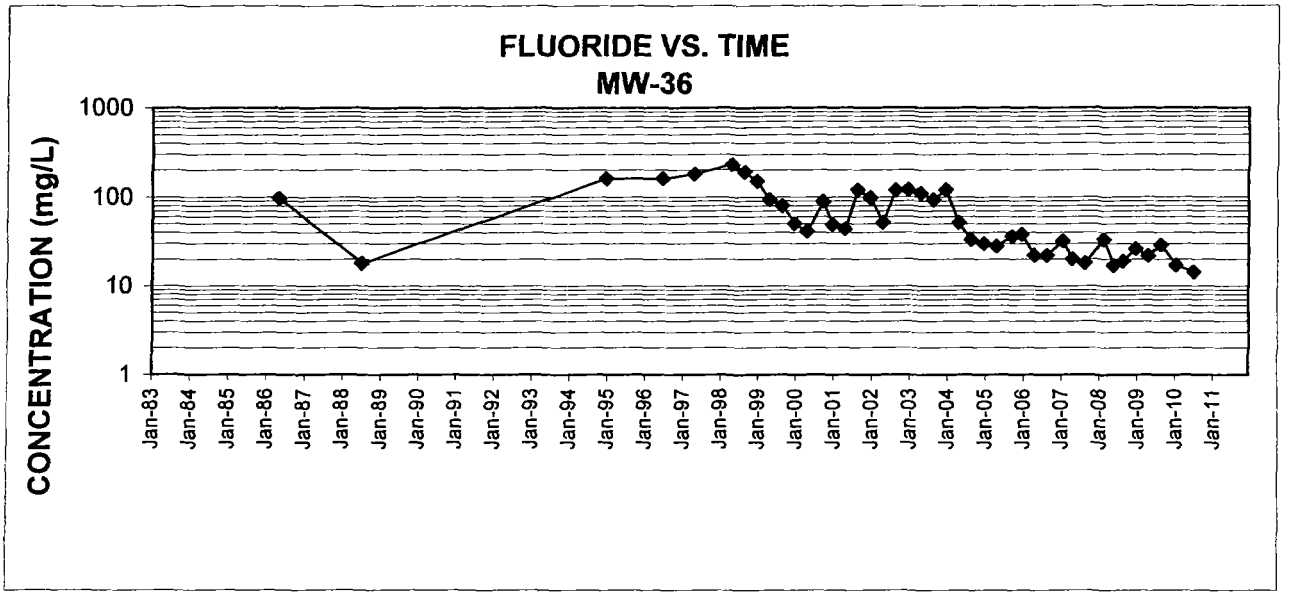
Jan-10
Jan-11


FLUORIDE VS. TIME
MW-36
CONCENTRATION (mg/L)
1000
100
10
1
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
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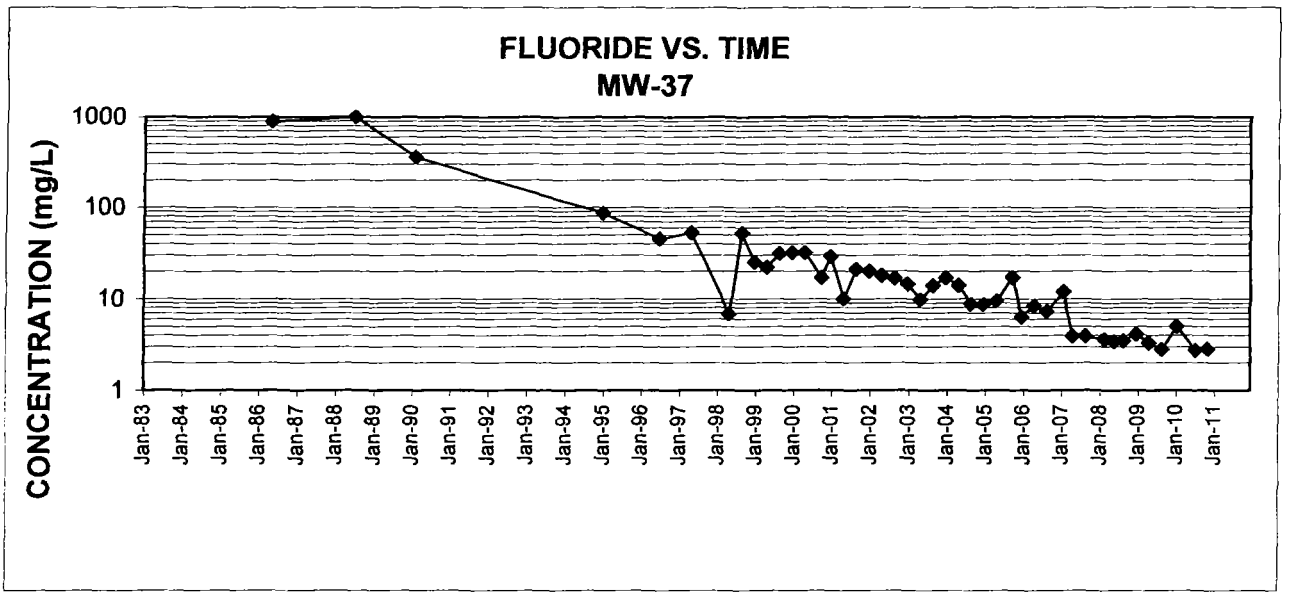
Jan-10
Jan-11


FLUORIDE VS. TIME
MW-37
CONCENTRATION (mg/L)
1000
100
10
1
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
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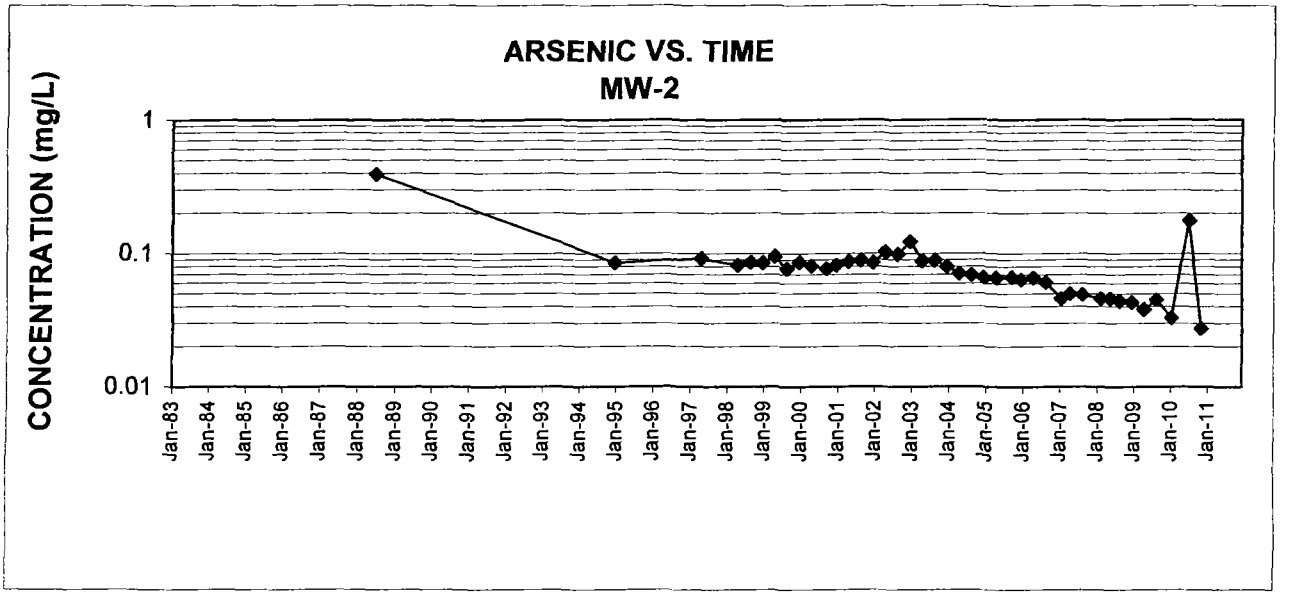
Jan-10
Jan-11

APPENDIX D-4

ARSENIC


ARSENIC VS. TIME
MW-2
CONCENTRATION (mg/L)
1
0.1
0.01
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
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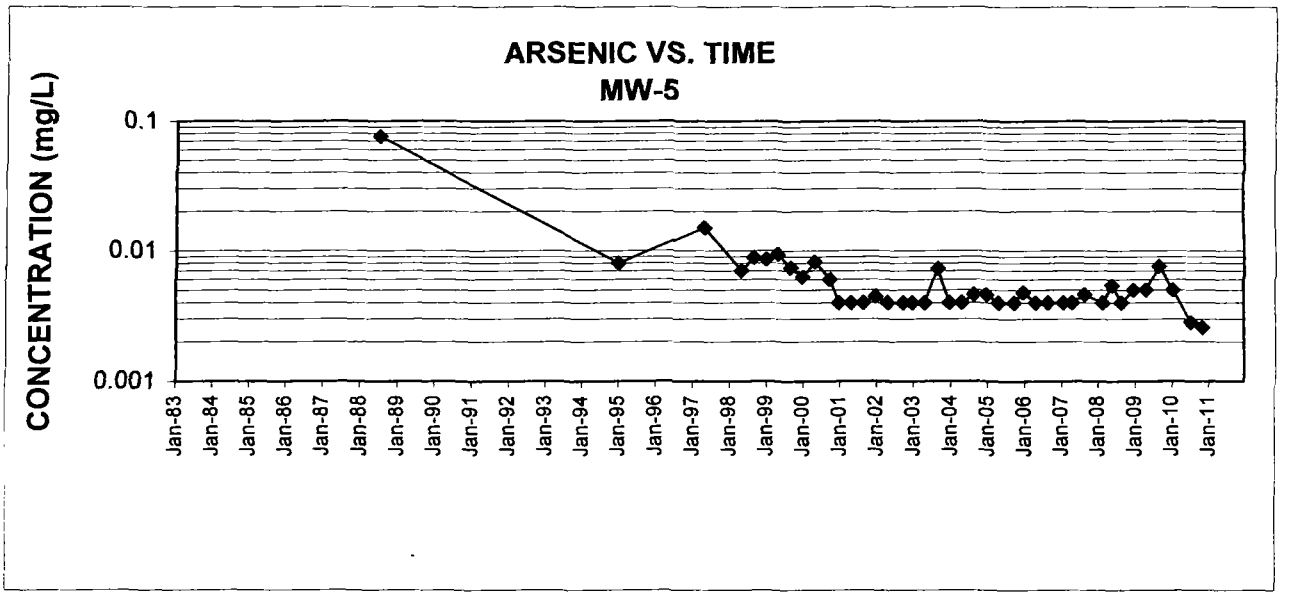
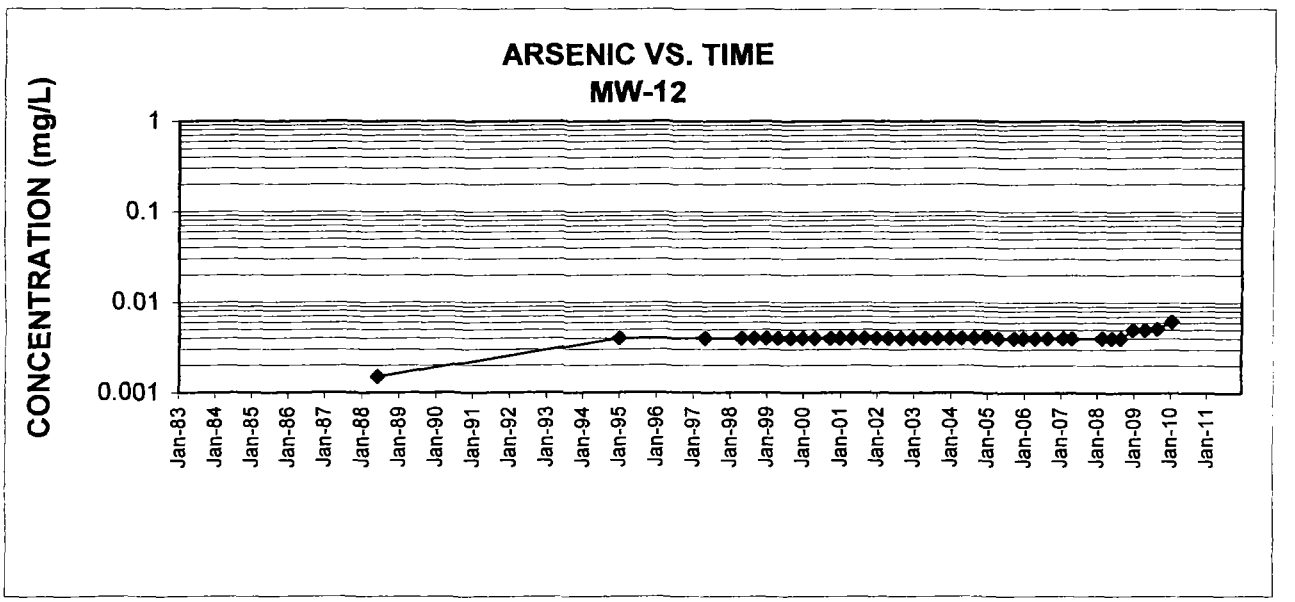
Jan-08
Jan-09
Jan-10
Jan-11


ARSENIC VS. TIME
MW-5
CONCENTRATION (mg/L)
0.1
0.01
0.001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11


ARSENIC VS. TIME
MW-12
CONCENTRATION (mg/L)
1
0.1
0.01
0.001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
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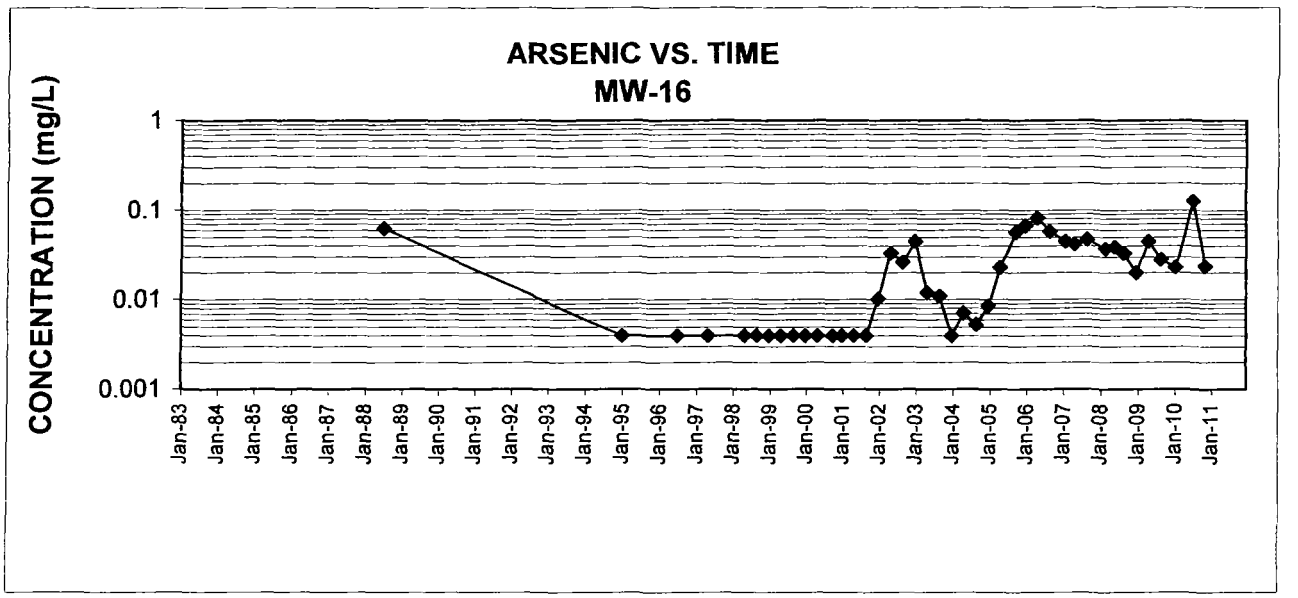
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11


ARSENIC VS. TIME
MW-16
CONCENTRATION (mg/L)
1
0.1
0.01
0.001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
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Jan-05
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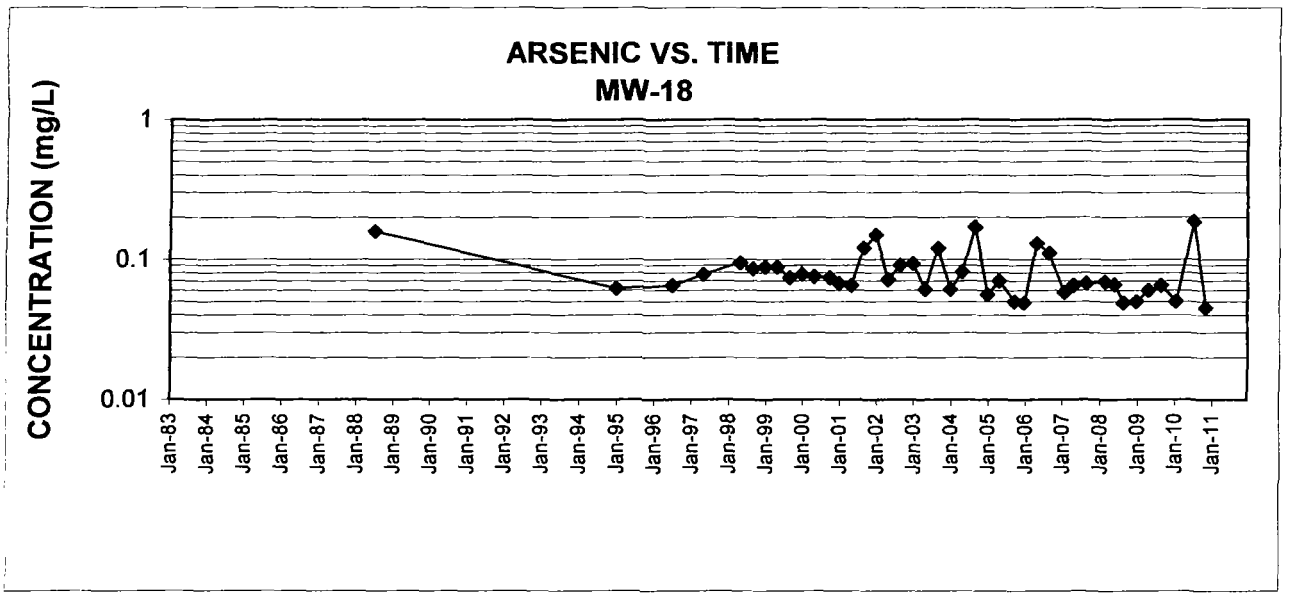
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11


ARSENIC VS. TIME
MW-18
CONCENTRATION (mg/L)
1
0.1
0.01
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
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Jan-04
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Jan-06
Jan-07
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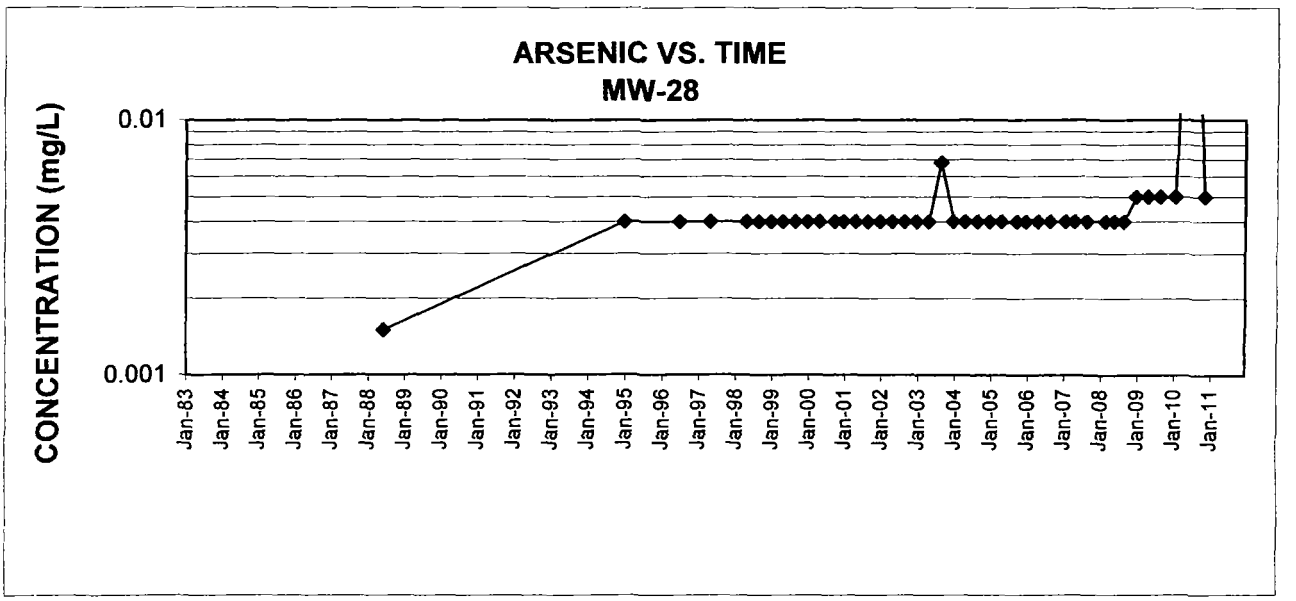
Jan-09
Jan-10
Jan-11


