932001

Fourth Quarter Year 2001 Monitoring Event Report and Annual Report for 2001, Site No. 932001, Airco Properties, Inc., Witmer Road Landfill Niagara Falls, New York

Prepared for

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April 2002
Project No. 12040.69

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CONTENTS

Page

LIST OF FIGURES

LIST OF TABLES

1. INTRODUCTION

EA Engineering, P.C. and its affiliate EA Engineering, Science, and Technology initiated the post-closure monitoring and facility maintenance program at the Witmer Road Landfill located in Niagara Falls, New York in December 2000. Post-closure monitoring and facility maintenance is required by New York State Solid Waste Management Facilities Regulations (6 NYCRR Part 360-2.15[k][4]) and stipulated in the Order on Consent No. B9-0470-94-12. The purpose of this monitoring event report is to summarize the analytical results of the fourth quarter Year 2001 ground-water monitoring event that was completed at this site in December 2001 and to summarize and evaluate analytical trends from the five monitoring events completed since December 2000.

1.1 OBJECTIVES

In accordance with the Revised Final Post-Closure Monitoring and Facility Maintenance Plan (EA 2001a), environmental monitoring points will be maintained and sampled during the post-closure monitoring period. Sampling includes collection of ground water, surface water, and leachate samples. The Revised Final Post-Closure Monitoring and Facility Maintenance Plan documents sampling locations and sampling parameters and methods, in addition to other required maintenance activities, such as landfill cap inspections. It is anticipated that within 5 years of the start of post-closure monitoring, this Plan will be re-evaluated based on the data collected at the site so that the monitoring plan will be focused to address site-specific issues that may be identified.

The objectives of the Post-Closure Monitoring and Facility Maintenance Program are to:

- Collect representative ground-water and surface water samples in order to monitor potential leachate migration from the landfill and to document the effectiveness of the recently installed landfill capping system
- Evaluate these data to determine whether potential impacts may be occurring that could affect human health or the environment
- Monitor and record leachate flow data
- Conduct quarterly landfill inspections
- Provide this information to the BOC Group and the New York State Department of Environmental Conservation (NYSDEC).

As noted in the Revised Final Post-Closure Monitoring and Facility Maintenance Plan, the results of the quarterly sampling events will be summarized in a letter report describing the findings of the environmental sampling. Monitoring event letter reports will be limited to documenting the results of each sampling round. This report summarizes the findings of the fifth

post-closure monitoring event completed at this site. This report also summarizes and evaluates ground water, surface water and leachate analytical results, leachate flow, and landfill inspection data collected for the five quarters since closure.

2. BACKGROUND

The Witmer Road Landfill is part of the Vanadium Corporation of America site that is located in the Town of Niagara Falls, New York (Figure 1). The Vanadium site is approximately 150 acres. This quarterly sampling event focused on the 25-acre Airco parcel operated by the BOC Group. The site contains waste material from the operation of onsite and nearby production facilities.

An Immediate Investigative Work Assignment (IIWA) was conducted by NYSDEC for a portion of the 150-acre parcel in August 1997. Approximately 70 acres from the Niagara Mohawk A National Grid Company (NMNGC) and New York Power Authority parcel were investigated. During the investigation, NYSDEC determined that the site had been used by Vanadium Corporation of America (the owners of the site from 1924 to 1964) to dispose of wood, brick, ash, lime slag, ferrochromium silicon slag, and ferrochromium silicon dust. According to the IIWA, much of the surface material consisted of fill, including fly ash, dust, slag, and cinder materials.

Analysis of site ground water during a preliminary site assessment that was reviewed as part of the NYSDEC IIWA indicated that surface water and ground-water standards were exceeded for hexavalent chromium and pH. Based on the IIWA and other investigations, the facility has been listed as a Class 2 Hazardous Waste Site in the New York State Registry of Inactive Hazardous Waste Sites (Site No. 932001). A Class 2 listing indicates a significant threat to public health and the environment, and requires remedial action.

Remedial measures were completed at the Witmer Road Landfill during 2000, which included installation of a low permeability cap and leachate relief system. A complete description of the history of the site, and the construction details of the landfill capping system, can be found in the Interim Remedial Measure Report (EA 2001b).

3. FOURTH QUARTER MONITORING EVENT – DECEMBER 2001 ACTIVITIES

The fourth quarter 2001 monitoring event included the following activities:

- Relief pipe flow monitoring (for the period 1-24 October)
- Monitoring well gauging
- Ground-water sampling
- Leachate sampling
- Surface water sampling
- Landfill engineering inspection.

The relief pipe flow monitoring was performed through 24 October 2001 since monitoring equipment was removed from the relief pipe on that date to prevent potential damage due to inclement weather. The equipment will be reinstalled and data collection will continue in Spring 2002. Further details on the December 2001 quarterly sampling activities are discussed below.

3.1 MONITORING WELL GAUGING

The site monitoring wells (MW-1B through MW-8B [Figure 2]) were gauged prior to sampling on 4 December 2001. The depth to water ranged from 4.56 ft at MW-6B to 13.50 ft at MW-2B. Gauging data recorded since December 2000 are summarized in Table 1.

Illustrations in Appendix A are the interpretations of ground-water flow patterns based on gauging data collected during each of the five quarterly sampling events. The ground-water contours were interpreted using two methods. The first interpretation is computer-generated from ground-water elevations measured during the quarterly events. The second interpretation illustrates the data based on ground-water elevations and a hydrogeochemical analysis of the ground-water analytical results. Hydrogeochemical analysis (in this case, trend graphs and scatter plots of analytical data) is used to provide a clearer picture of site hydrogeologic conditions. In addition to ground-water elevations, ground-water analytical results are evaluated to determine if the ground-water flow patterns are consistent with the surrounding ground-water chemistry.

Based on the second interpretive method, it appears that a ground-water divide bisects the landfill. This interpretation is consistent for each of the monitoring events since December 2000. Based on this evaluation, ground water flows from northwest to southeast and east and west off of the divide. This interpretation is consistent with the information from the IIWA.

3.2 GROUND-WATER, LEACHATE, AND SURFACE WATER SAMPLING

3.2.1 Sampling Procedures

Monitoring wells were sampled on 5 December 2001. Eight ground-water samples were collected from the site monitoring wells. Monitoring wells MW-2B, MW-4B, MW-5B, and

MW-7B were purged using dedicated bailers due to low recharge and well volume. These wells were bailed dry at least once and allowed to recharge prior to sample collection. Monitoring wells MW-1B, MW-3B, MW-6B, and MW-8B had adequate recharge rates. A minimum of 4 well volumes were removed and water quality readings were allowed to stabilize prior to sample collection, with the exception of MW-8B which was pumped dry after one well volume and then sampled after recharge.

One leachate sample (L-1) and one surface-water sample (SS-1) were also collected on 5 December 2001. Plans were made for the collection of a second surface water sample (SS-2); however, the sampling location was dry and no sample was collected. The surface water sample was collected from the wetland adjacent to monitoring well MW-6B. The leachate sample was collected directly from the leachate discharge pipe in the southwest corner of the landfill. Samples were submitted to Environmental Laboratory Services of North Syracuse, New York for analysis of phenolics by U.S. Environmental Protection Agency (EPA) Method 420.2, sulfate by EPA Method 375.3, ammonia (expressed as nitrogen) by EPA Method 350.2, silica by EPA Method 200.7, and Target Analyte List metals by EPA Series 6010/620 (including hexavalent chromium).

Ground-water sampling results were compared to NYSDEC Ambient Water Quality Standards (AWQS) and guidance values for Class GA waters. Leachate and surface water samples were compared to NYSDEC AWQS for Class D waters. If no Class D standards were applicable for a particular compound, analytical results were compared to the more stringent Class C standards. Analytical results are summarized on the table provided in Appendix B. Copies of the field notebook, including the results for well gauging, purging, and sampling, are provided in Appendix C. Laboratory chain-of-custody records are provided in Appendix D. Laboratory Form I analytical results are included in Appendix E.

3.3 ANALYTICAL RESULTS

Based on the analytical results collected during the fourth quarter 2000 and first quarter 2001, NYSDEC approved a reduction in the sampling requirements for the remaining 2001 sampling events. As per a letter to NYSDEC dated 5 June 2001, samples were analyzed for the following water quality parameters: ammonia, phenolics, and sulfate, and total (unfiltered) metals. Summary tables listing analytical results for the fourth quarter 2001 event compared to applicable NYSDEC AWQS are included in Appendix B. Notable results of chemical analyses are as follows.

3.3.1 Routine Metals

Unfiltered metals samples were collected from each of the site monitoring wells, the leachate discharge, and a surface water location (Figure 2). Notable results included the following:

- Hexavalent chromium, chromium, iron, magnesium, manganese, selenium, sodium, and thallium were detected in one or more of the ground-water samples and the leachate samples at concentrations in excess of NYSDEC AWQS.

3.3.2 Water Quality Parameters

Water quality parameters, including ammonia (expressed as N), phenolics, and sulfate, were also analyzed. Notable results included the following:

- Phenolics were detected above NYSDEC AWQS in the sample collected from monitoring well MW-7B

- Sulfate was detected in excess of NYSDEC AWQS in samples collected from monitoring wells MW-5B, MW-6B and the associated duplicate, and MW-8B

- Water quality parameters did not exceed NYSDEC AWQS in the surface water or leachate samples.

3.4 LANDFILL INSPECTION

A landfill cap inspection was conducted on 5 December 2001. The Landfill Cap Inspection Checklist is provided as Appendix F. No deterioration or damage to the landfill, cap, drainage swales, or access roads was noted during the engineering inspection. However, fence damage was noted near monitoring well MW-7B. It appears that a fence post was struck and buckled. In addition, NYSDEC reported that a portion of the perimeter fence was cut after the December 2001 inspection. Both damaged areas were repaired in January 2002 and are discussed in Section 4.3.

4. ANNUAL SUMMARY OF POST-CLOSURE MONITORING AND FACILITY MAINTENANCE FOR THE PERIOD DECEMBER 2000 THROUGH DECEMBER 2001

4.1 WATER LEVEL GAUGING PROGRAM

During the 2001 monitoring events, ground-water monitoring wells were gauged to obtain depth to water measurements (Appendix A). Well gauging was conducted as part of quarterly sampling events completed in December 2000, and March, June, September, and December 2001. A summary of the quarterly gauging data includes interpretive water table elevation contour maps developed for the data collected during the quarterly sampling events. The data are also summarized on Table 1. Based on the gauging data alone, ground water flows from northwest to southeast with localized variations.

As stated earlier, a review of the IIWA indicates that an overburden ground-water divide bisects the landfill. The divide trends along the northern and eastern perimeter. The IIWA had a number of additional monitoring wells from which to collect data, which augmented their interpretation. However, a hydrogeochemical evaluation that couples the analytical results with ground-water elevation data for each sampling event provides an alternative interpretation of ground-water flow patterns. These alternative interpretations are provided in Appendix A (interpreted ground-water contour maps). It appears that a ground-water divide exists along the central and eastern portion of the landfill. Additional information and evaluation of the data discussed in subsequent sections of this report clarify and support this interpretation of the ground-water flow patterns. Using this interpretation, ground water flows from northwest to southeast and off the flanks of the divide.

4.2 MONITORING, SAMPLING, AND ANALYSIS PROGRAM

Ground-water, surface water, and leachate samples were collected on the following dates, unless otherwise indicated: 5 and 6 December 2000, 21 and 22 March 2001, 12 and 13 June 2001, 18 and 19 September 2001, and 4 and 5 December 2001. Summary tables and tag maps for each quarterly sampling event are provided in Appendix G. During this timeframe, two 6 NYCRR Part 360-2.11 baseline (December 2000 and March 2001) and three modified routine sampling events were completed (June, September, and December 2001). The NYSDEC-approved modification of the routine sampling events consisted of a reduced parameter list based on the analytical results for numerous sampling events completed at this site in the past. The modification of the sampling events required analysis for a limited number of metals, water quality parameters, and collection of field parameters. During the June, September, and December 2001 sampling events, the metals list was reduced to chromium, hexavalent chromium, iron, lead, magnesium, manganese, selenium, silica, sodium, and zinc. In addition, after the March 2001 event, only unfiltered samples were collected at this site.

4.2.1 Volatile Organic Compounds

4.2.1.1 Fourth Quarter – December 2000

During December 2000, six ground-water samples and one duplicate sample were collected from the site monitoring wells. Samples were not collected from monitoring wells MW-4B or MW-5B due to insufficient water volumes for sampling. Samples were also collected from surface water and leachate sampling locations.

As noted above, during December 2000, a baseline sampling event was completed. Baseline events required the analysis for volatile organic compounds, metals, and water quality parameters. Analysis of ground-water samples in December 2000 indicated that trichloroethene and 1,1-dichloroethene were detected in ground-water samples at concentrations below NYSDEC AWQS. No volatile organic compounds were detected in surface water, leachate, or quality control samples.

4.2.1.2 First Quarter – March 2001

No volatile organic compounds were detected in ground-water samples collected during the first quarterly sampling event completed in March 2001.

Part 360 routine sampling events do not require volatile organic compound analysis; therefore, no volatile organic compound data were collected during the June, September, and December 2001 sampling events.

4.2.2 Baseline Metals

4.2.2.1 Fourth Quarter – December 2000

During December 2000, six ground-water samples, one surface sample, and one leachate sample were collected. Ground-water samples were collected from monitoring wells MW-1B, MW-2B, MW-3B, MW-6B, MW-7B, and MW-8B. Baseline metals sampling included analysis of total metals using unfiltered samples, and dissolved metals using filtered samples. Filtered samples were collected to assess the degree at which turbidity may affect the concentrations of metals within each sample. Notable results included the following:

- Chromium, iron, lead, magnesium, selenium, sodium, and thallium were detected in excess of NYSDEC AWQS in both filtered and unfiltered ground-water samples. Cadmium, hexavalent chromium, and zinc were also detected in concentrations above NYSDEC AWQS in unfiltered ground-water samples

- Total and dissolved selenium and thallium were detected in excess of NYSDEC AWQS in the surface water sample

- Total and dissolved chromium and total hexavalent chromium were detected in excess of NYSDEC AWQS in the leachate sample.

4.2.2.2 First Quarter – March 2001

During March 2001, eight ground-water samples, one leachate sample, and one surface water sample were collected and analyzed for Part 360 baseline parameters. Monitoring wells MW-1B, MW-2B, MW-3B, MW-4B, MW-5B, MW-6B, MW-7B, and MW-8B were sampled. Both filtered and unfiltered metal samples were collected during this event.

- Total chromium, hexavalent chromium, iron, magnesium, manganese, nickel, sodium, and thallium were detected in ground-water samples at concentrations in excess of NYSDEC AWQS
- Filtered cadmium, chromium, magnesium, and sodium were detected at concentrations in excess of NYSDEC AWQS
- Iron was detected in the surface water sample in excess of NYSDEC AWQS
- Total hexavalent chromium, chromium, and dissolved chromium were detected in excess of NYSDEC AWQS in the leachate sample.

4.2.3 Routine Metals

4.2.3.1 Second Quarter – June 2001

Eight ground-water samples, one leachate sample, and one surface water sample were collected during this sampling event. Monitoring wells MW-1B, MW-2B, MW-3B, MW-4B, MW-5B, MW-6B, MW-7B, and MW-8B were sampled. Only unfiltered samples were collected during this event. Results included:

- Total chromium, hexavalent chromium, iron, magnesium, manganese, and sodium were detected in ground-water samples at concentrations in excess of NYSDEC AWQS
- Iron and selenium were detected in the surface water sample in excess of NYSDEC AWQS
- Chromium and hexavalent chromium were detected in excess of NYSDEC AWQS in the leachate sample.

4.2.3.2 Third Quarter – September 2001

Six ground-water samples were collected from site monitoring wells during this sampling event. Monitoring wells MW-4B and MW-5B contained less than 1 ft of standing water in each, thus

providing insufficient water for sampling. Monitoring wells MW-1B, MW-2B, MW-3B, MW-6B, MW-7B, and MW-8B were sampled. A leachate sample was collected from the riser pipe at the leachate outfall. No surface water sample was collected. Notable results include:

- Total chromium, hexavalent chromium, iron, lead, magnesium, manganese, selenium, and sodium were detected in ground-water samples at concentrations in excess of NYSDEC AWQS

- Hexavalent chromium was detected in excess of the NYSDEC AWQS in the leachate sample. However, no discharge was observed from this location at the time of sample collection.

4.2.3.3 Fourth Quarter – December 2001

During December 2001, eight ground-water samples, one leachate sample, and one surface water sample were collected. Monitoring wells MW-1B, MW-2B, MW-3B, MW-4B, MW-5B, MW-6B, MW-7B, and MW-8B were sampled. Notable results included the following:

- Chromium, iron, magnesium, manganese, selenium, sodium, and thallium were detected in one or more of the ground-water samples at concentrations in excess of NYSDEC AWQS.

4.2.4 Water Quality Parameters

Water quality parameters, including alkalinity, ammonia (expressed as N), biological oxygen demand, chloride, chemical oxygen demand, nitrates (expressed as N), pH, phenolics, sulfate, total dissolved solids, total kjedahl nitrogen, and total organic carbon were analyzed during each sampling event.

4.2.4.1 Fourth Quarter – December 2000

Results from this sampling event included:

- Phenolics were detected above the AWQS in the sample collected at MW-2B

- Sulfate was detected in excess of the AWQS in samples collected from monitoring wells MW-6B and MW-8B.

4.2.4.2 First Quarter – March 2001

Results from this sampling event included:

- Phenolics were detected above the AWQS in the sample collected at MW-7B
- Sulfate was detected in excess of the AWQS in samples collected from monitoring wells MW-6B and MW-8B
- Water quality parameters did not exceed NYSDEC AWQS in the surface water or leachate samples.

4.2.4.3 Second Quarter – June 2001

- Phenolics were detected above the AWQS in the sample collected at MW-7B
- Sulfate was detected in excess of the AWQS in samples collected from monitoring wells MW-4B, MW-5B, MW-6B, and MW-8B
- Water quality parameters did not exceed NYSDEC AWQS in the surface water or leachate samples.

4.2.4.4 Third Quarter – September 2001

- Sulfate was detected in excess of the AWQS in samples collected from monitoring wells MW-6B and MW-8B. Ammonia was detected in excess of NYSDEC AWQS in MW-1B.
- Water quality parameters did not exceed NYSDEC AWQS in the surface water or leachate samples.

4.2.4.5 Fourth Quarter – December 2001

- Phenolics were detected above NYSDEC AWQS in the sample collected from monitoring well MW-7B
- Sulfate was detected in excess of NYSDEC AWQS in samples collected from monitoring wells MW-5B, MW-6B and the associated duplicate, and MW-8B.

4.3 QUARTERLY LANDFILL ENGINEERING INSPECTIONS

Landfill engineering inspections were completed during each of the quarterly sampling events. The landfill inspection checklists are provided in Appendix F. Following is a summary of the findings for each quarterly event.

4.3.1 December 2000

The landfill cap inspection was completed 29 November 2000. Notable results include:

- No cap erosion or exposed geotextile was noted on the ground surface. However, the geotextile fabric along the access road on the eastern side of the site is exposed. Additional stone is scheduled to be placed during 2001 to rectify this issue.
- The following areas require regrading:
  - Drainage ditch along the west and south of the site
  - Intermittent stream beyond the eastern fence-line
- Unauthorized access was noted, i.e., all-terrain vehicle tracks and attempted cutting of exterior access road fence lock.

4.3.2 March 2001

The landfill cap inspection was completed 1 March 2001. Notable results include:

- Erosion was noted in the southeast corner and the western side of the cap. No exposed geotextile was noted on the ground surface
- The drainage along the west and south of the site requires regrading
- A portion of the fence was damaged (by wind) along the north side of the landfill.

4.3.3 June 2001

Landfill cap inspections were completed 22 May and 19 June 2001. Notable results include:

- Three main "washout" locations were observed on the western side of the landfill. Two of three washout locations were converted to rock-lined drainage swales. The third "washout" location was repaired according to the original cap design.
- The southern access road and the NMNGC ditch to the east of the landfill were regraded
- The geotextile fabric that was exposed at locations along the eastern access road has been covered by additional stone
- The relief pipe discharge was redirected to the south to avoid contact with the abutting property to the west.

On 18 and 19 June 2001, a number of repairs were completed at the site. These repairs were the result of the damage noted during the quarterly landfill engineering inspections completed in December 2000, and March and June 2001. The primary repair to be completed was drainage damage to the cap. The following tasks were completed:

- Regrading of damaged caused by drainage off the cap. A second location was noted during a site walk, which was repaired 19 June 2001.
- Installation of geotextile
- Covered exposed fabric with crushed stone
- Placed topsoil on regraded areas and areas disturbed by construction activities
- Leveled stone for purge water drum shed. Shed was delivered on 19 June 2001
- Regraded the ditch adjacent to NMNGC property to facilitate flow of leachate
- Placed topsoil along southern bank to back fill washout areas. The areas were filled by hand and hay bales were placed at the top to hinder surface flow.
- Regraded the leachate discharge under the southern fence
- Repaired damaged caused by construction activities.

4.3.4 September 2001

The landfill cap inspection was completed on 18 September 2001. No deterioration or damage to the landfill cap, drainage swales, or access roads was noted during the engineering inspection.

4.3.5 December 2001

Landfill cap inspection was conducted on 5 December 2001. No deterioration or damage to the landfill, cap, drainage swales, or access roads was noted during the engineering inspection. However, damage to the fence adjacent to monitoring well MW-7B was noted. A post appeared to be damaged during mowing completed at the site. The post in this area was replaced in January 2002. During this repair, approximately 1 ft of fence was replaced. In addition, a portion of the fence had been cut in the southeast corner of the site. Approximately 1 ft of fence was replaced in this area. Warning signs were also installed. The signs were installed every 40-50 ft along the perimeter of the fence.

4.4 RELIEF PIPE FLOW MONITORING

A relief pipe monitoring system was installed in August 2001 to quantify the flow of water from the relief pipe. The system was designed to record the flow discharging from the pipe. Data were collected from 1 August to 24 October 2001. Table 2 and Figure 3 summarize the data that were collected during that time. From 11 September to 15 October 2001, no leachate discharged through the system. The maximum daily discharge between 1 August and 24 October was 7,078 gal. The total discharge during this timeframe was 44,484 gal.

An evaluation of the rainfall during the reporting period (Appendix H) indicates that there is not a rapid response in flow rate after the start of a significant rainfall event. The precipitation data in the Buffalo, New York area during the reporting period indicate below normal rainfall from July to September 2001. During October 2001, the rainfall was 1.25 in. above normal. The total rainfall was 4.34 in. The conditions from July through early to mid-October would likely preclude a rapid response to infiltration because available water would be lost to evaporation, evapotranspiration, and trapped in the vadose zone. Data from mid- to late October 2001 indicate that rainfall was more consistent and discharge appears to have increased accordingly, suggesting that the relief pipe may be in contact with the water table, and not perched ground water as previously expected. However, additional data from different seasons are required to fully evaluate the connectivity of the relief pipe to the ground-water table. Therefore, the equipment will be reinstalled in the spring and data will be collected through 2002 as weather permits. At the conclusion of data collection in 2002, final data interpretation will be performed and conclusions and recommendations will be evaluated.

4.5 HYDROGEOCHEMICAL EVALUATION

The summary of analytical results indicates that through the reporting period there were a number of elevated concentrations of metals observed at various locations at this site.

In order to provide a clearer picture of what is occurring hydrogeochemically at the site, EA has constructed trend graphs and scatter plots of various analytes to determine the locations where leachate indicators have impacted ground water. Trend graphs provide a picture of the analytes of concern and the variations in their concentrations through time. Scatter plots of concentrations of ions provide an opportunity to improve the conceptual model of site hydrogeology and also monitor the effectiveness of the landfill cap in reducing leachate concentrations through time. They also provide an opportunity to further modify the ground-water sampling requirements for the site by identifying the analytes of concern and designing the sampling program to monitor those specific analytes.

Appendix I provides trend graphs for the various metals and water quality parameters detected at each of the sampling locations. Analytical results collected during the NYSDEC IIWA are included in these trend graphs.

Using the leachate samples as a baseline or initial source, it is possible to determine what effect the leachate generated at the Witmer Road Landfill has on the ambient ground-water chemistry, and it is possible to determine the effect of offsite sources. This can be coupled with known hydrogeologic characteristics to provide a picture of the ground-water chemistry at the site and the surrounding area.

A review of the trend graphs indicates the following general observations.

MW-1B, MW-3B, MW-5B, and MW-6B

These well locations have had consistent concentrations of analytes through the reporting period. Well MW-1B had concentrations of chromium and hexavalent chromium above NYSDEC AWQS during the March 2001 sampling event. Wells MW-5B and MW-6B had relatively high concentrations of iron during two separate sampling events, December 2001 and June 2001 respectively. During these sampling events, turbidity during sample collection at wells MW-5B and MW-6B was also elevated, suggesting that the iron concentrations at these locations during these events may have been an artifact of elevated turbidity.

MW-2B

The trend graphs for monitoring well MW-2B depict a gradual increase in the chromium and hexavalent chromium concentrations through the reporting period.

MW-4B

The trend graphs for this sampling location indicate that there have been fluctuations in the concentrations of chromium and hexavalent chromium through the reporting period. The December 2000 and September 2001 sampling events indicate that the concentration of the ions was below the NYSDEC AWQS. The concentrations during the March, June, and December 2001 sampling events were above the AWQS.

MW-7B

The graphs indicate a gradual decrease in the concentration of chromium and hexavalent chromium since December 2000. However, the concentrations remain above the AWQS.

MW-8B

The graphs indicate that there was a spike in the concentration of chromium and hexavalent chromium during the June 2001 sampling round. The concentrations of these ions were consistent during the other sampling events. The concentrations were above the AWQS during each sampling events.

Surface Water Sample SS-1

The graphs for the surface water sampling point indicate that there was a single spike of chromium and hexavalent chromium above the AWQS during the December 2001 sampling event. Data from the other sampling rounds indicate concentrations for these ions were below the AWQS.

Relief Pipe Sample L-1

The graphs illustrate that there are elevated concentrations of chromium and hexavalent chromium above the AWQS at this sampling location. Since June 2001, it appears that the concentrations of these ions have decreased. In addition, there was a single elevated concentration of phenols above the AWQS in September 2001. The concentration of phenol during the remaining sampling events has been below the AWQS.

The graphs also indicate that the primary leachate indicators are chromium, hexavalent chromium, sodium, and ammonia. These four analytes provide a chemical signature that may be used to identify locations where leachate generated from the debris at the Witmer Road Landfill has impacted ground water and surface water. It is important to evaluate the data to determine if these four leachate indicators are found in upgradient sampling locations. If the analytes are found at upgradient locations at concentrations similar to those found in the leachate, it can be concluded that the concentrations of these analytes are representative of ambient water quality and should be evaluated as such.

The hydrogeochemical signature of ground water at upgradient monitoring well MW-1B indicates that, relative to the leachate, ground water at this location is high in sulfate, magnesium, sodium, and silica. Other wells with similar signatures to MW-1B include MW-3B, MW-5B, and MW-6B. The wells sampled during the IIWA, including MW-103A, MW-104A, and MW-105A also appear to fall in the ambient water zone. These wells are located on the NMNGC property east, north, and northeast of the BOC site, respectively. Sodium is common to both the leachate and the background ground water and in similar concentrations, making it a poor leachate indicator. The lack of ammonia, chromium, and hexavalent chromium concentrations in ambient or background ground-water samples suggests that these parameters may be effective leachate indicators and can be used to identify areas where leachate has impacted local ground water.

Scatter plots of chromium and hexavalent chromium (Appendix I) indicate that there are essentially three zones of water at this site. The first zone is the ambient ground water. The second zone is the mixing zone where ambient ground water mixes with leachate. The third zone is leachate. The ambient ground water zone is identified by low concentrations of chromium and hexavalent chromium. The leachate zone is identified by elevated concentrations of chromium and hexavalent chromium. The mixing zone where leachate and ambient ground water combine falls between these clusters. The scatter plots reinforce the results of the trend graphs. Monitoring wells MW-1B, MW-3B, MW-5B, and MW-6B are consistent with ambient ground-

water quality. Monitoring wells MW-2B, MW-4B, MW-7B, and MW-8B appear to fall within a mixing zone of leachate and ambient ground water. Monitoring well MW-2B appears to be the most highly impacted monitoring well. It has had consistently higher concentrations of chromium and hexavalent chromium than the other wells in the mixing zone. MW-2B has also had elevated concentrations of ammonia similar to leachate.

One of the metals of concern has been silica. From the trend graphs and scatter plots, it appears that the leachate samples have low silica concentrations, while the background ground water has relatively elevated concentrations of silica. The wells located within the mixing zone have slightly elevated concentrations of silica. This suggests that the source of the silica might be a local offsite source, not from the Witmer Road Landfill.

The results of the scatter plots confirm the conceptual model of ground-water flow described in the IIWA report completed by the NYSDEC. The mixing zone wells are found at points on either side of the overburden ground-water divide, resulting in slight variations in sample chemistry at those locations. The divide also prevents more widespread migration of leachate-impacted ground water.

5. CONCLUSIONS AND RECOMMENDATIONS

Based on the evaluation of the data through the reporting period of December 2000 through December 2001, EA makes the following conclusions and recommendations.

5.1 GROUND-WATER ANALYSIS

Analytical results for metals indicate that the primary leachate indicators are chromium, hexavalent chromium, sodium, and ammonia. Of these, sodium is common to ground water found at this site; therefore, it was eliminated as an effective leachate indicator. Using the remaining analytes, it was observed that wells MW-1B, MW-3B, MW-5B, and MW-6B have similar ground-water chemistry and are consistent with ambient or background ground-water quality. The chemistry of these wells is also similar to three of the offsite wells sampled during the IIWA (MW-103A, MW-104A, and MW-105A), which further support the premise that the wells are consistent with ambient or background ground-water quality.

Wells MW-2B, MW-4B, MW-7B, and MW-8B have similar hydrogeochemical signatures. Their chemical signatures suggest that these wells lie in a mixing zone between leachate and ambient ground water. This is supported by the ground-water flow patterns identified at the site by the NYSDEC in the IIWA report and through slight modifications of EA's ground-water flow patterns.

Silica has been identified as a contaminant of concern. Based on the concentrations of silica identified in leachate and in the samples collected from the wells in the mixing and ambient ground-water zones, it appears that concentrations of silica are the result of offsite activities and not the result of leachate migration from this landfill.

Based on the analytical results since December 2000, EA recommends that the current post-closure monitoring frequency remain at four routine sampling events for 2002. As previously performed, sampling analysis will include phenolics by EPA Method 420.2, sulfate by EPA Method 375.3, ammonia (expressed as nitrogen) by EPA Method 350.2, silica by EPA Method 200.7, and Target Analyte List metals by EPA Series 6010/6020, including hexavalent chromium (SM18 3500-CR D[1]). At the end of this period, an evaluation of the analytical data will be completed and a modified list of analytes and sampling frequency will be submitted for NYSDEC approval.