ARSENIC VS. TIME
MW-28
CONCENTRATION (mg/L)
0.01
0.001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
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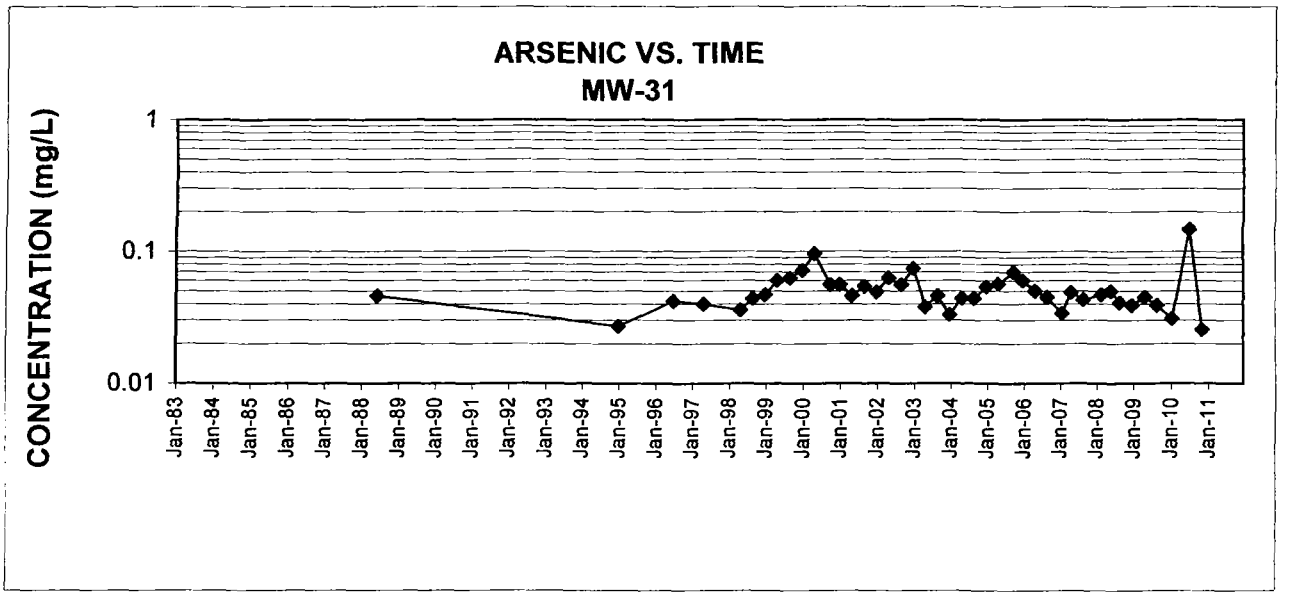
Jan-10
Jan-11


ARSENIC VS. TIME
MW-31
CONCENTRATION (mg/L)
1
0.1
0.01
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
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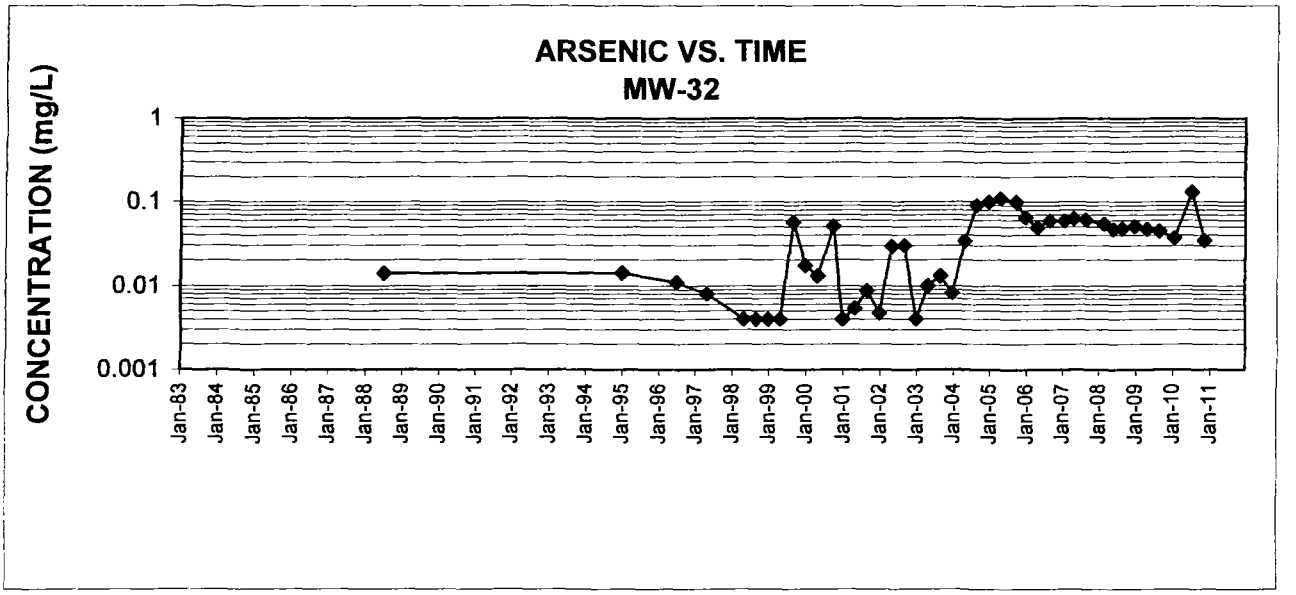
Jan-09
Jan-10
Jan-11


ARSENIC VS. TIME
MW-32
CONCENTRATION (mg/L)
1
0.1
0.01
0.001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
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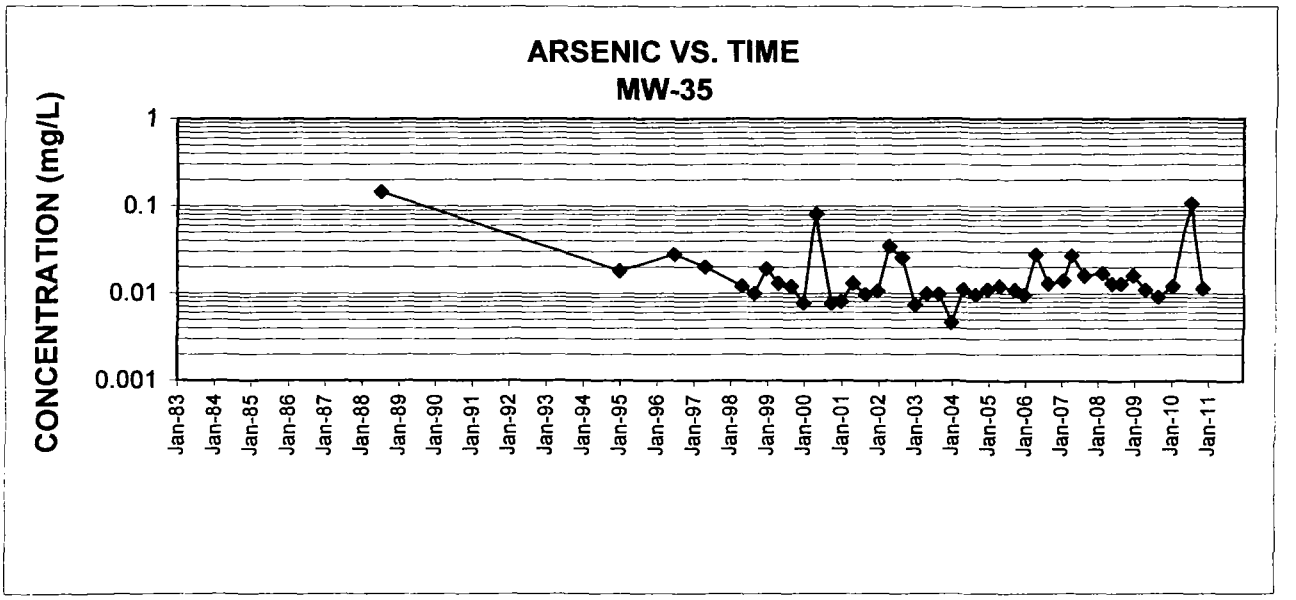
Jan-09
Jan-10
Jan-11


ARSENIC VS. TIME
MW-35
CONCENTRATION (mg/L)
1
0.1
0.01
0.001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
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Jan-07
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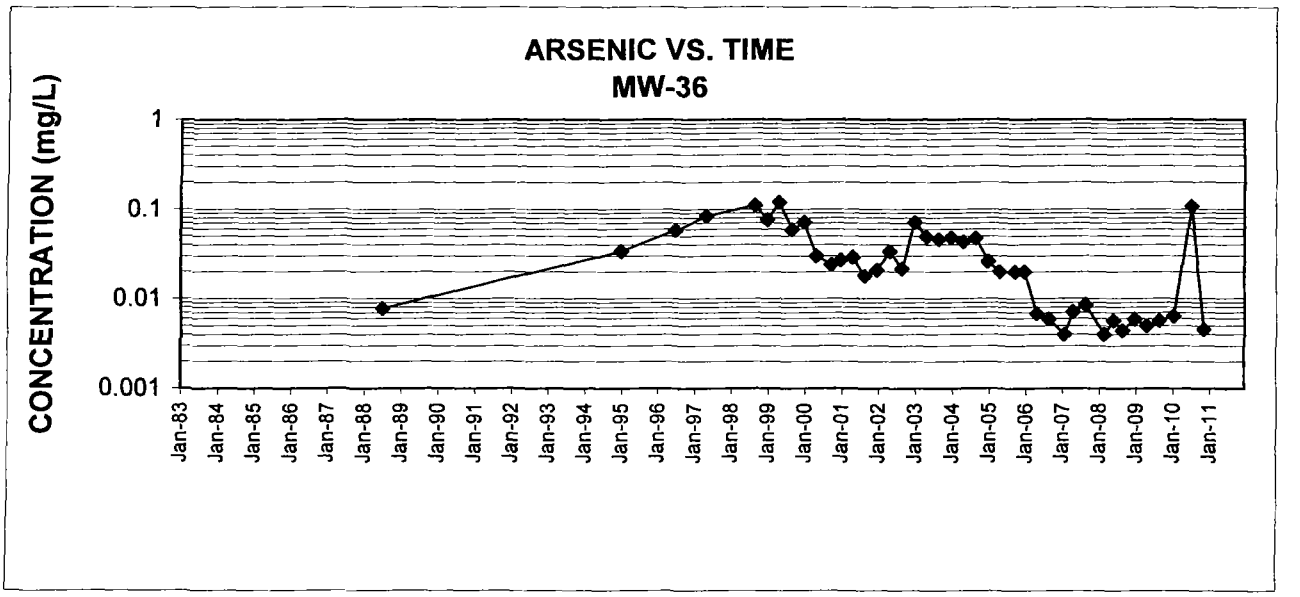
Jan-09
Jan-10
Jan-11


ARSENIC VS. TIME
MW-36
CONCENTRATION (mg/L)
1
0.1
0.01
0.001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
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Jan-07
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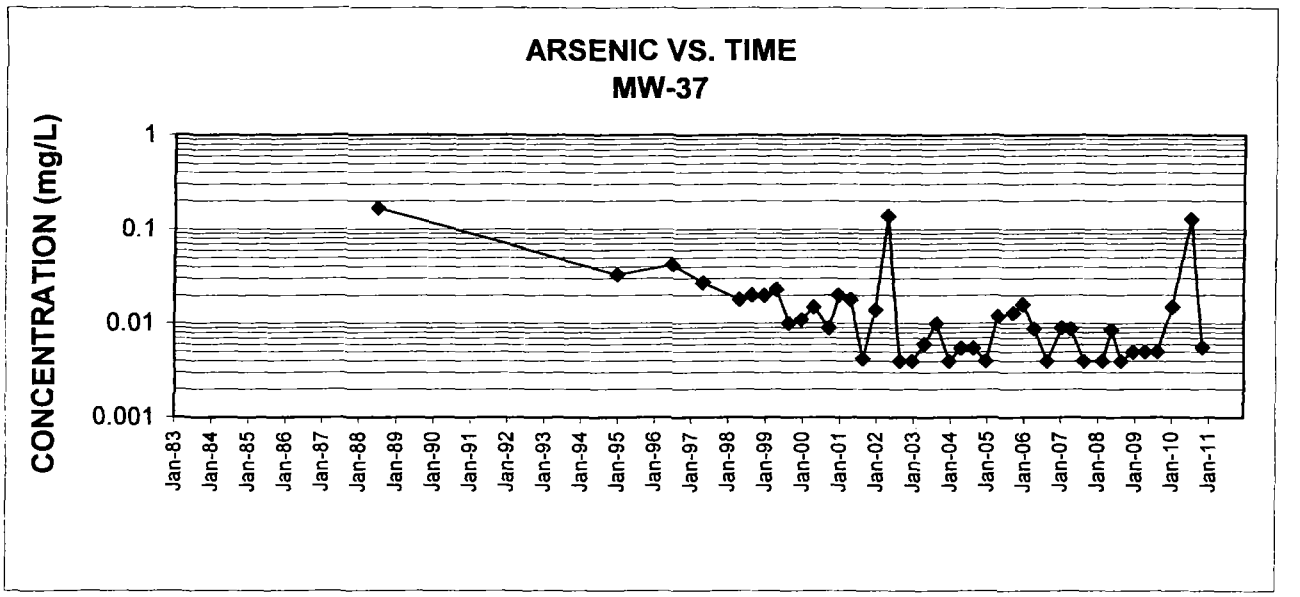
Jan-09
Jan-10
Jan-11


ARSENIC VS. TIME
MW-37
CONCENTRATION (mg/L)
1
0.1
0.01
0.001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
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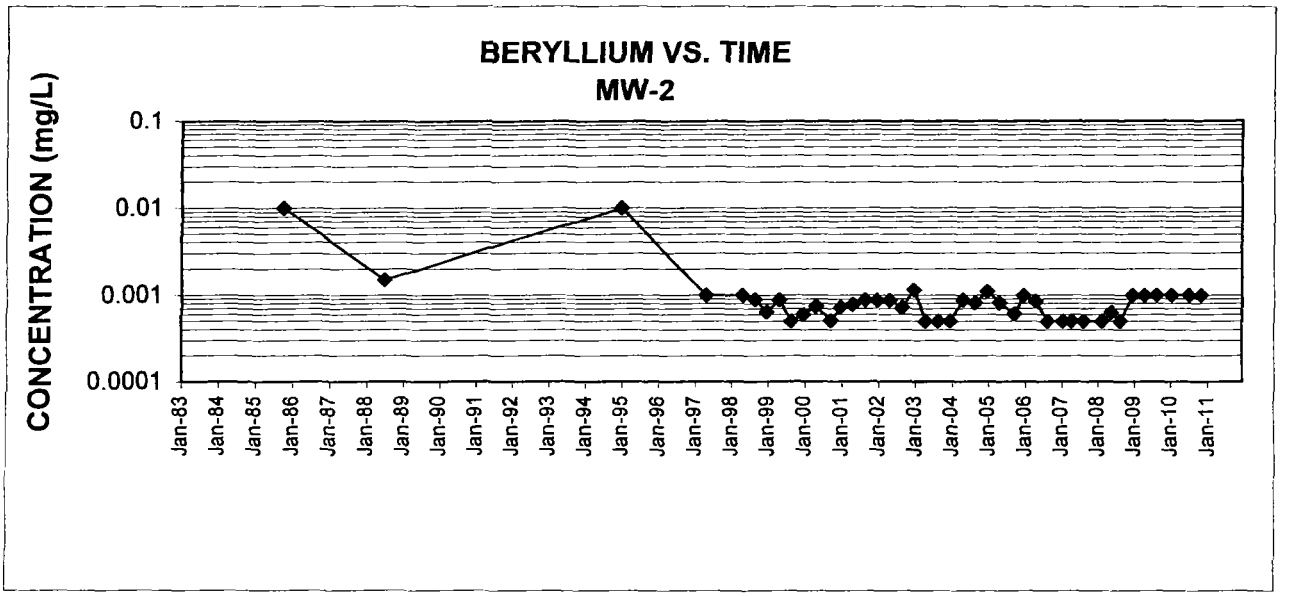
Jan-09
Jan-10
Jan-11

APPENDIX D-5

BERYLLIUM


BERYLLIUM VS. TIME
MW-2
CONCENTRATION (mg/L)
0.1
0.01
0.001
0.0001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
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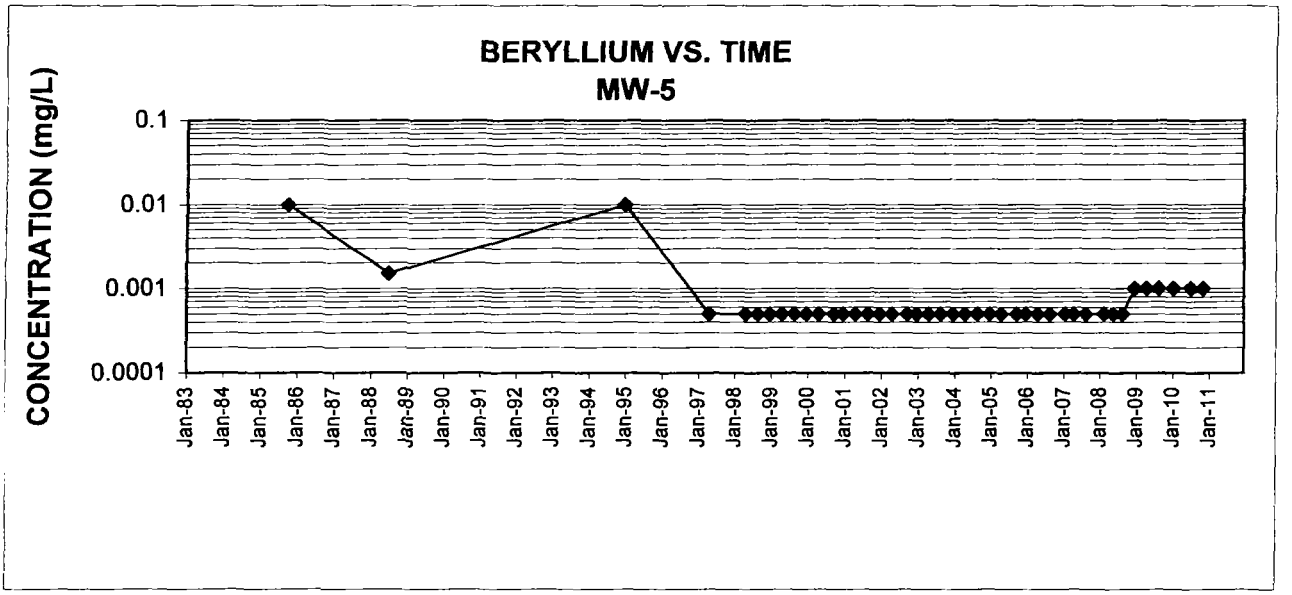
Jan-09
Jan-10
Jan-11


BERYLLIUM VS. TIME
MW-5
CONCENTRATION (mg/L)
0.1
0.01
0.001
0.0001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
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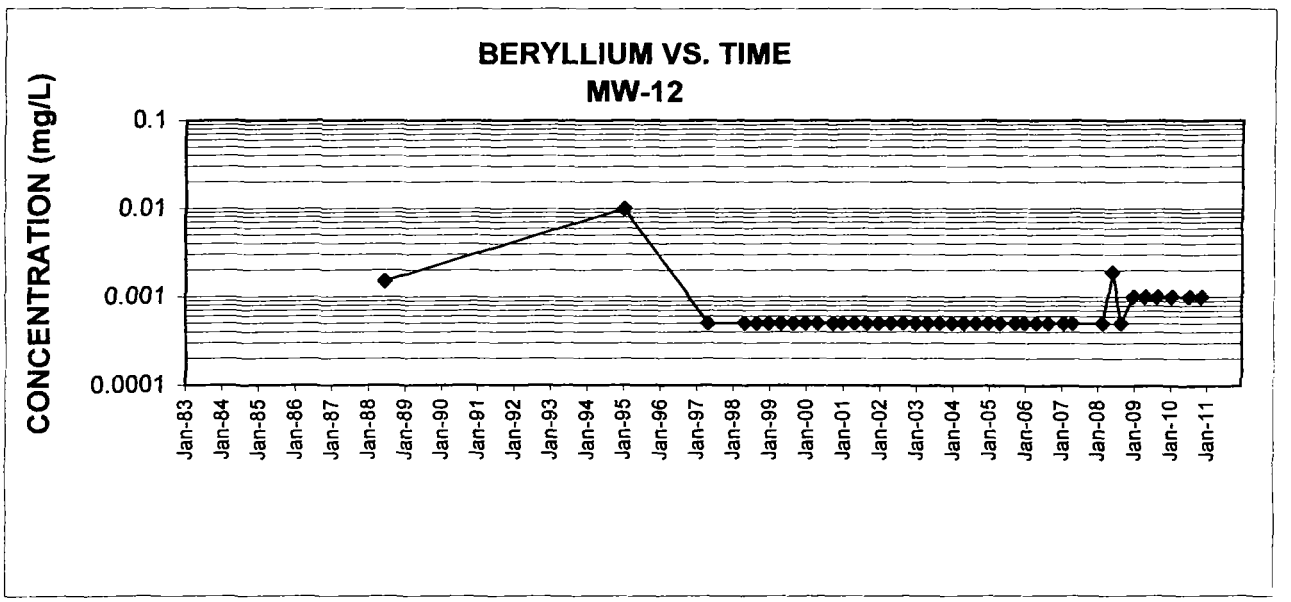
Jan-09
Jan-10
Jan-11


BERYLLIUM VS. TIME
MW-12
CONCENTRATION (mg/L)
0.1
0.01
0.001
0.0001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
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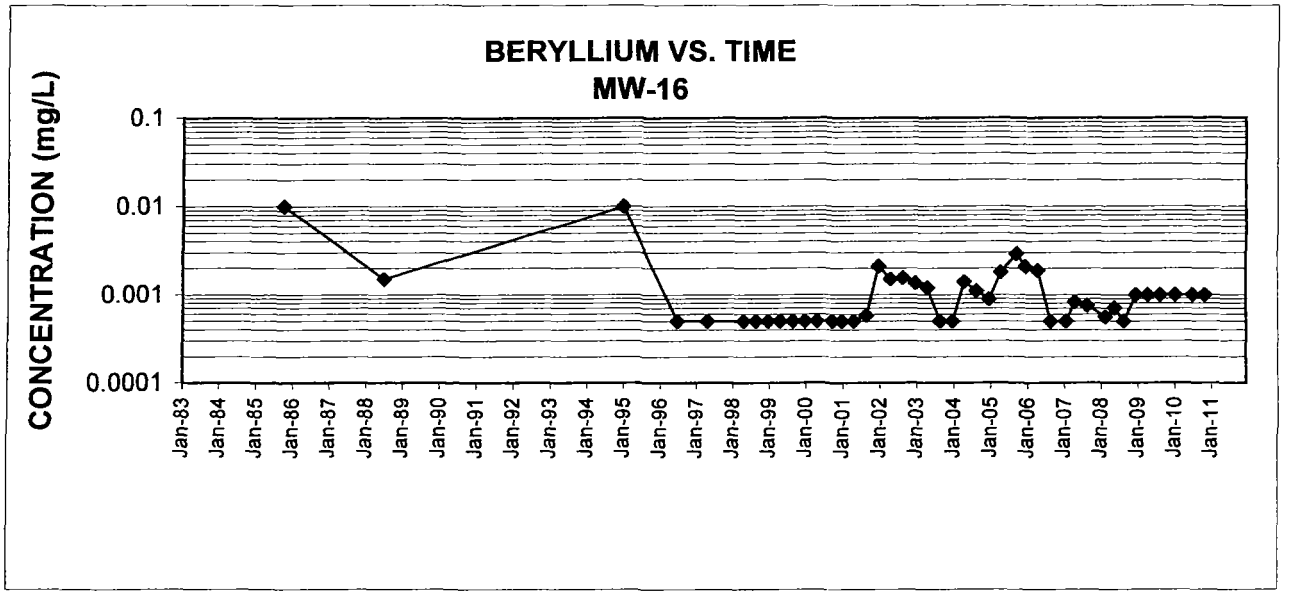
Jan-10
Jan-11


BERYLLIUM VS. TIME
MW-16
CONCENTRATION (mg/L)
0.1
0.01
0.001
0.0001
Jan-83
Jan-84
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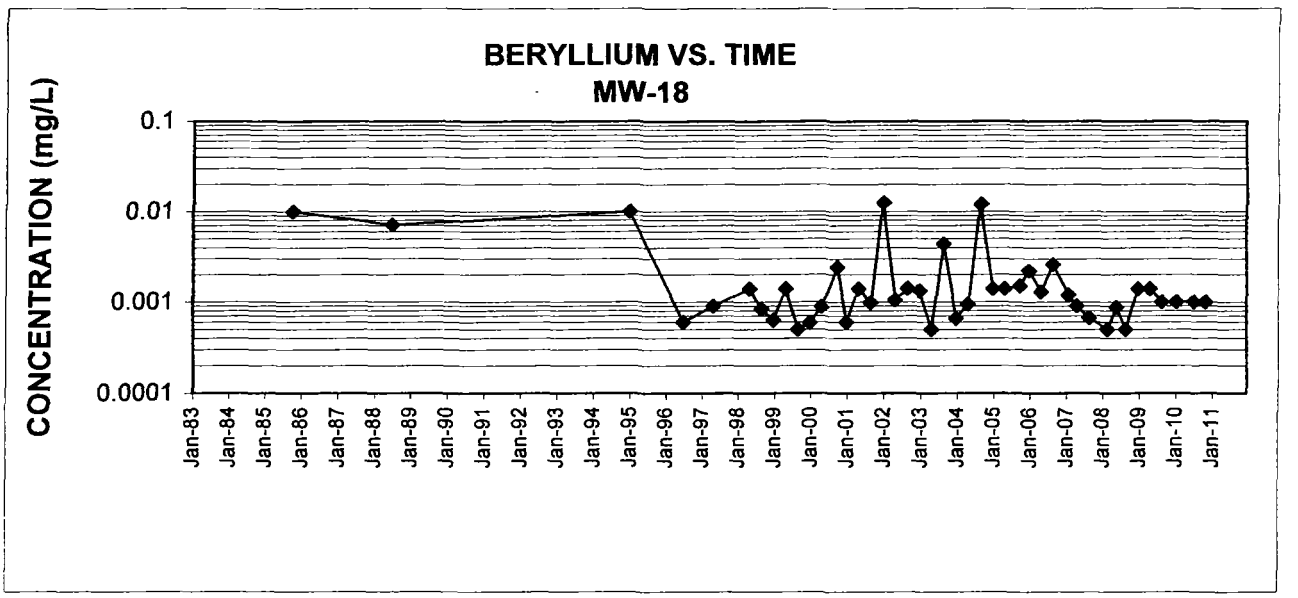
BERYLLIUM VS. TIME
MW-18
CONCENTRATION (mg/L)
0.1
0.01
0.001
0.0001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
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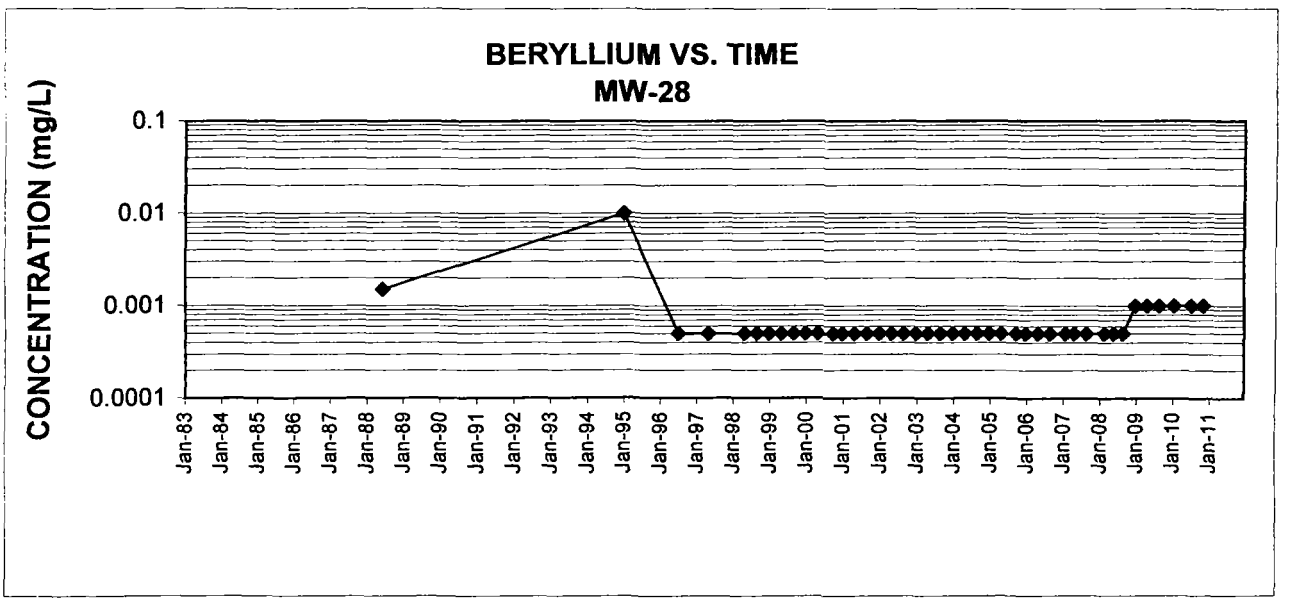
BERYLLIUM VS. TIME
MW-28
CONCENTRATION (mg/L)
0.1
0.01
0.001
0.0001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
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Jan-96
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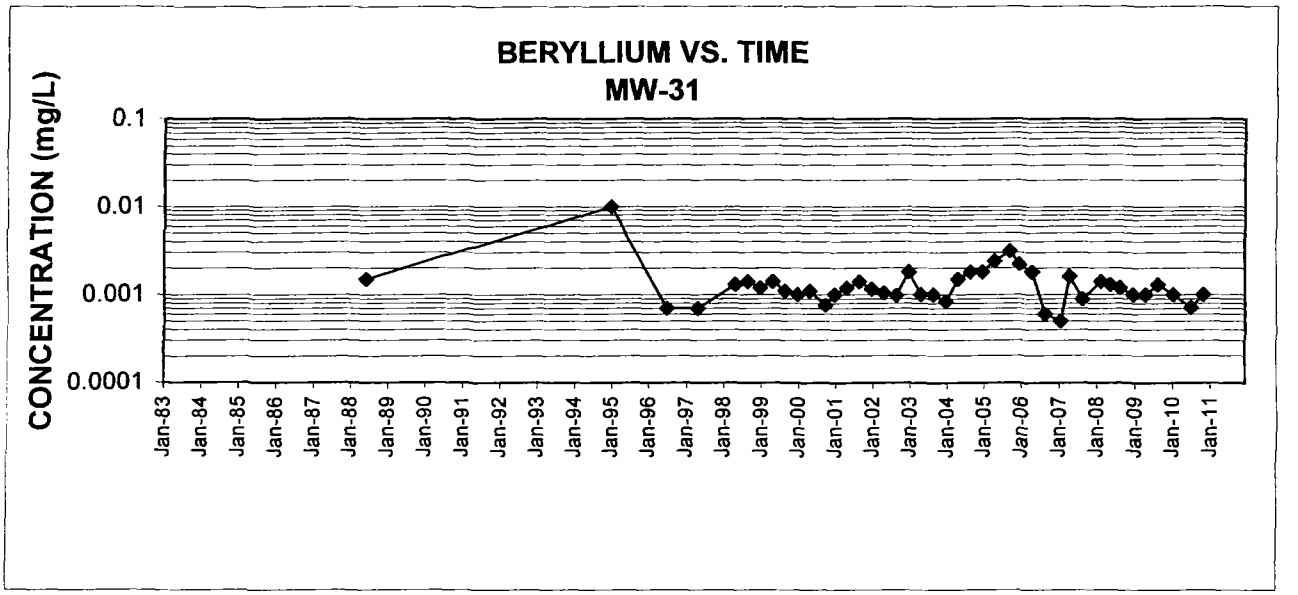
BERYLLIUM VS. TIME
MW-31
CONCENTRATION (mg/L)
0.1
0.01
0.001
0.0001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
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Jan-99
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Jan-10
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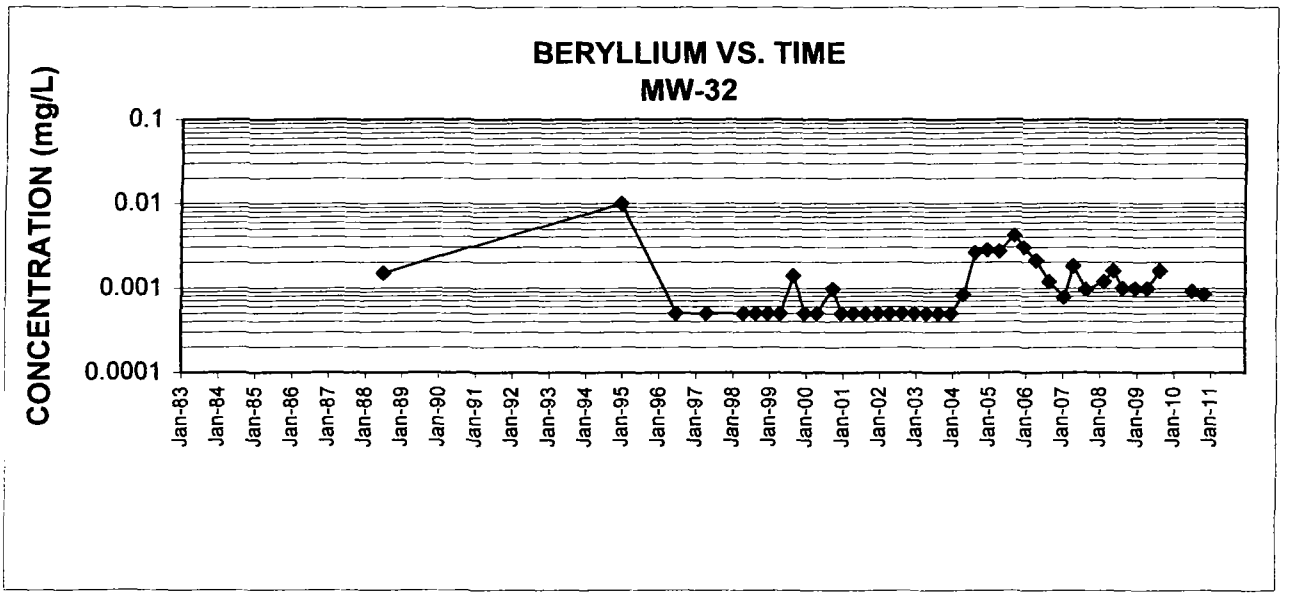
BERYLLIUM VS. TIME
MW-32
CONCENTRATION (mg/L)
0.1
0.01
0.001
0.0001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
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Jan-99
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Jan-09
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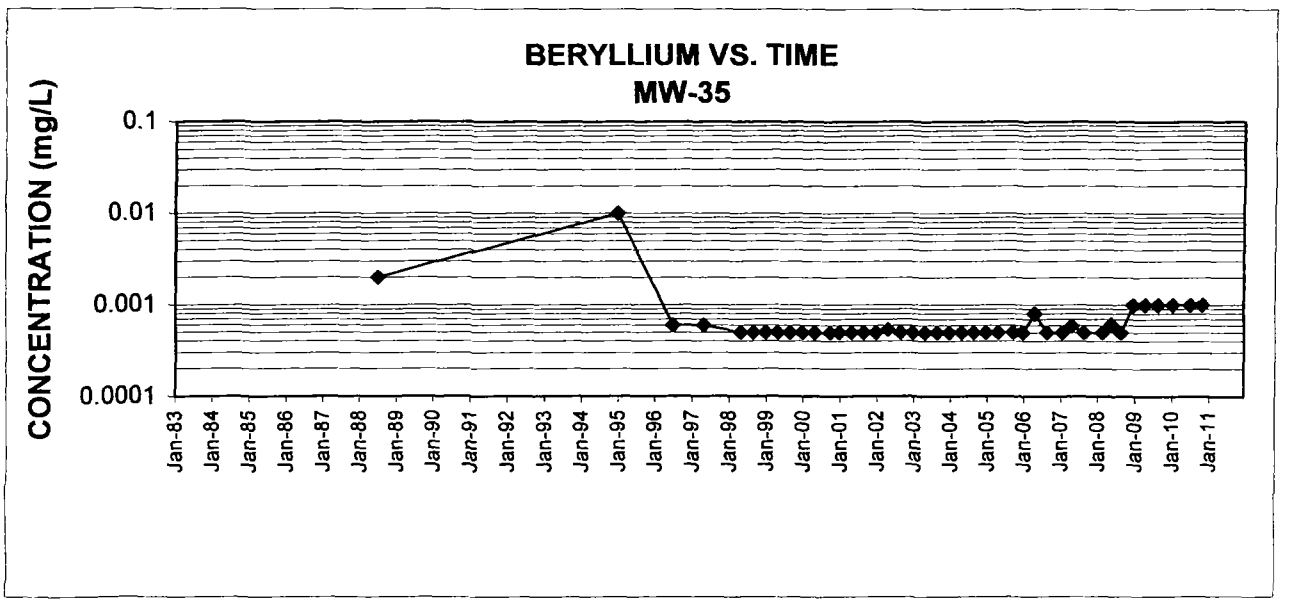
Jan-11


BERYLLIUM VS. TIME
MW-35
CONCENTRATION (mg/L)
0.1
0.01
0.001
0.0001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
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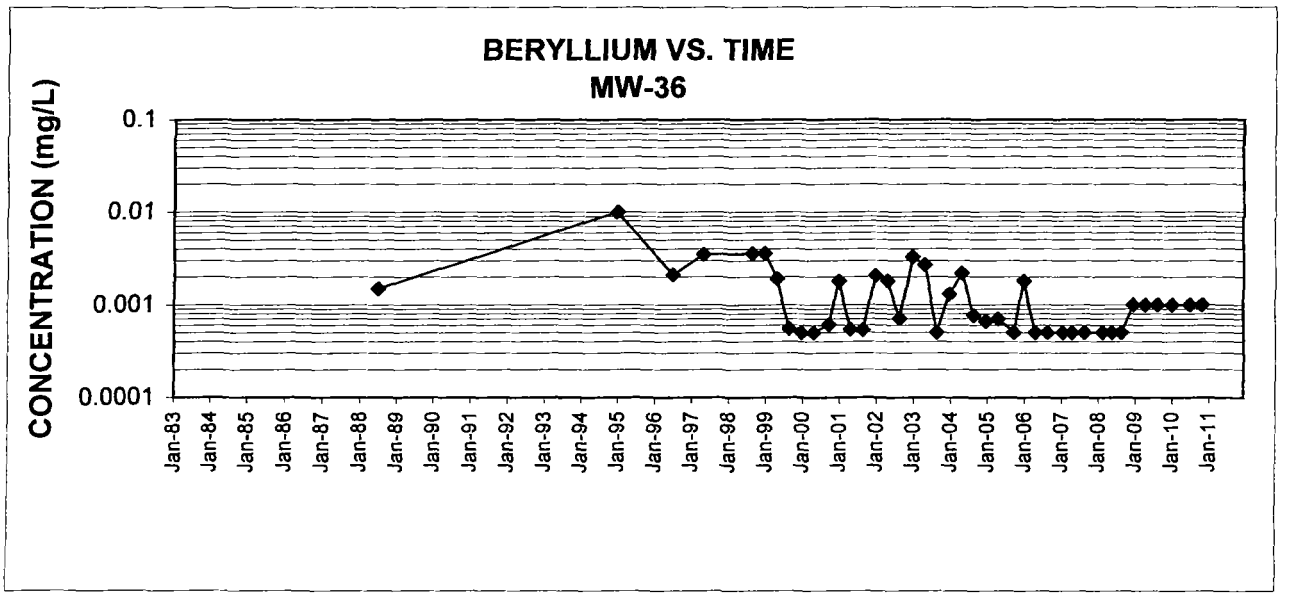
Jan-10
Jan-11


BERYLLIUM VS. TIME
MW-36
CONCENTRATION (mg/L)
0.1
0.01
0.001
0.0001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
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Jan-01
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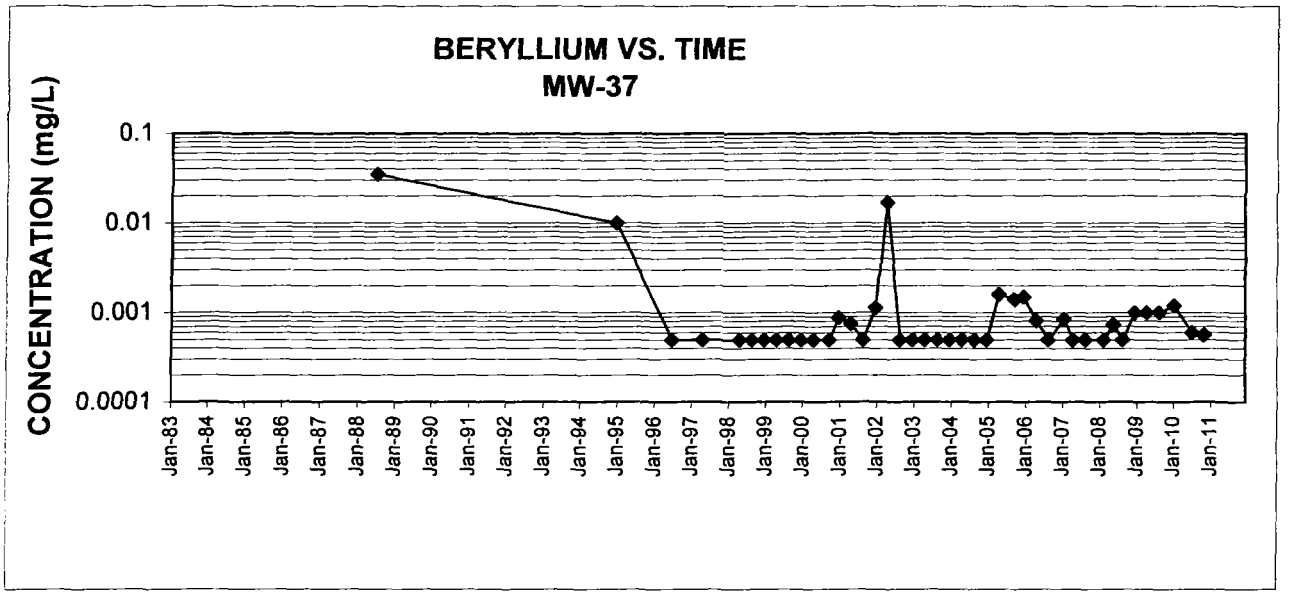
Jan-09
Jan-10
Jan-11