5.2 LANDFILL INSPECTIONS

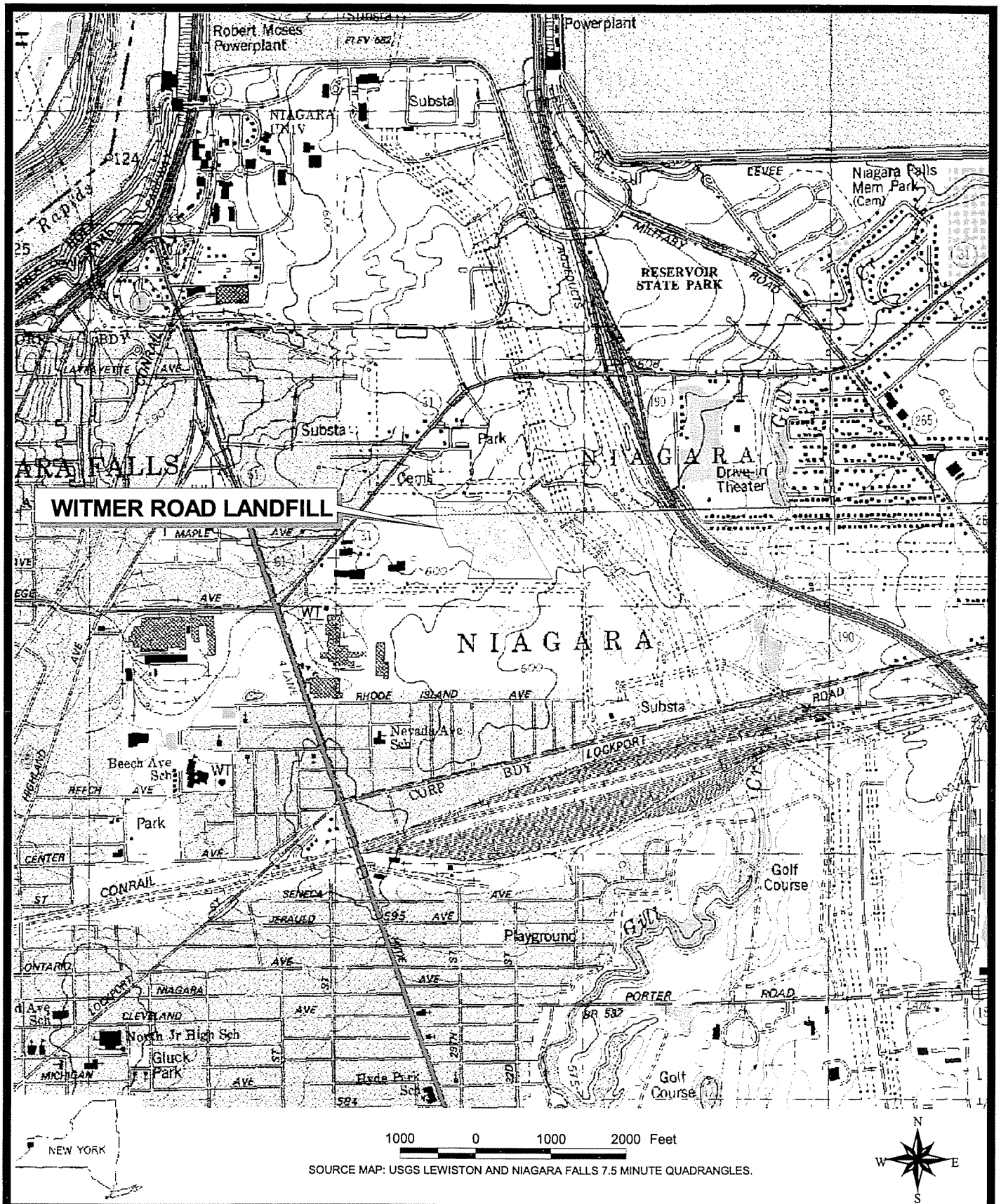
Landfill inspections should continue to be completed on a quarterly basis. Incidents of fences being damaged and people entering the site have been noted during 2001, requiring repair of fences and installation of warning signs. Landfill repairs were completed in June 2001 and

4. American Public Health Association, American Water Works Association, and Water Environment Federation. 1998. Standard Method for Examination of Water and Wastewater, 20th Edition.

January 2002. These repairs addressed drainage, erosion, and fence damages that occurred during the reporting period. In addition, the inspections should continue to monitor the condition of the landfill cap and the surrounding drainage areas to identify areas where excess erosion has or may occur.

5.3 RELIEF PIPE FLOW MONITORING

From 1 August until 24 October, 44,484 gal of leachate were discharged from the leachate relief pipe. There was no leachate discharge from the relief pipe throughout September. Leachate discharge did not appear to respond rapidly to precipitation events. Because of drought conditions, this lack of a response may be the result of the loss of any available water to plants, evaporation, or being trapped in pore spaces in the vadose zone. Leachate flow monitoring will resume during spring 2002. The data will be downloaded during the sampling events and landfill engineering inspections. The results of the additional flow monitoring will be discussed during a technical review meeting in fall 2002.



SOURCE MAP: USGS LEWISTON AND NIAGARA FALLS 7.5 MINUTE QUADRANGLES.

EA ENGINEERING, SCIENCE, AND TECHNOLOGY	WITMER ROAD LANDFILL NIAGARA FALLS, NEW YORK	FIGURE 1 SITE LOCATION MAP

PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT No	FILE No
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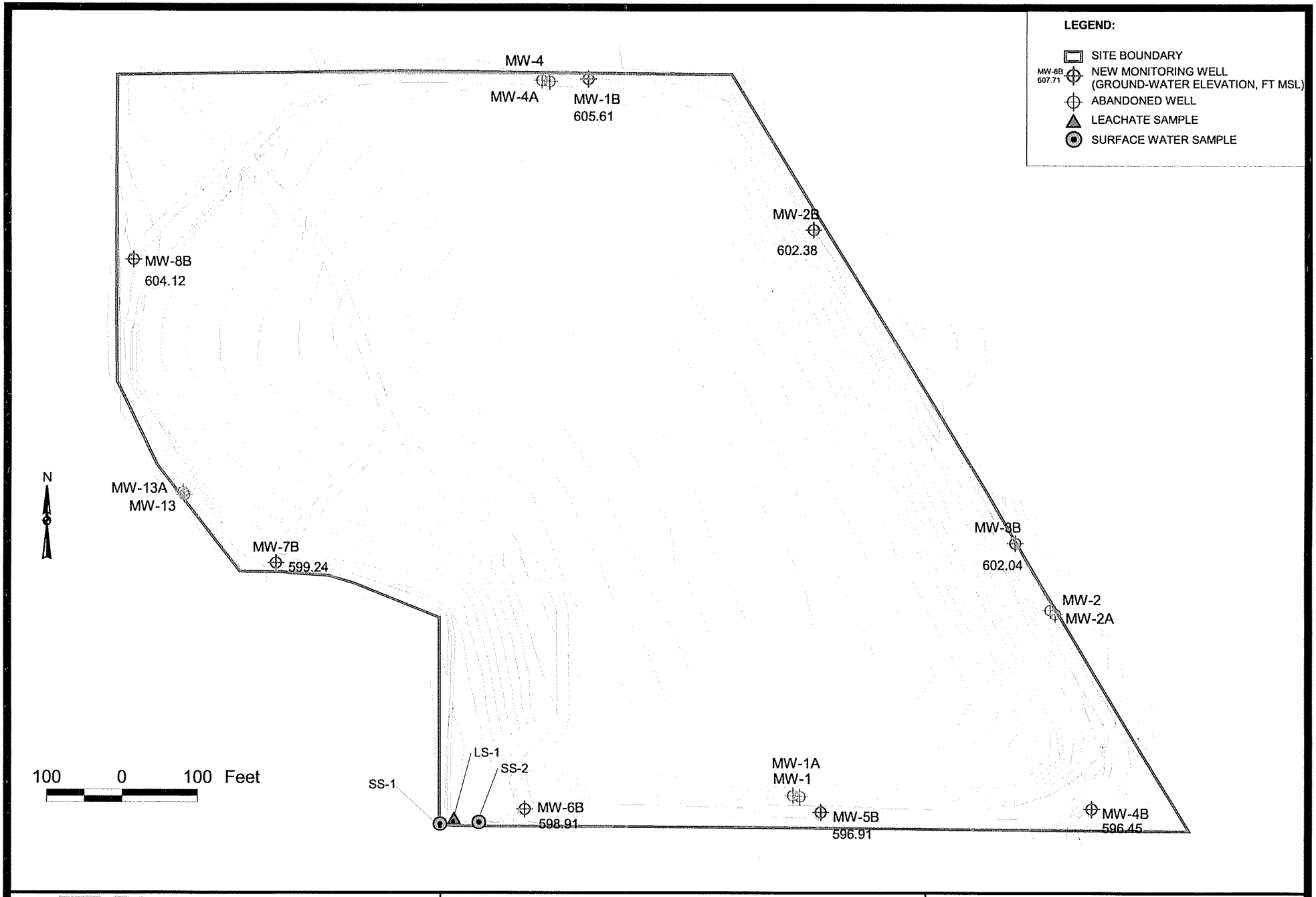

EA ENGINEERING, SCIENCE, AND TECHNOLOGY	WITMER ROAD LANDFILL NIAGARA FALLS, NEW YORK	FIGURE 2 MONITORING WELL SITE MAP	

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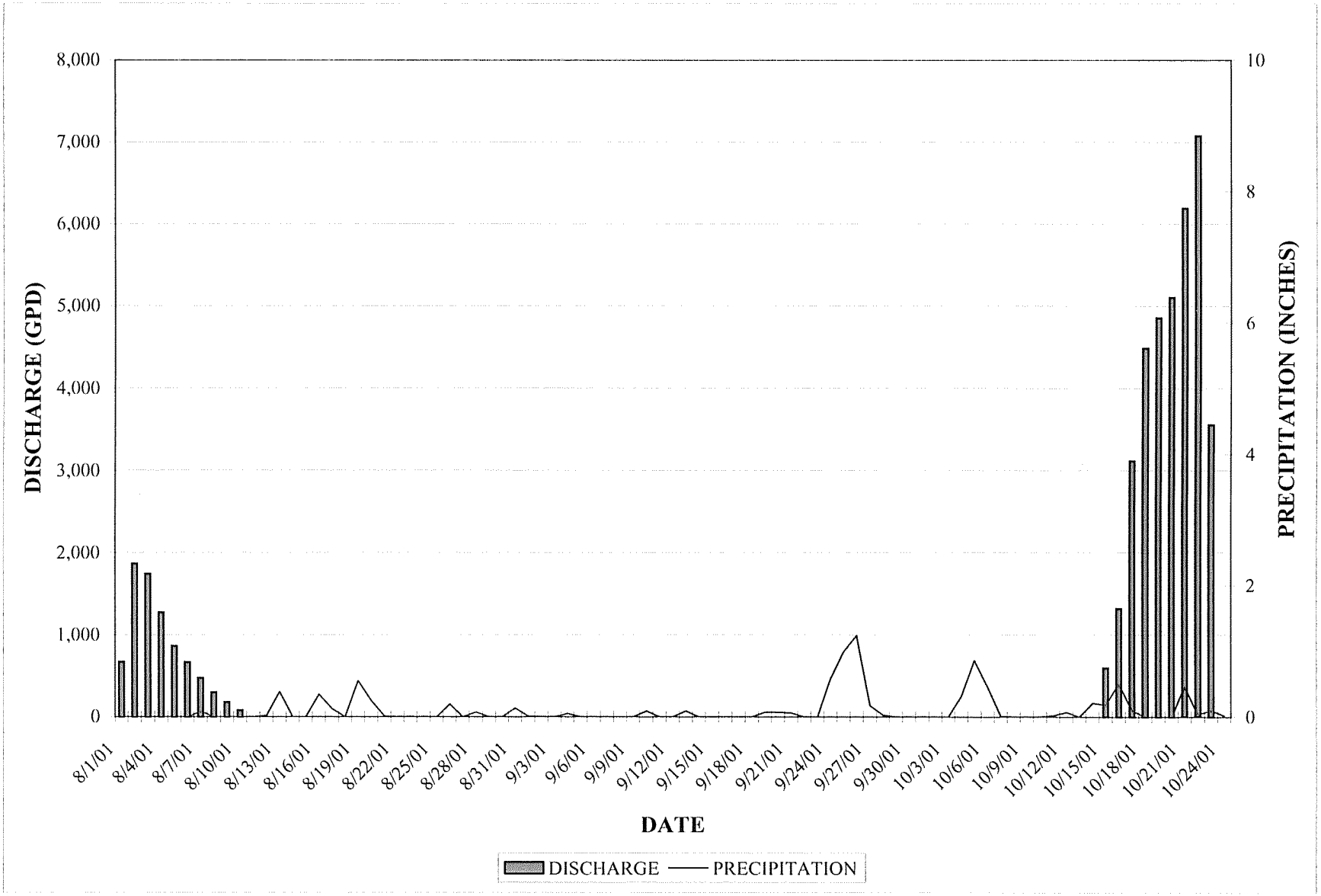


Figure 3 Daily Leachate Discharge Rate and Precipitation Totals
Witmer Road Landfill

TABLE 1 SUMMARY OF QUARTERLY GAUGING DATA

Gauging Date	Depth to Water (ft MSL)	Well Elevation (ft AMSL)	Water Elevation (ft MSL)
MW-1B			
05 DEC 00	15.85	617.77	601.92
21 MAR 01	09.74	617.77	608.03
12 JUN 01	11.11	617.77	606.66
18 SEP 01	16.42	617.77	601.35
04 DEC 01	12.16	617.77	605.61
MW-2B			
05 DEC 00	16.68	615.88	599.20
21 MAR 01	12.23	615.88	603.65
12 JUN 01	13.11	615.88	602.77
18 SEP 01	17.42	615.88	598.46
04 DEC 01	13.50	615.88	602.38
MW-3B			
05 DEC 00	11.20	611.22	600.02
21 MAR 01	07.84	611.22	603.38
12 JUN 01	08.67	611.22	602.55
18 SEP 01	13.48	611.22	597.74
04 DEC 01	09.18	611.22	602.04
MW-4B			
05 DEC 00	12.88	606.68	593.80
21 MAR 01	04.62	606.68	602.06
12 JUN 01	07.85	606.68	598.83
18 SEP 01	Dry	606.68	---
04 DEC 01	10.23	606.68	596.45
MW-5B			
05 DEC 00	10.51	605.48	594.97
21 MAR 01	03.70	605.48	601.78
12 JUN 01	05.97	605.48	599.51
18 SEP 01	Dry	605.48	---
04 DEC 01	08.57	605.48	596.91
MW-6B			
05 DEC 00	04.80	603.47	598.67
21 MAR 01	03.15	603.47	600.32
12 JUN 01	06.76	603.47	596.71
18 SEP 01	07.17	603.47	596.30
04 DEC 01	04.56	603.47	598.91
MW-7B			
05 DEC 00	11.22	609.48	598.26
21 MAR 01	08.77	609.48	600.71
12 JUN 01	09.31	609.48	600.17
18 SEP 01	12.67	609.48	596.81
04 DEC 01	10.24	609.48	599.24
MW-8B			
05 DEC 00	09.61	611.62	602.01
21 MAR 01	03.91	611.62	607.71
12 JUN 01	05.57	611.62	606.05
18 SEP 01	10.73	611.62	600.89
04 DEC 01	07.50	611.62	604.12

NOTES: MSL = Mean sea level.
AMSL = Above mean sea level.

TABLE 2 FLOW MEASUREMENTS AT LEACHATE DISCHARGE PIPE

Date	Minimum Daily Flow Rate (gpm)	Maximum Daily Flow Rate (gpm)	Average Daily Flow Rate (gpm)	Total Flow Per Day (gals)	Total Precipitation
AUGUST					
8/1/2001	1.23	1.58	1.41	675.32	0
8/2/2001	1.15	1.49	1.30	1868.89	0
8/3/2001	0.99	1.40	1.21	1744.58	0
8/4/2001	0.66	1.32	0.89	1275.92	0
8/5/2001	0.35	0.99	0.60	867.60	0
8/6/2001	0.36	0.72	0.47	671.82	0
8/7/2001	0.14	0.60	0.33	475.41	0.08
8/8/2001	0.09	0.35	0.21	297.83	0
8/9/2001	0.04	0.22	0.12	177.80	0
8/10/2001	0.00	0.22	0.05	78.53	0
8/11/01-8/31/01	0.00	0.00	0.00	0.00	2.05
Monthly Results to Date	0.00	1.58	0.66	8133.70	
SEPTEMBER					
9/1/01-9/30/01	0.00	0.00	0.00	0.00	3.45
Monthly Results to Date	0.00	0.00	0.00	0.00	
OCTOBER					
10/1/01-10/15/01	0.00	0.00	0.00	0.00	2.11
10/16/2001	0.00	1.49	0.42	600.04	0.5
10/17/2001	0.35	1.68	0.82	1324.18	0.1
10/18/2001	1.49	3.07	2.17	3120.08	0
10/19/2001	2.82	3.36	3.12	4489.20	0
10/20/2001	2.94	3.54	3.38	4864.81	0
10/21/2001	3.36	4.58	3.55	5111.35	0.46
10/22/2001	3.41	5.30	4.30	6197.99	0.04
10/23/2001	3.61	5.30	4.92	7078.76	0.1
10/24/2001[a]	5.14	5.30	5.17	3564.68	0.02
Monthly Results to Date	0.00	5.30	2.79	36351.09	4.34

(a) Flow logger removed at approximately 1530 on 24 October 2001.

NOTE: Data are recorded every 30 minutes, 24 hours per day.

REFERENCES

American Public Health Association, American Water Works Association, and Water Environment Federation. 1998. Standard Method for Examination of Water and Wastewater, 20th Edition.

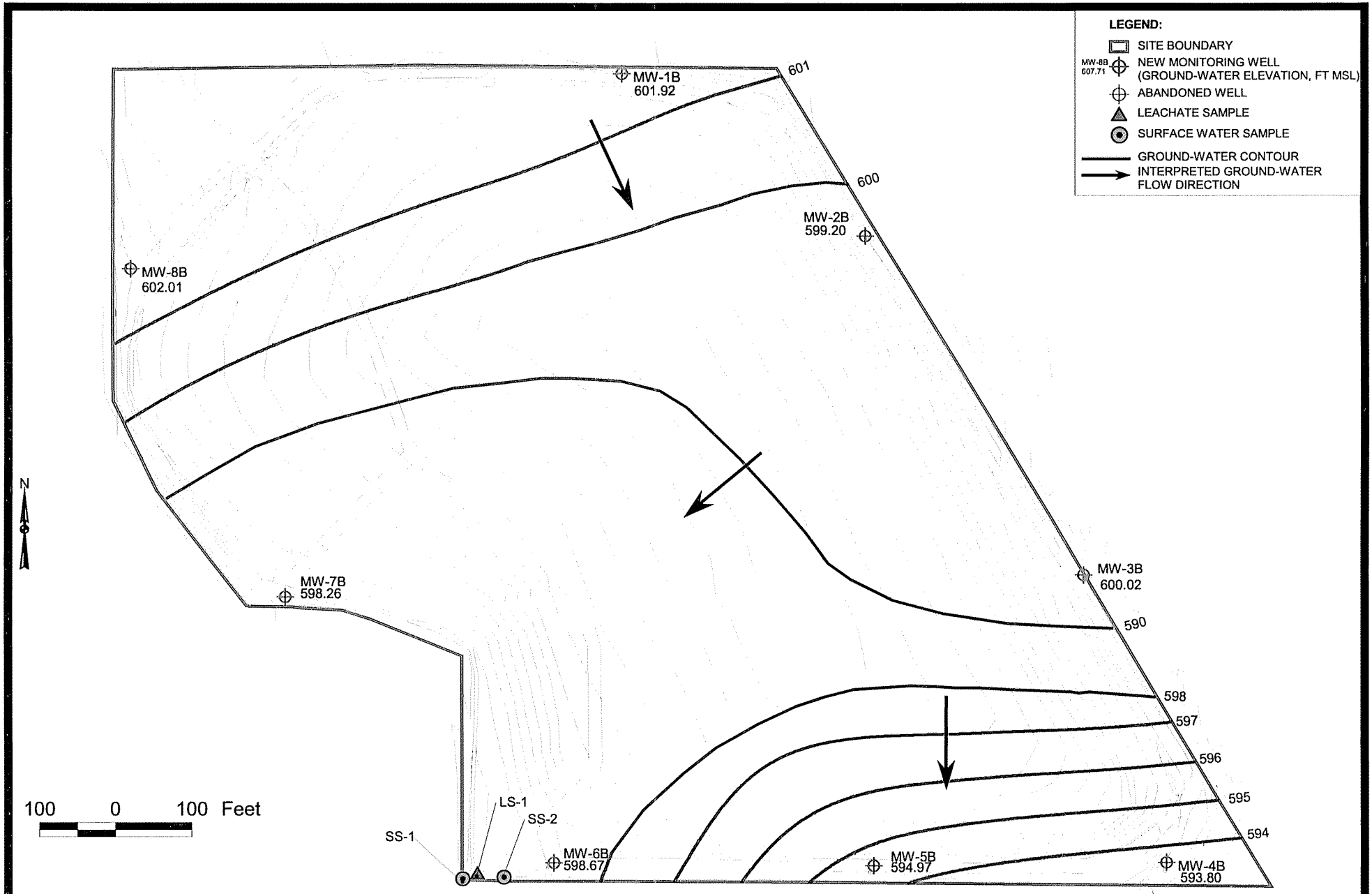
EA Engineering, Science, and Technology. 2001a. Interim Remedial Measure Report Documenting Closure of the Witmer Road Landfill, Niagara Falls, New York. Appendix A – Revised Final Post-Closure Monitoring and Facility Maintenance Plan. January.

EA Engineering, Science, and Technology. 2001b. Interim Remedial Measure Report Documenting Closure of the Witmer Road Landfill, Niagara Falls, New York. January.

New York State Department of Environmental Conservation (NYSDEC). 1999. Water Quality Regulations – Surface Water and Ground-Water Classifications and Standards New York State Codes, Rules and Regulations Title 6, Chapter X Parts 700-706.

Appendix A

Interpreted Ground-Water Contour Maps



EA ENGINEERING, SCIENCE, AND TECHNOLOGY	WITMER ROAD LANDFILL NIAGARA FALLS, NEW YORK	SPATIAL ANALYST CONTOUR MAP DECEMBER 2000

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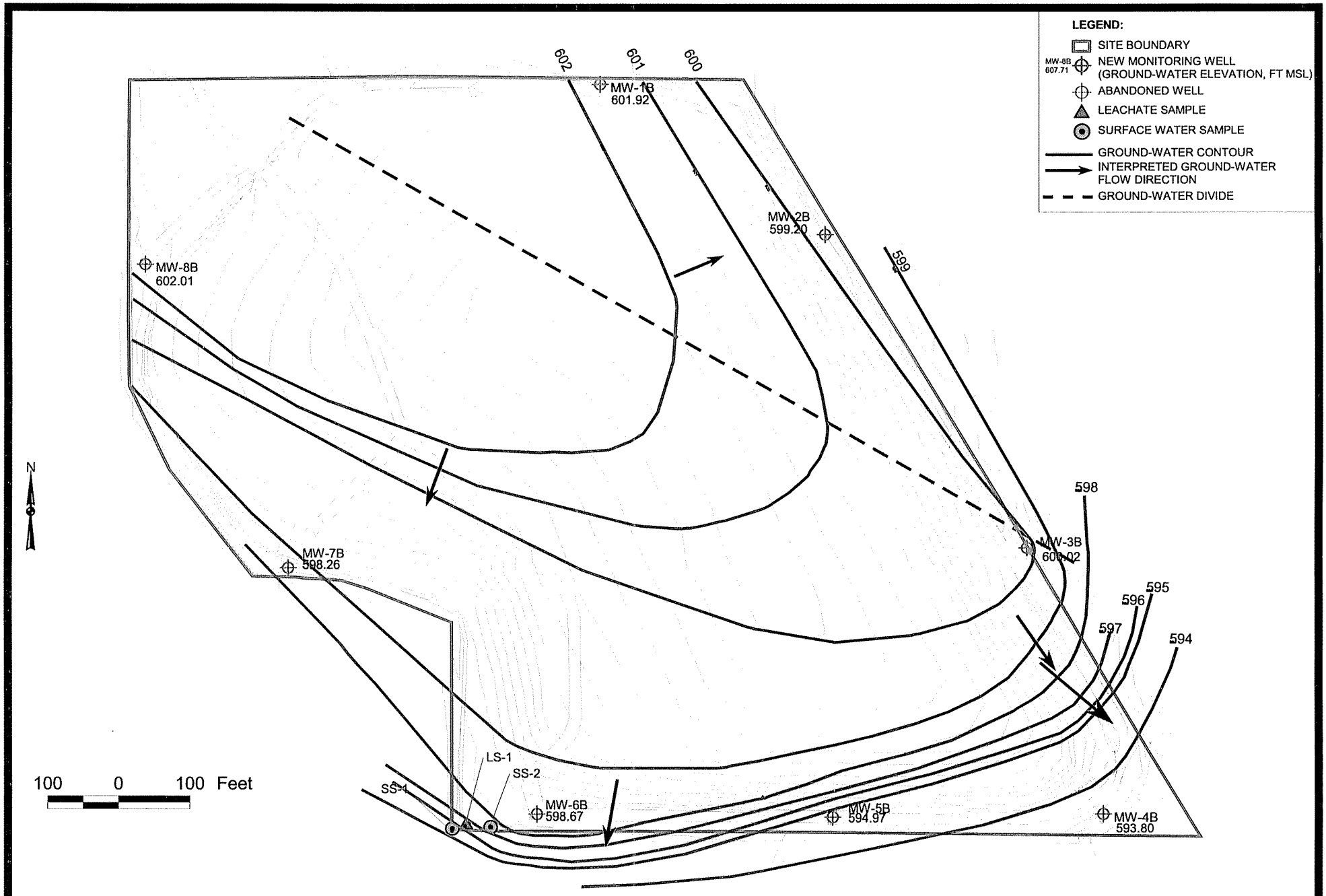

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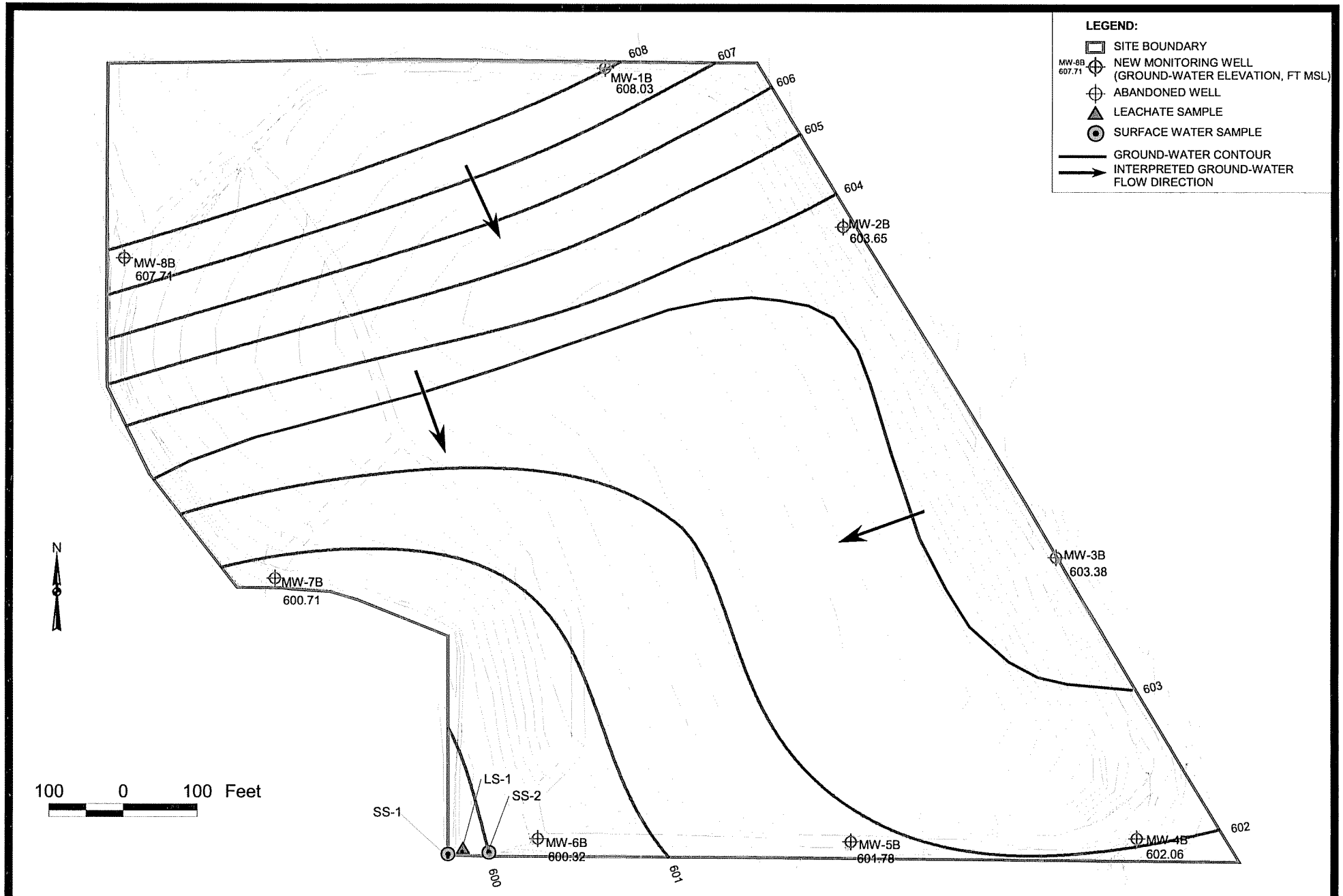

EA ENGINEERING, SCIENCE, AND TECHNOLOGY	WITMER ROAD LANDFILL NIAGARA FALLS, NEW YORK				SPATIAL ANALYST CONTOUR MAP MARCH 2001		
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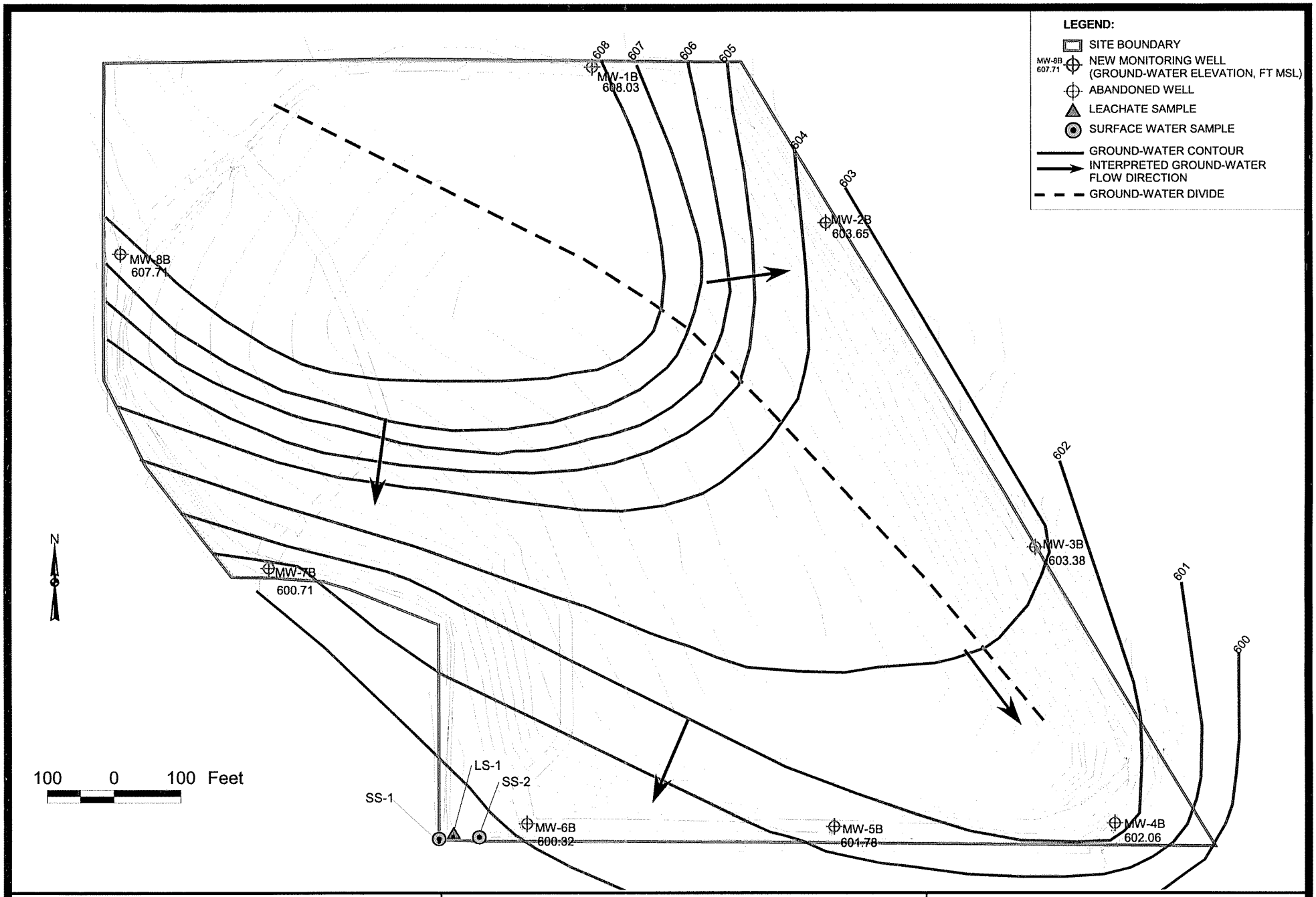