BERYLLIUM VS. TIME
MW-37
CONCENTRATION (mg/L)
0.1
0.01
0.001
0.0001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
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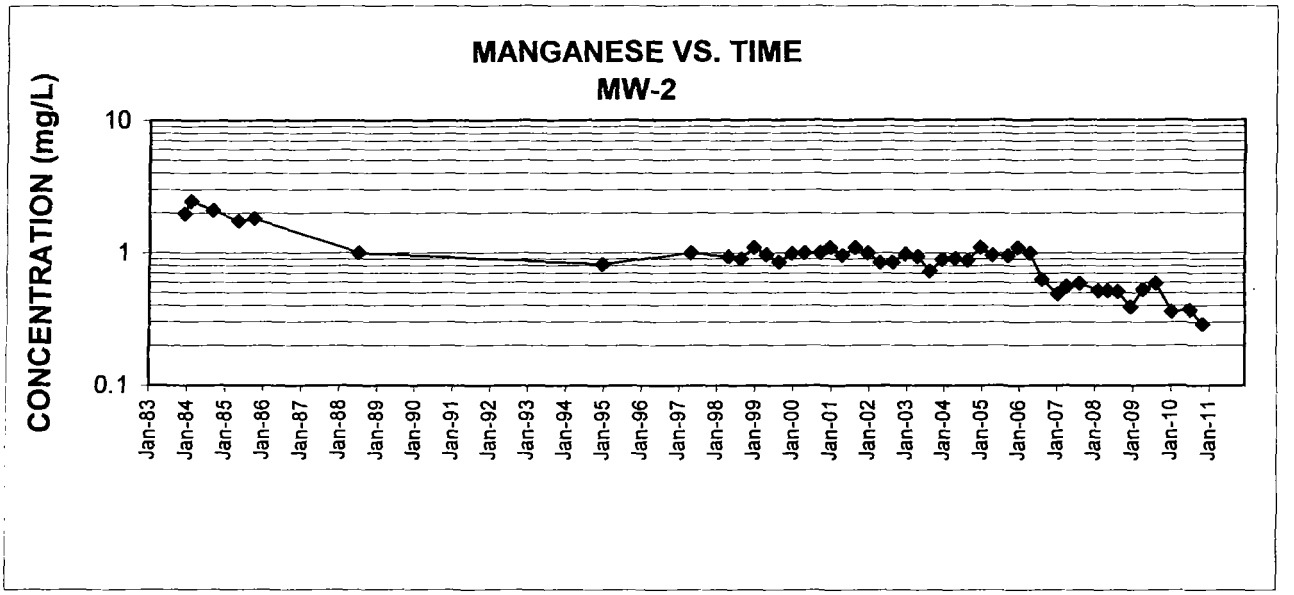
Jan-10
Jan-11

APPENDIX D-6

MANGANESE


MANGANESE VS. TIME
MW-2
CONCENTRATION (mg/L)
10
1
0.1
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
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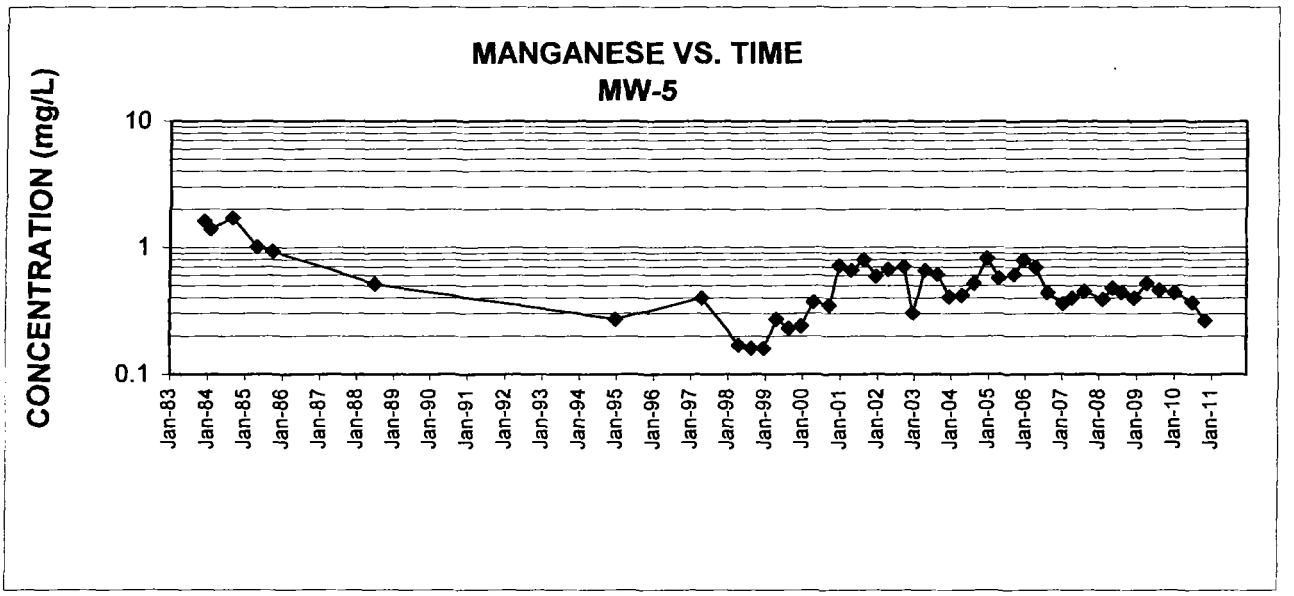
Jan-09
Jan-10
Jan-11


MANGANESE VS. TIME
MW-5
CONCENTRATION (mg/L)
10
1
0.1
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
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Jan-02
Jan-03
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Jan-05
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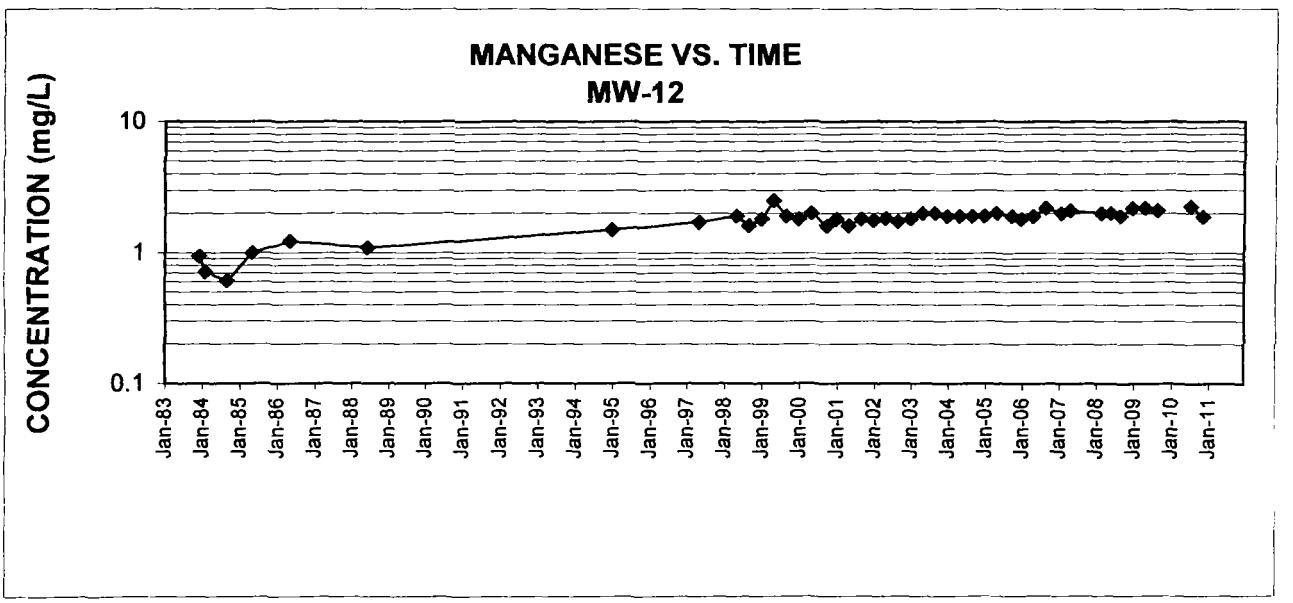
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11


MANGANESE VS. TIME
MW-12
CONCENTRATION (mg/L)
10
1
0.1
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
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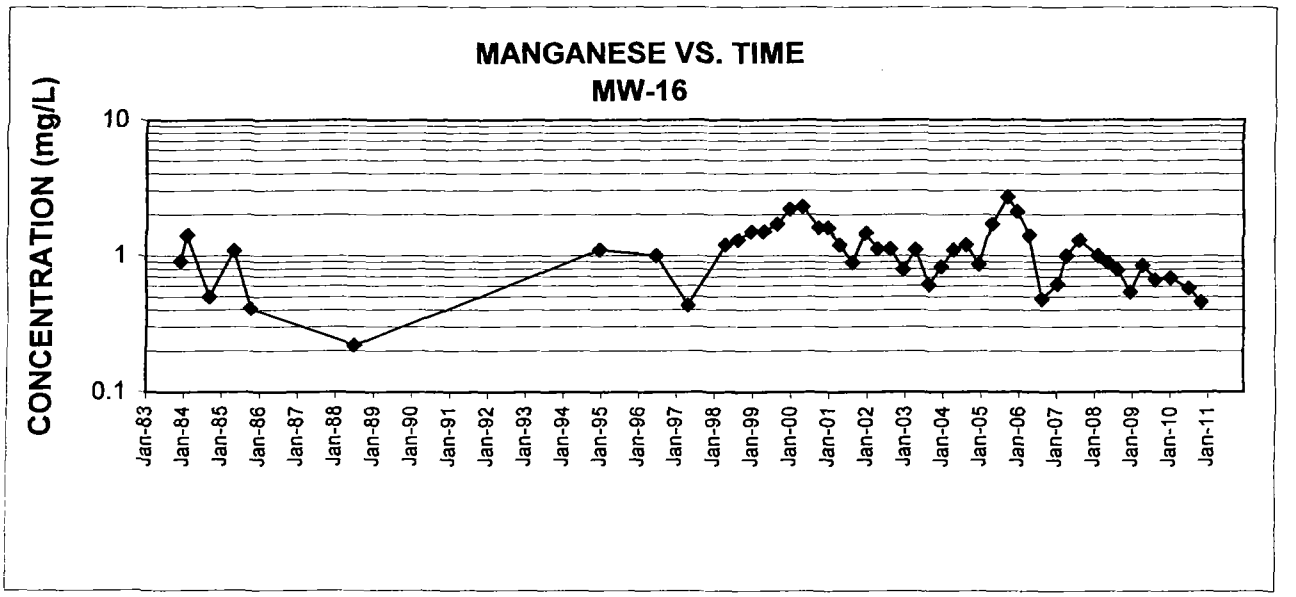
Jan-10
Jan-11


MANGANESE VS. TIME
MW-16
CONCENTRATION (mg/L)
10
1
0.1
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
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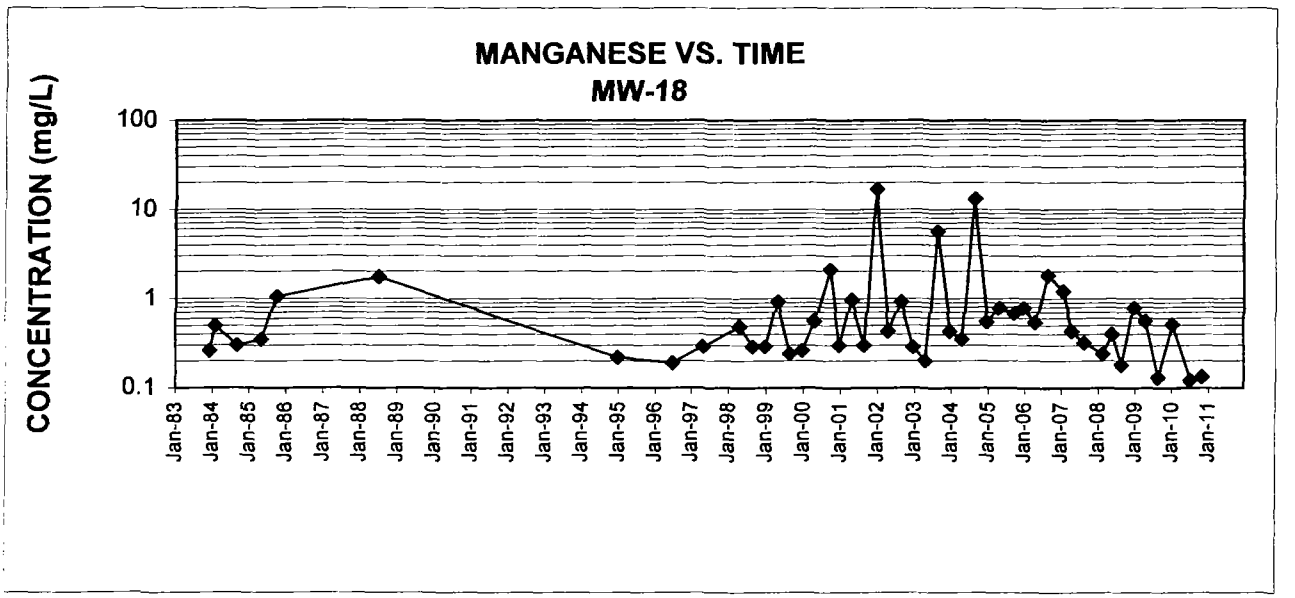
Jan-11


MANGANESE VS. TIME
MW-18
CONCENTRATION (mg/L)
100
10
1
0.1
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
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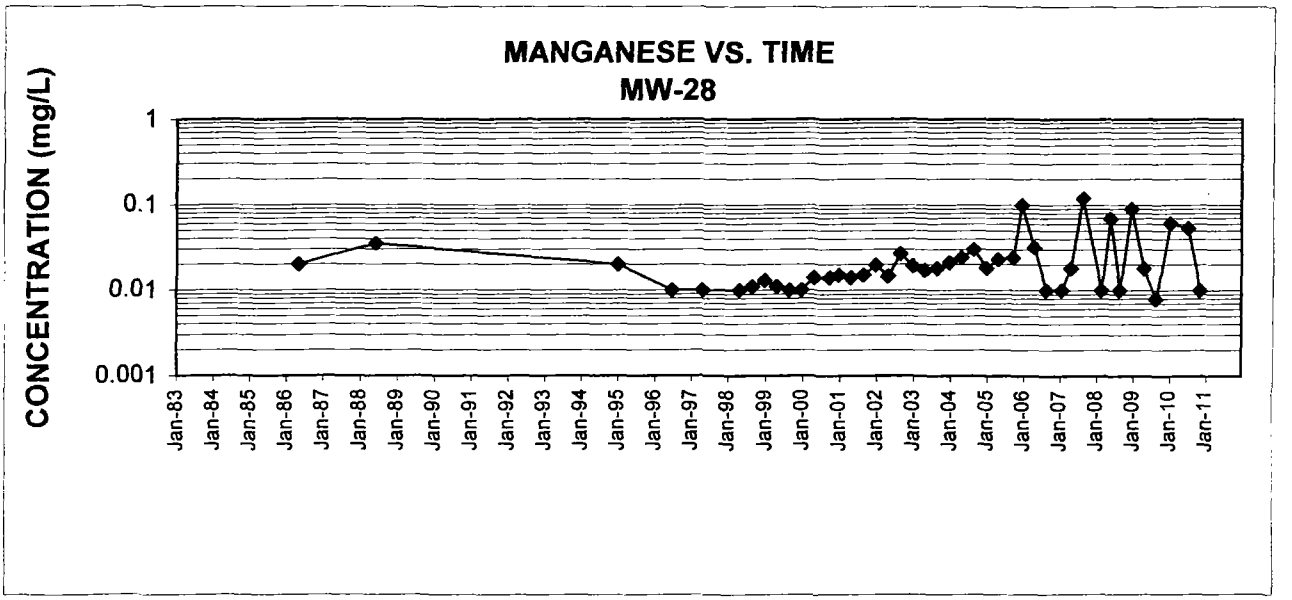
Jan-11


MANGANESE VS. TIME
MW-28
CONCENTRATION (mg/L)
1
0.1
0.01
0.001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
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Jan-96
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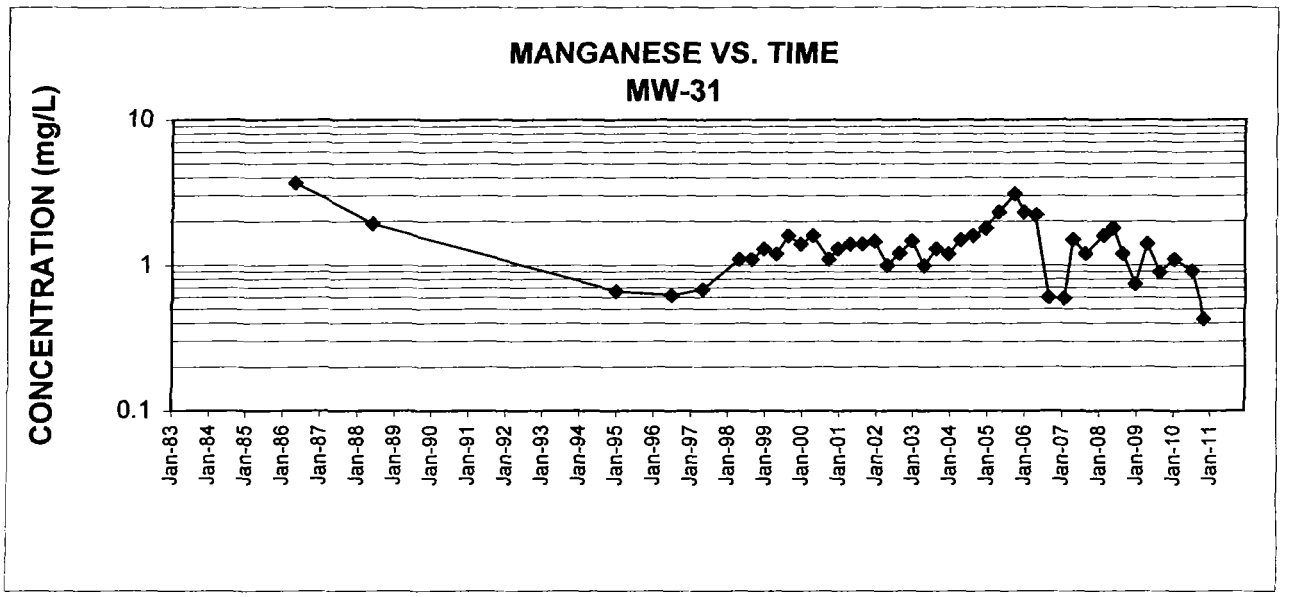
Jan-11


MANGANESE VS. TIME
MW-31
CONCENTRATION (mg/L)
10
1
0.1
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
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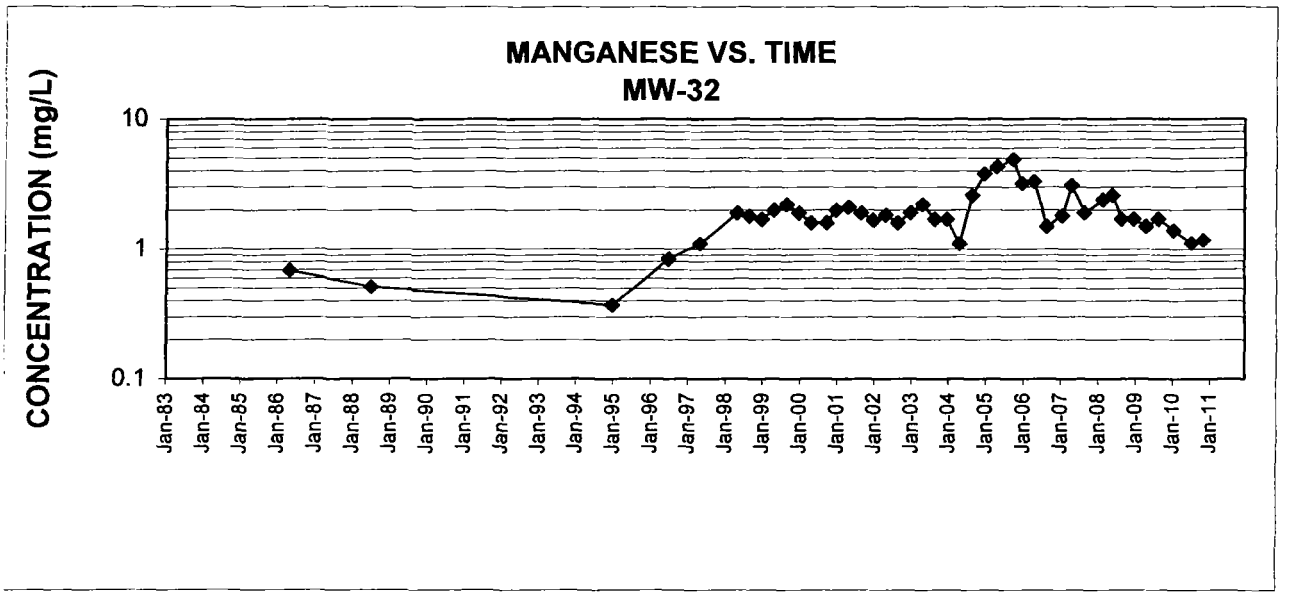
Jan-11


MANGANESE VS. TIME
MW-32
CONCENTRATION (mg/L)
10
1
0.1
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
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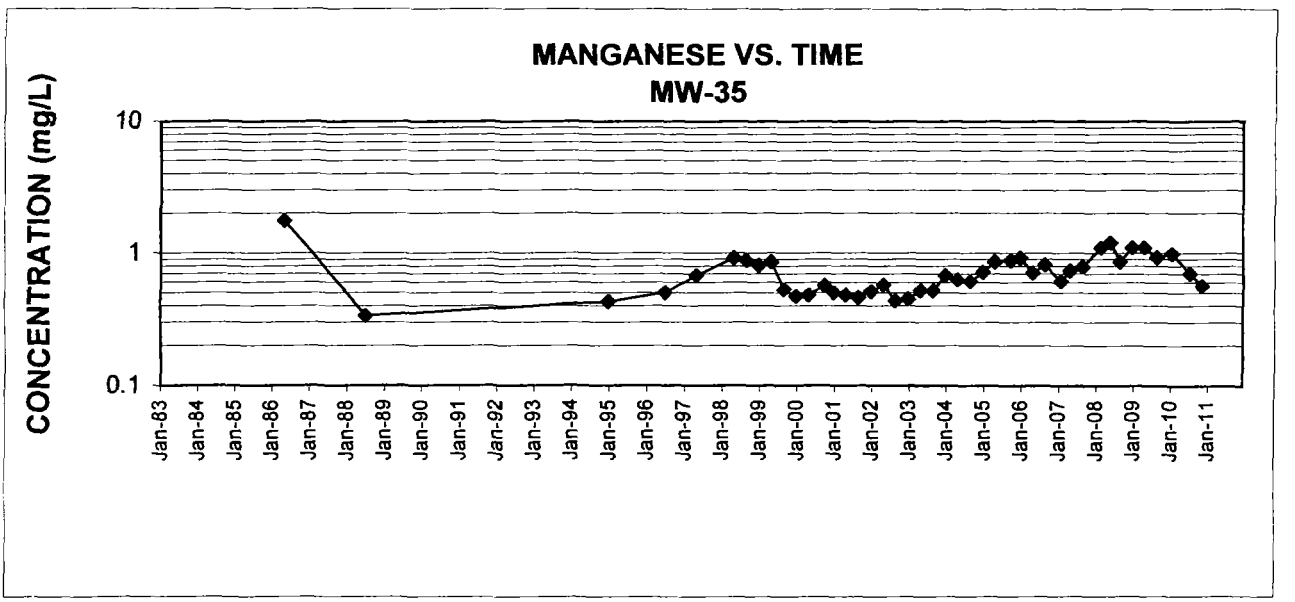
MANGANESE VS. TIME
MW-35
CONCENTRATION (mg/L)
10
1
0.1
Jan-83
Jan-84
Jan-85
Jan-86
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Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
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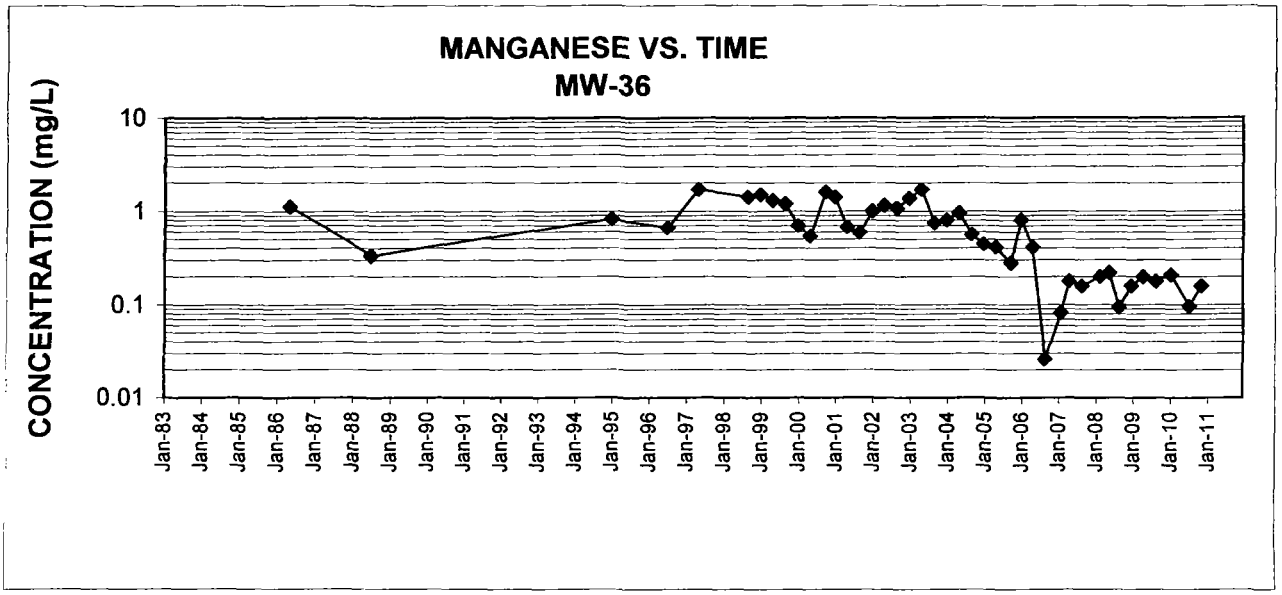
MANGANESE VS. TIME
MW-36
CONCENTRATION (mg/L)
10
1
0.1
0.01
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
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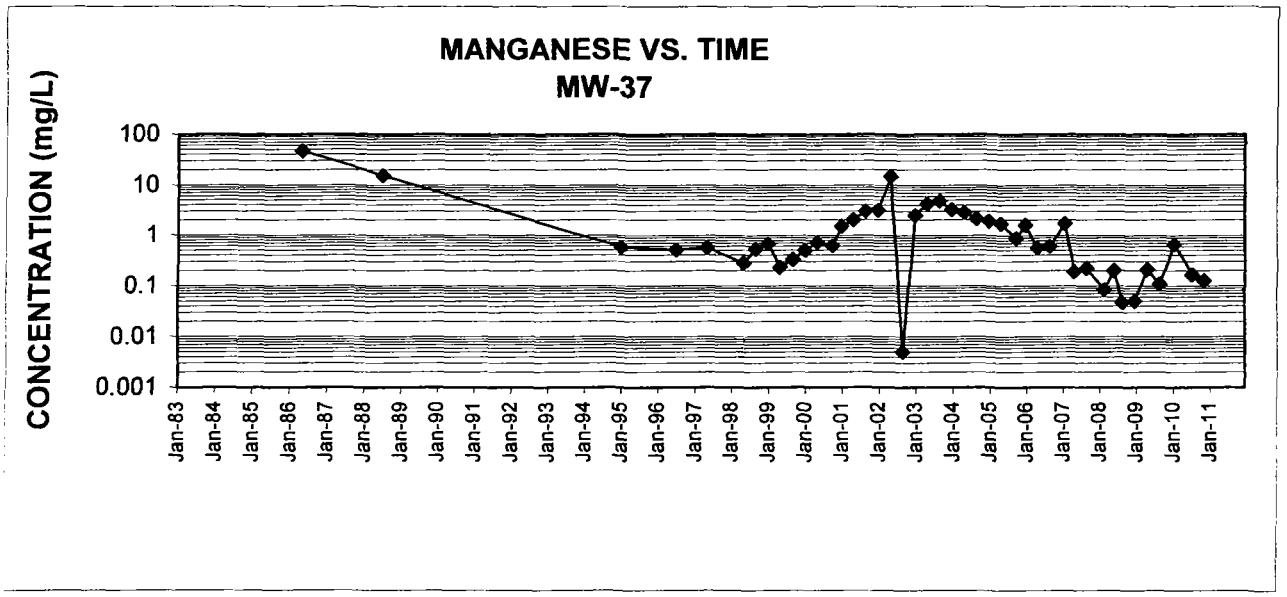
MANGANESE VS. TIME
MW-37
CONCENTRATION (mg/L)
100
10
1
0.1
0.01
0.001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
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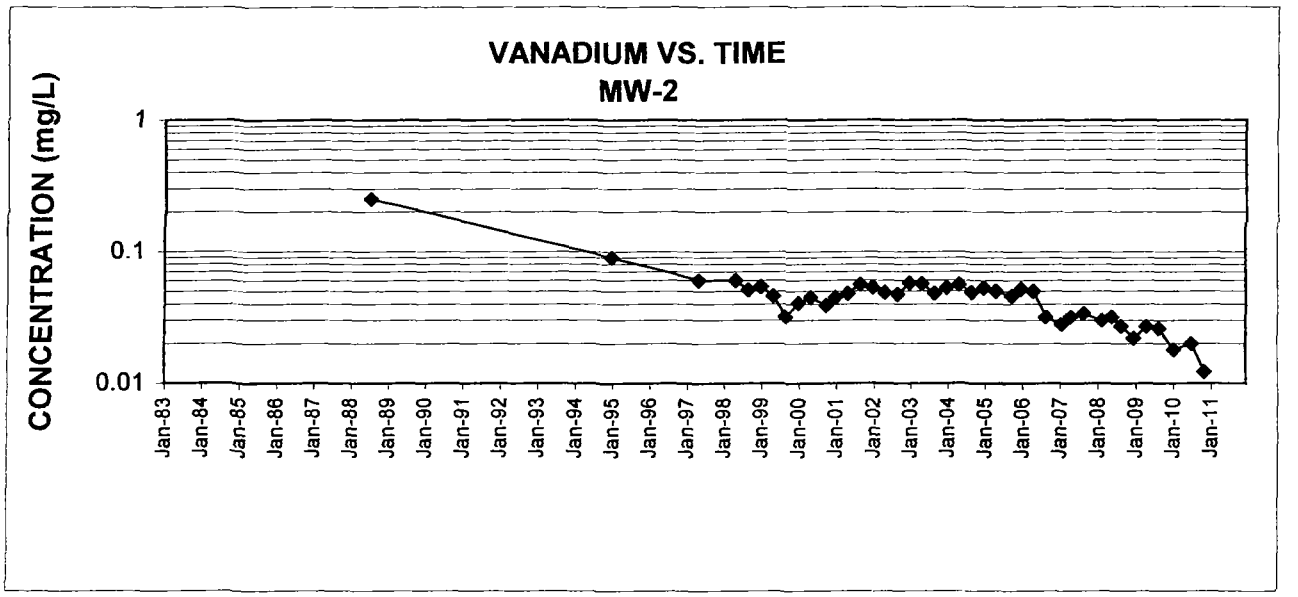
Jan-10
Jan-11

APPENDIX D-7

VANADIUM


VANADIUM VS. TIME
MW-2
CONCENTRATION (mg/L)
1
0.1
0.01
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
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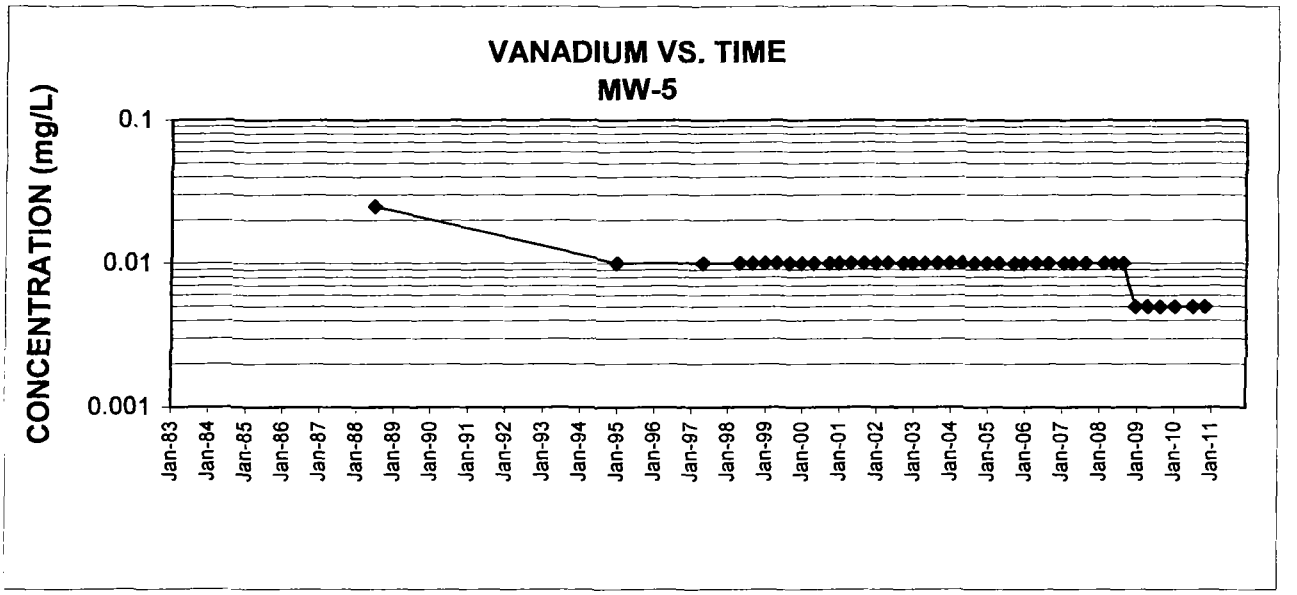
VANADIUM VS. TIME
MW-5
CONCENTRATION (mg/L)
0.1
0.01
0.001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
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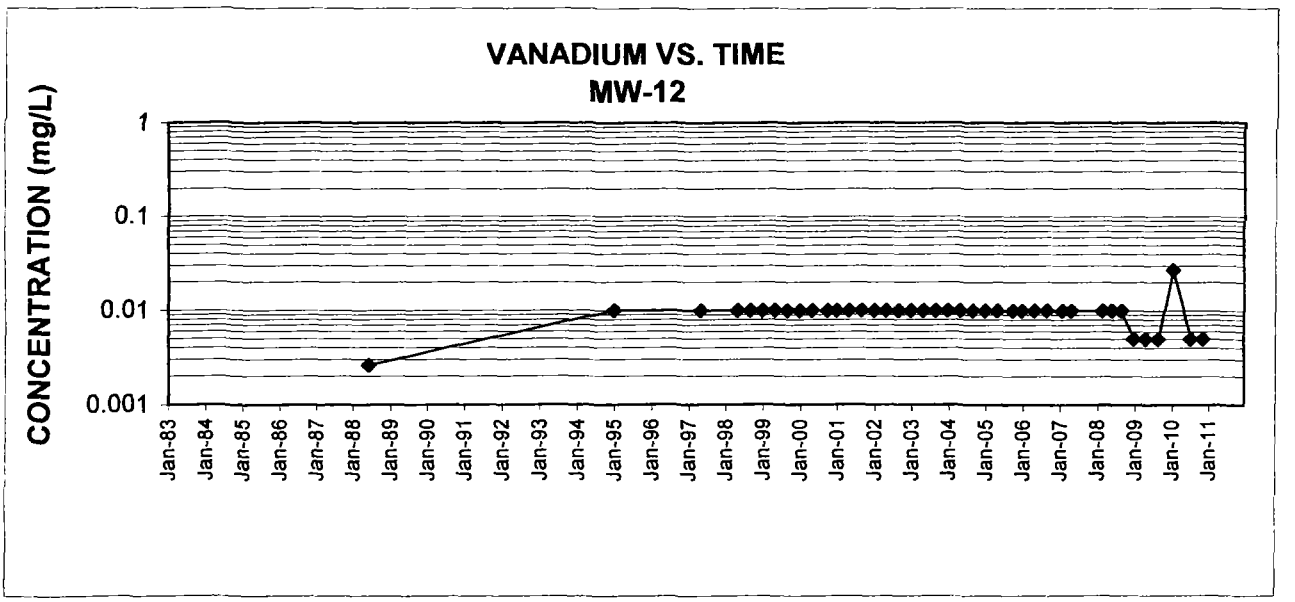
VANADIUM VS. TIME
MW-12
CONCENTRATION (mg/L)
1
0.1
0.01
0.001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
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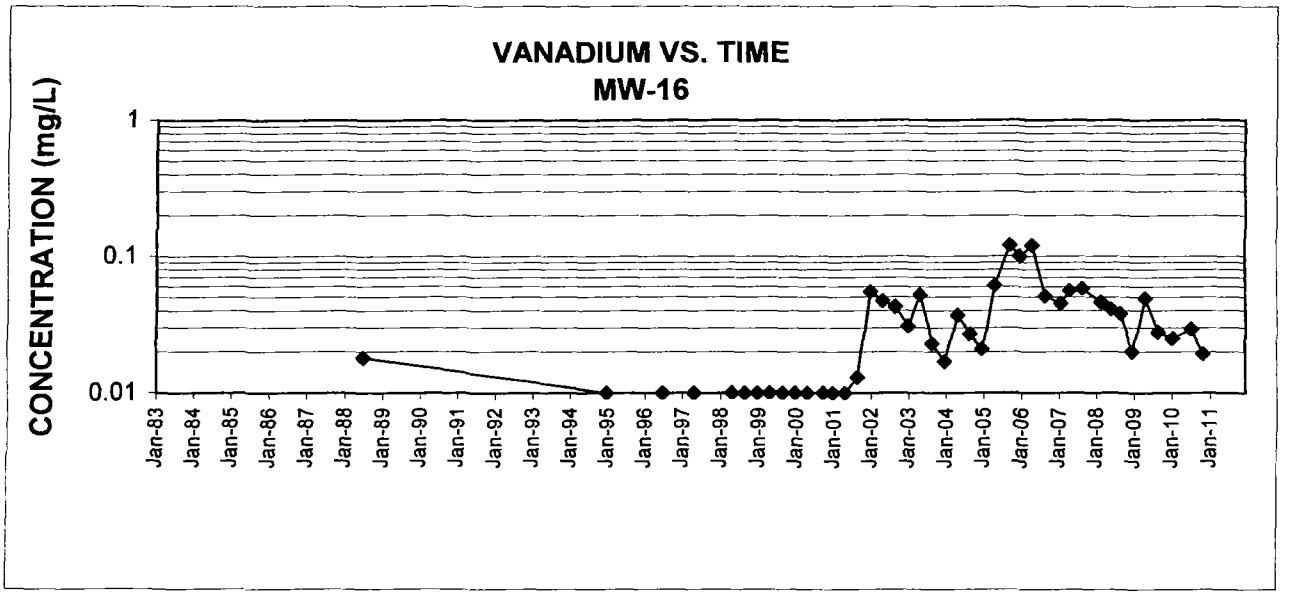
Jan-11


VANADIUM VS. TIME
MW-16
CONCENTRATION (mg/L)
1
0.1
0.01
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
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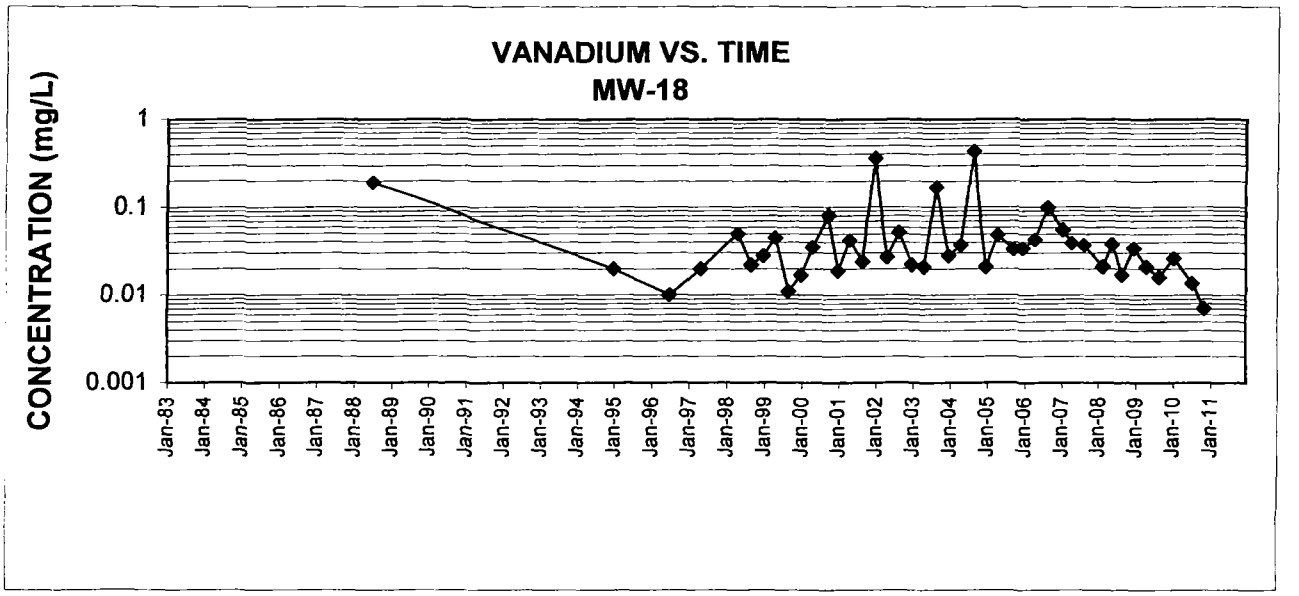
Jan-10
Jan-11