EA ENGINEERING, SCIENCE, AND TECHNOLOGY	WITMER ROAD LANDFILL NIAGARA FALLS, NEW YORK	INTERPRETED GROUND-WATER CONTOUR MAP MARCH 2001	

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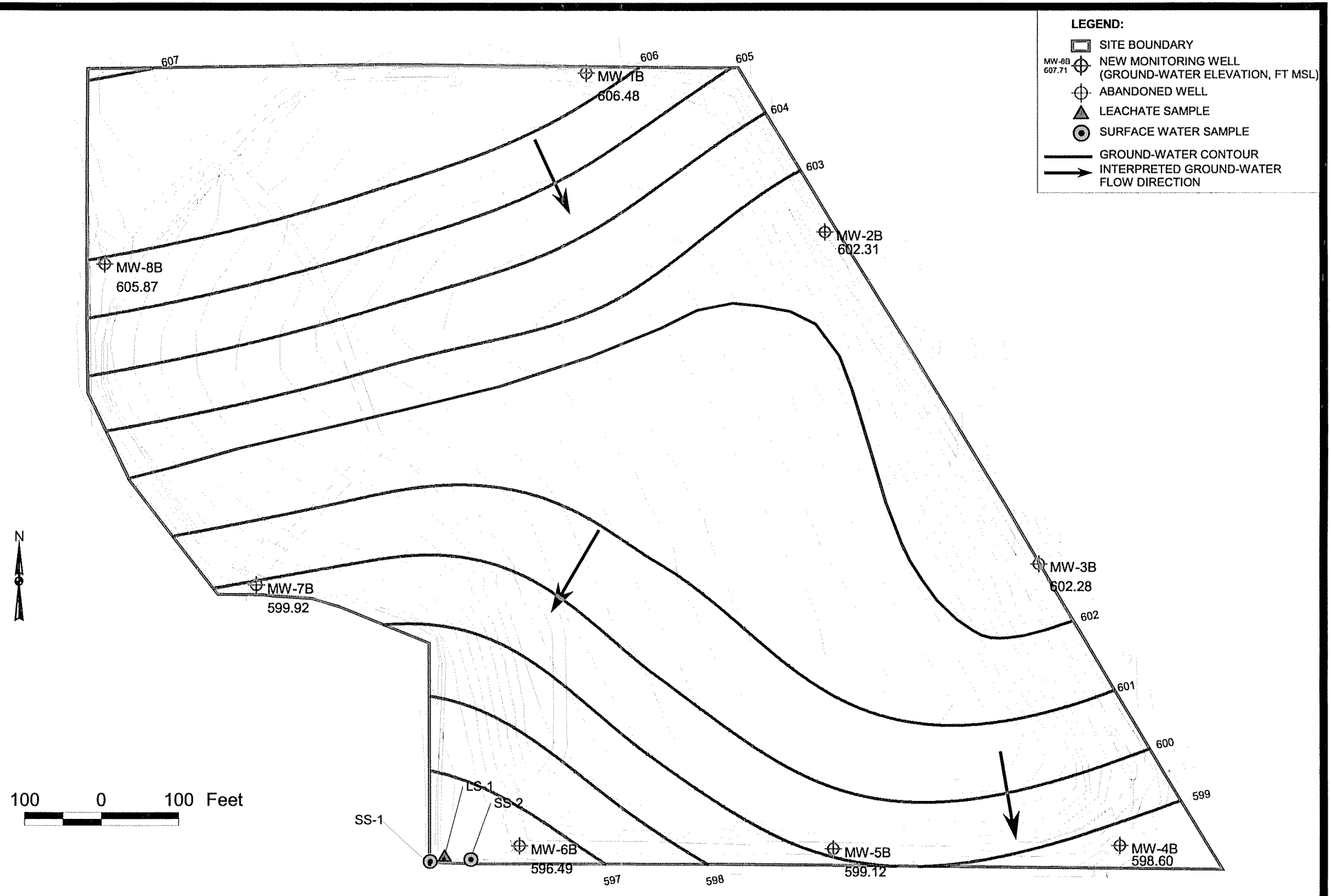

EA ENGINEERING, SCIENCE, AND TECHNOLOGY	WITMER ROAD LANDFILL NIAGARA FALLS, NEW YORK	SPATIAL ANALYST CONTOUR MAP JUNE 2001

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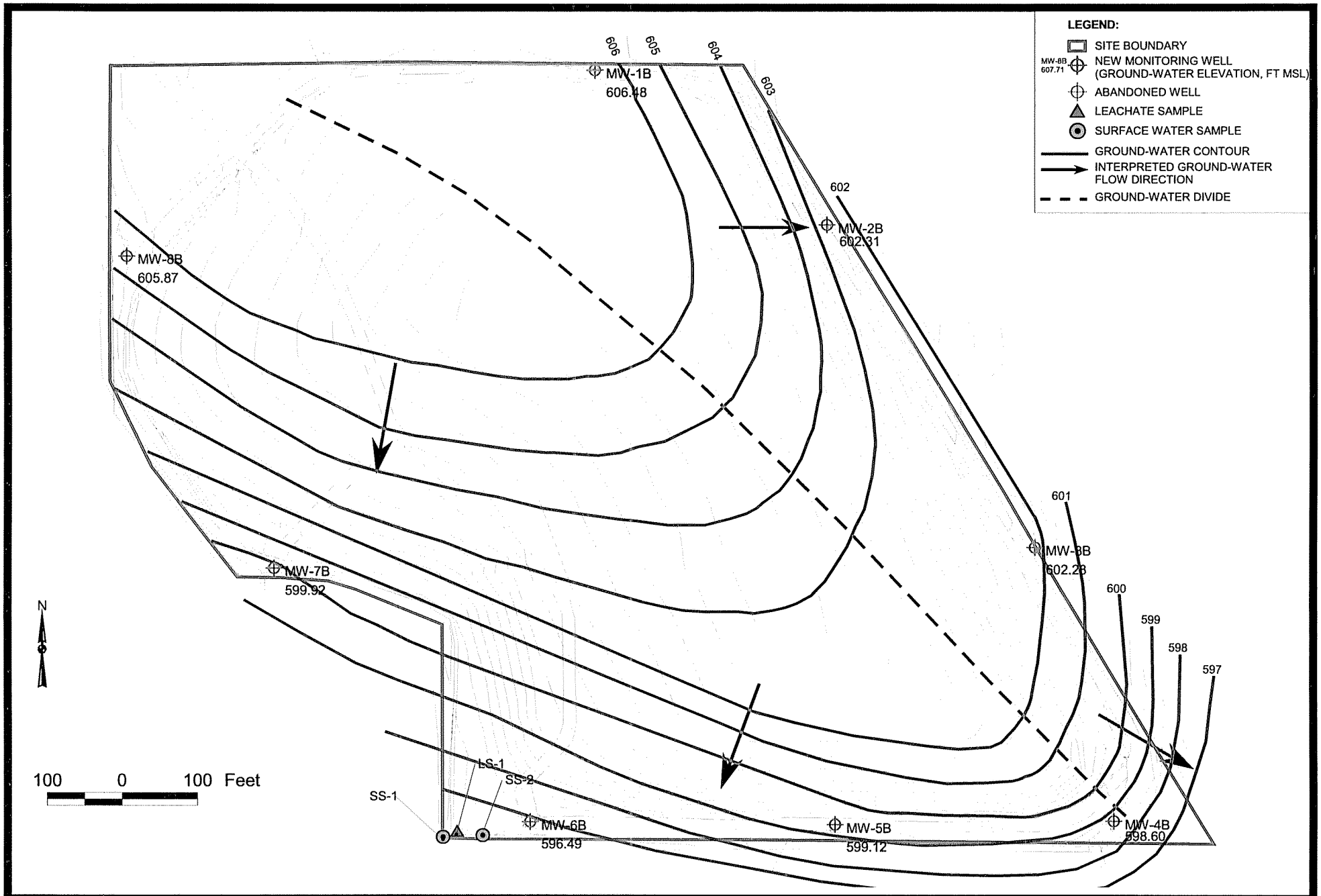

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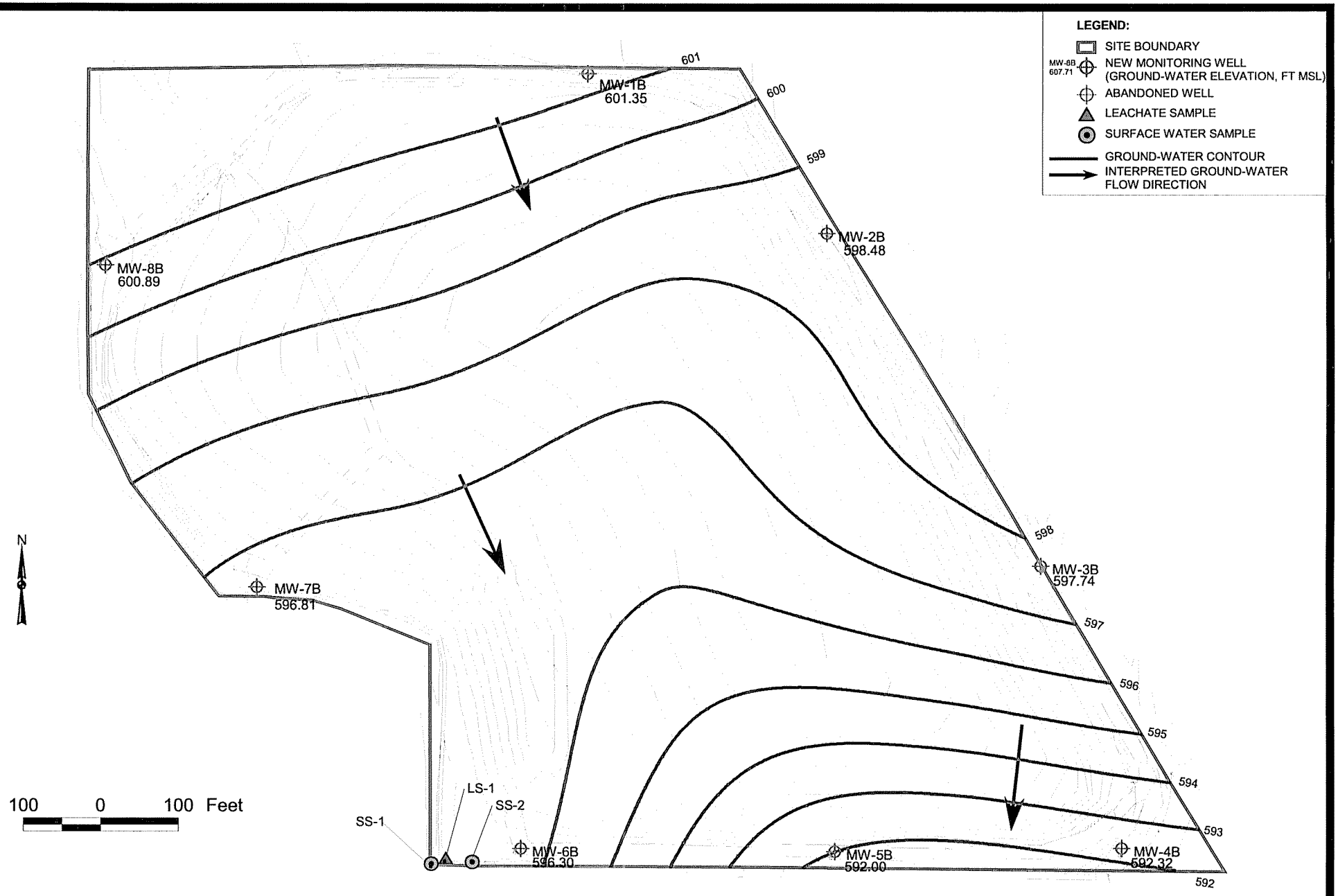

EA ENGINEERING, SCIENCE, AND TECHNOLOGY	WITMER ROAD LANDFILL NIAGARA FALLS, NEW YORK	SPATIAL ANALYST CONTOUR MAP SEPTEMBER 2001

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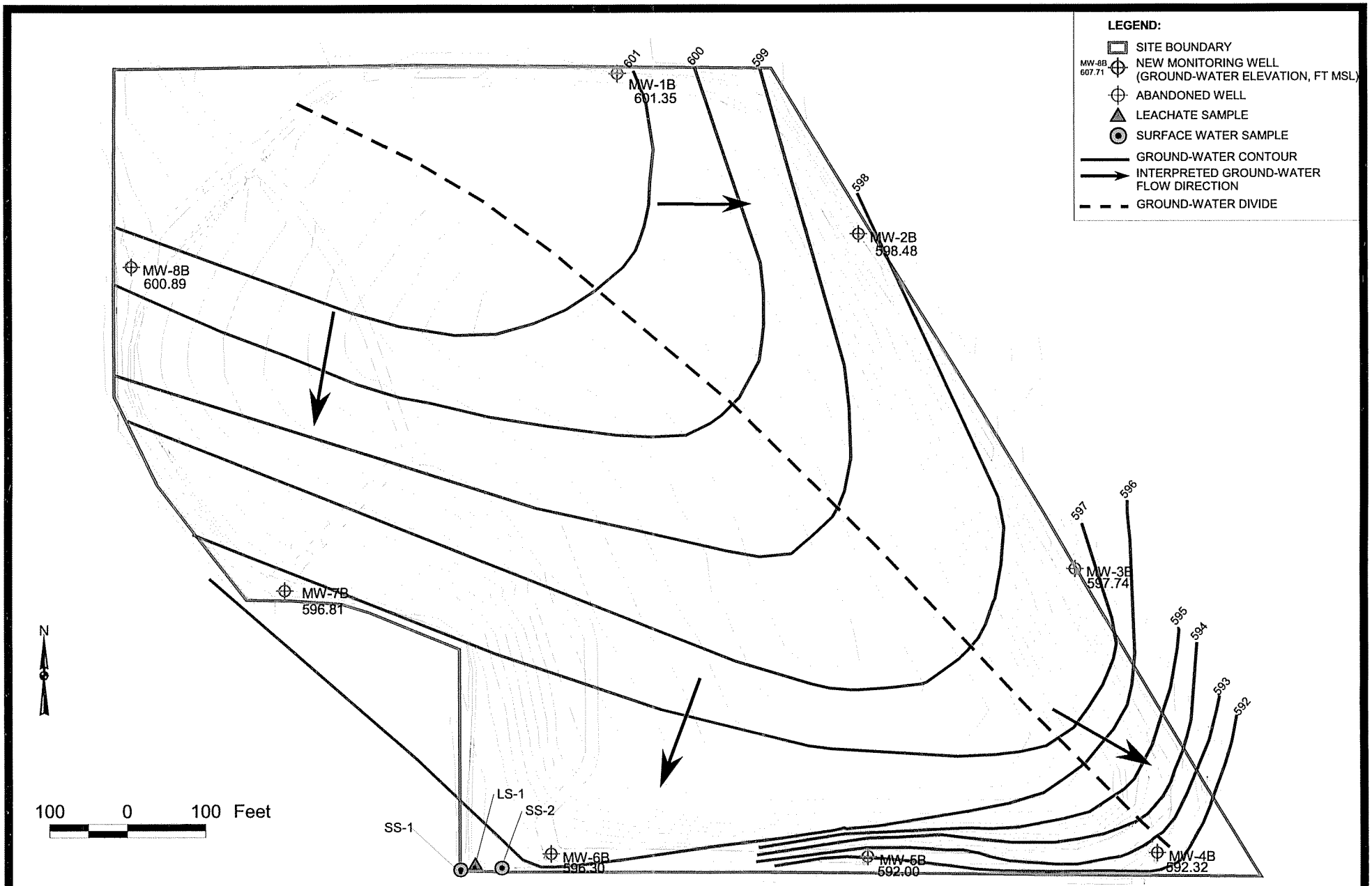

EA ENGINEERING, SCIENCE, AND TECHNOLOGY	WITMER ROAD LANDFILL NIAGARA FALLS, NEW YORK	INTERPRETED GROUND-WATER CONTOUR MAP SEPTEMBER 2001

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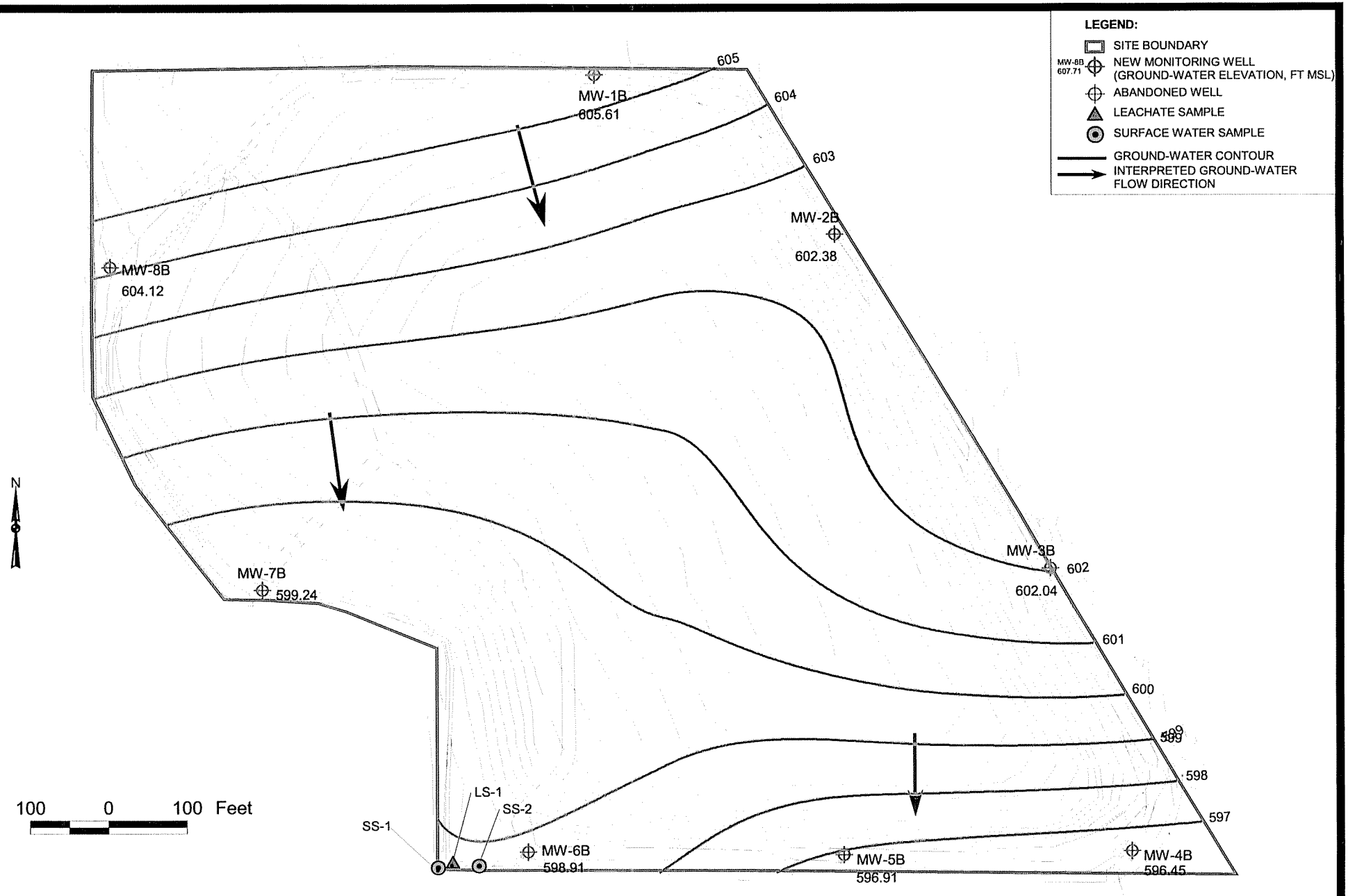

EA ENGINEERING, SCIENCE, AND TECHNOLOGY	WITMER ROAD LANDFILL NIAGARA FALLS, NEW YORK	SPATIAL ANALYST CONTOUR MAP DECEMBER 2001

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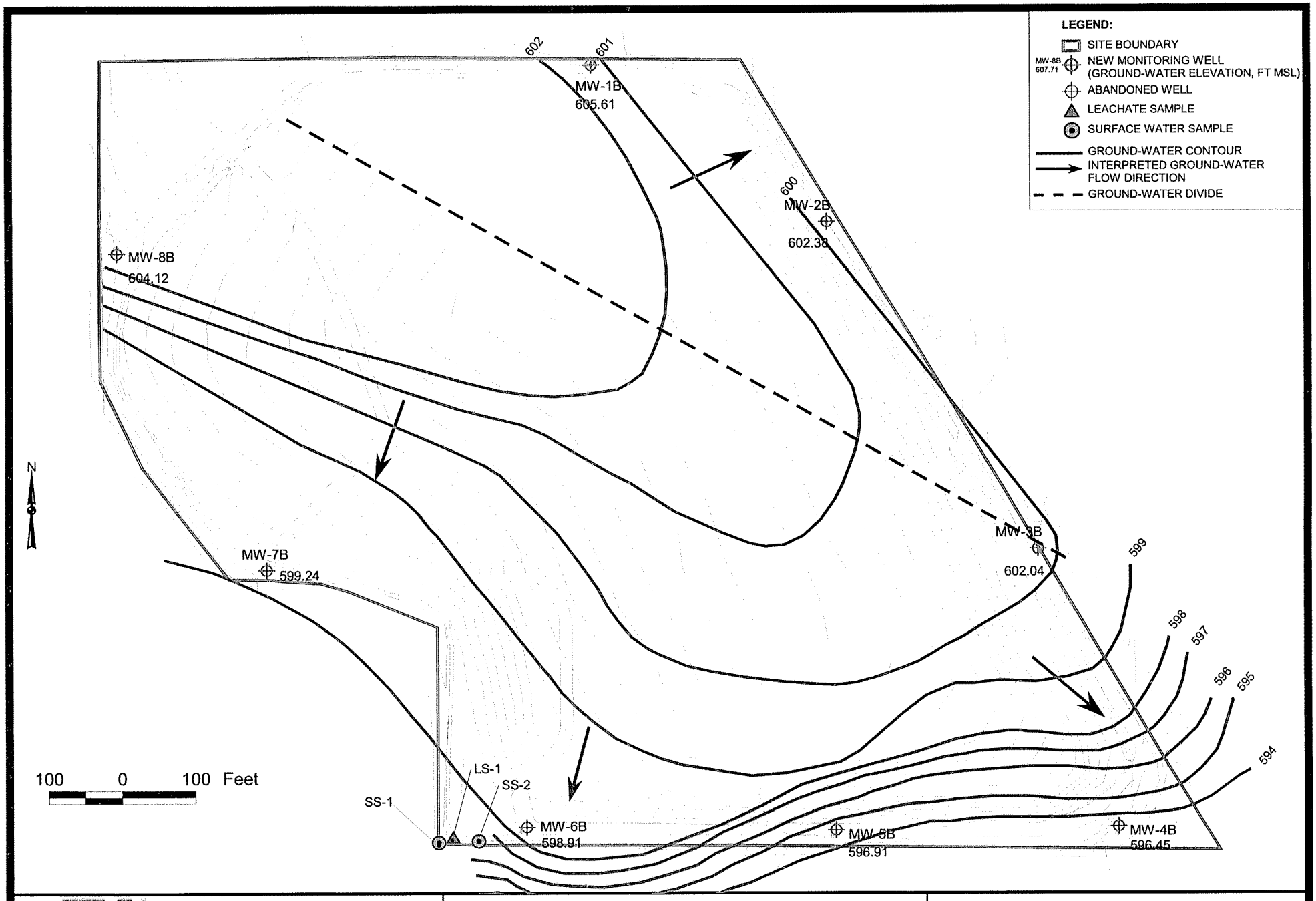

EA ENGINEERING, SCIENCE, AND TECHNOLOGY	WITMER ROAD LANDFILL NIAGARA FALLS, NEW YORK	INTERPRETED GROUND-WATER CONTOUR MAP DECEMBER 2001

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Appendix B

December 2001 Analytical Results

APPENDIX B SUMMARY OF ANALYTICAL RESULTS OF GROUND-WATER, SURFACE WATER, AND LEACHATE SAMPLES COLLECTED IN DECEMBER 2001, WITMER ROAD LANDFILL, NIAGARA FALLS, NEW YORK

Ground Water

Baseline Metals by EPA Method 6010/6020 (mg/L)

Total (Unfiltered)

Compound/Element	AWQS	MW-1B	MW-2B	MW-3B	MW-4B	MW-5B	MW-6 (Dup)	MW-6B	MW-7B	MW-8B
Chromium	0.05	(<0.005U)	**0.369**	(<0.005U)	**0.217**	0.019	(<0.005U)	(<0.005U)	**0.21**	**0.16**
Chromium, Hexavalent	0.05	(<0.01U)	**0.39**	(<0.01U)	**0.19**	(<0.01U)	(<0.01U)	(<0.01U)	**0.18**	**0.11**
Iron	0.3	0.242	0.295	0.057	**2.9**	**13.1**	**0.688**	**1.8**	**9.9**	**2.9**
Lead	0.025	(<0.005U)	(<0.005U)	(<0.005U)	0.006	0.021	(<0.005U)	(<0.005U)	0.005	0.007
Magnesium	35*	**54.1**	(<1U)	3.5	**49.7**	**78.4**	**76.3**	**75.4**	11	**59.8**
Manganese	0.3	**0.671**	0.008	(<0.005U)	0.071	0.295	0.092	0.135	0.199	**0.425**
Selenium	0.01	(<0.005U)	0.008	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	**0.053**
Silica	---	15.5	1.3	19.2	53.3	192	19.3	25.2	158	49
Sodium	20	**119**	**61.9**	**60.5**	**70.4**	**103**	**68**	**65.1**	**58.5**	**157**
Thallium	0.0005*	**0.006**	(<0.005U)	(<0.005U)	(<0.005U)	**0.007**	**0.007**	(<0.005U)	(<0.005U)	(<0.005U)
Zinc	2*	0.237	0.012	(<0.005U)	0.039	0.233	0.007	0.011	0.054	0.133

Water Quality Parameters (mg/L)

Compound/Element	AWQS	MW-1B	MW-2B	MW-3B	MW-4B	MW-5B	MW-6 (Dup)	MW-6B	MW-7B	MW-8B
Ammonia (expressed as N)	2	(<1U)	1.4	(<1U)	(<1U)	(<1U)	(<1U)	(<1U)	(<1U)	(<1U)
Phenolics	0.001	(<0.002U)	(<0.002U)	(<0.002U)	(<0.002U)	(<0.002U)	(<0.002U)	(<0.002U)	**0.009**	(<0.002U)
Sulfate	250	184	16	52.5	176	**259**	**261**	**310**	41.9	**464**

Surface Water

Baseline Metals by EPA Method 6010/6020 (mg/L)

Total (Unfiltered)

Compound/Element	AWQS	SS-1
Chromium	---**	0.432
Chromium, Hexavalent	0.016	**0.34**
Iron	0.3	**5.5**
Lead	---**	0.032
Magnesium	---	522
Manganese	---	0.226
Selenium	0.0046	**0.027**
Silica	---	112
Sodium	---	77.2
Thallium	0.02	(<0.005U)
Zinc	---**	0.067

Water Quality Parameters (mg/L)

Compound/Element	AWQS	SS
Ammonia (expressed as N)	---	3.8
Phenolics	---	0.064
Sulfate	---	44.6

Leachate

Baseline Metals by EPA Method 6010/6020 (mg/L)

Total (Unfiltered)

		L1
Compound/Element	**AWQS**	
Chromium	---	0.5
Chromium, Hexavalent	0.016	**0.23**
Iron	0.3	(<0.025U)
Lead	---	(<0.005U)
Magnesium	---	(<1U)
Manganese	---	(<0.005U)
Selenium	---	0.023
Silica	---	0.563
Sodium	---	74.4
Thallium	0.02	(<0.005U)
Zinc	---	(<0.005U)

Water Quality Parameters (mg/L)

		L1
Compound/Element	**AWQS**	
Ammonia (expressed as N)	---	4.3
Phenolics	---	0.028
Sulfate	---	12.3

QA/QC

Baseline Metals by EPA Method 6010/6020 (mg/L)

Total (Unfiltered)

		Rinse Blank	Source Water Blank
Compound/Element	**AWQS**		
Chromium	---	(<0.005U)	(<0.005U)
Chromium, Hexavalent	---	(<0.01U)	(<0.01U)
Iron	---	0.058	(<0.025U)
Lead	---	(<0.005U)	(<0.005U)
Magnesium	---	(<1U)	(<1U)
Manganese	---	(<0.005U)	(<0.005U)
Selenium	---	(<0.005U)	(<0.005U)
Silica	---	(<0.214U)	(<0.214U)
Sodium	---	(<1U)	(<1U)
Thallium	---	(<0.005U)	0.005
Zinc	---	(<0.005U)	(<0.005U)

Water Quality Parameters (mg/L)

		Rinse Blank	Source Water Blank
Compound/Element	**AWQS**		
Ammonia (expressed as N)	---	(<1U)	(<1U)
Phenolics	---	<0.002*U)	(<0.002U)
Sulfate	---	(<4U)	(<4U)

TABLE NOTES

AWQS	=	New York State Ambient Water Quality Standards and Guidance Values from Water Quality Regulations, Title 6, Chapter X Parts 700-706 August 1999.
*	=	Indicates guidance value.
**	=	Indicates calculated standard.
U	=	Not detected. Sample quantitation limits shown as (<__U).

Only those analytes detected in at least one of the samples is shown on this table.
Results shaded and in boldface indicate concentrations in excess of New York State Ambient Water Quality Standards or Guidance Values.

Analytical Methods for Water Quality Parameters

Ammonia (expressed as Nitrogen)	=	EPA 350.2
Phenolics	=	EPA 420.2
Sulfate	=	EPA 375.3

Appendix C

December 2001 Field Notes

TOHDEC01

WEATHER: 50°, OVERCAST
PERSONNEL: J. CLARK, B. CASEY

ON SITE @ 1245 FOR QTLY GW SAMPLING.

GAUGING	DTW	
MW-1B :	12.16	PUMP
MW-2B :	13.50	BAIL ✓
MW-3B :	9.18	PUMP
MW-4B :	10.23	~~PUMP~~ BAIL ✓
MW-5B :	8.57	BAIL
MW-6B :	4.56	PUMP
MW-7B :	10.24	BAIL
MW-8B :	7.50	PUMP

NOTE: PURGE METHOD DETERMINED BY PAST LL's + METHODS USED IN PRIOR SAMPLING EVENTS

- CALIB. HORIBA
  - PH: 4.00
  - COND: 4.50
  - TURB: 0.0
  - DO: 8.61 ERR 6

CALIB AGAIN - NO ERROR MESSAGE

TOHDEC01

MW-2B

PURGE METHOD: ~~HAND~~ BAIL DTW: 13.50
TIME: 1345

H_2O QUALITY TOTAL GAL BAILED ~2.5

INITIAL	ENDING
PH: 8.04	ph: 13.39
TEMP: 13.74	temp: 12.66
COND: 4.03	COND 4.48
DO: 5.60	DO: 6.10
TURB: 0.3	TURB 3.2
SAL: 0.2	SAL 0.2

MW-4B

PURGE METHOD: HAND BAIL DTW: 10.23
TIME: 1350

H_2O QUALITY TOTAL GAL BAILED ~2.0

pH: 10.17	10.73
TEMP: 13.60	13.32
COND: 1.05	0.99
DO: 7.52	7.86
TURB: 2.5	160.0
SAL: 0	0

TO4DEC01

MW-5B

PURGE METHOD: HAND BAIL DTW: 8.57

TIME: 1440

TOT GAL BAILED ~1.5

H_2O QUALITY

	INITIAL	ENDING
pH	9.83	9.30
TEMP	13.80	13.33
COND	1.28	1.42
DO	8.87	7.56
TURB	8.3	809.0
SAL	0.1	0.1

MW-7B

PURGE METHOD: HAND BAIL DTW: 10.24

TOTAL GAL BAILED ~ 3 TIME: 1500

H_2O QUALITY

pH	9.92	9.95
TEMP	13.03	13.48
COND	0.469	0.421
DO	6.81	6.24
TURB	26.0	>999.0
SAL	0.0	0.0

4DEC01

WO5DEC01

WEATHER: 45° PARTLY CLOUDY

PERSONNEL: J. CLARK, B CASEY

ON SITE FOR QTLY GW SAMPLING

MW-1B

PURGE METHOD: 2" SUB DTW: 12.16 TIME: 9:20

PARAM	INITIAL	1	2	3	4	5
TIME	9:20	9:24	9:28	9:32	9:36	9:40
pH	6.35	6.69	6.81	6.84	6.89	6.91
TEMP	12.31	12.27	12.44	12.41	12.44	12.46
COND	1.63	1.61	1.61	1.61	1.61	1.61
DO	3.87	2.54	1.82	1.55	1.35	1.28
TURB	>999.0	42.7	16.5	7.1	4.5	4.5
SAL	0.1	0.1	0.1	0.1	0.1	0.1
DTW	15.13	—	15.05	—	14.98	—
RATE	—	1L/M				

WRL-MW1B-1201 @ 0945

HORIBA CALIBRATION (0082071)

ph : 3.98
temp : 12.86
DO : 9.24
TURB : 2.4
COND : 4.53
SAL : 0.2

SAMPLE COLLECTION TIMES

MW1B : 0945
MW2B : 0935
MW3B : 1043
MW4B : 1035
MW5B : 1055
MW6B : 1120
MW7B : 1300
MW8B : 1415
DUP : @ MW6B 1325
RB : 1230
LI : 1140
SS : 1125
SWB : 1155

W05DEC01

MW-3B

purge method 2" sub DTW 8.59 TIME 10:20

PARAM	INITIAL	1	2	3	4
time	10:25	10:29	10:33	10:37	10:41
ph	11.07	10.81	10.52	10.22	9.99
TEMP	13.71	14.53	15.04	15.69	15.92
COND	0.618	0.543	0.532	0.547	0.556
DO	2.40	2.41	2.40	2.32	1.98
TURB	<0	<0	<0	<0	<0
SAL	0.0	0.0	0.0	0.0	0.0
DTW	11.30	—	12.58	—	12.66
RATE	0.5 L/m				↑

WRL-MW3B-1201 @ 10:48

WED 05 DEC 01

MW-6B

purge method 2" sub DTW 5.14 TIME 11:20

PARAM	INITIAL	1	2	3	4	5
time	10:22	11:26	11:30	11:34	11:38	11:42
ph	8.22	7.89	7.81	7.71	7.63	7.50
temp	13.67	13.89	14.34	14.98	14.79	15.14
cond	1.22	1.17	1.18	1.19	1.21	1.22
DO	5.84	5.72	5.47	4.65	3.91	2.92
TURB	15.4	5.2	<0	<0	<0	1.8
SAL	0.1	0.1	0.1	0.1	0.1	0.1
DTW	10.65	13.67	—	17.59	—	19.75
RATE	1 L/m	→	→	→		

6	7	8	9
11:46	11:50	11:54	11:58
7.44	7.43	7.45	7.47
15.12	15.14	15.17	15.27
1.24	1.25	1.25	1.25
1.91	2.52	3.90	4.65
<0	<0	<0	<0
0.1	0.1	0.1	0.1
—	19.78	—	19.91

WRL - MW6B - 1201 @ 1200

WOS DEC 01

WEIR READING @ LEACHATE DISCHARGE = 19837 GPD

LEACHATE H_2O QUALITY

PH: 13.29
TEMP: 13.84
COND: 7.65
DO: 5.96
TURB: <0
SAL: 0.4

W05DEC01

MW-8B

purge method 2" sub DTW 6.35 time 1300

Param	initial	1	2	3	4
time	13:05	13:09	13:13	13:17	13:21
ph	8.91	8.11			
temp	14.14	14.36			
COND	1.83	1.78			
DO	1.62	4.07			
TURB	38.6	46.2			
SAL	0.1	0.1			
DTW	11.31	—			
RATE	L/m				

WRL-MW8B-1201 @ 1415

- MW8B DRY after one well volume @ 13:11, WILL LET RECHARGE AND THEN SAMPLE.

W05DEC01

NOTE:

THE FENCE POST USED FOR DETERMINING H_2O LEVEL IN THE WETLAND WAS REMOVED FROM ITS ORIGINAL LOCATION. IT WAS TAKEN OUT OF THE WETLAND AND STUCK IN THE GROUND CLOSER TO THE FENCE. WE DO NOT KNOW WHO IS RESPONSIBLE FOR DOING THIS. NO MEASUREMENT WAS TAKEN.

5DEC01

7 76

W16JAN02

WEATHER: PARTLY CLOUDY, 25°
PERSONNEL: J. CLARK
JOHN WHITE } FOX FENCE
ANDY HASTINGS }

- ON SITE @ 0955 FOR OVERSIGHT OF FENCE REPAIR IN SW CORNER AND NEAR MW-7B
- JOHN WHITE ASKED ABOUT THE SIGNS TO BE INSTALLED NEXT WEEK. WANTED TO KNOW WHERE WE WANTED THEM. CALLED CHIP, HE SAID EVERY 4-5 PANELS SHOULD BE OK.
- @ SW CORNER, HAD TO REPLACE ~ 1' OF FABRIC
- @ MW-7B, INSTALLED NEW POST + REPLACED ~ 3' OF FABRIC

Appendix D

December 2001 Laboratory Chain-of-Custody

Environmental
LABORATORY SERVICES
7280 Caswell Street, Hancock Air Park North Syracuse, NY 13212
(315) 458-8033 FAX (315) 458-0249 (800) 843-8265

CHAIN OF CUSTODY RECORD
and Authorization for Analysis

Name	Title
Company	Dept.
Address	Job/PO No.
City, State, Zip	

The following services may result in additional charges:

☐ Telephone Results Telephone No. _____

☐ Fax Results Fax No. _____

Express Service
Advance Agreement Required
☐ 1 Week ☐ 48 Hour

To be completed by Sampler. Please remember to record this information on the container label.

ELS Number	*Date	*Time	*Comp.	*Grab	*Matrix	*Sampling Location	Number of Containers	Container Type/Preservative: Plastic/No Preservatives	Plastic/HNO_3	Plastic/H_2SO_4	Plastic/NaOH+Ascorbic Acid	Plastic/NaOH+Zinc Acetate	Glass/No Preservative	Glass/Sodium Thiosulfate	Amber Glass/No Pres.	Amber Glass/H_2SO_4	Other: (specify)	Analyses Required, Remarks, and/or Special Instructions

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White - LABORATORY Canary - ACCOMPANIES RESULTS Pink - CLIENT

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				X														

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White - LABORATORY Canary - ACCOMPANIES RESULTS Pink - CLIENT

Please return completed form and all sample containers to Environmental Laboratory Services.

Environmental LABORATORY SERVICES

7280 Caswell Street, Hancock Air Park North Syracuse, NY 13212
(315) 458-8033 FAX (315) 458-0249 (800) 843-8265

CHAIN OF CUSTODY RECORD
and Authorization for Analysis

Name	Title
Company	Dept.
Address	Job/PO No.
City, State, Zip	

The following services may result in additional charges:

☐ Telephone Results Telephone No. _____

☐ Fax Results Fax No. _____

Express Service
Advance Agreement Required
☐ 1 Week ☐ 48 Hour

To be completed by Sampler. Please remember to record this information on the container label.

ELS Number	*Date	*Time	*Comp.	*Grab	*Matrix	*Sampling Location	Number of Containers	Container Type/Preservative: Plastic/No Preservatives	Plastic/HNO_3	Plastic/H_2SO_4	Plastic/NaOH+Ascorbic Acid	Plastic/NaOH+Zinc Acetate	Glass/No Preservative	Glass/Sodium Thiosulfate	Amber Glass/No Pres.	Amber Glass/H_2SO_4	Other: (specify)	Analyses Required, Remarks, and/or Special Instructions

Containers Dispensed by:	Date	Time	Container(s) Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
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White - LABORATORY Canary - ACCOMPANIES RESULTS Pink - CLIENT

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☐ Telephone Results Telephone No. _____ Express Service

☐ Fax Results Fax No. _____ Advance Agreement Required ☐ 1 Week ☐ 48 Hour

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ELS Number	*Date	*Time	*Comp.	*Grab	*Matrix	*Sampling Location	Number of Containers	Container Type/Preservative: Plastic/No Preservatives	Plastic/HNO_3	Plastic/H_2SO_4	Plastic/NaOH+Ascorbic Acid	Plastic/NaOH+Zinc Acetate	Glass/No Preservative	Glass/Sodium Thiosulfate	Amber Glass/No Pres.	Amber Glass/H_2SO_4	Other: (specify)	Analyses Required, Remarks, and/or Special Instructions

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Sampler Signature:	Date	Time	Received at Lab by:	Date	Time

White - LABORATORY Canary - ACCOMPANIES RESULTS Pink - CLIENT

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				X														

Containers Dispensed by:	Date	Time	Container(s) Received by:	Date	Time
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Sampler Signature:					

White - LABORATORY **Canary - ACCOMPANIES RESULTS** **Pink - CLIENT**

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2217.ELS..202.9310

Environmental
LABORATORY SERVICES
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☐ Telephone Results Telephone No. _____

☐ Fax Results Fax No. _____

Express Service
Advance Agreement Required
☐ 1 Week ☐ 48 Hour

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	*Date	*Time	*Comp.	*Grab	*Matrix	*Sampling Location		Plastic/No Preservatives	Plastic/HNO_3	Plastic/H_2SO_4	Plastic/NaOH+Ascorbic Acid	Plastic/NaOH+Zinc Acetate	Glass/No Preservative	Glass/Sodium Thiosulfate	Amber Glass/No Pres.	Amber Glass/H_2SO_4	Other: (specify)	

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White - LABORATORY Canary - ACCOMPANIES RESULTS Pink - CLIENT

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White - LABORATORY **Canary - ACCOMPANIES RESULTS** **Pink - CLIENT**

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☐ Fax Results Fax No. _____

Express Service
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White - LABORATORY **Canary - ACCOMPANIES RESULTS** **Pink - CLIENT**

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White - LABORATORY **Canary - ACCOMPANIES RESULTS** **Pink - CLIENT**

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2217.ELS..202.9310

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Relinquished by:	Date	Time	Received by:	Date	Time
Your signature authorizes ELS to analyze the sample(s) as indicated. Relinquished by:	Date	Time	Received at Lab by:	Date 12/5/01	Time 1710
Sampler Signature:					

White - LABORATORY **Canary - ACCOMPANIES RESULTS** **Pink - CLIENT**

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Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received at Lab by:	Date 12/5/01	Time 1740
Sampler Signature:					

Your signature authorizes ELS to analyze the sample(s) as indicated.

White - LABORATORY **Canary - ACCOMPANIES RESULTS** ***Pink - CLIENT***

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Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Your signature authorizes ELS to analyze the sample(s) as indicated. Relinquished by:	Date	Time	Received at Lab by:	Date 12/5/01	Time 1740
Sampler Signature:					

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☐ Telephone Results Telephone No. _____ Express Service

☐ Fax Results Fax No. _____ Advance Agreement Required ☐ 1 Week ☐ 48 Hour

ELS Number	To be completed by Sampler. Please remember to record this information on the container label.						Number of Containers	Container Type/Preservative										Analyses Required, Remarks, and/or Special Instructions
	*Date	*Time	*Comp.	*Grab	*Matrix	*Sampling Location		Plastic/No Preservatives	Plastic/HNO_3	Plastic/H_2SO_4	Plastic/NaOH+Ascorbic Acid	Plastic/NaOH+Zinc Acetate	Glass/No Preservative	Glass/Sodium Thiosulfate	Amber Glass/No Pres.	Amber Glass/H_2SO_4	Other: (specify)	

Containers Dispensed by:	Date	Time	Container(s) Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Relinquished by:	Date	Time	Received by:	Date	Time
Your signature authorizes ELS to analyze the sample(s) as indicated. Relinquished by:	Date	Time	Received at Lab by:	Date 12/5/01	Time 1742
Sampler Signature:					

White - LABORATORY **Canary - ACCOMPANIES RESULTS** ***Pink - CLIENT***

Please return completed form and all sample containers to Environmental Laboratory Services.

Appendix E

December 2001 Form I
Analytical Results

Environmental
LABORATORY SERVICES
7280 Caswell Street, Hancock Air Park, North Syracuse, NY 13212
(315) 458-8033 FAX (315) 458-0249, (800) 842-4667

Certified in:
*Connecticut
*Delaware
*Maryland
*Massachusetts
*New Hampshire
*New Jersey
*New York
*Pennsylvania
*Rhode Island

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E.A. ENGINEERING & SCIENCE TECHNOLOGY
737 FLY RD.

EAST SYRACUSE NY 13057-
ATTN: MR. SCOTT GRAHAM

P.O. #
CLIENT JOB NUMBER:

PROJECT #: 998346
RECEIVED: 12/5/01

TEST PERFORMED	RESULTS	UNITS	DATE PERFORMED	METHOD NUMBER	PERFORMED BY
SAMPLE #: 216358 CLIENT SAMPLE ID: WRL-MW5B-1201				**DATE SAMPLED: 12/05/01**	
PHENOLICS	<0.002	MG/L	12/11/01	EPA 420.2	DMP
SAMPLE #: 216359 CLIENT SAMPLE ID: WRL-MW5B-1201				**DATE SAMPLED: 12/05/01**	
NITROGEN, AMMONIA	<1.0	MG/L	12/17/01	EPA 350.2	DMP
SAMPLE #: 216360 CLIENT SAMPLE ID: WRL-MW5B-1201				**DATE SAMPLED: 12/05/01**	
ZINC	0.233	MG/L	12/12/01	EPA 6020	NS
THALLIUM	0.007	MG/L	12/12/01	EPA 6020	NS
SODIUM	103	MG/L	12/13/01	EPA 6010	NS
SELENIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
SILICA	192	MG/L	1/4/02	EPA 200.7	
MANGANESE	0.295	MG/L	12/12/01	EPA 6020	NS
MAGNESIUM	78.4	MG/L	12/13/01	EPA 6010	NS
LEAD	0.021	MG/L	12/12/01	EPA 6020	NS
IRON	13.1	MG/L	12/13/01	EPA 6010	NS
CHROMIUM	0.019	MG/L	12/12/01	EPA 6020	NS
CADMIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
METALS DIGESTION	YES		12/6/01	EPA 3005	BRD

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ATTN: MR. SCOTT GRAHAM

P.O. #
CLIENT JOB NUMBER:

PROJECT #: 998346
RECEIVED: 12/5/01

TEST PERFORMED	RESULTS	UNITS	DATE PERFORMED	METHOD NUMBER	PERFORMED BY
SAMPLE #: 216361 **CLIENT SAMPLE ID: WRL-MW5B-1201**					**DATE SAMPLED: 12/05/01**
SULFATE	259	MG/L	12/19/01	EPA 375.2	DMP
SAMPLE #: 216362 **CLIENT SAMPLE ID: WRL-MW5B-1201**					**DATE SAMPLED: 12/05/01**
CHROMIUM, HEXAVALENT	<0.010	MG/L @ 08:45	12/6/01	SM18 3500-CR D	DMP
SAMPLE #: 216363 **CLIENT SAMPLE ID: WRL-MW1B-1201**					**DATE SAMPLED: 12/05/01**
PHENOLICS	<0.002	MG/L	12/11/01	EPA 420.2	DMP
SAMPLE #: 216364 **CLIENT SAMPLE ID: WRL-MW1B-1201**					**DATE SAMPLED: 12/05/01**
NITROGEN, AMMONIA	<1.0	MG/L	12/17/01	EPA 350.2	DMP
SAMPLE #: 216365 **CLIENT SAMPLE ID: WRL-MW1B-1201**					**DATE SAMPLED: 12/05/01**
ZINC	0.237	MG/L	12/12/01	EPA 6020	NS
THALLIUM	0.006	MG/L	12/12/01	EPA 6020	NS
SODIUM	119	MG/L	12/13/01	EPA 6010	NS
SELENIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
SILICA	15.5	MG/L	1/4/02	EPA 200 7	
MANGANESE	0.671	MG/L	12/12/01	EPA 6020	NS
MAGNESIUM	54.1	MG/L	12/13/01	EPA 6010	NS
LEAD	<0.005	MG/L	12/12/01	EPA 6020	NS
IRON	0.242	MG/L	12/13/01	EPA 6010	NS
CHROMIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
CADMIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
METALS DIGESTION	YES		12/6/01	EPA 3005	BRD
SAMPLE #: 216366 **CLIENT SAMPLE ID: WRL-MW1B-1201**					**DATE SAMPLED: 12/05/01**

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CLIENT JOB NUMBER:

PROJECT #: 998346
RECEIVED: 12/5/01

TEST PERFORMED	RESULTS	UNITS	DATE PERFORMED	METHOD NUMBER	PERFORMED BY
SAMPLE #: 216366 CLIENT SAMPLE ID: WRL-MW1B-1201				**DATE SAMPLED: 12/05/01**	
SULFATE	184	MG/L	12/19/01	EPA 375.2	DMP
SAMPLE #: 216367 CLIENT SAMPLE ID: WRL-MW1B-1201				**DATE SAMPLED: 12/05/01**	
CHROMIUM, HEXAVALENT	<0.010	MG/L @ 08:45	12/6/01	SM18 3500-CR D	DMP
SAMPLE #: 216368 CLIENT SAMPLE ID: WRL-MW4B-1201				**DATE SAMPLED: 12/05/01**	
PHENOLICS	<0.002	MG/L	12/11/01	EPA 420.2	DMP
SAMPLE #: 216369 CLIENT SAMPLE ID: WRL-MW4B-1201				**DATE SAMPLED: 12/05/01**	
NITROGEN, AMMONIA	<1.0	MG/L	12/17/01	EPA 350.2	DMP
SAMPLE #: 216370 CLIENT SAMPLE ID: WRL-MW4B-1201				**DATE SAMPLED: 12/05/01**	
ZINC	0.039	MG/L	12/12/01	EPA 6020	NS
THALLIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
SODIUM	70.4	MG/L	12/13/01	EPA 6010	NS
SELENIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
SILICA	53.3	MG/L	1/4/02	EPA 200.7	
MANGANESE	0.071	MG/L	12/12/01	EPA 6020	NS
MAGNESIUM	49.7	MG/L	12/13/01	EPA 6010	NS
LEAD	0.006	MG/L	12/12/01	EPA 6020	NS
IRON	2.9	MG/L	12/13/01	EPA 6010	NS
CHROMIUM	0.217	MG/L	12/12/01	EPA 6020	NS
CADMIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
METALS DIGESTION	YES		12/6/01	EPA 3005	BRD
SAMPLE #: 216371 CLIENT SAMPLE ID: WRL-MW4B-1201				**DATE SAMPLED: 12/05/01**	

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CLIENT JOB NUMBER:

PROJECT #: 998346
RECEIVED: 12/5/01

TEST PERFORMED	RESULTS	UNITS	DATE PERFORMED	METHOD NUMBER	PERFORMED BY
SAMPLE #: 216371 CLIENT SAMPLE ID: WRL-MW4B-1201				**DATE SAMPLED: 12/05/01**	
SULFATE	176	MG/L	12/19/01	EPA 375.2	DMP
SAMPLE #: 216372 CLIENT SAMPLE ID: WRL-MW4B-1201				**DATE SAMPLED: 12/05/01**	
CHROMIUM, HEXAVALENT	0.19	MG/L @ 08:45	12/6/01	SM18 3500-CR D	DMP
SAMPLE #: 216373 CLIENT SAMPLE ID: WRL-MW3B-1201				**DATE SAMPLED: 12/05/01**	
PHENOLICS	<0.002	MG/L	12/11/01	EPA 420.2	DMP
SAMPLE #: 216374 CLIENT SAMPLE ID: WRL-MW3B-1201				**DATE SAMPLED: 12/05/01**	
NITROGEN, AMMONIA	<1.0	MG/L	12/17/01	EPA 350 2	DMP
SAMPLE #: 216375 CLIENT SAMPLE ID: WRL-MW3B-1201				**DATE SAMPLED: 12/05/01**	
ZINC	<0.005	MG/L	12/12/01	EPA 6020	NS
THALLIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
SODIUM	60.5	MG/L	12/13/01	EPA 6010	NS
SELENIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
SILICA	19.2	MG/L	1/4/02	EPA 200.7	
MANGANESE	<0.005	MG/L	12/12/01	EPA 6020	NS
MAGNESIUM	3.5	MG/L	12/13/01	EPA 6010	NS
LEAD	<0.005	MG/L	12/12/01	EPA 6020	NS
IRON	0.057	MG/L	12/13/01	EPA 6010	NS
CHROMIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
CADMIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
METALS DIGESTION	YES		12/6/01	EPA 3005	BRD
SAMPLE #: 216376 CLIENT SAMPLE ID: WRL-MW3B-1201				**DATE SAMPLED: 12/05/01**	

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ATTN: MR. SCOTT GRAHAM

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CLIENT JOB NUMBER:

TEST PERFORMED	RESULTS	UNITS	DATE PERFORMED	METHOD NUMBER	PERFORMED BY
SAMPLE #: 216376	**CLIENT SAMPLE ID: WRL-MW3B-1201**				**DATE SAMPLED: 12/05/01**
SULFATE	52.5	MG/L	12/19/01	EPA 375.2	DMP
SAMPLE #: 216377	**CLIENT SAMPLE ID: WRL-MW3B-1201**				**DATE SAMPLED: 12/05/01**
CHROMIUM, HEXAVALENT	<0.010	MG/L @ 08:45	12/6/01	SM18 3500-CR D	DMP
SAMPLE #: 216378	**CLIENT SAMPLE ID: WRL-L1-1201**				**DATE SAMPLED: 12/05/01**
PHENOLICS	0.028	MG/L	12/11/01	EPA 420.2	DMP
SAMPLE #: 216379	**CLIENT SAMPLE ID: WRL-L1-1201**				**DATE SAMPLED: 12/05/01**
NITROGEN, AMMONIA	4.3	MG/L	12/17/01	EPA 350.2	DMP
SAMPLE #: 216380	**CLIENT SAMPLE ID: WRL-L1-1201**				**DATE SAMPLED: 12/05/01**
ZINC	<0.005	MG/L	12/12/01	EPA 6020	NS
THALLIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
SODIUM	74.4	MG/L	12/13/01	EPA 6010	NS
SELENIUM	0.023	MG/L	12/12/01	EPA 6020	NS
SILICA	0.563	MG/L	1/4/02	EPA 200.7	
MANGANESE	<0.005	MG/L	12/12/01	EPA 6020	NS
MAGNESIUM	<1.0	MG/L	12/13/01	EPA 6010	NS
LEAD	<0.005	MG/L	12/12/01	EPA 6020	NS
IRON	<0.025	MG/L	12/13/01	EPA 6010	NS
CHROMIUM	0.500	MG/L	12/12/01	EPA 6020	NS
CADMIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
METALS DIGESTION	YES		12/6/01	EPA 3005	BRD
SAMPLE #: 216381	**CLIENT SAMPLE ID: WRL-L1-1201**				**DATE SAMPLED: 12/05/01**

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P.O. #
CLIENT JOB NUMBER:

PROJECT #: 998346
RECEIVED: 12/5/01

TEST PERFORMED	RESULTS	UNITS	DATE PERFORMED	METHOD NUMBER	PERFORMED BY
SAMPLE #: 216381	**CLIENT SAMPLE ID: WRL-L1-1201**			**DATE SAMPLED: 12/05/01**	
SULFATE	12.3	MG/L	12/19/01	EPA 375.2	DMP
SAMPLE #: 216382	**CLIENT SAMPLE ID: WRL-L1-1201**			**DATE SAMPLED: 12/05/01**	
CHROMIUM, HEXAVALENT	0.23	MG/L @ 08:45	12/6/01	SM18 3500-CR D	DMP
SAMPLE #: 216383	**CLIENT SAMPLE ID: WRL-MW8B-1201**			**DATE SAMPLED: 12/05/01**	
PHENOLICS	<0.002	MG/L	12/11/01	EPA 420.2	DMP
SAMPLE #: 216384	**CLIENT SAMPLE ID: WRL-MW8B-1201**			**DATE SAMPLED: 12/05/01**	
NITROGEN, AMMONIA	<1.0	MG/L	12/17/01	EPA 350.2	DMP
SAMPLE #: 216385	**CLIENT SAMPLE ID: WRL-MW8B-1201**			**DATE SAMPLED: 12/05/01**	
ZINC	0.133	MG/L	12/12/01	EPA 6020	NS
THALLIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
SODIUM	157	MG/L	12/13/01	EPA 6010	NS
SELENIUM	0.053	MG/L	12/12/01	EPA 6020	NS
SILICA	49.0	MG/L	1/4/02	EPA 200.7	
MANGANESE	0.425	MG/L	12/12/01	EPA 6020	NS
MAGNESIUM	59.8	MG/L	12/13/01	EPA 6010	NS
LEAD	0.007	MG/L	12/12/01	EPA 6020	NS
IRON	2.9	MG/L	12/13/01	EPA 6010	NS
CHROMIUM	0.160	MG/L	12/12/01	EPA 6020	NS
CADMIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
METALS DIGESTION	YES		12/6/01	EPA 3005	BRD
SAMPLE #: 216386	**CLIENT SAMPLE ID: WRL-MW8B-1201**			**DATE SAMPLED: 12/05/01**	

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737 FLY RD.

EAST SYRACUSE NY 13057-
ATTN: MR. SCOTT GRAHAM

P.O. #
CLIENT JOB NUMBER:

PROJECT #: 998346
RECEIVED: 12/5/01

TEST PERFORMED	RESULTS	UNITS	DATE PERFORMED	METHOD NUMBER	PERFORMED BY
SAMPLE #: 216386 CLIENT SAMPLE ID: WRL-MW8B-1201				**DATE SAMPLED: 12/05/01**	
SULFATE	464	MG/L	12/19/01	EPA 375.2	DMP
SAMPLE #: 216387 CLIENT SAMPLE ID: WRL-MW8B-1201				**DATE SAMPLED: 12/05/01**	
CHROMIUM, HEXAVALENT	0.11	MG/L @ 08:45	12/6/01	SM18 3500-CR D	DMP
SAMPLE #: 216388 CLIENT SAMPLE ID: WRL-SS-1201				**DATE SAMPLED: 12/05/01**	
PHENOLICS	0.064	MG/L	12/11/01	EPA 420.2	DMP
SAMPLE #: 216389 CLIENT SAMPLE ID: WRL-SS-1201				**DATE SAMPLED: 12/05/01**	
NITROGEN, AMMONIA	3.8	MG/L	12/17/01	EPA 350.2	DMP
SAMPLE #: 216390 CLIENT SAMPLE ID: WRL-SS-1201				**DATE SAMPLED: 12/05/01**	
ZINC	0.067	MG/L	12/12/01	EPA 6020	NS
THALLIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
SODIUM	77.2	MG/L	12/13/01	EPA 6010	NS
SELENIUM	0.027	MG/L	12/12/01	EPA 6020	NS
SILICA	112	MG/L	1/4/02	EPA 200.7	
MANGANESE	0.226	MG/L	12/12/01	EPA 6020	NS
MAGNESIUM	522	MG/L	12/13/01	EPA 6010	NS
LEAD	0.032	MG/L	12/12/01	EPA 6020	NS
IRON	5.5	MG/L	12/13/01	EPA 6010	NS
CHROMIUM	0.432	MG/L	12/12/01	EPA 6020	NS
CADMIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
METALS DIGESTION	YES		12/6/01	EPA 3005	BRD
SAMPLE #: 216391 CLIENT SAMPLE ID: WRL-SS-1201				**DATE SAMPLED: 12/05/01**	

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P.O. #
CLIENT JOB NUMBER:

PROJECT #: 998346
RECEIVED: 12/5/01

TEST PERFORMED	RESULTS	UNITS	DATE PERFORMED	METHOD NUMBER	PERFORMED BY
SAMPLE #: 216391 CLIENT SAMPLE ID: WRL-SS-1201				**DATE SAMPLED: 12/05/01**	
SULFATE	44.6	MG/L	12/19/01	EPA 375.2	DMP
SAMPLE #: 216392 CLIENT SAMPLE ID: WRL-SS-1201				**DATE SAMPLED: 12/05/01**	
CHROMIUM, HEXAVALENT	0.34	MG/L @ 08:45	12/6/01	SM18 3500-CR D	DMP
SAMPLE #: 216398 CLIENT SAMPLE ID: WRL-MW7B-1201				**DATE SAMPLED: 12/05/01**	
PHENOLICS	0.009	MG/L	12/11/01	EPA 420.2	DMP
SAMPLE #: 216399 CLIENT SAMPLE ID: WRL-MW7B-1201				**DATE SAMPLED: 12/05/01**	
NITROGEN, AMMONIA	<1.0	MG/L	12/17/01	EPA 350.2	DMP
SAMPLE #: 216400 CLIENT SAMPLE ID: WRL-MW7B-1201				**DATE SAMPLED: 12/05/01**	
ZINC	0.054	MG/L	12/12/01	EPA 6020	NS
THALLIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
SODIUM	58.5	MG/L	12/13/01	EPA 6010	NS
SELENIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
SILICA	158	MG/L	1/4/02	EPA 200.7	
MANGANESE	0.199	MG/L	12/12/01	EPA 6020	NS
MAGNESIUM	11.0	MG/L	12/13/01	EPA 6010	NS
LEAD	0.005	MG/L	12/12/01	EPA 6020	NS
IRON	9.9	MG/L	12/13/01	EPA 6010	NS
CHROMIUM	0.210	MG/L	12/12/01	EPA 6020	NS
CADMIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
METALS DIGESTION	YES		12/6/01	EPA 3005	BRD
SAMPLE #: 216401 CLIENT SAMPLE ID: WRL-MW7B-1201				**DATE SAMPLED: 12/05/01**	

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CLIENT JOB NUMBER:

PROJECT #: 998346
RECEIVED: 12/5/01

TEST PERFORMED	RESULTS	UNITS	DATE PERFORMED	METHOD NUMBER	PERFORMED BY
SAMPLE #: 216401 CLIENT SAMPLE ID: WRL-MW7B-1201				**DATE SAMPLED: 12/05/01**	
SULFATE	41.9	MG/L	12/19/01	EPA 375.2	DMP
SAMPLE #: 216402 CLIENT SAMPLE ID: WRL-MW7B-1201				**DATE SAMPLED: 12/05/01**	
CHROMIUM, HEXAVALENT	0.18	MG/L @ 08:45	12/6/01	SM18 3500-CR D	DMP
SAMPLE #: 216408 CLIENT SAMPLE ID: WRL-MW2B-1201				**DATE SAMPLED: 12/05/01**	
PHENOLICS	<0.002	MG/L	12/11/01	EPA 420.2	DMP
SAMPLE #: 216409 CLIENT SAMPLE ID: WRL-MW2B-1201				**DATE SAMPLED: 12/05/01**	
NITROGEN, AMMONIA	1.4	MG/L	12/17/01	EPA 350.2	DMP
SAMPLE #: 216410 CLIENT SAMPLE ID: WRL-MW2B-1201				**DATE SAMPLED: 12/05/01**	
ZINC	0.012	MG/L	12/12/01	EPA 6020	NS
THALLIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
SODIUM	61.9	MG/L	12/13/01	EPA 6010	NS
SELENIUM	0.008	MG/L	12/12/01	EPA 6020	NS
SILICA	1.3	MG/L	1/4/02	EPA 200 7	
MANGANESE	0.008	MG/L	12/12/01	EPA 6020	NS
MAGNESIUM	<1.0	MG/L	12/13/01	EPA 6010	NS
LEAD	<0.005	MG/L	12/12/01	EPA 6020	NS
IRON	0.295	MG/L	12/13/01	EPA 6010	NS
CHROMIUM	0.369	MG/L	12/12/01	EPA 6020	NS
CADMIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
METALS DIGESTION	YES		12/6/01	EPA 3005	BRD
SAMPLE #: 216411 CLIENT SAMPLE ID: WRL-MW2B-1201				**DATE SAMPLED: 12/05/01**	

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PROJECT #: 998346
RECEIVED: 12/5/01

TEST PERFORMED	RESULTS	UNITS	DATE PERFORMED	METHOD NUMBER	PERFORMED BY
SAMPLE #: 216411 CLIENT SAMPLE ID: WRL-MW2B-1201				**DATE SAMPLED: 12/05/01**	
SULFATE	16.0	MG/L	12/19/01	EPA 375.2	DMP
SAMPLE #: 216412 CLIENT SAMPLE ID: WRL-MW2B-1201				**DATE SAMPLED: 12/05/01**	
CHROMIUM, HEXAVALENT	0.39	MG/L @ 08:45	12/6/01	SM18 3500-CR D	DMP
SAMPLE #: 216413 CLIENT SAMPLE ID: WRL-RB-1201				**DATE SAMPLED: 12/05/01**	
PHENOLICS	<0.002*	MG/L	12/11/01	EPA 420.2	DMP
* Low spike recovery due to sample matrix interference.					
SAMPLE #: 216414 CLIENT SAMPLE ID: WRL-RB-1201				**DATE SAMPLED: 12/05/01**	
NITROGEN, AMMONIA	<1.0	MG/L	12/17/01	EPA 350.2	DMP
SAMPLE #: 216415 CLIENT SAMPLE ID: WRL-RB-1201				**DATE SAMPLED: 12/05/01**	
ZINC	<0.005	MG/L	12/12/01	EPA 6020	NS
THALLIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
SODIUM	<1.0	MG/L	12/13/01	EPA 6010	NS
SELENIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
SILICA	<0.214	MG/L	1/4/02	EPA 200.7	
MANGANESE	<0.005	MG/L	12/12/01	EPA 6020	NS
MAGNESIUM	<1.0	MG/L	12/13/01	EPA 6010	NS
LEAD	<0.005	MG/L	12/12/01	EPA 6020	NS
IRON	0.058	MG/L	12/13/01	EPA 6010	NS
CHROMIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
CADMIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
METALS DIGESTION	YES		12/6/01	EPA 3005	BRD

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E.A. ENGINEERING & SCIENCE TECHNOLOGY
737 FLY RD.