VANADIUM VS. TIME
MW-18
CONCENTRATION (mg/L)
1
0.1
0.01
0.001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
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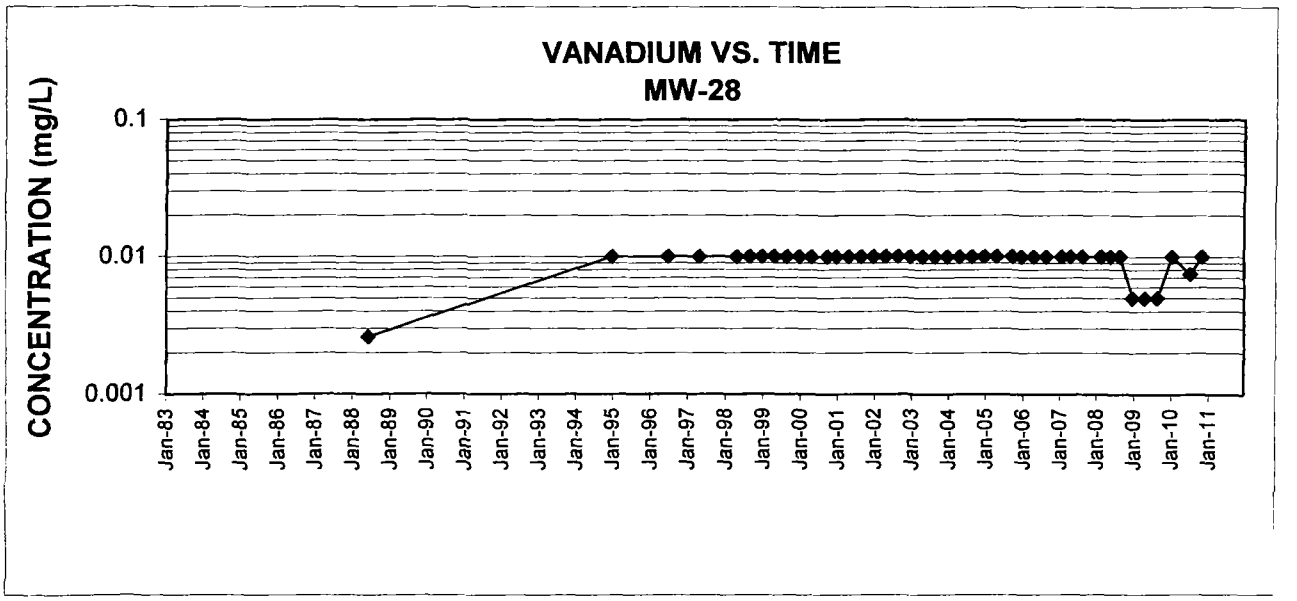
Jan-09
Jan-10
Jan-11


VANADIUM VS. TIME
MW-28
CONCENTRATION (mg/L)
0.1
0.01
0.001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
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Jan-95
Jan-96
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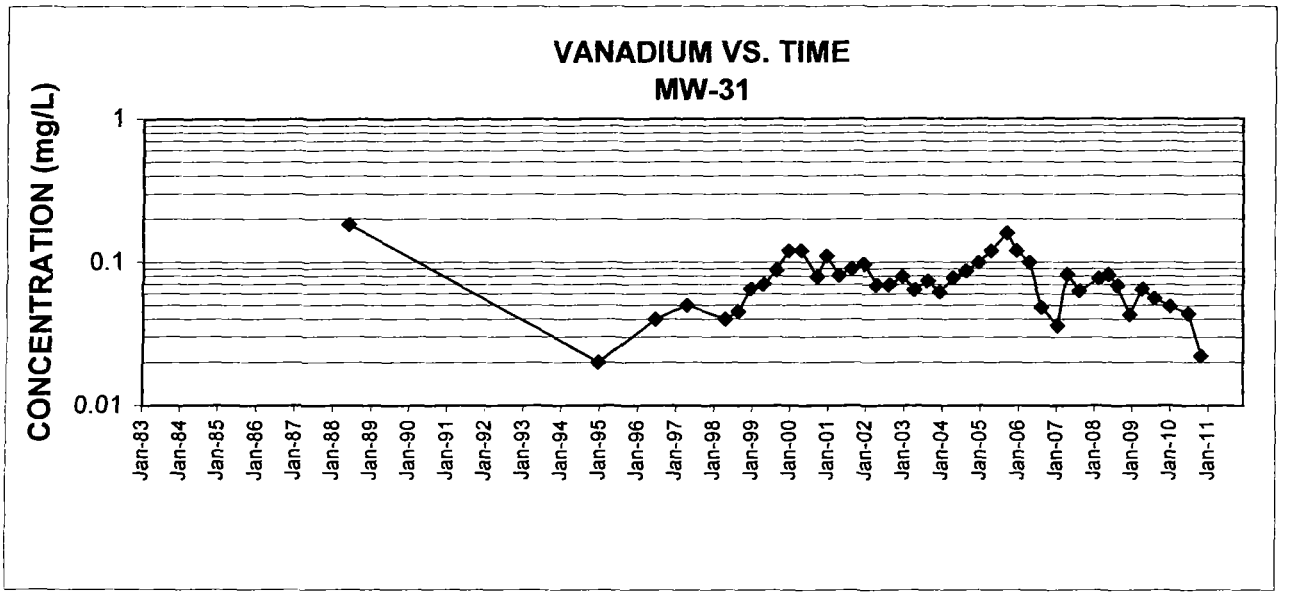
Jan-10
Jan-11


VANADIUM VS. TIME
MW-31
CONCENTRATION (mg/L)
1
0.1
0.01
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
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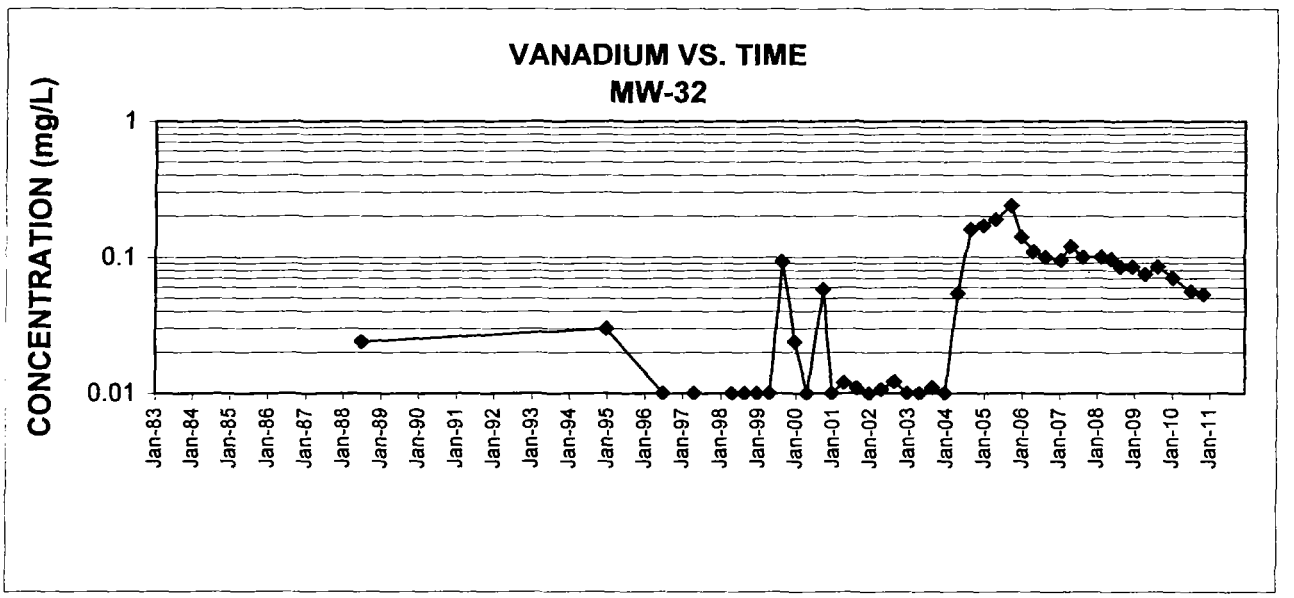
Jan-10
Jan-11


VANADIUM VS. TIME
MW-32
CONCENTRATION (mg/L)
1
0.1
0.01
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
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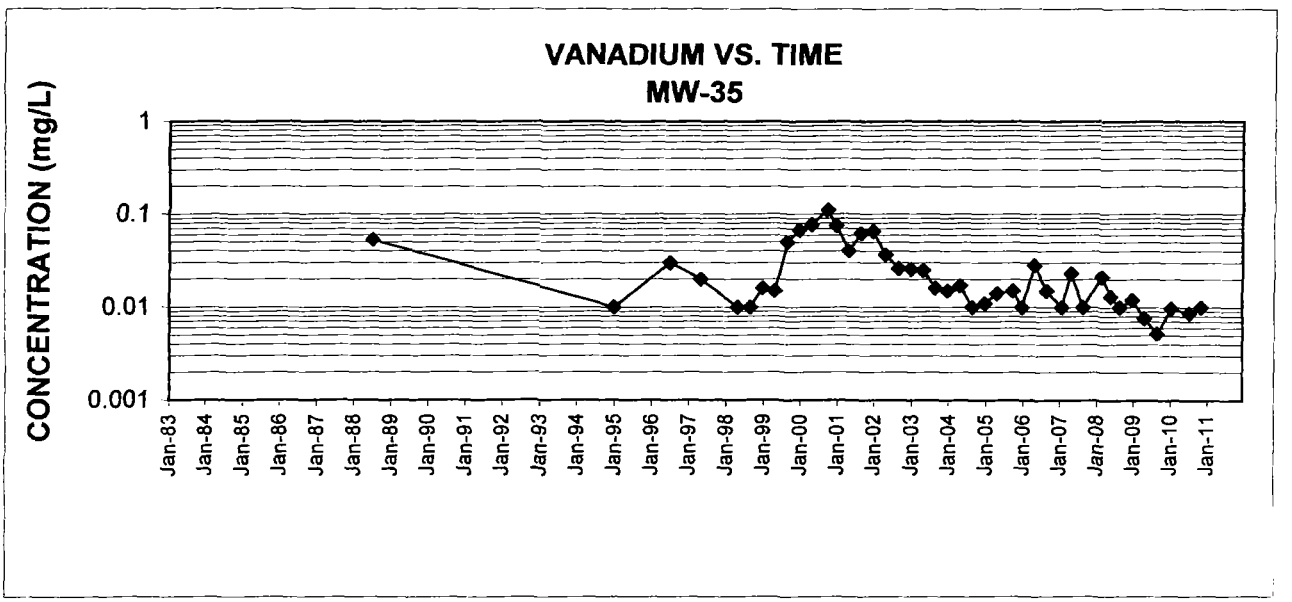
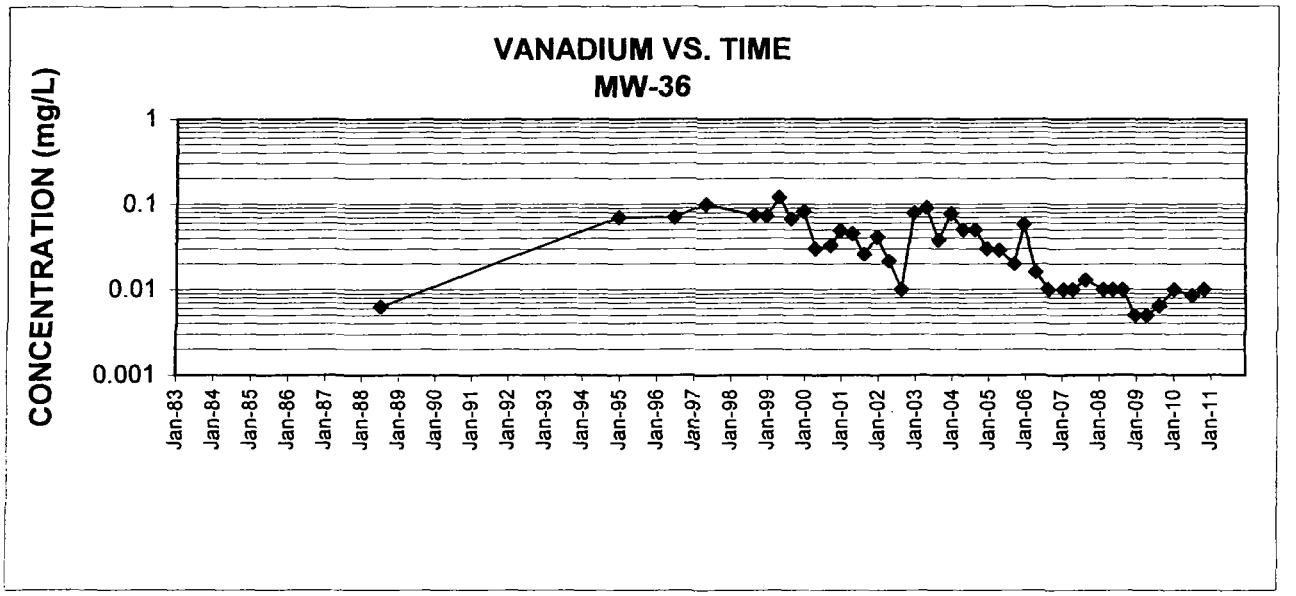
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11


VANADIUM VS. TIME
MW-35
CONCENTRATION (mg/L)
1
0.1
0.01
0.001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11


VANADIUM VS. TIME
MW-36
CONCENTRATION (mg/L)
1
0.1
0.01
0.001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
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Jan-06
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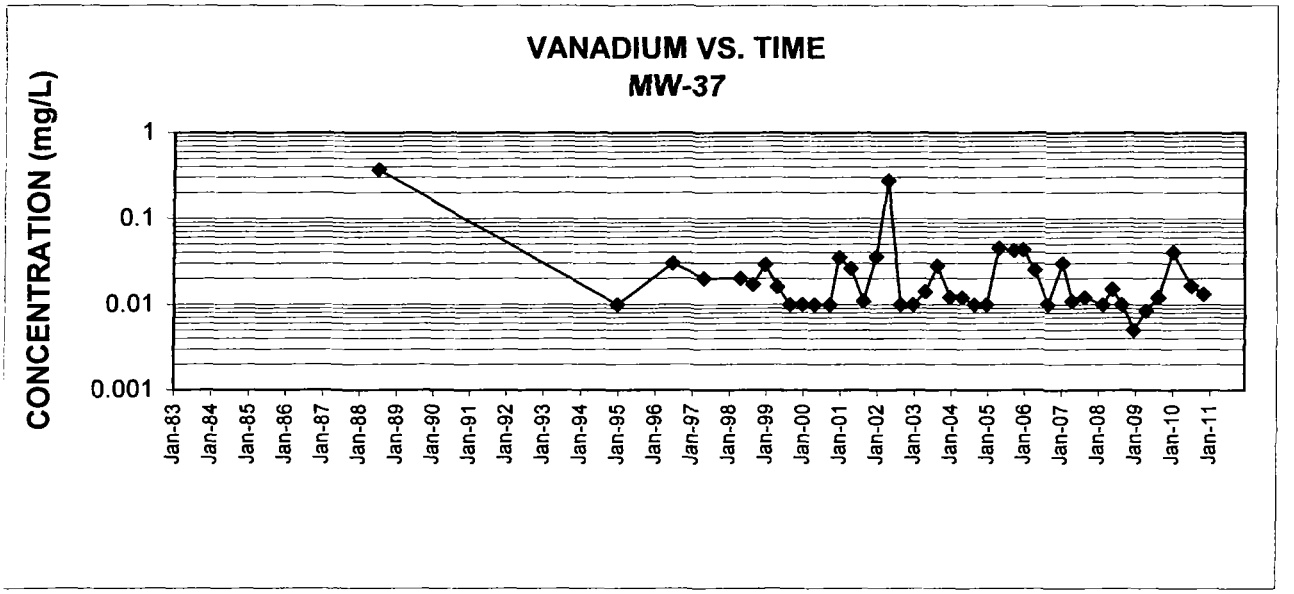
Jan-08
Jan-09
Jan-10
Jan-11


VANADIUM VS. TIME
MW-37
CONCENTRATION (mg/L)
1
0.1
0.01
0.001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
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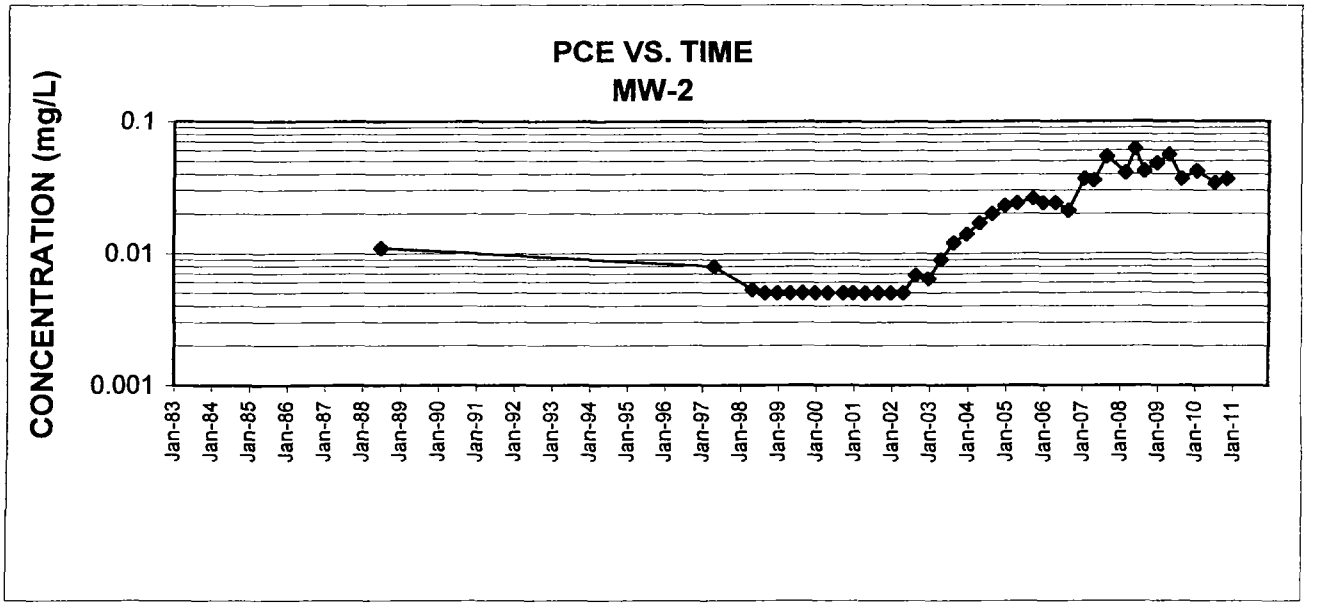
Jan-10
Jan-11

APPENDIX D-8

TETRACHLOROETHENE


PCE VS. TIME
MW-2
CONCENTRATION (mg/L)
0.1
0.01
0.001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
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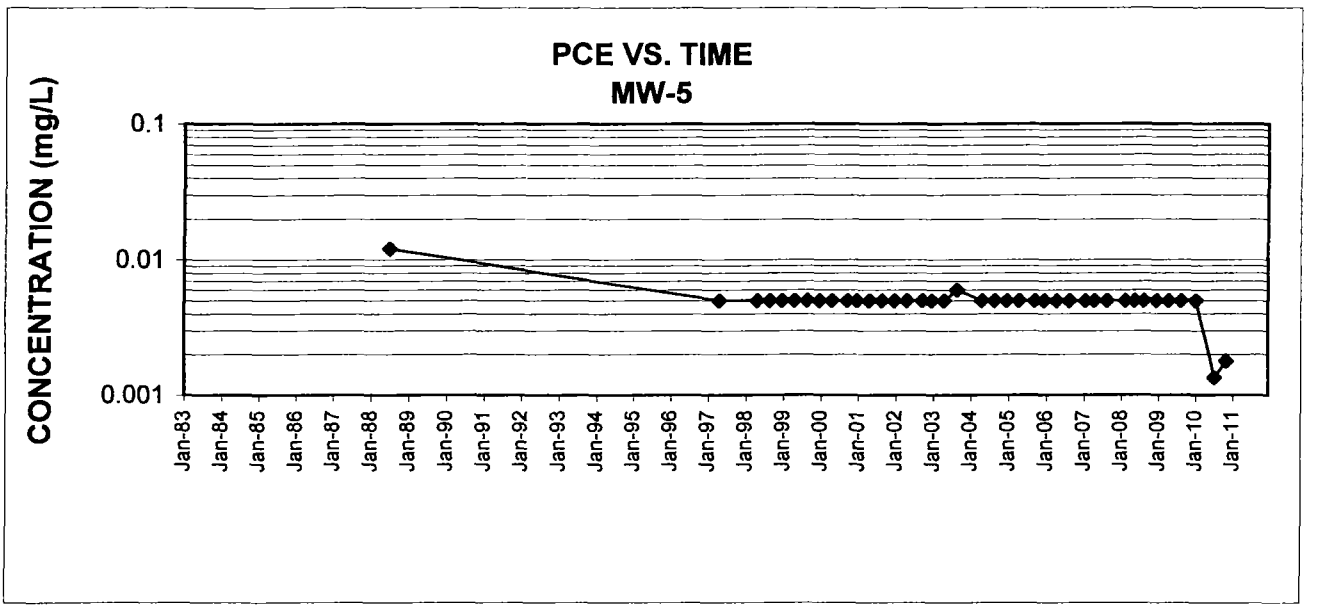
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11