EAST SYRACUSE NY 13057-
ATTN: MR. SCOTT GRAHAM

P.O. #
CLIENT JOB NUMBER:

PROJECT #: 998346
RECEIVED: 12/5/01

TEST PERFORMED	RESULTS	UNITS	DATE PERFORMED	METHOD NUMBER	PERFORMED BY
SAMPLE #: 216416 CLIENT SAMPLE ID: WRL-RB-1201				**DATE SAMPLED: 12/05/01**	
SULFATE	<4	MG/L	12/19/01	EPA 375.2	DMP
SAMPLE #: 216417 CLIENT SAMPLE ID: WRL-RB-1201				**DATE SAMPLED: 12/05/01**	
CHROMIUM, HEXAVALENT	<0.010	MG/L @ 08:45	12/6/01	SM18 3500-CR D	DMP
SAMPLE #: 216418 CLIENT SAMPLE ID: WRL-MW6B-1201				**DATE SAMPLED: 12/05/01**	
PHENOLICS	<0.002	MG/L	12/19/01	EPA 420.2	DMP
SAMPLE #: 216419 CLIENT SAMPLE ID: WRL-MW6B-1201				**DATE SAMPLED: 12/05/01**	
NITROGEN, AMMONIA	<1.0	MG/L	12/17/01	EPA 350.2	DMP
SAMPLE #: 216420 CLIENT SAMPLE ID: WRL-MW6B-1201				**DATE SAMPLED: 12/05/01**	
ZINC	0.011	MG/L	12/12/01	EPA 6020	NS
THALLIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
SODIUM	65.1	MG/L	12/13/01	EPA 6010	NS
SELENIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
SILICA	25.2	MG/L	1/4/02	EPA 200.7	
MANGANESE	0.135	MG/L	12/12/01	EPA 6020	NS
MAGNESIUM	75.4	MG/L	12/13/01	EPA 6010	NS
LEAD	<0.005	MG/L	12/12/01	EPA 6020	NS
IRON	1.8	MG/L	12/13/01	EPA 6010	NS
CHROMIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
CADMIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
METALS DIGESTION	YES		12/6/01	EPA 3005	BRD

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737 FLY RD.

EAST SYRACUSE NY 13057-
ATTN: MR. SCOTT GRAHAM

P.O. #
CLIENT JOB NUMBER:

PROJECT #: 998346
RECEIVED: 12/5/01

TEST PERFORMED	RESULTS	UNITS	DATE PERFORMED	METHOD NUMBER	PERFORMED BY
SAMPLE #: 216421 CLIENT SAMPLE ID: WRL-MW6B-1201				**DATE SAMPLED: 12/05/01**	
SULFATE	310	MG/L	12/19/01	EPA 375.2	DMP
SAMPLE #: 216422 CLIENT SAMPLE ID: WRL-MW6B-1201				**DATE SAMPLED: 12/05/01**	
CHROMIUM, HEXAVALENT	<0.010	MG/L @ 08:45	12/6/01	SM18 3500-CR D	DMP
SAMPLE #: 216423 CLIENT SAMPLE ID: WRL-DUP-1201				**DATE SAMPLED: 12/05/01**	
PHENOLICS	<0.002	MG/L	12/19/01	EPA 420.2	DMP
SAMPLE #: 216424 CLIENT SAMPLE ID: WRL-DUP-1201				**DATE SAMPLED: 12/05/01**	
NITROGEN, AMMONIA	<1.0	MG/L	12/17/01	EPA 350.2	DMP
SAMPLE #: 216425 CLIENT SAMPLE ID: WRL-DUP-1201				**DATE SAMPLED: 12/05/01**	
ZINC	0.007	MG/L	12/12/01	EPA 6020	NS
THALLIUM	0.007	MG/L	12/12/01	EPA 6020	NS
SODIUM	68.0	MG/L	12/13/01	EPA 6010	NS
SELENIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
SILICA	19.3	MG/L	1/4/02	EPA 200.7	
MANGANESE	0.092	MG/L	12/12/01	EPA 6020	NS
MAGNESIUM	76.3	MG/L	12/13/01	EPA 6010	NS
LEAD	<0.005	MG/L	12/12/01	EPA 6020	NS
IRON	0.688	MG/L	12/13/01	EPA 6010	NS
CHROMIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
CADMIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
METALS DIGESTION	YES		12/6/01	EPA 3005	BRD
SAMPLE #: 216426 CLIENT SAMPLE ID: WRL-DUP-1201				**DATE SAMPLED: 12/05/01**	

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E.A. ENGINEERING & SCIENCE TECHNOLOGY
737 FLY RD.

EAST SYRACUSE NY 13057-
ATTN: MR. SCOTT GRAHAM

P.O. #
CLIENT JOB NUMBER:

PROJECT #: 998346
RECEIVED: 12/5/01

TEST PERFORMED	RESULTS	UNITS	DATE PERFORMED	METHOD NUMBER	PERFORMED BY
SAMPLE #: 216426 CLIENT SAMPLE ID: WRL-DUP-1201				**DATE SAMPLED: 12/05/01**	
SULFATE	261	MG/L	12/19/01	EPA 375.2	DMP
SAMPLE #: 216427 CLIENT SAMPLE ID: WRL-DUP-1201				**DATE SAMPLED: 12/05/01**	
CHROMIUM, HEXAVALENT	<0.010	MG/L @ 08:45	12/6/01	SM18 3500-CR D	DMP
SAMPLE #: 216428 CLIENT SAMPLE ID: WRL-SWB-1201				**DATE SAMPLED: 12/05/01**	
PHENOLICS	<0.002	MG/L	12/19/01	EPA 420.2	DMP
SAMPLE #: 216429 CLIENT SAMPLE ID: WRL-SWB-1201				**DATE SAMPLED: 12/05/01**	
NITROGEN, AMMONIA	<1.0	MG/L	12/17/01	EPA 350.2	DMP
SAMPLE #: 216430 CLIENT SAMPLE ID: WRL-SWB-1201				**DATE SAMPLED: 12/05/01**	
ZINC	<0.005	MG/L	12/12/01	EPA 6020	NS
THALLIUM	0.005	MG/L	12/12/01	EPA 6020	NS
SODIUM	<1.0	MG/L	12/13/01	EPA 6010	NS
SELENIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
SILICA	<0.214	MG/L	1/4/02	EPA 200 7	
MANGANESE	<0.005	MG/L	12/12/01	EPA 6020	NS
MAGNESIUM	<1.0	MG/L	12/13/01	EPA 6010	NS
LEAD	<0.005	MG/L	12/12/01	EPA 6020	NS
IRON	<0.025	MG/L	12/13/01	EPA 6010	NS
CHROMIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
CADMIUM	<0.005	MG/L	12/12/01	EPA 6020	NS
METALS DIGESTION	YES		12/6/01	EPA 3005	BRD
SAMPLE #: 216431 CLIENT SAMPLE ID: WRL-SWB-1201				**DATE SAMPLED: 12/05/01**	

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E.A. ENGINEERING & SCIENCE TECHNOLOGY
737 FLY RD.

EAST SYRACUSE NY 13057-
ATTN: MR. SCOTT GRAHAM

P.O. #
CLIENT JOB NUMBER:

PROJECT #: 998346
RECEIVED: 12/5/01

TEST PERFORMED	RESULTS	UNITS	DATE PERFORMED	METHOD NUMBER	PERFORMED BY
SAMPLE #: 216431 CLIENT SAMPLE ID: WRL-SWB-1201				**DATE SAMPLED: 12/05/01**	
SULFATE	<4	MG/L	12/19/01	EPA 375.2	DMP
SAMPLE #: 216432 CLIENT SAMPLE ID: WRL-SWB-1201				**DATE SAMPLED: 12/05/01**	
CHROMIUM, HEXAVALENT	<0.010	MG/L @ 08:45	12/6/01	SM18 3500-CR D	DMP

Faxed Copy *

Douglas W. Mendrala
Laboratory Director

01/07/2002
Date

All tests performed under NYS ELAP laboratory certification # 11375 unless otherwise stated.

* *The original signed copy will follow this fascimile in the mail.*

Appendix F

Landfill Inspection Checklists

INSPECTION # 1 (11/00)

LANDFILL CAP INSPECTION CHECKLIST
WITMER ROAD LANDFILL, NIAGARA FALLS, NEW YORK

EA Personnel:	Donald Conan, James Hayward
NYSDEC Personnel:	Mike Hinton, James Tuck
Date:	29 November, 2000
Weather:	Overcast, no precipitation, 35° F

General:

Jim and I inspected the landfill with Mike Hinton and Jim Tuck. The four of us walked the perimeter road and noted the following:

NYSDEC noted the cleanup effort around the interior gate (in the NiMo R-O-W)was not completed. Sandbags, a drum, lathe, fence posts, and paint cans were some of the items present in the area.

The padlock on the exterior gate (at Witmer Rd) had some "teeth marks" on it. It appeared someone with an undersized set of bolt cutters attempted to break in.

1. **Inspection of ground surface for exposure of geotextile cover (cap erosion):**

No cap erosion or exposed geotextile was noted.

Survey grade sticks should be removed prior to first mowing.

2. **Inspection of ground surface for differential settlement resulting in soil cracking or ponded water:**

The southeast corner of the CAP could use some regrading work. The fence fabric is out of spec in some locations here, but it is more due to the irregular grade than the fence being installed wrong. According to NYSDEC, this is also a "problem spot" regarding unauthorized access. An ATV trail is visible from the corner and the State is concerned about people entering the site at this location.

3. **Identification of stressed vegetation:**

None noted.

4. **Identification of seeps, rooted vegetation (trees), and/or animal burrows:**

There is a CAP underdrain that daylights at the southwest corner of the site. NYSDEC wants the drain raised 6-inches above grade (it is currently flush with grade). Also, the fence fabric is very high at the southwest corner.

5. **Identification of deteriorating equipment (i.e., monitoring wells, fencing, or drainage structures):**

Although no equipment was noted as deteriorated, the constructed fence appeared to be out of "spec" in several locations:

The fence fabric is installed above the specified 2-inches above grade in several locations around the site. NYSDEC is concerned about potential liability by approving a product that was not constructed per the specifications. They're also concerned about site security (unauthorized entry) where the gap below the fence is substantial. Many of these locations were photographed during the inspection, and Jim and I marked up a drawing hi-lighting problem areas. This is a real issue with the State.

6. **Inspection of stormwater drainage swales for erosion, sloughing, or flow-through:**

The ditch along the west side of the site requires regrading.

7. **Inspection of east side of the landfill (Niagara Mohawk Power Corporation parcel) along the intermittent stream for the presence of erosion or sloughing:**

The intermittent stream beyond the eastern fence-line requires grading work. The irregular grade of the ditch/stream centerline is causing ponding in several locations. The NYSDEC claim they noted this to SLC while still onsite.

8. Inspection of access roads:

Geotextile fabric is exposed along the access road on the eastern side of the site. It's my understanding the specifications call for 6-inches of stone cover.

The access road is badly rutted along the southern side. Although the road needs to be re-graded, I'm not sure if that will prevent the problem from re-occurring. The aggregate used does not appear have enough fines to "bind" the stone.

Note: The fence fabric was installed on the inside of the posts on the south side of the site. The fabric is on the outside of the posts everywhere else.

INSPECTION #2 (3/01)

LANDFILL CAP INSPECTION
WITMER ROAD LANDFILL, NIAGARA FALLS, NEW YORK

EA Personnel: Donald Conan, John Clark

NYSDEC Personnel: Mike Hinton

Other Personnel: Mark Fox (Fox Fence)

Date: 01 March, 2001

Weather: Overcast, no precipitation, windy, 20° F

General:

John Clark and Don Conan inspected the landfill with Mike Hinton. Mark Fox (Fox Fence) was on-site to go over the necessary repair work (lowering the fence fabric) to get the fence within spec (bottom of fence within 2-inches from grade). Since no work has been performed since the last inspection, the following items are in addition to those noted in the November inspection checklist. Those comments generated from the November inspection still must be addressed and are not repeated here.

Mike Hinton inquired on EA's plans to label the monitoring wells. Mike referred to the plans and specs which he believes includes a post (with sign) adjacent to each well.The four of us walked the landfill and noted the following:

1. **Inspection of ground surface for exposure of geotextile cover (cap erosion):**

   Erosion was noted in two areas of the cap, southeast corner and the western side. Photographs of the damage were taken. EA (Syracuse) will contact SLC to notify them of the damage and coordinate repairs.

2. **Inspection of ground surface for differential settlement resulting in soil cracking or ponded water:**

   See November 2000 checklist.

3. **Identification of stressed vegetation:**

None noted.

4. **Identification of seeps, rooted vegetation (trees), and/or animal burrows:**

NYSDEC is concerned with the cap underdrain that daylights at the southwest corner of the site. Raising the drain 6-inches was discussed during the November 2000 inspection, but was ruled-out by EA since it would raise the water table under the cap by the same amount (6-inches). Mike Hinton referenced the plans/specs, which depict the drain outlet 6-inches above the stone. Removing 6-inches of stone around the outlet may be an option?

5. **Identification of deteriorating equipment (i.e., monitoring wells, fencing, or drainage structures):**

A portion of the fence was damaged (by wind) along the north side of the landfill. Fox Fence will make repairs when they return to lower the fence fabric.

6. **Inspection of stormwater drainage swales for erosion, sloughing, or flow-through:**

The ditch along the west side of the site has been filled in with a significant quantity of silt due to wash-out of upgradient topsoil cover.

7. **Inspection of east side of the landfill (Niagara Mohawk Power Corporation parcel) along the intermittent stream for the presence of erosion or sloughing:**

See November 2000 checklist.

8. **Inspection of access roads:**

See November 2000 checklist.

INSPECTION # 3 (6/01)

LANDFILL CAP INSPECTION
WITMER ROAD LANDFILL, NIAGARA FALLS, NEW YORK

EA Personnel: Donald Conan

NYSDEC Personnel: Mike Hinton

Other Personnel: Kevin P. (SLC Superintendent)

Date: 19 June, 2001

Weather: Partly Cloudy, no precipitation, windy, 85° F

General:

Don Conan performed a preliminary inspection of the landfill with Mike Hinton and John Kuhn (SLC) on 22 May 2001. The purpose of the preliminary inspection was to identify necessary repair work. A site-walk was conducted and the following items were noted:

- There were three main "washout" locations on the west side of the landfill. Due to the severity of 2 of the wash-out locations, a suggestion was made to consider converting the wash-outs to armored drainage swales,
- The southern access road was rutted and required grading,
- The geotextile was exposed at a few locations along the eastern access road. Run-of-crusher road material will be delivered and placed to provide required cover,
- The NiMO ditch to the east of the landfill required some grading to minimize ponding of water within the ditch.

Between the preliminary inspection date (22 May 2001) and the mobilization date for repair work (18 June 2001) the following issues were raised and resolved as follows:

- It was decided to convert 2 of the 3 "washout" locations to rock-lined drainage swales, the third will be repaired per the original cap design.
- The property owner to the west of the site was concerned about the leachate drain discharging across their property. Redirecting the leachate under the southern fence was added to the repair list.

A preconstruction site-walk was conducted on 18 June 2001 by Don Conan and Mike Hinton to evaluate changes in site conditions from the 22 May 2001 preliminary inspection. Two "washout" locations on the south side of the landfill were added to the repair list at this time.

1. **Inspection of ground surface for exposure of geotextile cover (cap erosion):**

   Repair work to the 5 aforementioned "washouts" was approved by NYSDEC.

2. **Inspection of ground surface for differential settlement resulting in soil cracking or ponded water:**

   None noted.

3. **Identification of stressed vegetation:**

   None noted. The first mowing is scheduled for the second week of July 2001.

4. **Identification of seeps, rooted vegetation (trees), and/or animal burrows:**

   Flow from the cap underdrain that daylights at the southwest corner of the site was redirected to flow under the south fence. The repair was approved by NYSDEC. NYSDEC is concerned that the flowrate from the cap underdrain is not decreasing. NYSDEC stated that letting the drain freely discharge was considered a temporary measure and if the flow did not slow down, some action (e.g. cap the drain, or treat the leachate) may be required.

   No rooted vegetation or animal burrows were observed during the inspection. However, paw prints from a small dog or coyote were observed in mud near the southwest corner.

5. **Identification of deteriorating equipment (i.e., monitoring wells, fencing, or drainage structures):**

   None noted.

6. **Inspection of stormwater drainage swales for erosion, sloughing, or flow-through:**

   The ditch along the west side of the site that had been filled in with silt due to wash-out of upgradient topsoil cover was regraded.

7. **Inspection of east side of the landfill (Niagara Mohawk Power Corporation parcel) along the intermittent stream for the presence of erosion or sloughing:**

Regrading of the NiMo ditch was approved by NYSDEC.

8. **Inspection of access roads:**

Repair work to the access road included adding and grading run-of crush stone to areas where the geotextile was exposed. The repair work was approved by NYSDEC

LANDFILL CAP INSPECTION CHECKLIST
WITMER ROAD LANDFILL, NIAGARA FALLS, NEW YORK

EA Personnel: HAYWARD

Date: 9/18/01

Weather: SUNNY 75°F

1. Inspection of ground surface for exposure of geotextile cover (cap erosion):
   NO CAP EROSION OR EXPOSED GEOTEXTILE NOTED.

2. Inspection of ground surface for differential settlement resulting in soil cracking or ponded water:
   NONE NOTED.

3. Identification of stressed vegetation:
   NONE NOTED. GRASS HAS BEEN MOWED.

4. Identification of seeps, rooted vegetation (trees), and/or animal burrows:
   NONE NOTED.

5. Identification of deteriorating equipment (i.e., monitoring wells, fencing, or drainage structures): GREEN MARKING STAKE AT MW-48 WAS BENT, APPARENTLY BY MOWER — NO DAMAGE TO WELL. STRAIGHTENED STAKE. NO OTHER DETERIORATION NOTED.

6. Inspection of stormwater drainage swales for erosion, sloughing, or flow-through:
   NONE NOTED.

7. Inspection of east side of the landfill (Niagara Mohawk Power Corporation parcel) along the intermittent stream for the presence of erosion or sloughing:
   NONE NOTED.

8. Inspection of access roads:
   NO ISSUES OR DEFICIENCIES NOTED

fax to Chip
12/10/01
– see e-mail also

LANDFILL CAP INSPECTION CHECKLIST
WITMER ROAD LANDFILL, NIAGARA FALLS, NEW YOR

EA Personnel: HAYWARD (MIKE HINTON, DEC)

Date: 12/5/01

Weather: CLOUDY, 65°

1. Inspection of ground surface for exposure of geotextile cover (cap erosion):
   NO DEFICIENCIES OBSERVED

2. Inspection of ground surface for differential settlement resulting in soil cracking or ponded water: NO DEFICIENCIES OBSERVED

3. Identification of stressed vegetation:
   NONE OBSERVED

4. Identification of seeps, rooted vegetation (trees), and/or animal burrows:
   NONE OBSERVED

5. Identification of deteriorating equipment (i.e., monitoring wells, fencing, or drainage structures): FENCE DAMAGE IN VICINITY OF MW-7 (POST WAS STRUCK, BUCKLED)

6. Inspection of stormwater drainage swales for erosion, sloughing, or flow-through:
   NO DEFICIENCIES OBSERVED

7. Inspection of east side of the landfill (Niagara Mohawk Power Corporation parcel) along the intermittent stream for the presence of erosion or sloughing:
   NONE OBSERVED

8. Inspection of access roads:
   NO DEFICIENCIES OBSERVED

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To CHIP	From JIM	
Co./Dept.	Co.	
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Fax #	Fax #	

Appendix G

Analytical Summary Tables and Tag Maps

APPENDIX G SUMMARY OF ANALYTICAL RESULTS OF GROUND-WATER, SURFACE WATER, AND LEACHATE SAMPLES COLLECTED IN DECEMBER 2000, WITMER ROAD LANDFILL, NIAGARA FALLS, NEW YORK

Ground Water

Volatile Organic Compounds by EPA Method 601-602 (µg/L)

		WRL-MW1B	WRL-MW2B	WRL-MW3B	WRL-MW6B	WRL-MW6B (Dup)	WRL-MW7B	WRL-MW8B
Compound/Element	**AWQS**							
1,1-Dichloroethane	5	(<1U)	1.4	(<1U)	(<1U)	(<1U)	(<1U)	(<1U)
Trichloroethene	5	1.6	(<1U)	(<1U)	(<1U)	(<1U)	(<1U)	(<1U)

Baseline Metals by EPA Method 6010/6020 (mg/L)

Dissolved (Filtered)

		WRL-MW1B	WRL-MW2B	WRL-MW3B	WRL-MW6B	WRL-MW6B (Dup)	WRL-MW7B	WRL-MW8B
Compound/Element	**AWQS**							
Aluminum	---	(<0.005U)	0.19	0.14	(<0.005U)	(<0.005U)	0.006	0.38
Arsenic	0.025	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	0.005
Barium	1	0.081	0.34	0.01	0.05	0.05	0.032	0.058
Boron	1	(<0.005U)	(<0.1U)	(<0.1U)	(<0.1U)	(<0.1U)	(<0.1U)	(<0.1U)
Cadmium	0.005	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)
Calcium	---	143	391	18.8	95.5	97.9	11.1	138
Chromium	0.05	(<0.005U)	**0.26**	(<0.005U)	(<0.005U)	(<0.005U)	**0.22**	**0.15**
Copper	0.2	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)
Iron	0.3	(<0.025U)	(<0.025U)	(<0.025U)	(<0.025U)	(<0.025U)	(<0.025U)	**0.45**
Lead	0.025	**0.15**	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)
Magnesium	35*	**46.8**	(<1U)	7.5	**62**	**65.2**	5.6	**65.6**
Manganese	0.3	**0.43**	(<0.005U)	(<0.005U)	0.037	0.042	(<0.005U)	0.14
Nickel	0.1	(<0.005U)	0.006	0.005	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)
Potassium	---	4.1	15.2	2	2.6	2.8	1.7	4
Selenium	0.01	(<0.005U)	0.009	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	**0.2**
Silica	---	16	1.49	18.9	14.3	14.4	13.5	17.4
Sodium	20	**83.1**	**48.5**	**42.4**	**47.9**	**50**	**52.1**	**82.2**
Thallium	0.0005*	**0.0016**	**0.0025**	**0.0034**	**0.0063**	**0.0014**	**0.0021**	**0.0017**
Zinc	2*	0.12	0.006	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	0.032

Ground Water

Baseline Metals by EPA Method 6010/6020 (mg/L)

Total (Unfiltered)

Compound/Element	AWQS	WRL-MW1B	WRL-MW2B	WRL-MW3B	WRL-MW6B	WRL-MW6B (Dup)	WRL-MW7B	WRL-MW8B
Aluminum	---	2.8	8	0.11	0.039	(<0.005U)	3	53.6
Arsenic	0.025	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	0.015
Barium	1	0.11	0.33	0.014	0.05	0.045	0.057	0.48
Boron	1	0.16	(<0.1U)	(<0.1U)	(<0.1U)	(<0.1U)	(<0.005U)	(<0.1U)
Cadmium	0.005	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	**0.01**
Calcium	---	165	417	27.5	99.1	99.3	15.8	337
Chromium	0.05	0.009	**0.34**	(<0.005U)	(<0.005U)	(<0.005U)	**0.36**	**0.12**
Chromium, Hexavalent	0.05	(<0.01U)	**0.095**	(<0.01U)	(<0.01U)	(<0.01U)	**0.256**	**0.088**
Copper	0.2	(<0.005U)	0.011	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	0.096
Cyanide	0.2	(<0.004U)	(<0.004U)	(<0.004U)	(<0.004U)	(<0.004U)	0.006	(<0.004U)
Iron	0.3	**2.7**	**10**	0.044	0.063	(<0.025U)	**3.4**	**70.3**
Lead	0.025	0.014	0.025	(<0.005U)	(<0.005U)	(<0.005U)	**66.2**	**0.19**
Magnesium	35*	**55.4**	13.9	13.3	**65.8**	**69.4**	6.5	**142**
Manganese	0.3	**0.61**	**0.33**	0.021	0.044	0.062	0.076	**1.8**
Nickel	0.1	0.007	0.015	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	0.062
Potassium	---	6	18.3	1.4	2.8	2.5	6.5	29.1
Selenium	0.01	(<0.005U)	0.009	(<0.005U)	0.005	(<0.005U)	0.005	**0.13**
Silica	---	27.7	28.4	15.7	15.1	14.2	23.1	116
Sodium	20	**82.2**	**55.8**	**44.5**	**50.4**	**56.8**	**51.3**	**93.5**
Thallium	0.0005*	**0.0015**	**0.0021**	**0.0024**	**0.0071**	**0.0013**	**0.0019**	**0.0018**
Zinc	2*	**34**	0.24	(<0.005U)	(<0.005U)	(<0.005U)	(<0.1U)	1.9

Water Quality Parameters (mg/L)

Dissolved (Filtered)

Compound/Element	AWQS	WRL-MW1B	WRL-MW2B	WRL-MW3B	WRL-MW6B	WRL-MW6B (Dup)	WRL-MW7B	WRL-MW8B
Hardness	---	549	976	77.6	493	513	50.7	613

Total (Unfiltered)

Compound/Element	AWQS	WRL-MW1B	WRL-MW2B	WRL-MW3B	WRL-MW6B	WRL-MW6B (Dup)	WRL-MW7B	WRL-MW8B
Hardness	---	641	1100	124	518	533	66.2	1430

Ground Water

Water Quality Parameters (mg/L)

Compound/Element	AWQS	WRL-MW1B	WRL-MW2B	WRL-MW3B	WRL-MW6B	WRL-MW6B (Dup)	WRL-MW7B	WRL-MW8B
Alkalinity	---	350	1000	91	271	272	129	380
Ammonia (expressed as N)	2	(<1U)	**2.57**	(<1U)	(<1U)	(<1U)	(<1U)	(<1U)
BOD	---	2	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
Chloride	250	233	44	57.1	61.7	61.8	10.3	68.1
COD	---	(<5U)	11.2	12.5	5.24	5.24	7.91	(<5U)
Nitrate (expressed as N)	10	(<0.1U)	(<0.1U)	(<0.1U)	1.19	1.19	(<0.1U)	3.68
pH	---	7.56	11.95	9.06	7.96	7.84	8.6	7.84
Phenolics	0.001	(<0.002U)	**0.0139**	**0.00484**	(<0.002U)	(<0.002U)	**0.00222**	(<0.002U)
Sulfate	250	214	21.7	22.1	**305**	**317**	39	**475**
TDS	---	1040	1010	252	765	837	238	1130
TKN	---	(<1U)	2.23	(<1U)	(<1U)	(<1U)	(<1U)	(<1U)
TOC	---	3.3	4.7	3.6	3	3.1	2.5	2.5

Surface Water

Volatile Organic Compounds by EPA Method 601-602 (µg/L)

		WRL-SS
Compound/Element	**AWQS**	
1,1-Dichloroethane	---	(<1U)
Trichloroethene	40	(<1U)

Baseline Metals by EPA Method 6010/6020 (mg/L)

Dissolved (Filtered)

		WRL-SS
Compound/Element	**AWQS**	
Aluminum	---	0.22
Arsenic	0.34	(<0.005U)
Barium	---	0.14
Boron	10	(<0.11U)
Cadmium	0.017**	(<0.005U)
Calcium	---	150
Chromium	0.0402**	(<0.005U)
Copper	0.0466**	(<0.005U)
Iron	0.3	(<0.025U)
Lead	0.3942**	(<0.005U)
Magnesium	---	(<1U)
Manganese	---	(<0.005U)
Nickel	1**	0.009
Potassium	---	139
Selenium	0.0046	**0.01**
Silica	---	13.7
Sodium	---	78
Thallium	0.02	0.0054
Zinc	0.3583**	(<0.005U)

Surface Water

Baseline Metals by EPA Method 6010/6020 (mg/L)

Total (Unfiltered)

		WRL-SS
Compound/Element	**AWQS**	
Aluminum	---	0.38
Arsenic	0.34	(<0.005U)
Barium	---	0.14
Boron	10	0.1
Cadmium	0.017**	(<0.005U)
Calcium	---	149
Chromium	0.0402**	(<0.005U)
Chromium, Hexavalent	0.016	(<0.01U)
Copper	0.0466**	(<0.005U)
Cyanide	0.022	(<0.004U)
Iron	0.3	0.16
Lead	0.3942**	(<0.005U)
Magnesium	---	(<1U)
Manganese	---	(<0.005U)
Nickel	1**	0.009
Potassium	---	134
Selenium	0.0046	**0.011**
Silica	---	13.5
Sodium	---	77.7
Thallium	0.02	0.0043
Zinc	0.3583**	(<0.005U)

Water Quality Parameters (mg/L)

Dissolved (Filtered)

		WRL-SS
Compound/Element	**AWQS**	
Hardness	---	374

Total (Unfiltered)

		WRL-SS
Compound/Element	**AWQS**	
Hardness	---	371

Surface Water

Water Quality Parameters (mg/L)

		WRL-SS
Compound/Element	**AWQS**	
Alkalinity	---	220
Ammonia (expressed as N)	---	24.8
BOD	---	9
Chloride	---	59.5
COD	---	33.6
Nitrate (expressed as N)	---	(<0.1U)
pH	---	10.35
Phenolics	---	0.0546
Sulfate	---	621
TDS	---	1160
TKN	---	25.6
TOC	---	(<1U)

Leachate

Volatile Organic Compounds by EPA Method 601-602 (µg/L)

Compound/Element	AWQS	WRL-L1
1,1-Dichloroethane	---	(<1U)
Trichloroethene	40	(<1U)

Baseline Metals by EPA Method 6010/6020 (mg/L)

Dissolved (Filtered)

Compound/Element	AWQS	WRL-L1
Aluminum	---	0.009
Arsenic	0.34	(<0.005U)
Barium	---	0.42
Boron	---	(<0.1U)
Cadmium	0.0888	(<0.005U)
Calcium	---	648
Chromium	0.053	**0.6**
Copper	0.1853	0.005
Iron	0.3	(<0.025U)
Lead	2	(<0.005U)
Magnesium	---	(<1U)
Manganese	---	(<0.005U)
Nickel	5	0.01
Potassium	---	51.3
Selenium	---	0.025
Silica	---	0.53
Sodium	---	54.6
Thallium	0.02	0.0019
Zinc	1	(<0.005U)

Leachate

Baseline Metals by EPA Method 6010/6020 (mg/L)

Total (Unfiltered)

		WRL-L1
Compound/Element	**AWQS**	
Aluminum	---	0.01
Arsenic	0.34	(<0.005U)
Barium	---	0.43
Boron	---	(<0.1U)
Cadmium	0.0888	(<0.005U)
Calcium	---	682
Chromium	0.053	**0.63**
Chromium, Hexavalent	0.016	**0.63**
Copper	0.1853	(<0.005U)
Cyanide	0.022	(<0.004U)
Iron	0.3	(<0.025U)
Lead	2	(<0.005U)
Magnesium	---	(<1U)
Manganese	---	(<0.005U)
Nickel	5	0.01
Potassium	---	55.1
Selenium	---	0.025
Silica	---	0.57
Sodium	---	57.5
Thallium	0.02	0.0015
Zinc	1	(<0.005U)

Water Quality Parameters (mg/L)

Dissolved (Filtered)

		WRL-L1
Compound/Element	**AWQS**	
Hardness	---	1620

Total (Unfiltered)

		WRL-L1
Compound/Element	**AWQS**	
Hardness	---	1700

Leachate

Water Quality Parameters (mg/L)

		WRL-L1
Compound/Element	**AWQS**	
Alkalinity	---	1740
Ammonia (expressed as N)	---	3.4
BOD	---	5
Chloride	---	32.9
COD	---	(<5U)
Nitrate (expressed as N)	---	(<0.1U)
pH	---	11.09
Phenolics	---	0.0266
Sulfate	---	12
TDS	---	1410
TKN	---	4.32
TOC	---	5.3

QA/QC

Volatile Organic Compounds by EPA Method 601-602 (µg/L)

Compound/Element	AWQS	Rinse Blank	Source Water Blank
1,1-Dichloroethane	---	(<1U)	(<1U)
Trichloroethene	---	(<1U)	(<1U)

Baseline Metals by EPA Method 6010/6020 (mg/L)

Dissolved (Filtered)

Compound/Element	AWQS	Rinse Blank	Source Water Blank
Aluminum	---	(<0.005U)	(<0.005U)
Arsenic	---	(<0.005U)	(<0.005U)
Barium	---	(<0.005U)	(<0.005U)
Boron	---	(<0.1U)	(<0.1U)
Cadmium	---	(<0.005U)	(<0.005U)
Calcium	---	(<0.5U)	(<0.5U)
Chromium	---	(<0.005U)	(<0.005U)
Copper	---	(<0.005U)	(<0.005U)
Iron	---	(<0.025U)	(<0.025U)
Lead	---	(<0.005U)	(<0.005U)
Magnesium	---	(<1U)	(<1U)
Manganese	---	(<0.005U)	(<0.005U)
Nickel	---	(<0.005U)	(<0.005U)
Potassium	---	(<1U)	(<1U)
Selenium	---	(<0.005U)	(<0.005U)
Silica	---	0.1	(<0.1U)
Sodium	---	(<1U)	(<1U)
Thallium	---	0.0069	0.0027
Zinc	---	(<0.005U)	(<0.005U)

QA/QC

Baseline Metals by EPA Method 6010/6020 (mg/L)

Total (Unfiltered)

		Rinse Blank	Source Water Blank
Compound/Element	**AWQS**		
Aluminum	---	(<0.005U)	(<0.005U)
Arsenic	---	(<0.005U)	(<0.005U)
Barium	---	(<0.005U)	(<0.005U)
Boron	---	(<0.1U)	(<0.1U)
Cadmium	---	(<0.005U)	(<0.005U)
Calcium	---	(<0.5U)	(<0.5U)
Chromium	---	(<0.005U)	(<0.005U)
Chromium, Hexavalent	---	(<0.01U)	(<0.01U)
Copper	---	(<0.005U)	(<0.005U)
Cyanide	---	(<0.004U)	(<0.004U)
Iron	---	(<0.025U)	(<0.025U)
Lead	---	(<5.4U)	(<0.005U)
Magnesium	---	(<1U)	(<1U)
Manganese	---	(<0.005U)	(<0.005U)
Nickel	---	(<0.005U)	(<0.005U)
Potassium	---	(<1U)	(<1U)
Selenium	---	(<0.005U)	(<0.005U)
Silica	---	(<0.1U)	(<0.1U)
Sodium	---	(<1U)	(<1U)
Thallium	---	0.0082	0.0028
Zinc	---	(<0.005U)	(<0.005U)

Water Quality Parameters (mg/L)

Dissolved (Filtered)

		Rinse Blank	Source Water Blank
Compound/Element	**AWQS**		
Hardness	---	(<5.4U)	(<5.4U)

Total (Unfiltered)

		Rinse Blank	Source Water Blank
Compound/Element	**AWQS**		
Hardness	---	(<5.4U)	5.4

QA/QC

Water Quality Parameters (mg/L)

Compound/Element	AWQS	Rinse Blank	Source Water Blank
Alkalinity	---	3	4
Ammonia (expressed as N)	---	(<1U)	(<1U)
BOD	---	(<2U)	(<2U)
Chloride	---	(<1U)	(<1U)
COD	---	6.61	(<5U)
Nitrate (expressed as N)	---	(<0.1U)	(<0.1U)
pH	---	6.14	5.63
Phenolics	---	(<0.002U)	(<0.002U)
Sulfate	---	(<2U)	(<4U)
TDS	---	(<4U)	25
TKN	---	(<1U)	(<1U)
TOC	---	(<1U)	(<1U)

TABLE NOTES

AWQS	=	New York State Ambient Water Quality Standards and Guidance Values from Division of Water and Technical and Operationial Guidance Series (1.1.1) June 1998.
*	=	Indicated guidance value.
**	=	Standard calculated based on sample hardness as per NYW AWQS.
U	=	Not detected. Sample quantitation limits shown as (<__U).
BOD	=	Biological Oxygen Demand.
COD	=	Chemical Oxygen Demand.
TOC	=	Total Organic Carbon.
TDS	=	Total Dissolved Solids.
TKN	=	Total Kjeldahl Nitrogen.

Only those analytes detected in at least one of the samples is shown on this table.
Results shaded and in boldface indicate concentrations in excess of New York State Ambient Water Quality Standards or Guidance Values.

Analytical Methods for Water Quality Parameters

Alkalinity	=	EPA 310.1
Ammonia (expressed as Nitrogen)	=	EPA 350.2
BOD	=	SM1852
Chloride	=	EPA 325.2
COD	=	EPA 410.4
Nitrate	=	EPA 353.2
pH	=	EPA 150.1
Phenolics	=	EPA 420.2
Sulfate	=	EPA 375.3
TDS	=	EPA 160.1
TKN	=	EPA 351.3
TOC	=	SW846 9060

APPENDIX G SUMMARY OF ANALYTICAL RESULTS OF GROUND-WATER, SURFACE WATER, AND LEACHATE SAMPLES COLLECTED IN MARCH 2001, WITMER ROAD LANDFILL, NIAGARA FALLS, NEW YORK

Ground Water

Volatile Organic Compounds by EPA Method 601-602 (µg/L)

Compound/Element	AWQS	WRL MW1B	WRL MW2B	WRL MW3B	WRL MW4B	WRL MW5B	WRL MW6B	WRL MW6B (Dup)	WRL MW7B	WRL MW8B
Total VOC	---	4.3	1	0	0	0	0	0	0	0
1,1-Dichloroethene	5	(<1U)	1	(<1U)	(<1U)	(<1U)	(<1U)	(<1U)	(<1U)	(<1U)
Trichloroethene	5	4.3	(<1U)	(<1U)	(<1U)	(<1U)	(<1U)	(<1U)	(<1U)	(<1U)

Baseline Metals by EPA Method 6010/6020 (mg/L)

Dissolved (Filtered)

Compound/Element	AWQS	WRL MW1B	WRL MW2B	WRL MW3B	WRL MW4B	WRL MW5B	WRL MW6B	WRL MW6B (Dup)	WRL MW7B	WRL MW8B
Aluminum	---	(<0.005U)	0.148	0.011	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)
Barium	1	0.081	0.294	0.012	0.044	0.028	0.039	0.038	0.031	0.031
Boron	1	0.167	(<0.1U)	(<0.1U)	(<0.1U)	(<0.1U)	(<0.1U)	(<0.1U)	(<0.1U)	(<0.1U)
Cadmium	0.005	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	**0.008**	(<0.005U)	(<0.005U)
Calcium	---	134	384	28.7	68.9	105	98.7	100B*	9.9	135
Chromium	0.05	(<0.005U)	**0.309**	0.008	**0.09**	0.006	(<0.005U)	(<0.005U)	**0.279**	**0.39B***
Copper	0.2	(<0.005U)	0.018	(<0.005U)	0.014	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)
Hardness	---	557	958	130	369	573	566	560	45.1	638
Iron	0.3	0.071	(<0.025U)	(<0.025U)	(<0.025U)	(<0.025U)	0.025B*	0.035B*	(<0.025U)	(<0.025U)
Lead	0.025	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)
Magnesium	35*	**54.4**	(<1U)	14.2	**47.9**	**75.4**	**77.5**	**75.3B***	5	**73.1**
Manganese	0.3	**0.57**	(<0.005U)	0.009	0.114	0.024	0.082	0.085	0.01	0.067
Nickel	0.1	0.009	0.012	(<0.005U)	0.009	(<0.005U)	(<0.005U)	0.006	(<0.005U)	0.006
Potassium	---	4.2	11.7	1.6	4.1B*	1.2	2.3	2.3B*	7	2.7
Selenium	0.01	(<0.005U)	0.01	(<0.005U)	0.005	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	**0.233B***
Silica	---	21.88	6.73	17.8	24	23.3	20.7	13.4	16.9	16.9
Sodium	20	**107**	**40.6**	**43.3**	**105B***	**68.1B***	**67.4**	**63.1**	**55**	**106**
Thallium	0.0005*	(<0.001U)	**0.004**	**0.002**	(<0.001U)	(<0.001U)	(<0.001U)	(<0.001U)	**0.003**	(<0.001U)
Zinc	2*	0.217	0.044	(<0.005U)	0.091	0.028	0.009	0.019	(<0.005U)	0.032

Total (Unfiltered)

Compound/Element	AWQS	WRL MW1B	WRL MW2B	WRL MW3B	WRL MW4B	WRL MW5B	WRL MW6B	WRL MW6B (Dup)	WRL MW7B	WRL MW8B
Aluminum	---	9.7	0.658	1.3	0.242	0.261	0.152	6	10.3	4
Barium	1	0.148	0.292	0.017	0.042	0.029	0.036	0.072	0.093	0.057
Boron	1	0.164	(<0.1U)	(<0.1U)	(<0.1U)	(<0.1U)	(<0.1U)	(<0.1U)	(<0.1U)	(<0.1U)
Cadmium	0.005	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)
Calcium	---	173	382	26.6	87.6	110	101	143B*	21.9	131
Chromium	0.05	**0.129**	**0.325**	0.012	**0.169**	0.018	(<0.005U)	0.043	**0.331**	**0.168B***
Chromium, Hexavalent	0.05	(<0.01U)	**0.298**	(<0.01U)	**0.137**	(<0.01U)	(<0.01U)	(<0.01U)	**0.197**	**0.194**
Copper	0.2	0.013	0.01	(<0.005U)	0.007	(<0.005U)	(<0.005U)	0.007	(<0.005U)	0.009
Cyanide	0.2	(<0.004U)	0.007	(<0.004U)	(<0.004U)	(<0.004U)	(<0.004U)	(<0.004U)	(<0.004U)	(<0.004U)
Hardness	---	737	953	119	449	596	567	728	92.9	614
Iron	0.3	**7.8**	**0.399**	**1.2**	0.289	**0.306**	0.229B*	**5.4B***	**8.5**	**3.2**
Lead	0.025	**0.032**	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	0.005
Magnesium	35*	**74.2**	(<1U)	12.7	**55.9**	**78.3**	**76.7**	**90.4**	9.3	**69.5**
Manganese	0.3	**0.895**	0.017	0.034	0.026	0.023	0.09	**0.373**	0.174	0.183

Ground Water

Baseline Metals by EPA Method 6010/6020 (mg/L)

		WRL MW1B	WRL MW2B	WRL MW3B	WRL MW4B	WRL MW5B	WRL MW6B	WRL MW6B (Dup)	WRL MW7B	WRL MW8B
Nickel	0.1	0.052	0.008	0.015	(<0.005U)	0.007	0.007	**0.125**	0.015	0.027
Potassium	---	8.5	13.5	1.7	2.3B*	1.1	2.3	4.9B*	10.7	6.2
Selenium	0.01	(<0.005U)	0.007	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	**0.112B***
Silica	---	78.1	16.4	23.5	23.2	24.4	19.2	83.9	76.3	35.4
Sodium	20	**102**	**42.3**	**42.3**	**55.3B***	**55.8B***	**68.1**	**64.8**	**58.9**	**134**
Thallium	0.0005*	(<0.001U)	**0.001**	(<0.001U)	(<0.001U)	(<0.001U)	(<0.001U)	(<0.001U)	(<0.001U)	(<0.001U)
Zinc	2*	0.559	0.037	0.018	0.025	0.029	0.01	0.028	0.027	0.078

Water Quality Parameters (mg/L)

		WRL MW1B	WRL MW2B	WRL MW3B	WRL MW4B	WRL MW5B	WRL MW6B	WRL MW6B (Dup)	WRL MW7B	WRL MW8B
Compound/Element	**AWQS**									
Alkalinity	---	386	930	114	336	455	264	307	139	372
Ammonia (expressed as N)	2	(<1U)	1.31	(<1U)	(<1U)	(<1U)	(<1U)	(<1U)	(<1U)	(<1U)
BOD	---	3	(<1U)	1	1	2	(<1U)	2.8	1	1
Chloride	250	208	39	66.2	13.9	36	60.8	58	14.2	67.2
COD	---	21.7	7.9	6.91	15.1	(<5U)	7.24	6.25	(<5U)	34.3
Color, apparent	---	25	5	5	20	5	5	10	70	40
Nitrate (expressed as N)	10	(<0.1U)	0.18	(<0.1U)	1.6	1.17	0.63	0.49	(<0.1U)	2.43
pH	---	6.05	11.52	8.11	7.3	6.86	7.07	6.96	8.64	6.99
Phenolics	0.001	(<0.002U)	(<0.002U)	(<0.002U)	(<0.002U)	(<0.002U)	(<0.002U)	(<0.002U)	**0.003**	(<0.002U)
Sulfate	250	158	13	19.6	**276**	**263**	**312**	**316**	37.7	**503**
TDS	---	934	983	260	776	893	848	852	231	1260
TKN	---	(<1U)	1.87	1.12	(<1U)	(<1U)	(<1U)	(<1U)	1.21	(<1U)
TOC	---	3.9	4	4.1	1.9	2.2	3	3	2	2

Surface Water

Volatile Organic Compounds by EPA Method 601-602 (µg/L)

Compound/Element	AWQS	WRL SS
Total VOC	---	0
1,1-Dichloroethene	---	(<1U)
Trichloroethene	40	(<1U)

Baseline Metals by EPA Method 6010/6020 (mg/L)

Total (Unfiltered)

Compound/Element	AWQS	WRL SS
Aluminum	---	27.7
Barium	---	0.17
Boron	10	(<0.1U)
Cadmium	---**	(<0.005U)
Calcium	---	93.5
Chromium	---**	0.035
Chromium, Hexavalent	0.016	(<0.01U)
Copper	---**	0.014
Cyanide	0.022	(<0.004U)
Hardness	---	329
Iron	0.3	**21.8**
Lead	---**	0.011
Magnesium	---	23.1
Manganese	---	0.267
Nickel	---**	0.019
Potassium	---	12
Selenium	0.0046	(<0.005U)
Silica	---	129
Sodium	---	9
Thallium	0.02	(<0.001U)
Zinc	---**	0.06

Water Quality Parameters (mg/L)

Compound/Element	AWQS	WRL SS
Alkalinity	---	124
Ammonia (expressed as N)	---	(<1U)
BOD	---	3
Chloride	---	11.6
COD	---	21.4
Color, apparent	---	60
Nitrate (expressed as N)	---	7.99
pH	---	7.68
Phenolics	---	(<0.002U)
Sulfate	---	142
TDS	---	439
TKN	---	2.78
TOC	---	10

Leachate

Volatile Organic Compounds by EPA Method 601-602 (µg/L)

		WRL L1
Compound/Element	**AWQS**	
Total VOC	---	0
1,1-Dichloroethene	---	(<1U)
Trichloroethene	40	(<1U)

Baseline Metals by EPA Method 6010/6020 (mg/L)

Dissolved (Filtered)

		WRL L1
Compound/Element	**AWQS**	
Aluminum	---	0.015
Barium	---	0.393
Boron	---	(<0.1U)
Cadmium	0.0888	(<0.005U)
Calcium	---	649
Chromium	0.053	**0.626**
Copper	0.1853	(<0.005U)
Hardness	---	1620
Iron	0.3	(<0.025U)
Lead	2	(<0.005U)
Magnesium	---	(<1U)
Manganese	---	(<0.005U)
Nickel	5	0.012
Potassium	---	52.3
Selenium	---	0.023
Silica	---	5.49
Sodium	---	62.8
Thallium	0.02	0.006
Zinc	1	0.005

Total (Unfiltered)

		WRL L1
Compound/Element	**AWQS**	
Aluminum	---	(<0.005U)
Barium	---	0.387
Boron	---	(<0.1U)
Cadmium	0.0888	(<0.005U)
Calcium	---	631
Chromium	0.053	**0.615**
Chromium, Hexavalent	0.016	**0.435**
Copper	0.1853	(<0.005U)
Cyanide	0.022	(<0.004U)
Hardness	---	1580
Iron	0.3	(<0.025U)
Lead	2	(<0.005U)
Magnesium	---	(<1U)
Manganese	---	(<0.005U)
Nickel	5	0.011
Potassium	---	52.8

Leachate

Baseline Metals by EPA Method 6010/6020 (mg/L)

		WRL L1
Selenium	---	0.022
Silica	---	5.63
Sodium	---	60.1
Thallium	0.02	0.002
Zinc	1	(<0.005U)

Water Quality Parameters (mg/L)

Compound/Element	AWQS	WRL L1
Alkalinity	---	1740
Ammonia (expressed as N)	---	3.92
BOD	---	(<1U)
Chloride	---	31.9
COD	---	15.5
Color, apparent	---	15
Nitrate (expressed as N)	---	(<0.1U)
pH	---	11.87
Phenolics	---	0.03
Sulfate	---	11.5
TDS	---	1510
TKN	---	4.58
TOC	---	5.9

QA/QC

Volatile Organic Compounds by EPA Method 601-602 (µg/L)

		Rinse blank	Source Water Blank	Trip Blank 1	Trip Blank 2	Trip Blank 3	Trip Blank 4
Compound/Element	**AWQS**						
Total VOC	---	0	0	0	0	0	0
1,1-Dichloroethene	---	(<1U)	(<1U)	(<1U)	(<1U)	(<1U)	(<1U)
Trichloroethene	---	(<1U)	(<1U)	(<1U)	(<1U)	(<1U)	(<1U)

Baseline Metals by EPA Method 6010/6020 (mg/L)

Total (Unfiltered)

		Rinse blank	Source Water Blank
Compound/Element	**AWQS**		
Aluminum	---	(<0.005U)	(<0.005U)
Barium	---	(<0.005U)	(<0.005U)
Boron	---	(<0.1U)	(<0.1U)
Cadmium	---	(<0.005U)	(<0.005U)
Calcium	---	(<0.5U)	(<0.5U)
Chromium	---	(<0.005U)	(<0.005U)
Chromium, Hexavalent	---	(<0.01U)	(<0.01U)
Copper	---	(<0.005U)	(<0.005U)
Cyanide	---	(<0.004U)	(<0.004U)
Hardness	---	(<5.4U)	(<5.4U)
Iron	---	(<0.025U)	(<0.025U)
Lead	---	(<0.005U)	(<0.005U)
Magnesium	---	(<1U)	(<1U)
Manganese	---	(<0.005U)	(<0.005U)
Nickel	---	(<0.005U)	(<0.005U)
Potassium	---	(<1U)	(<1U)
Selenium	---	(<0.005U)	(<0.005U)
Silica	---	12.4	6.28
Sodium	---	(<1U)	(<1U)
Thallium	---	0.004	(<0.001U)
Zinc	---	(<0.005U)	(<0.005U)

Water Quality Parameters (mg/L)

		Rinse blank	Source Water Blank
Compound/Element	**AWQS**		
Alkalinity	---	(<1U)	(<1U)
Ammonia (expressed as N)	---	(<1U)	(<1U)
BOD	---	(<1U)	(<1U)
Chloride	---	(<1U)	41.2
COD	---	(<5U)	(<5U)
Color, apparent	---	5	5
Nitrate (expressed as N)	---	(<0.1U)	(<0.1U)
pH	---	5.27	5.94
Phenolics	---	(<0.002U)	(<0.002U)
Sulfate	---	(<2U)	(<2U)
TDS	---	(<4U)	(<4U)
TKN	---	(<1U)	(<1U)
TOC	---	(<1U)	1.2

TABLE NOTES

AWQS	=	New York State Ambient Water Quality Standards and Guidance Values from Division of Water and Technical and Operational Guidance Series (1.1.1) June 1998.
*	=	Indicated guidance value.
**	=	Standard calculated based on sample hardness as per NYW AWQS.
U	=	Not detected. Sample quantitation limits shown as (<__U).
B*	=	The reported value is less than the Contract Required Detection Limit (CRDL) but greater than the Instrument Detection limit (IDL).
BOD	=	Biological Oxygen Demand.
COD	=	Chemical Oxygen Demand.
TOC	=	Total Organic Carbon.
TDS	=	Total Dissolved Solids.
TKN	=	Total Kjeldahl Nitrogen

Only those analytes detected in at least one of the samples is shown on this table.
Results shaded and in boldface indicate concentrations in excess of New York State Ambient Water Quality Standards or Guidance Values.

Analytical Methods for Water Quality Parameters

Alkalinity	=	EPA 310.1
Ammonia (expressed as Nitrogen)	=	EPA 350.2
BOD	=	SM1852
Chloride	=	EPA 325.2
COD	=	EPA 410.4
Nitrate	=	EPA 353.2
pH	=	EPA 150.1
Phenolics	=	EPA 420.2
Sulfate	=	EPA 375.3
TDS	=	EPA 160.1
TKN	=	EPA 351.3
TOC	=	SW846 9060

APPENDIX G SUMMARY OF ANALYTICAL RESULTS OF GROUND-WATER, SURFACE WATER, AND LEACHATE SAMPLES COLLECTED IN JUNE 2001, WITMER ROAD LANDFILL, NIAGARA FALLS, NEW YORK

Ground Water

Baseline Metals by EPA Method 6010/6020 (mg/L)

Total (Unfiltered)

Compound/Element	AWQS	WRL MW1B	WRL MW2B	WRL MW3B	WRL MW4B	WRL MW5B	WRL MW6B	WRL MW6B (Dup)	WRL MW7B	WRL MW8B
Chromium	0.05	(<0.005U)	**0.368**	0.01	**0.2**	0.007	0.016	0.017	**0.296**	**0.366**
Chromium, Hexavalent	0.05	(<0.01U)	**0.36**	(<0.01U#)	**0.175#**	(<0.01U)	(<0.01U)	(<0.01U)	**0.274**	**0.313**
Iron	0.3	**0.386**	**0.583**	**2.6**	**5.9**	**0.667**	**11.9**	**12.2**	**6.8**	**0.701**
Lead	0.025	(<0.005U)	(<0.005U)	(<0.005U)	0.014	(<0.005U)	0.006	0.006	(<0.005U)	(<0.005U)
Magnesium	35*	**55.6**	1.1	12.4	**50.5**	**70.2**	**85.2**	**84.4**	9.3	**67.1**
Manganese	0.3	**0.628**	0.024	0.066	0.107	0.051	**0.434**	**0.439**	0.161	0.073
Selenium	0.01	(<0.005U)	0.008	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	**0.211**
Silica	---	24.7	7.1	33	43.2	22.7	120	118	60.4	21.3
Sodium	20	**100**	**48**	**46.7**	**68.5**	**64.4**	**67.8**	**67.1**	**57.1**	**111**
Zinc	2*	0.261	0.02	0.017	0.089	0.015	0.024	0.025	0.014	0.011

Water Quality Parameters (mg/L)

Compound/Element	AWQS	WRL MW1B	WRL MW2B	WRL MW3B	WRL MW4B	WRL MW5B	WRL MW6B	WRL MW6B (Dup)	WRL MW7B	WRL MW8B
Ammonia (expressed as N)	2	(<1U)	1.5	(<1U)	(<1U)	(<1U)	(<1U)	(<1U)	(<1U)	(<1U)
Phenolics	0.001	(<0.002U)	(<0.002U)	(<0.002U)	(<0.002U)	(<0.002U)	(<0.002U)	(<0.002U)	**0.007**	(<0.002U)
Sulfate	250	167	15	26.8	190	192	**299**	**316**	43.1	**434**

Surface Water

Baseline Metals by EPA Method 6010/6020 (mg/L)

Total (Unfiltered)

Compound/Element	AWQS	WRL SS
Chromium	---**	0.011
Chromium, Hexavalent	0.016	(<0.01U)
Iron	0.3	**1.4**
Lead	---**	(<0.005U)
Magnesium	---	7.6
Manganese	---	0.038
Selenium	0.0046	**0.009**
Silica	---	30.3
Sodium	---	94.6
Zinc	---**	(<0.005U)

Water Quality Parameters (mg/L)

Compound/Element	AWQS	WRL SS
Ammonia (expressed as N)	---	12.2
Phenolics	---	0.212
Sulfate	---	498

Leachate

Baseline Metals by EPA Method 6010/6020 (mg/L)

Total (Unfiltered)

		WRL L1
Compound/Element	**AWQS**	
Chromium	---	0.63
Chromium, Hexavalent	0.016	**0.555**
Iron	0.3	(<0.025U)
Lead	---	(<0.005U)
Magnesium	---	(<1U)
Manganese	---	(<0.005U)
Selenium	---	0.026
Silica	---	8.2
Sodium	---	70.1
Zinc	---	(<0.005U)

Water Quality Parameters (mg/L)

		WRL L1
Compound/Element	**AWQS**	
Ammonia (expressed as N)	---	4.01
Phenolics	---	0.009
Sulfate	---	12.4

QA/QC

Baseline Metals by EPA Method 6010/6020 (mg/L)

Total (Unfiltered)

		Rinse Blank	Source Water Blank
Compound/Element	**AWQS**		
Chromium	---	(<0.005U)	(<0.005U)
Chromium, Hexavalent	---	(<0.01U)	(<0.01U)
Iron	---	(<0.025U)	(<0.025U)
Lead	---	(<0.005U)	(<0.005U)
Magnesium	---	(<1U)	(<1U)
Manganese	---	(<0.005U)	(<0.005U)
Selenium	---	(<0.005U)	(<0.005U)
Silica	---	3	2.8
Sodium	---	(<1U)	(<1U)
Zinc	---	(<0.005U)	(<0.005U)

Water Quality Parameters (mg/L)

		Rinse Blank	Source Water Blank
Compound/Element	**AWQS**		
Ammonia (expressed as N)	---	(<1U)	(<1U)
Phenolics	---	(<0.002U)	(<0.002U)
Sulfate	---	(<2U)	(<2U)

TABLE NOTES

AWQS	=	New York State Ambient Water Quality Standards and Guidance Values from Division of Water and Technical and Operational Guidance Series (1.1.1) June 1998.
*	=	Indicated guidance value.
**	=	Standard calculated based on sample hardness as per NYW AWQS.
#	=	Sample received outside holding time.
U	=	Not detected. Sample quantitation limits shown as (<__U).

Only those analytes detected in at least one of the samples is shown on this table.
Results shaded and in boldface indicate concentrations in excess of New York State Ambient Water Quality Standards or Guidance Values.

Analytical Methods for Water Quality Parameters

Ammonia (expressed as Nitrogen)	=	EPA 350.2
Phenolics	=	EPA 420.2
Sulfate	=	EPA 375.3

APPENDIX G SUMMARY OF ANALYTICAL RESULTS OF GROUND-WATER, SURFACE WATER, AND LEACHATE SAMPLES COLLECTED 19-20 SEPTEMBER 2001, WITMER ROAD LANDFILL, NIAGARA FALLS, NEW YORK

Ground Water

Baseline Metals by EPA Method 6010/6020 (mg/L)

Total (Unfiltered)

		WRL MW1B	WRL MW2B	WRL MW3B	WRL MW6B	WRL MW6B (Dup)	WRL MW7B	WRL MW8B
Compound/Element	**AWQS**							
Chromium	0.05	0.011	**0.333**	(<0.005U)	0.007	(<0.005U)	**0.231**	**0.136**
Chromium, Hexavalent	0.05	(<0.01U)	**0.299**	(<0.01U)	(<0.01U)	(<0.01U)	**0.18**	**0.146**
Iron	0.3	**3.4**	**0.98**	0.26	0.186	0.103	**6**	**1.3**
Lead	0.025	0.015	**0.039**	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)
Magnesium	35*	**61.3**	1.4	10.9	**69.2**	**67.6**	10.4	**62.1**
Manganese	0.3	**0.672**	0.03	0.008	0.079	0.067	0.151	0.19
Selenium	0.01	(<0.005U)	0.008	(<0.005U)	(<0.005U)	(<0.005U)	(<0.005U)	**0.125**
Silica	---	21	2.91	13.4	12.1	12.3	19.1	15.3
Sodium	20	**137**	**57.1**	**44.9**	**66.8**	**65.2**	**56.8**	**174**
Zinc	2*	0.27	0.023	(<0.005U)	(<0.005U)	(<0.005U)	0.011	0.021

Water Quality Parameters (mg/L)

		WRL MW1B	WRL MW2B	WRL MW3B	WRL MW6B	WRL MW6B (Dup)	WRL MW7B	WRL MW8B
Compound/Element	**AWQS**							
Ammonia (expressed as N)	2	(<1U)	2	(<1U)	(<1U)	(<1U)	(<1U)	(<1U)
Phenolics	1	(<2U)	**13.6**	(<2U)	(<2U)	(<2U)	(<2U)	(<2U)
Sulfate	250	209	13.9	23.1	**252**	**270**	37	**419**

Leachate

Baseline Metals by EPA Method 6010/6020 (mg/L)

Total (Unfiltered)

		WRL L1
Compound/Element	**AWQS**	
Chromium	---	0.413
Chromium, Hexavalent	0.016	**0.448**
Iron	0.3	0.044
Lead	---	(<0.005U)
Magnesium	---	(<1U)
Manganese	---	(<0.005U)
Selenium	---	0.022
Silica	---	0.77
Sodium	---	79.2
Zinc	---	(<0.005U)

Water Quality Parameters (mg/L)

		WRL L1
Compound/Element	**AWQS**	
Ammonia (expressed as N)	---	4.9
Phenolics	---	109
Sulfate	---	14.1

QA/QC

Baseline Metals by EPA Method 6010/6020 (mg/L)

Total (Unfiltered)

Compound/Element	AWQS	Rinse Blank	Source Water Blank
Chromium	---	(<0.005U)	(<0.005U)
Chromium, Hexavalent	---	(<0.01U)	(<0.01U)
Iron	---	(<0.025U)	(<0.025U)
Lead	---	(<0.005U)	(<0.005U)
Magnesium	---	(<1U)	(<1U)
Manganese	---	(<0.005U)	(<0.005U)
Selenium	---	(<0.005U)	(<0.005U)
Silica	---	(<0.21U)	(<0.21U)
Sodium	---	(<1U)	(<1U)
Zinc	---	(<0.005U)	(<0.005U)

Water Quality Parameters (mg/L)

Compound/Element	AWQS	Rinse Blank	Source Water Blank
Ammonia (expressed as N)	---	(<1U)	(<1U)
Phenolics	---	(<2U)	(<2U)
Sulfate	---	(<2U)	(<2U)

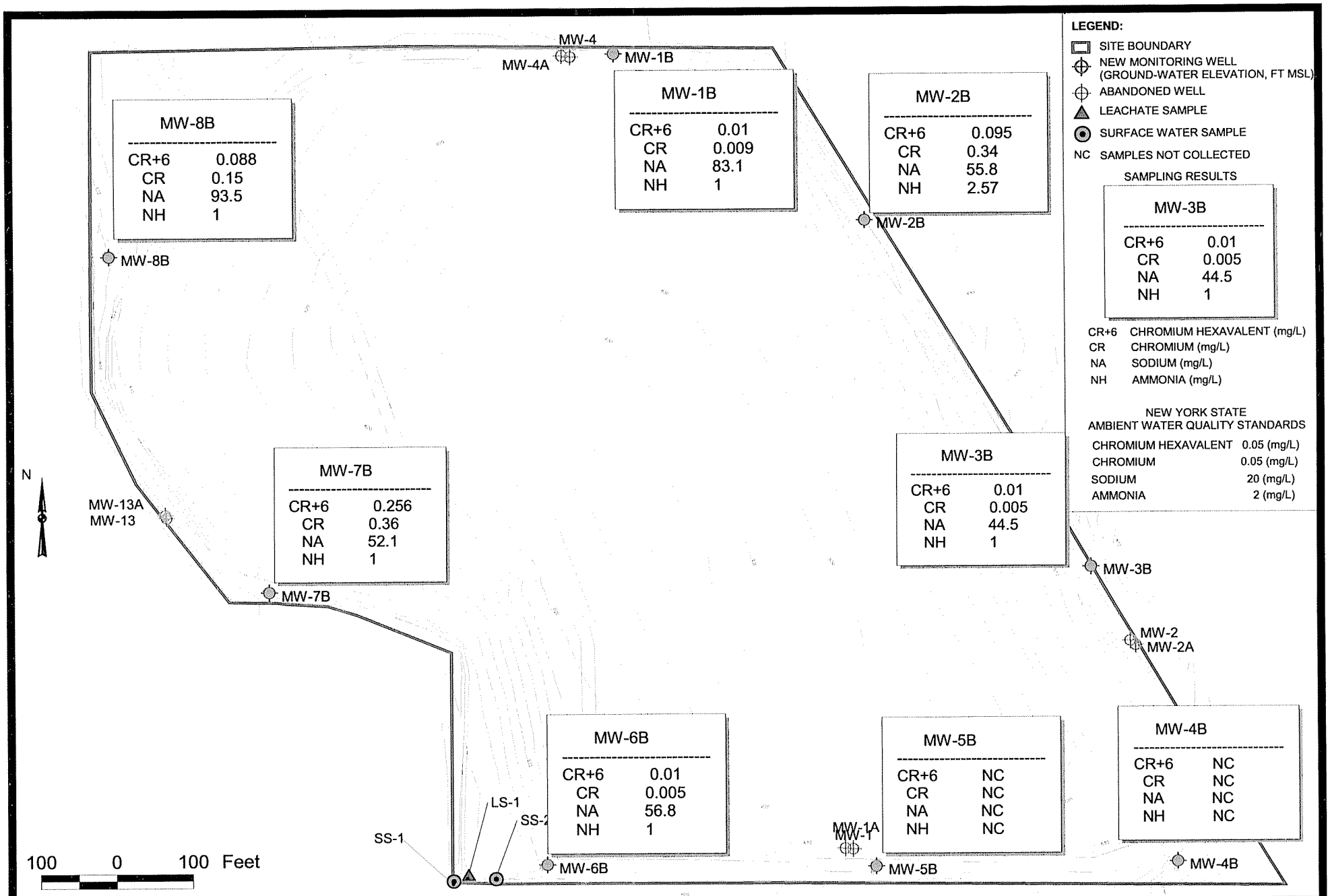
TABLE NOTES

AWQS	=	New York State Ambient Water Quality Standards and Guidance Values from Water Quality Regulations, Title 6, Chapter X Parts 700-706 August 1999.
*	=	Indicated guidance value.
U	=	Not detected. Sample quantitation limits shown as (<__U).