PCE VS. TIME
MW-5
CONCENTRATION (mg/L)
0.1
0.01
0.001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
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Jan-94
Jan-95
Jan-96
Jan-97
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Jan-00
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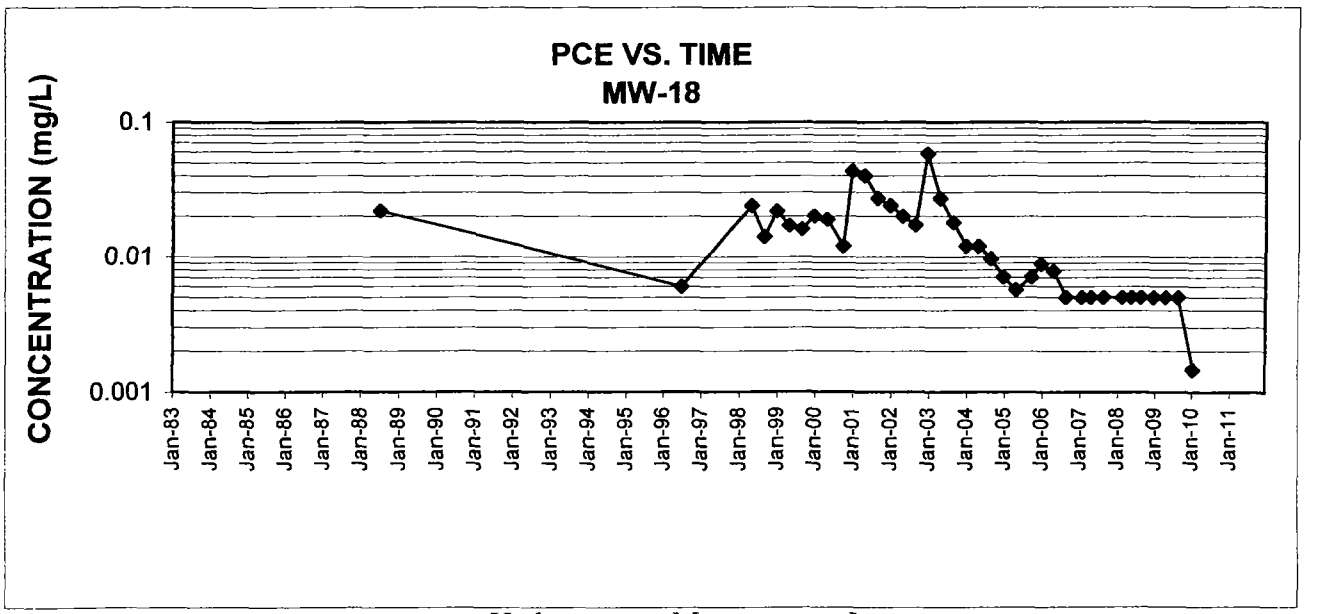
Jan-10
Jan-11


PCE VS. TIME
MW-18
CONCENTRATION (mg/L)
0.1
0.01
0.001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
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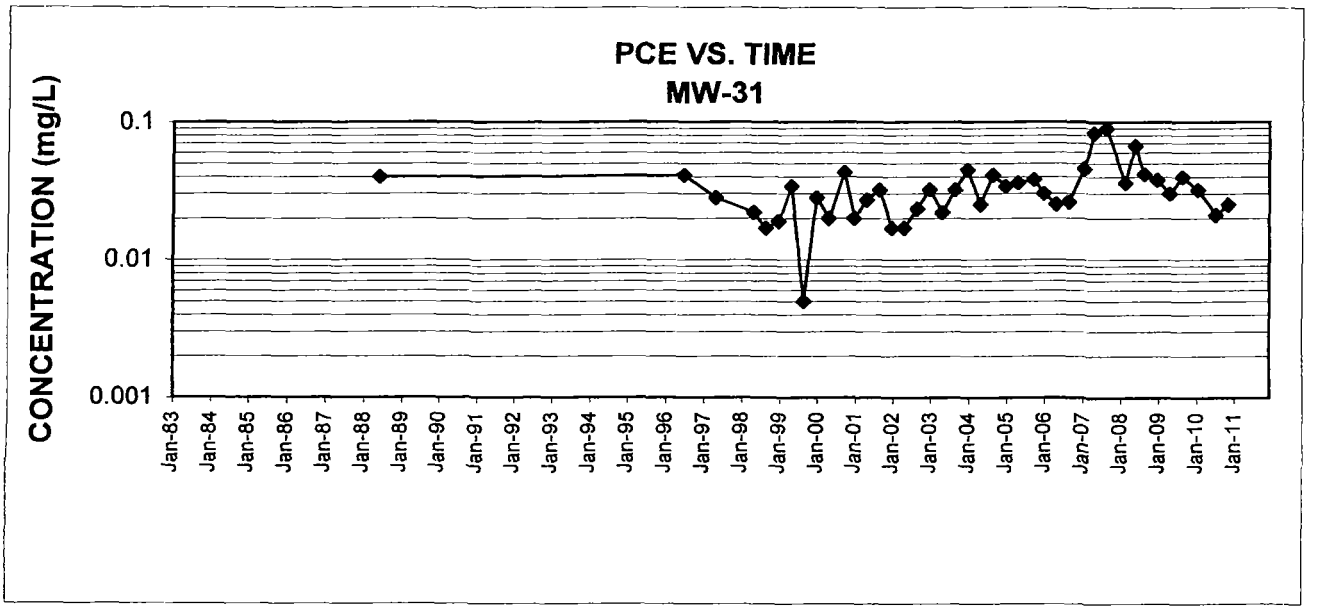
Jan-10
Jan-11


PCE VS. TIME
MW-31
CONCENTRATION (mg/L)
0.1
0.01
0.001
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
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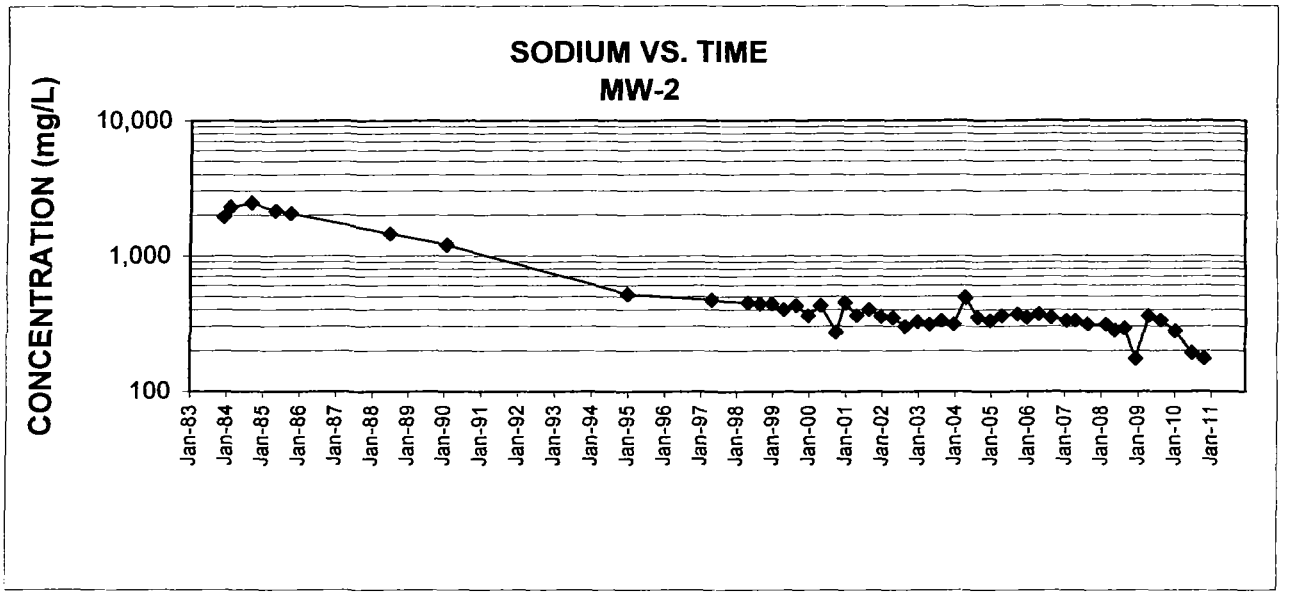
Jan-10
Jan-11

APPENDIX D-9

SODIUM


SODIUM VS. TIME
MW-2
CONCENTRATION (mg/L)
10,000
1,000
100
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
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Jan-99
Jan-00
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Jan-04
Jan-05
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Jan-07
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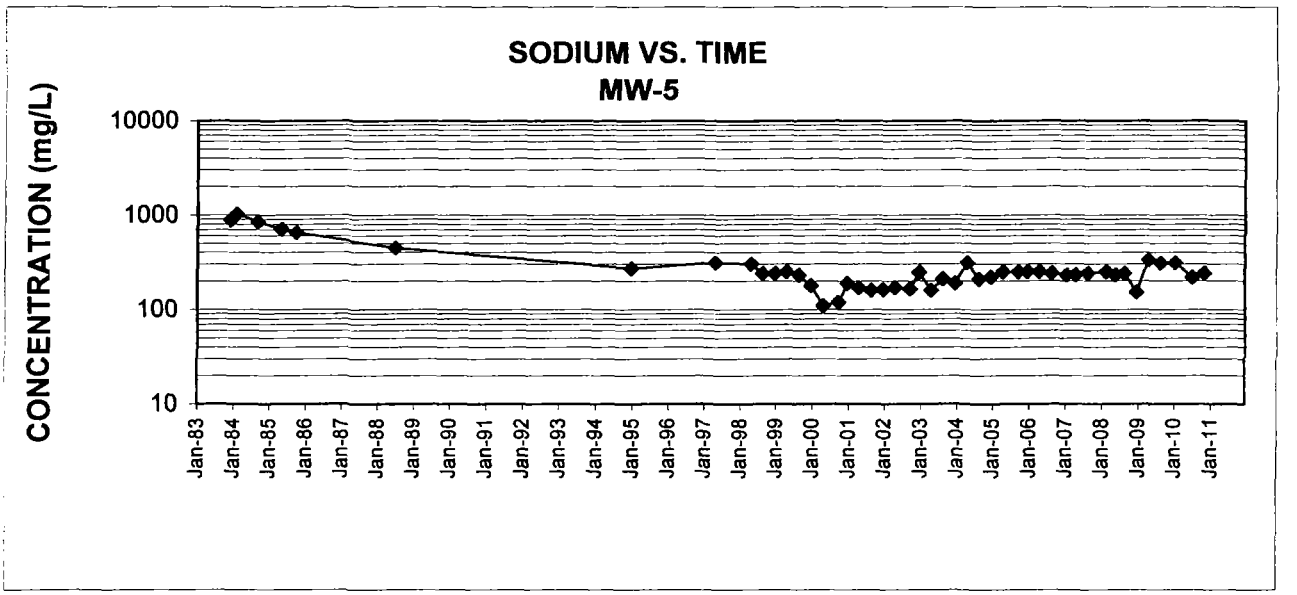
Jan-09
Jan-10
Jan-11


SODIUM VS. TIME
MW-5
CONCENTRATION (mg/L)
10000
1000
100
10
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
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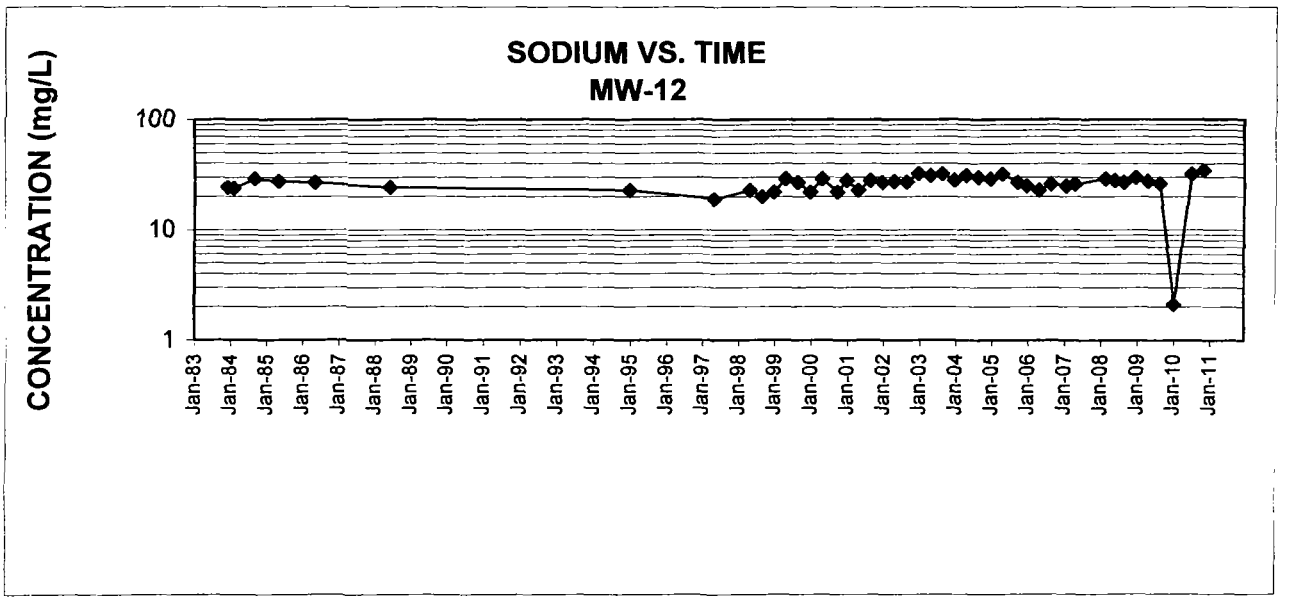
Jan-11


SODIUM VS. TIME
MW-12
CONCENTRATION (mg/L)
100
10
1
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
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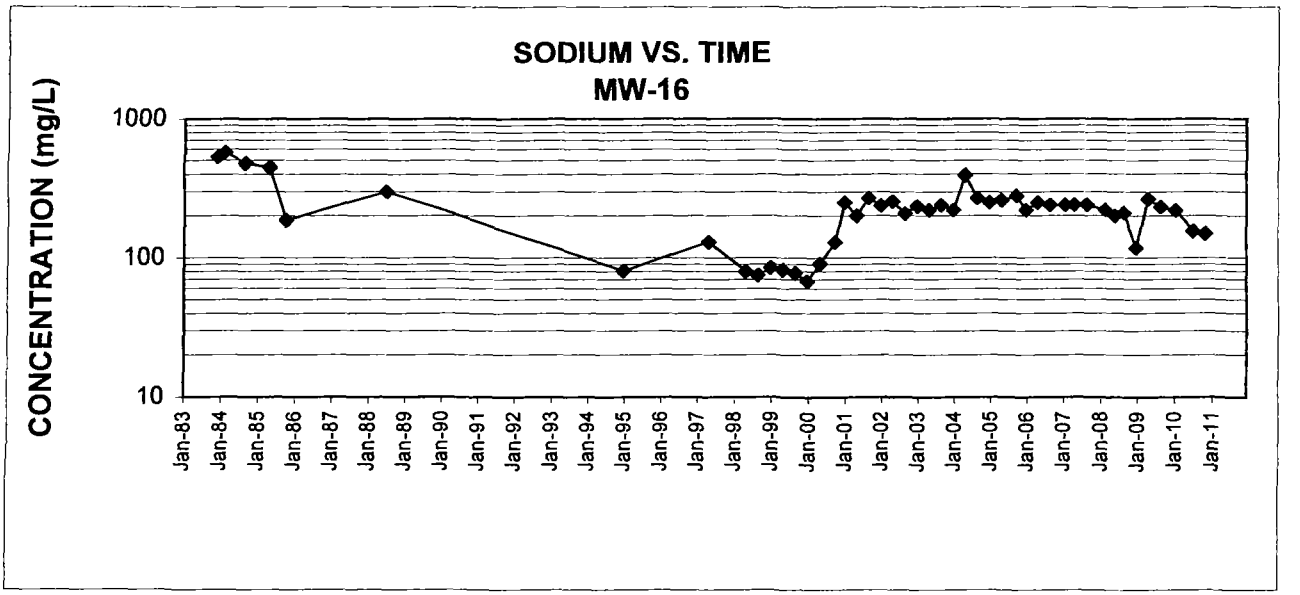
Jan-09
Jan-10
Jan-11


SODIUM VS. TIME
MW-16
CONCENTRATION (mg/L)
1000
100
10
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
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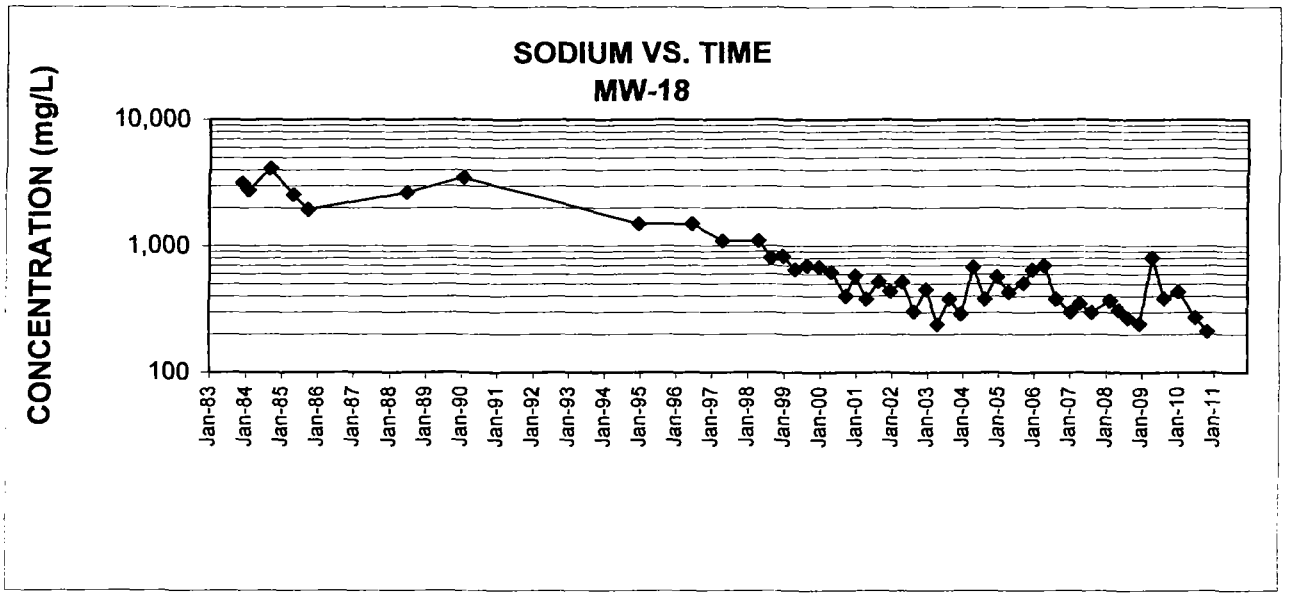
Jan-09
Jan-10
Jan-11


SODIUM VS. TIME
MW-18
CONCENTRATION (mg/L)
10,000
1,000
100
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
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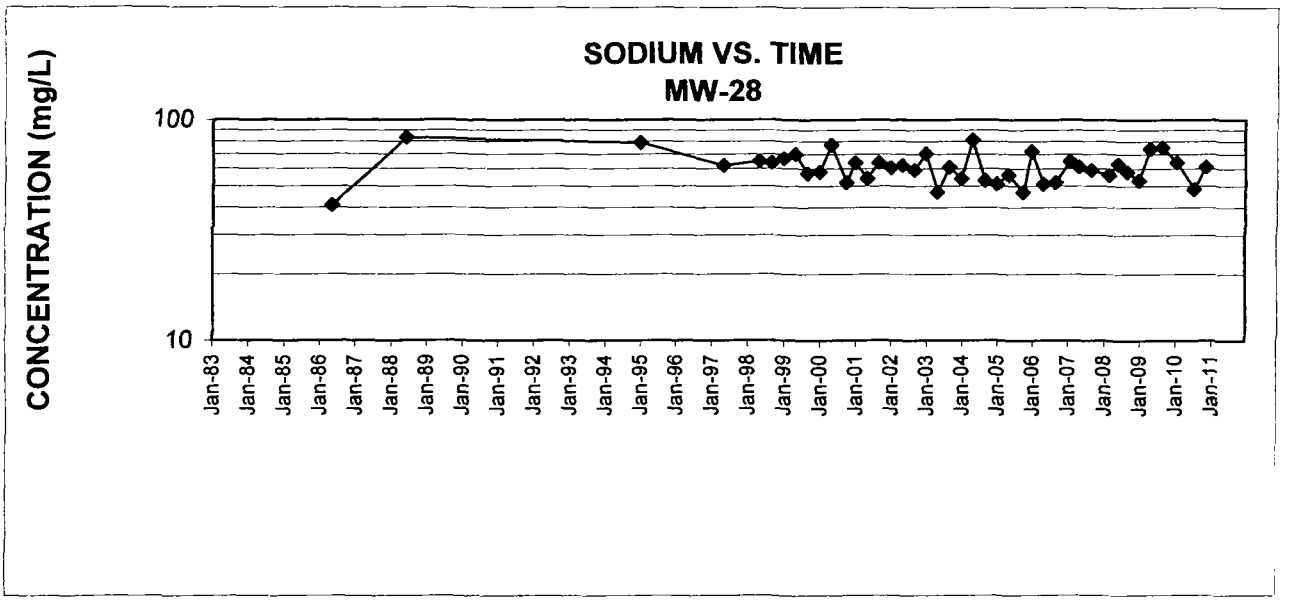
Jan-10
Jan-11