Only those analytes detected in at least one of the samples is shown on this table.
Results shaded and in boldface indicate concentrations in excess of New York State Ambient Water Quality Standards or Guidance Values.

Analytical Methods for Water Quality Parameters

Ammonia (expressed as Nitrogen)	=	EPA 350.2
Phenolics	=	EPA 420.2
Sulfate	=	EPA 375.3



EA ENGINEERING, SCIENCE, AND TECHNOLOGY

WITMER ROAD LANDFILL
NIAGARA FALLS, NEW YORK

DECEMBER 2000 SAMPLING RESULTS

PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT No	FILE No
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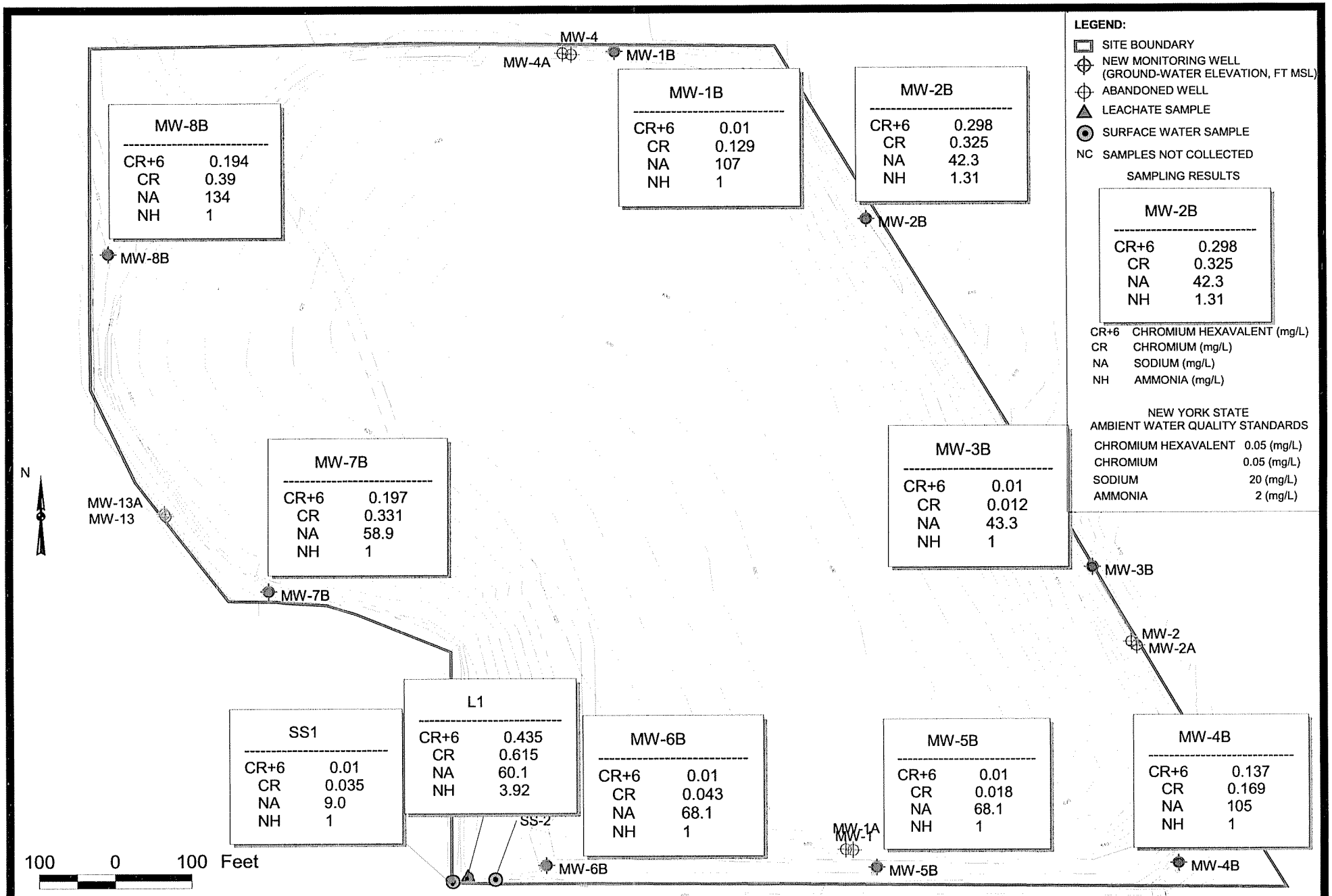

EA ENGINEERING, SCIENCE, AND TECHNOLOGY

WITMER ROAD LANDFILL
NIAGARA FALLS, NEW YORK

MARCH 2001 SAMPLING RESULTS

PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT No	FILE No
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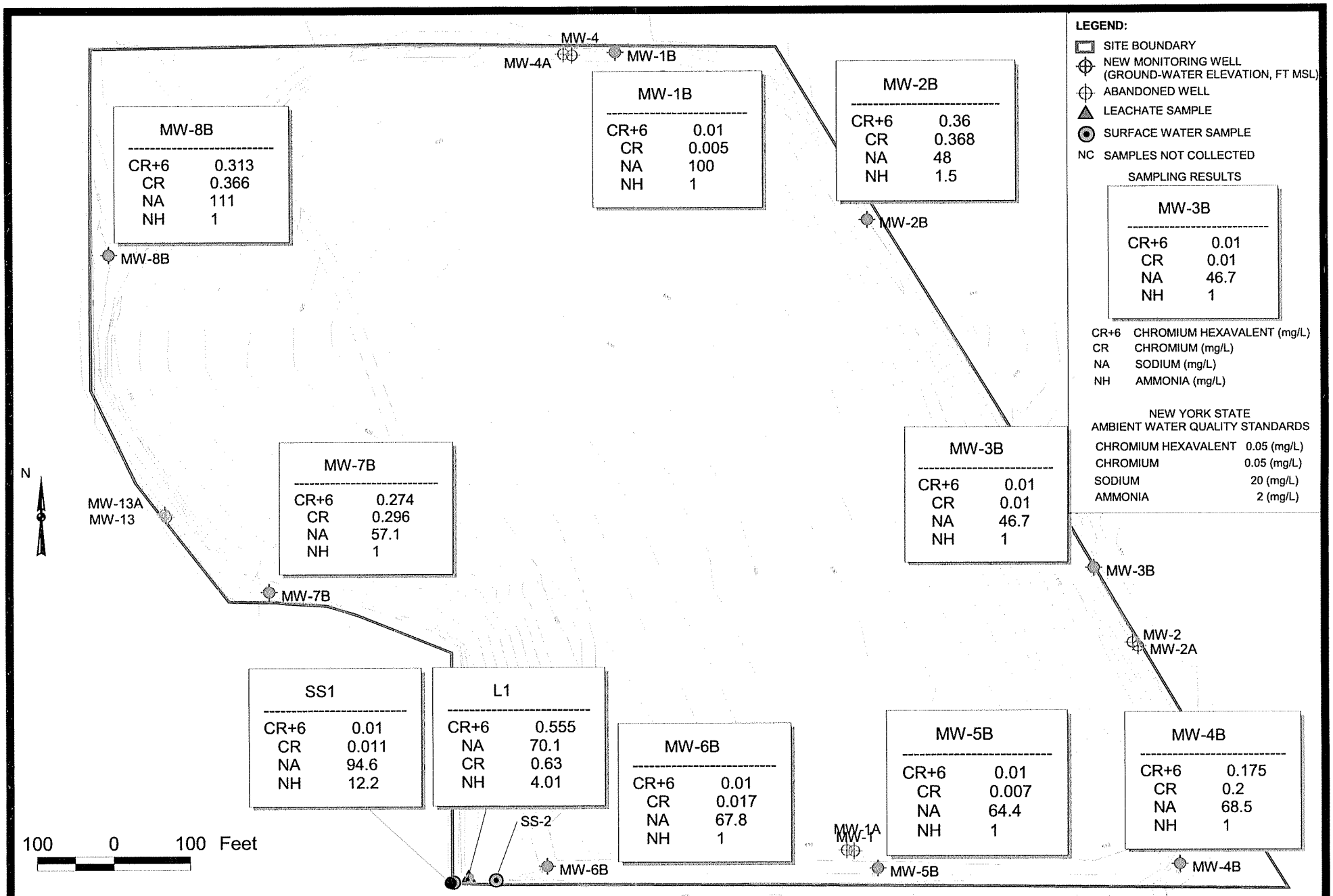
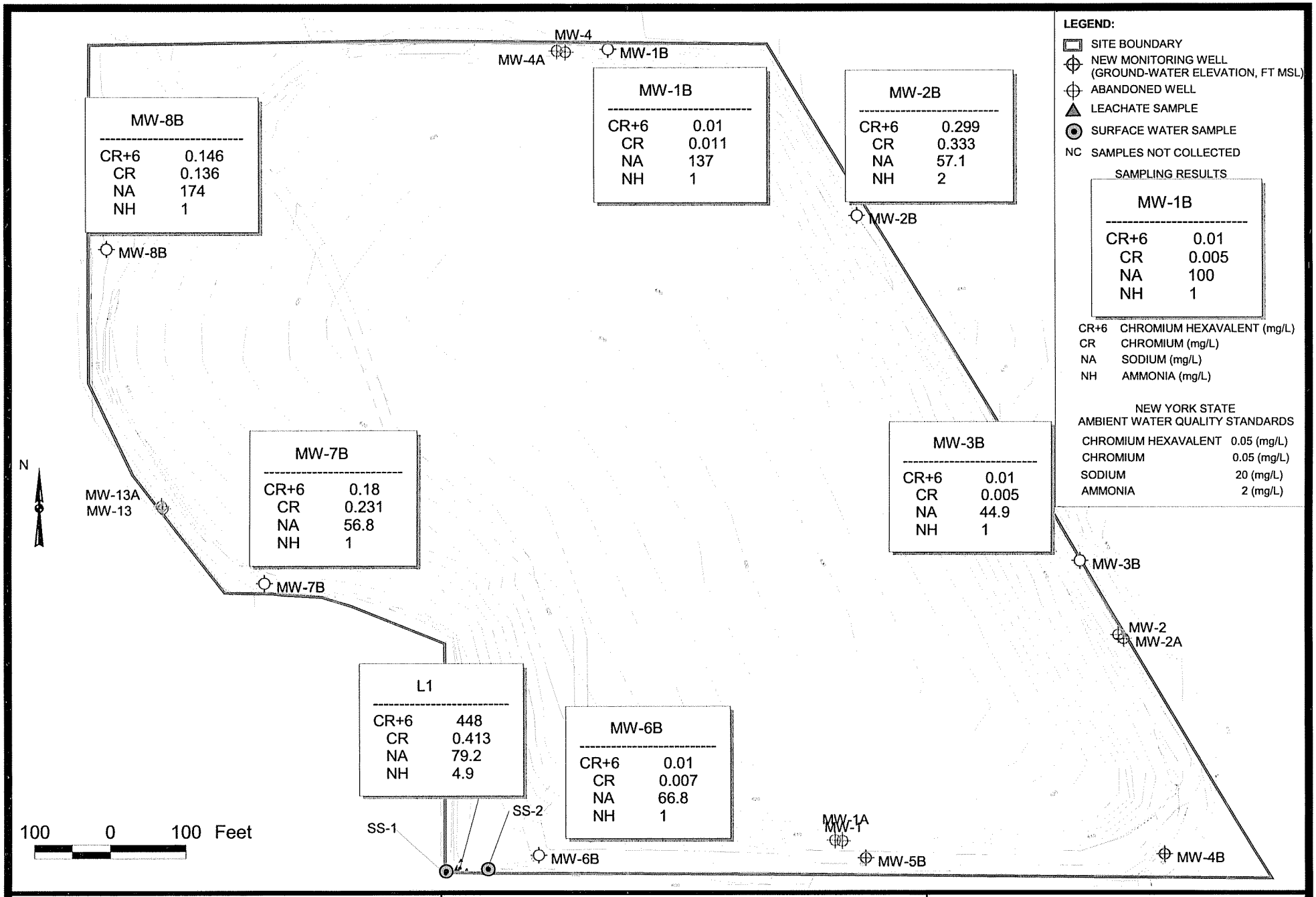


EA ENGINEERING, SCIENCE, AND TECHNOLOGY	WITMER ROAD LANDFILL NIAGARA FALLS, NEW YORK				JUNE 2001 SAMPLING RESULTS		
PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT No	FILE No
CEM	BT/RSC	BT/RSC	SLG	AS SHOWN	03 MARCH 2002	12040.69	I:\BOC-NIAGARA-GIS\ FINAL.APR

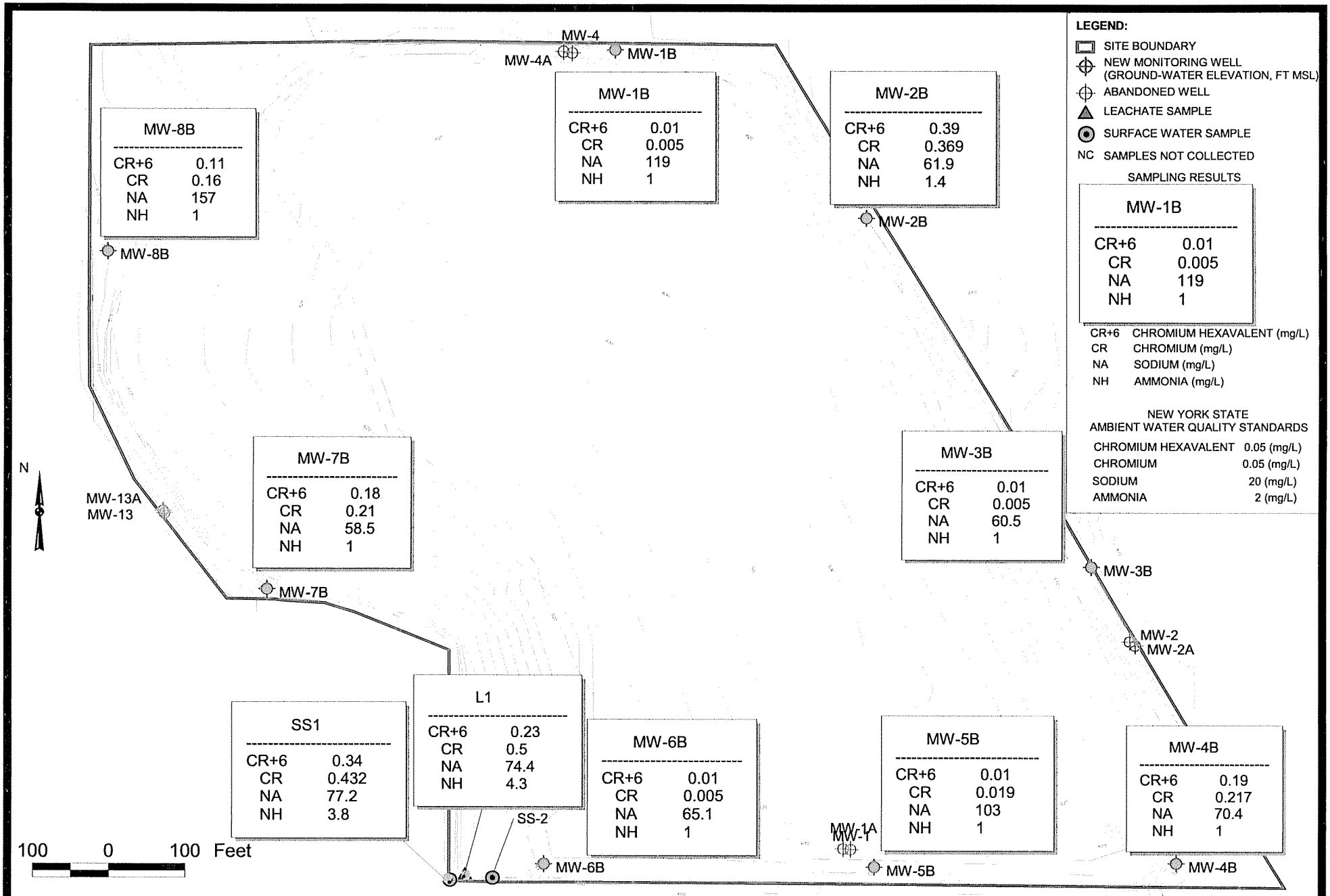


EA ENGINEERING, SCIENCE, AND TECHNOLOGY

WITMER ROAD LANDFILL
NIAGARA FALLS, NEW YORK

SEPTEMBER 2001 SAMPLING RESULTS

PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT No	FILE No
CEM	BT/RSC	BT/RSC	SLG	AS SHOWN	03 MARCH 2002	12040.69	I:\BOC-NIAGARA-GIS\ FINAL.APR



EA ENGINEERING, SCIENCE, AND TECHNOLOGY

WITMER ROAD LANDFILL
NIAGARA FALLS, NEW YORK

DECEMBER 2001 SAMPLING RESULTS

PROJECT MGR	DESIGNED BY	DRAWN BY	CHECKED BY	SCALE	DATE	PROJECT No	FILE No
CEM	BT/RSC	BT/RSC	SLG	AS SHOWN	03 MARCH 2002	12040.69	I:\BOC-NIAGARA-GIS\ FINAL.APR

Appendix H

National Weather Service Precipitation Data
July–October 2001

National Weather Service
Buffalo, New York

NATIONAL WEATHER SERVICE

Preliminary Climatological Data

Preliminary Local Climatological Data (WS Form: F-6)

Station: Buffalo NY
Month: July
Year: 2001

	Temperature in F							Pcpn	Snow		Wind				Sunshine		Sky	
							Columns											
1	2	3	4	5	6a	6b	7	8	9	10	11	12	13	14	15	16	1
Dy	Max	Min	Avg	Dep	HDD	CDD	Wtr	Snw	Dpth	Avg	Spd	Dir	Min	Psbl	S-S	Wx	S
1	76	53	65	-4	0	0	0.11	0.0	0	15.8	23	30	245	27		1,8	
2	68	46	57	-13	8	0	0.00	0.0	0	8.0	20	31	734	80			
3	72	52	62	-8	3	0	T	0.0	0	10.2	20	25	175	19			
4	73	64	69	-1	0	4	T	0.0	0	13.2	25	23	38	4		1	
5	73	57	65	-5	0	0	0.00	0.0	0	10.5	23	30	687	75			
6	72	52	62	-9	3	0	0.00	0.0	0	12.1	23	23	838	92		8	
7	80	57	69	-2	0	4	0.11	0.0	0	10.2	22	22	93	10			
8	81	66	74	3	0	9	0.02	0.0	0	9.2	16	24	406	45		1,8	
9	81	62	72	1	0	7	0.00	0.0	0	11.3	17	24	863	95			
10	81	63	72	1	0	7	0.05	0.0	0	9.3	18	24	798	88		1	
11	74	59	67	-4	0	2	0.03	0.0	0	10.3	22	23	528	58		1,3	
12	73	57	65	-6	0	0	0.00	0.0	0	9.5	21	31	392	43			
13	74	59	67	-4	0	2	0.00	0.0	0	9.2	22	24	353	39			
14	76	58	67	-4	0	2	0.00	0.0	0	7.7	18	31	431	48			
15	80	59	70	-1	0	5	0.00	0.0	0	7.6	16	22	533	59			
16	78	62	70	-1	0	5	T	0.0	0	4.6	13	25	71	8			
17	77	63	70	-1	0	5	0.17	0.0	0	5.9	14	04	45	5		1,3	
18	85	64	75	3	0	10	0.00	0.0	0	10.1	20	06	729	81		1	
19	83	67	75	3	0	10	T	0.0	0	4.6	14	31	275	31		1,8	
20	87	64	76	4	0	11	0.00	0.0	0	6.9	17	02	716	80		1,8	
21	88	66	77	5	0	12	0.00	0.0	0	8.2	15	25	635	71		1	
22	85	67	76	4	0	11	0.01	0.0	0	7.0	15	25	377	42		1,8	
23	90	70	80	8	0	15	0.00	0.0	0	10.1	20	23	689	77		1,8	
24	86	75	81	9	0	16	0.00	0.0	0	13.9	28	25	533	60		1,8	
25	83	67	75	3	0	10	0.03	0.0	0	6.3	15	03	400	45			
26	72	55	64	-8	1	0	0.20	0.0	0	8.8	21	50	733	83		1	
27	74	50	62	-9	3	0	0.00	0.0	0	7.2	16	07	765	87			
28	83	54	69	-2	0	4	0.00	0.0	0	6.9	16	08	475	54			
29	78	64	71	0	0	6	0.00	0.0	0	9.7	18	18	255	29			
30	80	65	73	2	0	8	0.00	0.0	0	4.7	14	02	245	28			
31	87	61	74	3	0	9	0.00	0.0	0	5.7	16	03	829	95			
Sm	2450	1878		-33	18	174	0.73	0.0		274.7				14886				
Avg	79.0	60.6	69.8						8.9									

Notes:

Last of several occurrences
Column 17 Peak Wind in M.P.H.

Preliminary Local Climatological Data (WS Form: F-6) , Page 2
Station: Buffalo NY
Month: July
Year: 2001

Temperature Data

Average Monthly: 69.8
Dptr fm normal: -1.3
Highest: 90 on 23
Lowest: 46 on 2

Precipitation Data

Total for Month: 0.73
Dptr fm normal: -2.35
Grtst 24hr 0.23 on 25-26

SNOW, ICE PELLETS, HAIL
Total month: 0.0
Grtst 24hr 0.0 on
Grtst depth: 0 on 31
Seasonal Total: 0.0

SYMBOLS USED IN COLUMN 16

1 = FOG
2 = FOG REDUCING VISIBILITY TO 1/4 MILE OR LESS
3 = THUNDER
4 = ICE PELLETS
5 = HAIL
6 = GLAZE OR RIME
7 = BLOWING DUST OR SAND VSBY 1/2 MILE OR LESS
8 = SMOKE OR HAZE
9 = BLOWING SNOW
x = TORNADO

No. of Days with

Max 32 or below: 0
Max 90 or above: 1
Min 32 or below: 0
Min 0 or below: 0

WEATHER - Days with

0.01 inch or more: 9
0.10 inch or more: 4
0.50 inch or more: 0
1.00 inch or more: 0

HDD (Base 65)
Total this Mo. 18
Dptr fm normal 13
Seasonal total 18
Dptr fm normal 13

CDD (Base 65)
Total this Mo. 174
Dptr fm normal -20
Seasonal total 314
Dptr fm normal 15

Pressure Data

Highest SLP 30.36 on 27
Lowest SLP 29.66 on 11

National Weather Service
Buffalo, New York

Preliminary Climatological Data

Preliminary Local Climatological Data (WS Form: F-6)

Station: Buffalo NY
Month: August
Year: 2001

	Temperature in F :							:Pcpn	:Snow :		Wind				:Sunshine:	Sky	
								Columns									
1	2	3	4	5	6a	6b	7	8	9	10	11	12	13	14	15	16	1
Dy	Max	Min	Avg	Dep	HDD	CDD	Wtr	Snw	Dpth	Avg	Spd	Dir	Min	Psbl	S-S	Wx	S
1	90	65	78	7	0	13	0.00	0.0	0	6.4	14	27	841	97			
2	84	69	77	6	0	12	0.00	0.0	0	11.3	21	23	63	7		8	
3	83	73	78	7	0	13	T	0.0	0	10.4	20	24	490	57		1,8	
4	86	67	77	6	0	12	0.00	0.0	0	5.4	16	03	361	42		1,8	
5	93	61	77	6	0	12	0.00	0.0	0	4.6	14	36	861	100			
6	88	66	77	6	0	12	0.00	0.0	0	10.7	22	24	829	97			
7	86	74	80	10	0	15	0.08	0.0	0	13.8	25	24	479	56		1,3,8	
8	91	73	82	12	0	17	0.00	0.0	0	11.2	18	24	737	86		1,8	
9	91	76	84	14	0	19	0.00	0.0	0	14.0	25	26	685	80		1,8	
10	86	65	76	6	0	11	T	0.0	0	10.4	21	24	545	64		3	
11	84	59	72	2	0	7	0.00	0.0	0	2.4	13	07	827	98			
12	79	66	73	3	0	8	0.02	0.0	0	1.3	10	23	65	8			
13	83	64	74	4	0	9	0.38	0.0	0	4.4	16	33	522	62		1,3	
14	79	60	70	0	0	5	0.00	0.0	0	3.0	18	01	739	88			
15	84	56	70	0	0	5	0.00	0.0	0	2.7	10	26	838	100			
16	83	63	73	4	0	8	0.34	0.0	0	4.4	16	22	25	3		1,8	
17	75	67	71	2	0	6	0.12	0.0	0	16.1	32	24	257	31		1,8	
18	77	65	71	3	0	6	T	0.0	0	6.4	14	22	38	5			
19	75	65	70	2	0	5	0.55	0.0	0	6.2	15	20	95	12		1,3,8	
20	75	63	69	1	0	4	0.24	0.0	0	9.0	22	24	356	43		1	
21	79	62	71	3	0	6	0.01	0.0	0	10.0	20	22	417	51		1	
22	79	60	70	2	0	5	0.00	0.0	0	7.6	16	25	797	98			
23	80	64	72	4	0	7	0.00	0.0	0	4.4	10	01	215	26			
24	79	58	69	1	0	4	0.00	0.0	0	8.6	16	06	673	83		1	
25	82	53	68	0	0	3	0.00	0.0	0	6.1	14	25	811	100			
26	84	67	76	9	0	11	0.19	0.0	0	13.4	24	22	433	54		1,3,8	
27	78	64	71	4	0	6	0.00	0.0	0	7.1	16	21	684	85		1,8	
28	79	61	70	3	0	5	0.07	0.0	0	9.5	17	29	310	39		1,3	
29	75	56	66	-1	0	1	0.00	0.0	0	4.5	12	03	520	65			
30	81	57	69	2	0	4	0.00	0.0	0	9.4	17	24	797	100			
31	76	61	69	3	0	4	0.13	0.0	0	9.8	23	28	10	1		1,8	
Sm	2544	1980		131	0	255	2.13	0.0		244.5			15320				
Avg	82.1	63.9	73.0														
								7.9									

Notes:

Last of several occurrences
Column 17 Peak Wind in M.P.H.

Preliminary Local Climatological Data (WS Form: F-6) , Page 2
Station: Buffalo NY
Month: August
Year: 2001

Temperature Data	Precipitation Data	SYMBOLS USED IN COLUMN 16
Average Monthly: 73.0	Total for Month: 2.13	1 = FOG
Dptr fm normal: 4.0	Dptr fm normal: -2.04	2 = FOG REDUCING VISIBILITY
Highest: 93 on 5	Grtst 24hr 0.55 on 19	TO 1/4 MILE OR LESS
Lowest: 53 on 25		3 = THUNDER
	SNOW, ICE PELLETS, HAIL	4 = ICE PELLETS
	Total month: 0.0	5 = HAIL
	Grtst 24hr 0.0 on	6 = GLAZE OR RIME
	Grtst depth: 0 on 31	7 = BLOWING DUST OR SAND
	Seasonal Total: 0.0	VSBY 1/2 MILE OR LESS
		8 = SMOKE OR HAZE
No. of Days with	WEATHER - Days with	9 = BLOWING SNOW
		x = TORNADO
Max 32 or below: 0	0.01 inch or more: 11	
Max 90 or above: 4	0.10 inch or more: 7	
Min 32 or below: 0	0.50 inch or more: 1	
Min 0 or below: 0	1.00 inch or more: 0	

HDD (Base 65)
Total this Mo. 0
Dptr fm normal -17
Seasonal total 18
Dptr fm normal -4

CDD (Base 65)
Total this Mo. 255
Dptr fm normal 114
Seasonal total 824
Dptr fm normal 384

Pressure Data
Highest SLP 30.31 on 1
Lowest SLP 29.72 on 31

National Weather Service
Buffalo, New York

Preliminary Climatological Data

Preliminary Local Climatological Data (WS Form: F-6)

Station: Buffalo NY
Month: September
Year: 2001

	Temperature in F :						:Pcpn	:Snow :		Wind			:Sunshine:		Sky	
								Columns								
1	2	3	4	5	6a	6b	7	8	9	10	11	12	13	14	15	16	1
Dy	Max	Min	Avg	Dep	HDD	CDD	Wtr	Snw	Dpth	Avg	Spd	Dir	Min	Psbl	S-S	Wx	S
1	66	51	59	-7	6	0	0.01	0.0	0	7.0	16	01	453	57		1	
2	72	47	60	-6	5	0	0.00	0.0	0	4.8	10	25	653	83			
3	76	54	65	-1	0	0	0.00	0.0	0	9.0	20	24	780	99			
4	75	60	68	3	0	3	0.05	0.0	0	9.9	18	36	490	63		1,3	
5	71	51	61	-4	4	0	0.00	0.0	0	5.6	13	03	780	100			
6	81	50	66	1	0	1	0.00	0.0	0	4.8	10	23	777	100			
7	87	58	73	8	0	8	0.00	0.0	0	9.2	18	20	520	67			
8	89	73	81	17	0	16	0.00	0.0	0	11.8	20	24	718	93		8	
9	90	72	81	17	0	16	0.00	0.0	0	10.6	20	16	768	100			
10	77	65	71	7	0	6	0.09	0.0	0	16.4	28	24	433	57		1	
11	74	58	66	3	0	1	0.00	0.0	0	7.4	14	23	708	93			
12	79	53	66	3	0	1	0.00	0.0	0	7.6	16	21	760	100			
13	69	56	63	0	2	0	0.09	0.0	0	8.6	16	03	160	21		1	
14	64	47	56	-7	9	0	0.00	0.0	0	8.0	17	02	649	86			
15	68	50	59	-3	6	0	0.00	0.0	0	5.0	14	36	475	63			
16	70	44	57	-5	8	0	0.00	0.0	0	5.7	13	27	729	98			
17	75	48	62	0	3	0	0.00	0.0	0	5.4	12	24	719	97			
18	77	57	67	6	0	2	T	0.0	0	5.9	14	04	395	53			
19	78	59	69	8	0	4	0.07	0.0	0	9.9	18	17	137	19			
20	74	63	69	8	0	4	0.07	0.0	0	14.3	25	24	270	37		1	
21	74	59	67	7	0	2	0.06	0.0	0	10.6	21	20	279	38			
22	68	57	63	3	2	0	0.00	0.0	0	9.3	18	24	80	11		1	
23	77	51	64	4	1	0	0.00	0.0	0	6.6	13	17	640	88		1	
24	66	53	60	0	5	0	0.58	0.0	0	8.7	16	22	0	0		1,8	
25	63	46	55	-4	10	0	0.99	0.0	0	12.2	30	20	120	17		1	
26	50	42	46	-12	19	0	1.24	0.0	0	11.2	24	20	0	0		1	
27	54	46	50	-8	15	0	0.17	0.0	0	6.9	15	32	30	4		1	
28	59	49	54	-3	11	0	0.03	0.0	0	7.4	15	35	115	16		1	
29	65	45	55	-2	10	0	0.00	0.0	0	6.8	17	04	702	99			
30	66	41	54	-3	11	0	0.00	0.0	0	4.7	13	04	708	100			
Sm	2154	1605		30	127	64	3.45	0.0		251.3			14048				
Avg	71.8	53.5	62.7						8.4								

Notes:
Last of several occurrences

Column 17 Peak Wind in M.P.H.