SODIUM VS. TIME
MW-28
CONCENTRATION (mg/L)
100
10
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
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Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
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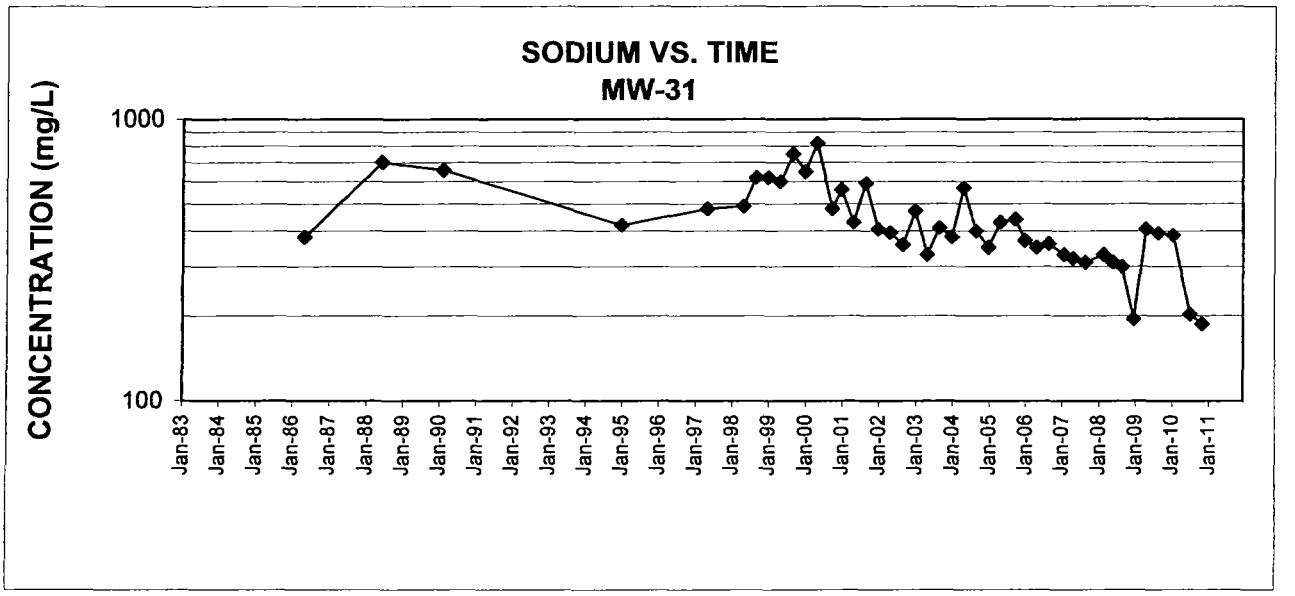
Jan-11


SODIUM VS. TIME
MW-31
CONCENTRATION (mg/L)
1000
100
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
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Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
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Jan-96
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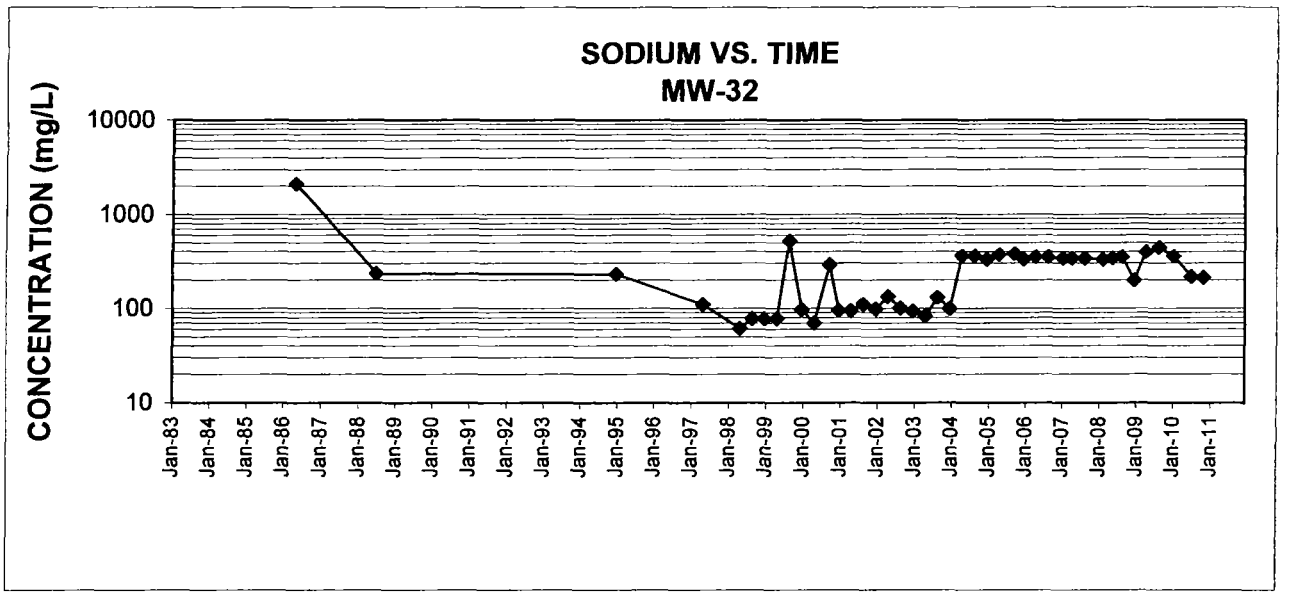
Jan-10
Jan-11


SODIUM VS. TIME
MW-32
CONCENTRATION (mg/L)
10000
1000
100
10
Jan-83
Jan-84
Jan-85
Jan-86
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Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
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Jan-95
Jan-96
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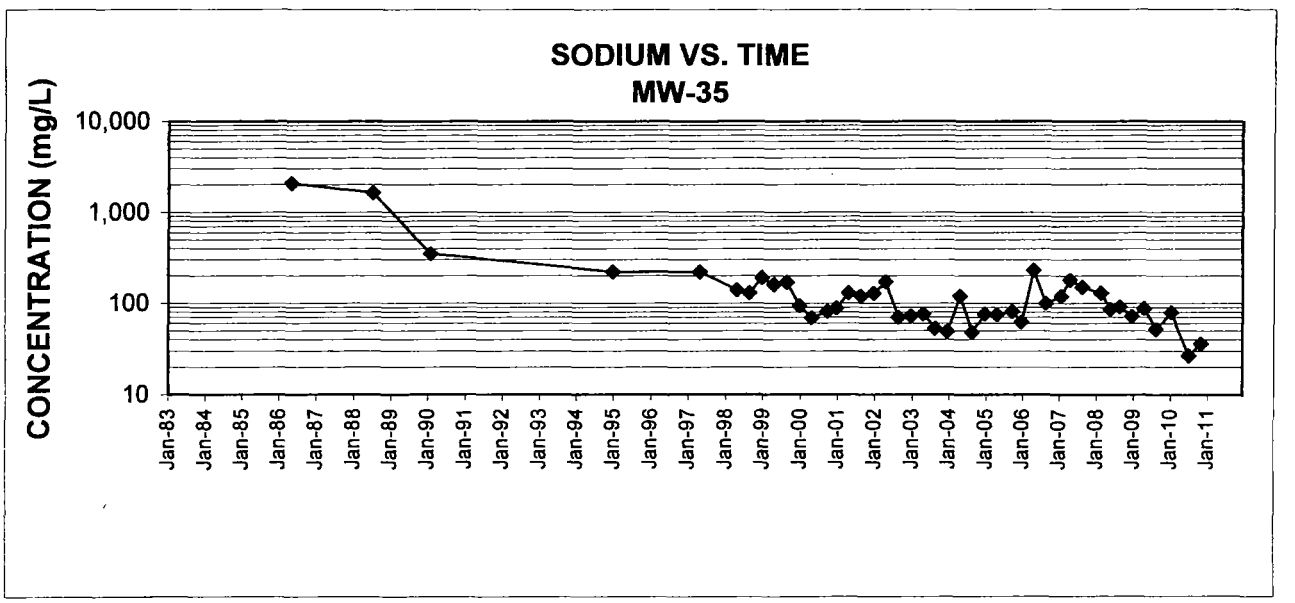
Jan-10
Jan-11


SODIUM VS. TIME
MW-35
CONCENTRATION (mg/L)
10,000
1,000
100
10
Jan-83
Jan-84
Jan-85
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Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
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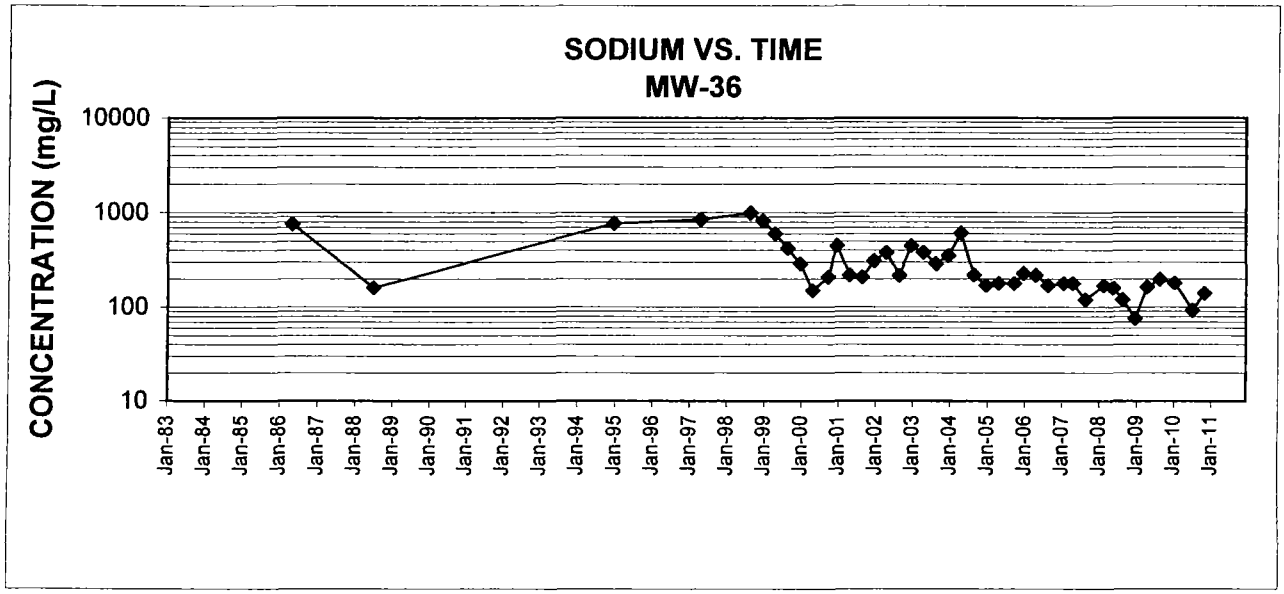
Jan-11


SODIUM VS. TIME
MW-36
CONCENTRATION (mg/L)
10000
1000
100
10
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
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Jan-98
Jan-99
Jan-00
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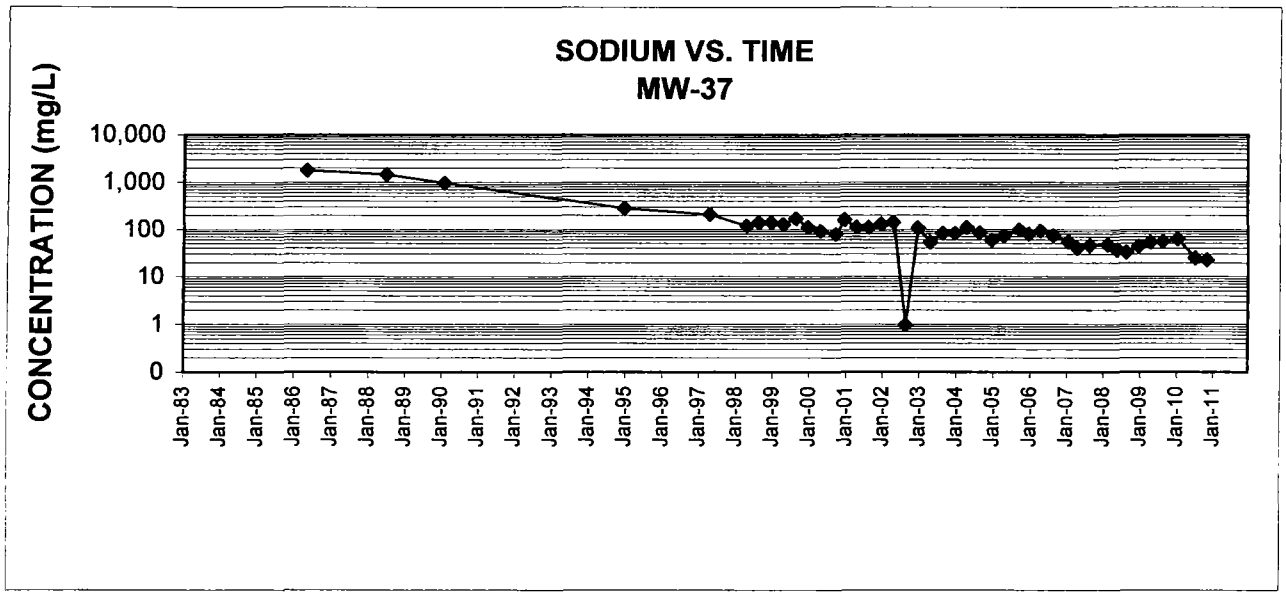
Jan-10
Jan-11


SODIUM VS. TIME
MW-37
CONCENTRATION (mg/L)
10,000
1,000
100
10
1
0
Jan-83
Jan-84
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
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Jan-96
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Jan-99
Jan-00
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APPENDIX E

CONTAMINANT MASS-IN-PLACE ESTIMATION AND SUPPORTING DATA

BASED ON JULY 2010 MONITORING EVENT

Hydrosystems Management, Inc.

APPENDIX E-1
ANALYTICAL RESULTS FOR GROUND-WATER SAMPLES
COLLECTED JULY 2010

ORMET CORPORATION
HANNIBAL, OHIO

SAMPLE I.D.:	MW-1	MW-2	MW-5	MW-7	MW-8	MW-10	MW-11	MW-12	MW-14	MW-15	MW-16	MW-17
Cyanide, Total	<0.005	6.43	1.38	0.007	0.173	<0.005	0.365	0.011	0.016	3.39/2.54	1.87	2.69/3.01
Fluoride	0.116	36.3	18.2	0.10	5.77	0.205	2.68	0.616	3.73	22.2/24.2	37.6	18.4/16.2

SAMPLE I.D.:	MW-18	MW-19	MW-28	MW-29S	MW-29D	MW-30	MW-31	MW-32	MW-34S	MW-34D	MW-35	MW-36
Cyanide, Total	4.35/3.96	<0.005	0.093	1.12	1.63	1.62	5.8	6.31	3.47	2.26	2.12	1.04/1.05
Fluoride	110/125	0.671	0.321	29	11.4	18.0	48.5	30.7	45.2	39.9	2.95	17/19

SAMPLE I.D.:	MW-37	MW-39S	MW-39D	MW-40S	MW-40D	MW-42S	MW-42D
Cyanide, Total	0.114	3.18	1.06	2.27	5.38	1.39	1.69
Fluoride	2.75	106	14	38.4	36.2	36.4	27.4

NOTE: All results in mg/L.

5.9/6.2 - Primary sample and duplicate sample.

APPENDIX E-1 (CONT.)
PLUME CONTOUR AREA CALCULATIONS
FOR TOTAL CYANIDE AND FLUORIDE
BASED ON RESULTS OF SAMPLING CONDUCTED JULY 2010

ORMET CORPORATION
HANNIBAL, OHIO

TOTAL CYANIDE	CONTOUR INTERVAL (from Figure 4)	CONTOUR AREA in sqare feet (estimated using CAD* software)
	0.2 - 1 mg/L	603,966
	1 - 5 mg/L	1,366,799
	5 mg/L	271,231

TOTAL FLUORIDE	CONTOUR INTERVAL (from Figure 3)	CONTOUR AREA in sqare feet (estimated using CAD* software)
	4 - 10 mg/L	305,647
	10 - 15 mg/L	283,192
	15 - 25 mg/L	416,970
	25 - 50 mg/L	814,133
	50 mg/L	11,196
	50 - 100 mg/L	224,743
	100 mg/L	11,055

* CAD - Computer Aided Drafting

APPENDIX E-1 (CONT.)
AVERAGE AQUIFER THICKNESS CALCULATIONS
WITHIN EACH PLUME CONTOUR INTERVAL
BASED ON RESULTS OF SAMPLING CONDUCTED JULY 2010

ORMET CORPORATION
HANNIBAL, OHIO

TOTAL CYANIDE

CONTOUR INTERVAL (from Figure 4)	MONITORING WELL ID	REPORTED CONCENTRATION (mg/L)	AQUIFER THICKNESS (in feet)	AVERAGE AQUIFER THICKNESS (b, in feet)
0.2 - 1 mg/L	MW-11 [MW34S&D]	0.365 NA	50.59 38.62	44.61
1 - 5 mg/L	MW-5 MW-15 MW-16 MW-17 MW-18 MW-29S&D MW-30 MW-34S&D MW-35 MW-36 MW-39S&D MW-40S&D MW-42S&D	1.4 3.4 1.9 3.0 4.4 1.4* 1.6 2.9* 2.1 1.1 2.1* 3.8* 1.5*	44.52 26.24 44.20 47.84 21.60 52.48 17.61 38.62 13.00 21.10 47.50 48.60 54.32	36.74
5 mg/L	MW-2 MW-31 MW-32	6.4 5.8 6.3	39.68 30.28 25.70	31.89

NOTE: In preparing the above-referenced isopleth map (i.e., Figure 4), the higher of the values reported for a primary and a duplicate sample, and the average of values for the shallow well and the deep well of a well cluster were used to draw contour lines.

* - Denotes average of the values for the shallow well and the deep well of a well cluster.

[ ] - Denotes use of a surrogate well for determination of a representative aquifer thickness.

NA - Not applicable.

APPENDIX E-1 (CONT.)
AVERAGE AQUIFER THICKNESS CALCULATIONS
WITHIN EACH PLUME CONTOUR INTERVAL
BASED ON RESULTS OF SAMPLING CONDUCTED JULY 2010

ORMET CORPORATION
HANNIBAL, OHIO

FLUORIDE

CONTOUR INTERVAL (from Figure 3)	MONITORING WELL ID	REPORTED CONCENTRATION (mg/L)	AQUIFER THICKNESS (in feet)	AVERAGE AQUIFER THICKNESS (b, in feet)
4 - 10 mg/L	MW-8 [MW-15]	5.8 NA	51.31 26.24	38.78
10 - 15 mg/L	[MW-15] [MW-5]	NA NA	26.24 44.52	35.38
15 - 25 mg/L	MW-5 MW-15 MW-17 MW-29S&D MW-30 MW-36	18.2 24.2 18.4 20.3* 18.0 19.0	44.52 26.24 47.84 52.48 17.61 21.10	34.97
25 - 50 mg/L	MW-2 MW-16 MW-31 MW-32 MW-34S&D MW-40S&D MW-42S&D	36.3 37.6 48.5 30.7 42.6* 37.3* 31.9*	39.68 44.20 30.28 25.70 38.62 48.60 54.32	40.20
50 mg/L	MW-39S&D	60.0*	47.50	47.50
50 - 100 mg/L	[MW-2] [MW-31]	NA NA	39.68 30.28	34.98
100 mg/L	MW-18	125	21.60	21.60

NOTE: In preparing the above-referenced isopleth map (i.e., Figure 3), the higher of the values reported for a primary and a duplicate sample, and the average of values for the shallow well and the deep well of a well cluster were used to draw contour lines.

* - Denotes average of the values for the shallow well and the deep well of a well cluster.

[ ] - Denotes use of a surrogate well for determination of a representative aquifer thickness.

NA - Not applicable.

APPENDIX E-1 (CONT.)
TOTAL CYANIDE AND FLUORIDE MASS-IN-PLACE
CALCULATION WORKSHEET
BASED ON RESULTS OF SAMPLING CONDUCTED JULY 2010

ORMET CORPORATION
HANNIBAL, OHIO

	Contour Interval	Contour Interval Area (in square feet) A	Average Aquifer Thickness (in feet) b	1. Aquifer Volume (in cubic feet) VA	Aquifer Porosity n	2. Volume of Ground Water (in cubic feet) Vgw	3. Volume of Ground Water (in Liters) Vgw	Average Concentration (mg/L) Cwi	4. Mass-in-Place for each interval (in mg) Mi	5. Mass-in-Place for each interval (in lbs) Mi
	(from Figure 4)									
TOTAL CYANIDE	5 mg/L	271,231	31.89	8,649,557	0.25	2,162,389	61,238,861	6.2	379,680,936	837
	1 - 5 mg/L	1,366,799	36.74	50,216,195	0.25	12,554,049	355,530,662	3.0	1,066,591,987	2,352
	0.2 - 1 mg/L	603,966	44.61	26,942,923	0.25	6,735,731	190,755,897	0.6	114,453,538	252
									Total Cyanide Mw:	3,441
	(From Figure 3)									
FLUORIDE	100 mg/L	11,055	21.60	238,788	0.25	59,697	1,690,619	125	211,327,380	466
	50 - 100 mg/L	224,743	34.98	7,861,510	0.25	1,965,378	55,659,492	75	4,174,461,884	9,205
	50 mg/L	11,196	47.50	531,810	0.25	132,953	3,765,215	60	225,912,888	498
	25-50 mg/L	814,133	40.20	32,728,147	0.25	8,182,037	231,715,278	38	8,805,180,561	19,415
	15 - 25 mg/L	416,970	34.97	14,581,441	0.25	3,645,360	103,236,602	20	2,064,732,031	4,553
	10 - 15 mg/L	283,192	35.38	10,019,333	0.25	2,504,833	70,936,877	13	922,179,406	2,033
	4 - 10 mg/L	305,647	38.78	11,852,991	0.25	2,963,248	83,919,174	7	587,434,217	1,295
									Total Fluoride Mw:	37,466

2. Vgw = VA x n
3. Vgw in ft3 multiplied by 28.32 L/ft3 = Vgw in Liters
4. Mi = Vgw x Cwi
5. Mi in mg divided by 1000 mg/g multiplied by 2.205x10-3 lb/g = Mi in pounds