Preliminary Local Climatological Data (WS Form: F-6) , Page 2
Station: Buffalo NY
Month: September
Year: 2001

Temperature Data		Precipitation Data		SYMBOLS USED IN COLUMN 16
Average Monthly:	62.7	Total for Month:	3.45	1 = FOG
Dptr fm normal:	0.8	Dptr fm normal:	-0.04	2 = FOG REDUCING VISIBILITY TO 1/4 MILE OR LESS
Highest:	90 on 9	Grtst 24hr	1.43 on 25-26	3 = THUNDER
Lowest:	41 on 30			4 = ICE PELLETS
		SNOW, ICE PELLETS, HAIL		5 = HAIL
		Total month:	0.0	6 = GLAZE OR RIME
		Grtst 24hr	0.0 on	7 = BLOWING DUST OR SAND VSBY 1/2 MILE OR LESS
		Grtst depth:	0 on 30	8 = SMOKE OR HAZE
		Seasonal Total:	0.0	9 = BLOWING SNOW
				x = TORNADO

No. of Days with		WEATHER - Days with	
Max 32 or below:	0	0.01 inch or more:	12
Max 90 or above:	1	0.10 inch or more:	4
Min 32 or below:	0	0.50 inch or more:	3
Min 0 or below:	0	1.00 inch or more:	1

HDD (Base 65)	
Total this Mo.	127
Dptr fm normal	-3
Seasonal total	145
Dptr fm normal	-7

CDD (Base 65)	
Total this Mo.	64
Dptr fm normal	27
Seasonal total	633
Dptr fm normal	156

Pressure Data
Highest SLP 30.35 on 14
Lowest SLP 29.75 on 25

National Weather Service
Buffalo, New York

Preliminary Climatological Data

Preliminary Local Climatological Data (WS Form: F-6)

Station: Buffalo NY
Month: October
Year: 2001

	Temperature in F :						:Pcpn	:Snow :		Wind				:Sunshine:	Sky	:
								Columns								
1	2	3	4	5	6a	6b	7	8	9	10	11	12	13	14	15	16	1
Dy	Max	Min	Avg	Dep	HDD	CDD	Wtr	Snw	Dpth	Avg	Spd	Dir	Min	Psbl	S-S	Wx	S
1	68	42	55	-2	10	0	0.00	0.0	0	9.4	18	22	603	86		1	
2	71	55	63	7	2	0	0.00	0.0	0	8.8	20	23	667	95		1,8	
3	78	53	66	10	0	1	0.00	0.0	0	14.0	26	23	699	100		1	
4	69	58	64	9	1	0	0.31	0.0	0	13.6	25	23	305	44		1	
5	58	49	54	-1	11	0	0.86	0.0	0	8.6	22	35	0	0		1	
6	55	42	49	-6	16	0	0.45	0.0	0	15.8	29	25	181	26		1	
7	48	36	42	-12	23	0	0.01	T	0	13.0	26	29	399	58		1	
8	49	31	40	-14	25	0	0.00	0.0	0	5.0	13	24	680	100			
9	63	35	49	-4	16	0	T	0.0	0	9.2	18	20	309	45			
10	71	53	62	9	3	0	0.00	0.0	0	11.5	22	21	649	96			
11	66	57	62	9	3	0	0.02	0.0	0	12.2	22	21	48	7		1	
12	66	57	62	10	3	0	0.07	0.0	0	7.4	14	18	0	0		1	
13	78	60	69	17	0	4	T	0.0	0	10.9	28	17	425	64			
14	71	55	63	11	2	0	0.21	0.0	0	19.2	29	17	10	2		1	
15	58	47	53	2	12	0	0.18	T	0	12.5	28	23	181	27		1,3,5	
16	63	44	54	3	11	0	0.50	0.0	0	10.9	35	23	47	7		1	
17	46	39	43	-8	22	0	0.10	0.0	0	18.4	30	28	117	18			
18	52	36	44	-6	21	0	0.00	0.0	0	9.2	21	21	654	100			
19	61	44	53	3	12	0	0.00	0.0	0	12.6	21	23	378	58			
20	61	44	53	3	12	0	T	0.0	0	9.9	22	23	651	100			
21	65	50	58	9	7	0	0.46	0.0	0	9.2	25	27	43	7		2,3	
22	61	48	55	6	10	0	0.04	0.0	0	3.0	10	21	434	67		2,8	
23	72	50	61	12	4	0	0.10	0.0	0	14.0	31	20	75	12		1	
24	69	61	65	17	0	0	0.02	0.0	0	10.4	22	15	252	39			
25	70	38	54	6	11	0	0.69	0.3	0	23.6	46	23	23	4		1,3,4	
26	46	36	41	-7	24	0	0.32	0.1	0	22.4	38	24	211	33		1,3,4	
27	41	36	39	-8	26	0	T	T	0	11.6	18	27	113	18			
28	44	36	40	-7	25	0	0.00	0.0	0	7.7	17	23	85	14			
29	52	36	44	-2	21	0	T	0.0	0	14.3	26	23	394	63			
30	48	37	43	-3	22	0	0.00	0.0	0	9.5	15	05	622	100			
31	58	40	49	3	16	0	T	0.0	0	11.0	18	20	38	6			
Sm	1878	1405			371	5	4.34	0.4		368.8			9293				
Avg	60.6	45.3	53.0							11.9							

Notes:

Last of several occurrences
Column 17 Peak Wind in M.P.H.

Preliminary Local Climatological Data (WS Form: F-6) , Page 2

Station: Buffalo NY
Month: October
Year: 2001

Temperature Data

Average Monthly: 53.0
Dptr fm normal: 1.9
Highest: 78 on 13
Lowest: 31 on 8

Precipitation Data

Total for Month: 4.34
Dptr fm normal: 1.25
Grtst 24hr 1.29 on 5-6

SNOW, ICE PELLETS, HAIL
Total month: 0.4
Grtst 24hr 0.4 on 25
Grtst depth: 0 on 31
Seasonal Total: 0.4

SYMBOLS USED IN COLUMN 16

1 = FOG
2 = FOG REDUCING VISIBILITY TO 1/4 MILE OR LESS
3 = THUNDER
4 = ICE PELLETS
5 = HAIL
6 = GLAZE OR RIME
7 = BLOWING DUST OR SAND VSBY 1/2 MILE OR LESS
8 = SMOKE OR HAZE
9 = BLOWING SNOW
x = TORNADO

No. of Days with

Max 32 or below: 0
Max 90 or above: 0
Min 32 or below: 1
Min 0 or below: 0

WEATHER - Days with

0.01 inch or more: 16
0.10 inch or more: 11
0.50 inch or more: 3
1.00 inch or more: 0

HDD (Base 65)
Total this Mo. 371
Dptr fm normal -60
Seasonal total 516
Dptr fm normal -67

CDD (Base 65)
Total this Mo. 5
Dptr fm normal 5
Seasonal total 638
Dptr fm normal 161

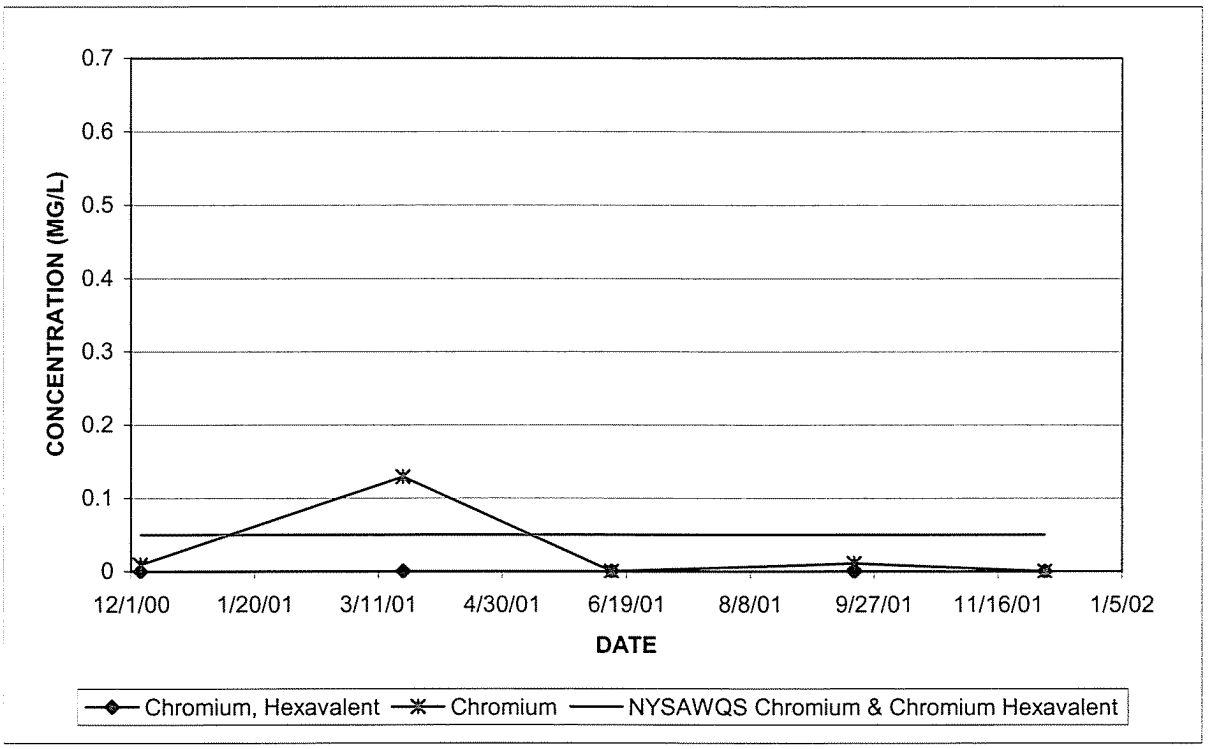
Pressure Data

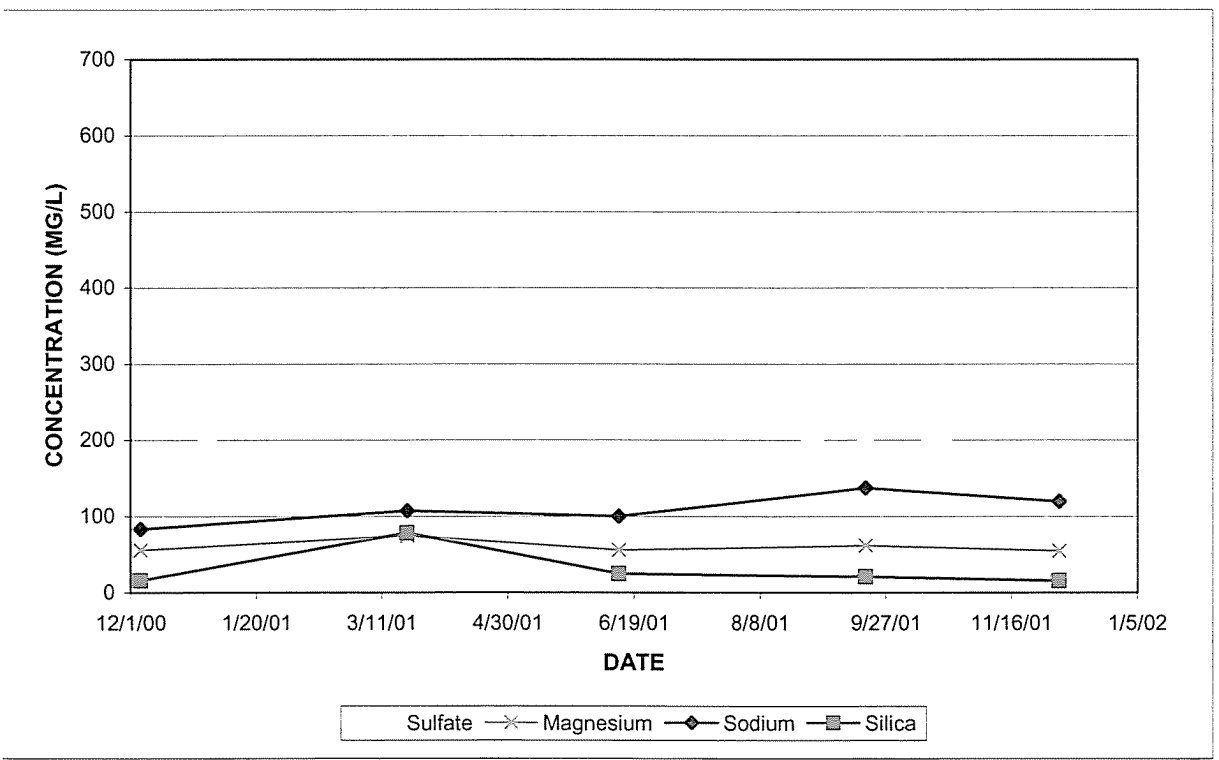
Highest SLP 30.64 on 30
Lowest SLP 29.32 on 25

Appendix I

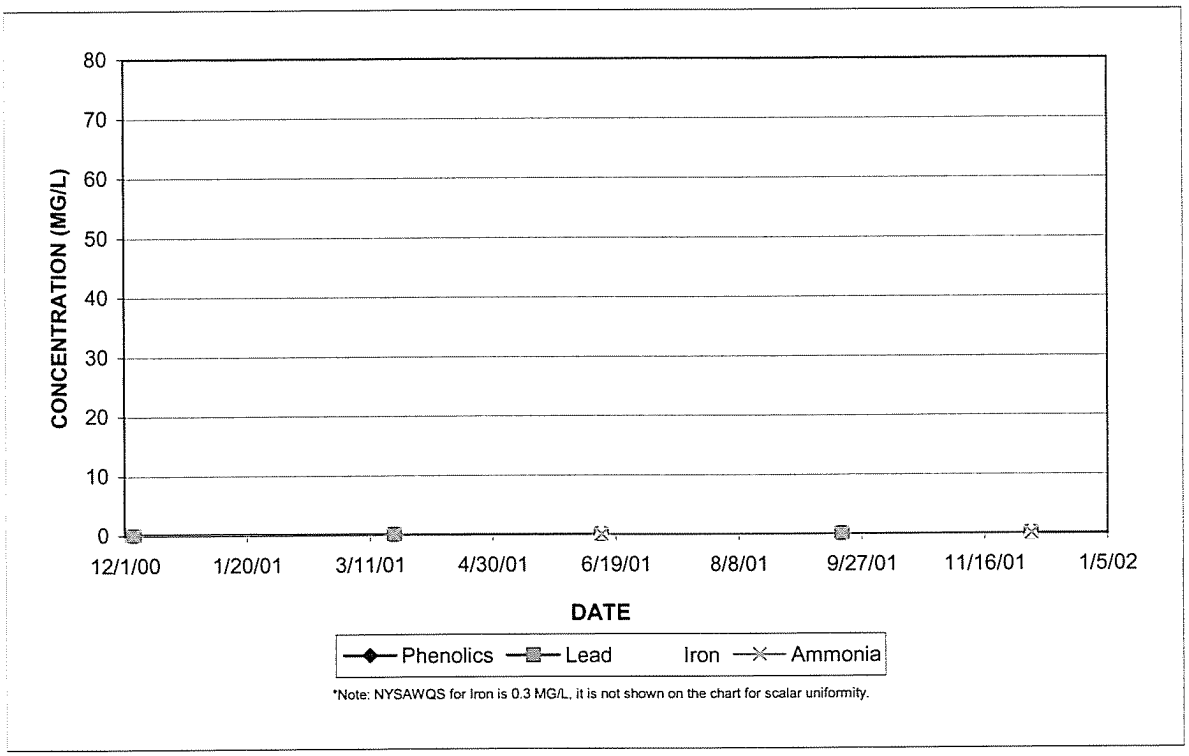
Analytical Trend Graphs and Scatter Plots

WRL-MW1B

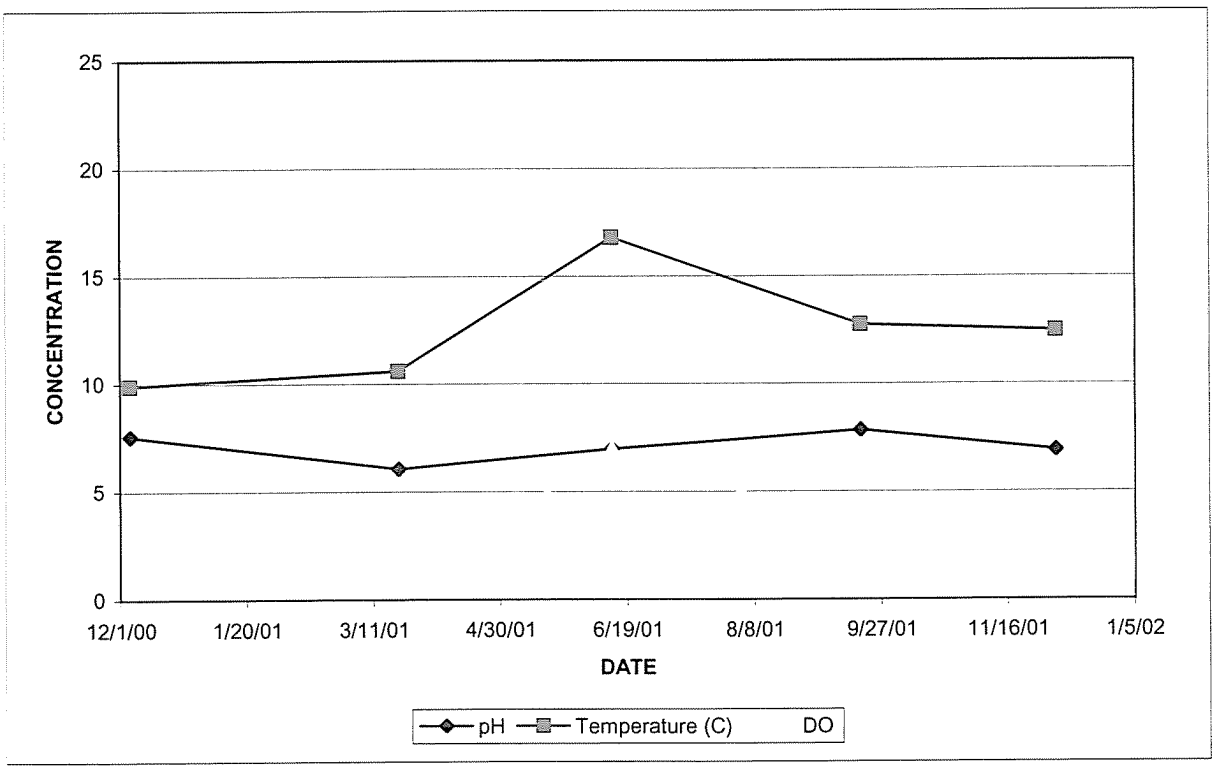

0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
CONCENTRATION (MG/L)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
Chromium, Hexavalent
Chromium
NYSAWQS Chromium & Chromium Hexavalent

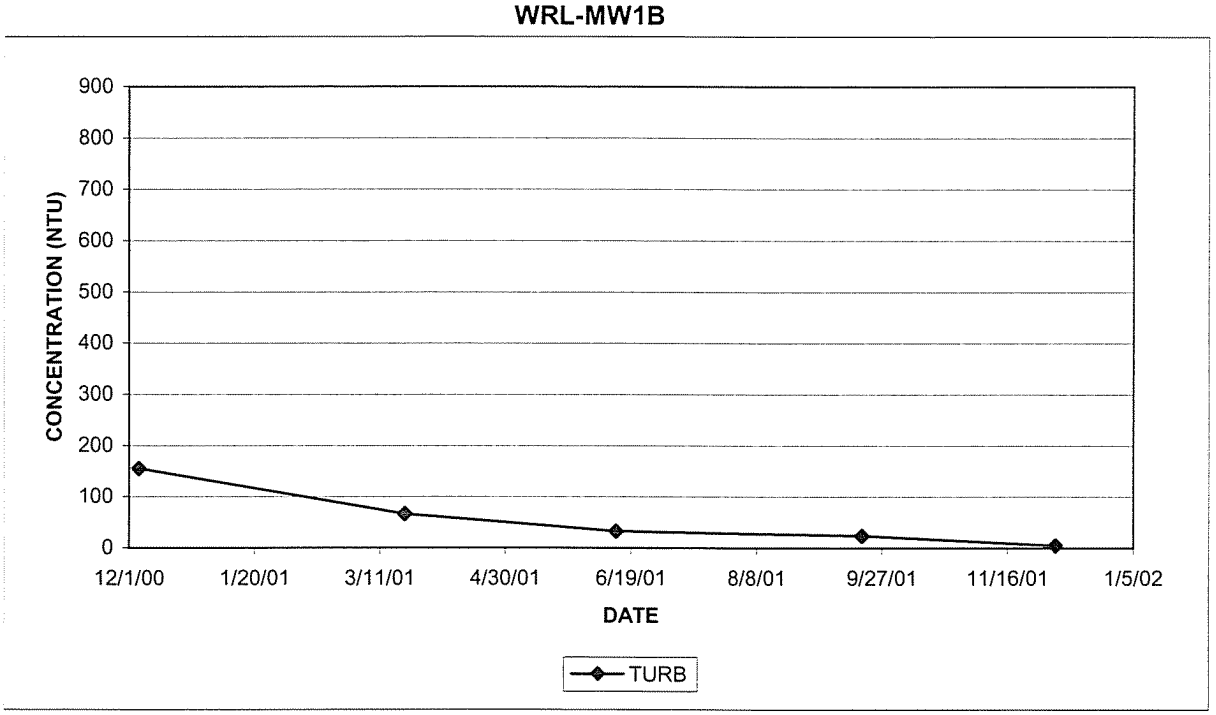

700
600
500
400
300
200
100
0
CONCENTRATION (MG/L)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
Sulfate
Magnesium
Sodium
Silica

WRL-MW1B

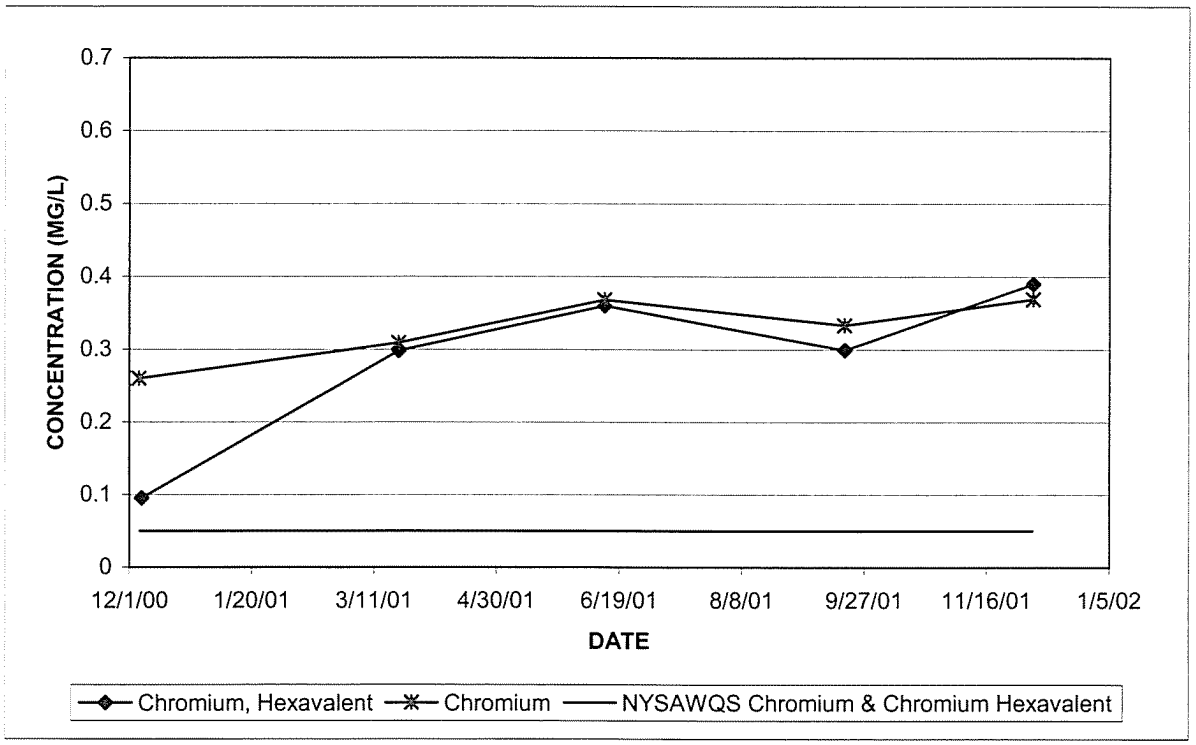


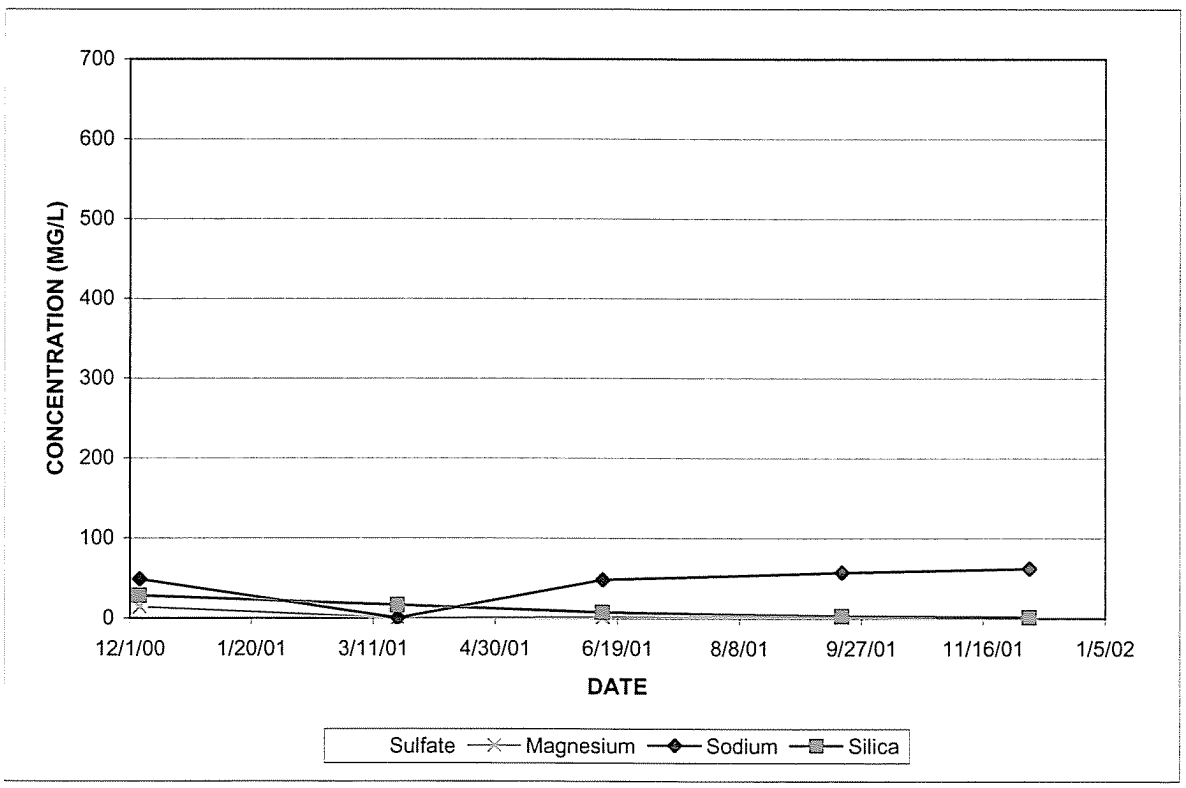
*Note: NYSAWQS for Iron is 0.3 MG/L, it is not shown on the chart for scalar uniformity.




WRL-MW1B
900
800
700
600
500
400
300
200
100
0
CONCENTRATION (NTU)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
TURB

WRL-MW2B


0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
CONCENTRATION (MG/L)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
Chromium, Hexavalent
Chromium
NYSAWQS Chromium & Chromium Hexavalent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500
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300
200
100
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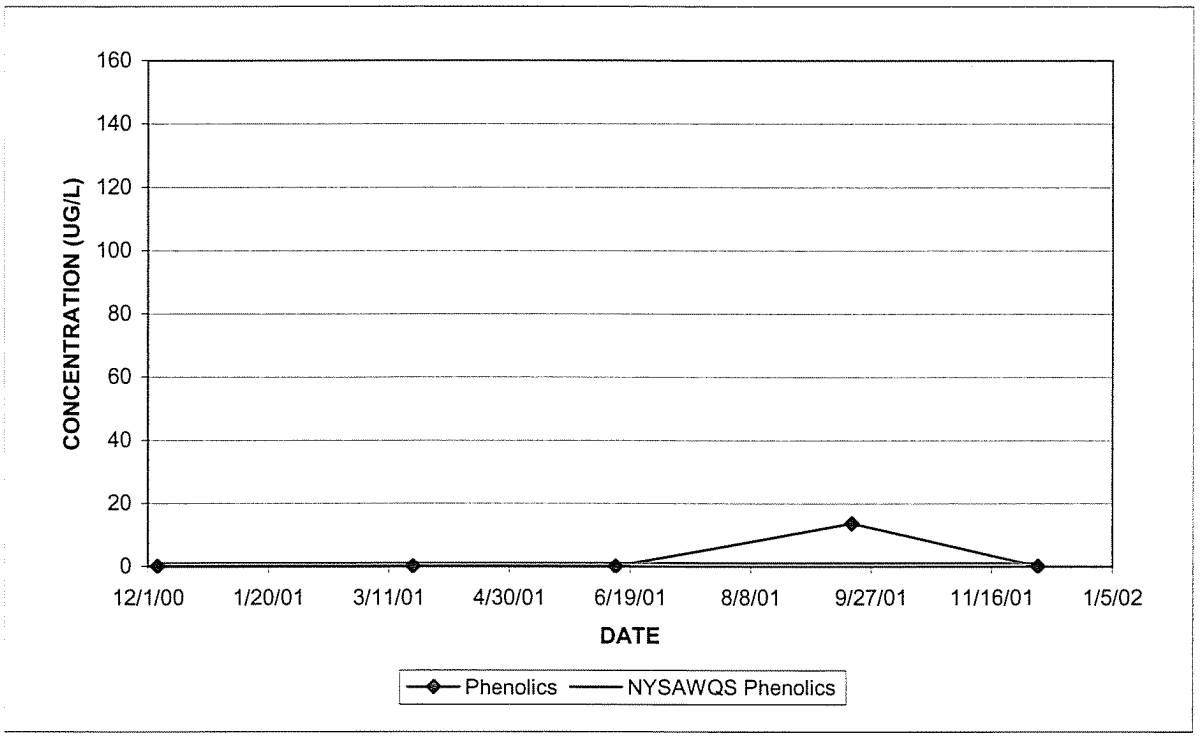
CONCENTRATION (MG/L)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
Sulfate
Magnesium
Sodium
Silica

WRL-MW2B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140
120
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60
40
20
0
CONCENTRATION (UG/L)
12/1/00
1/20/01
3/11/01
4/30/01
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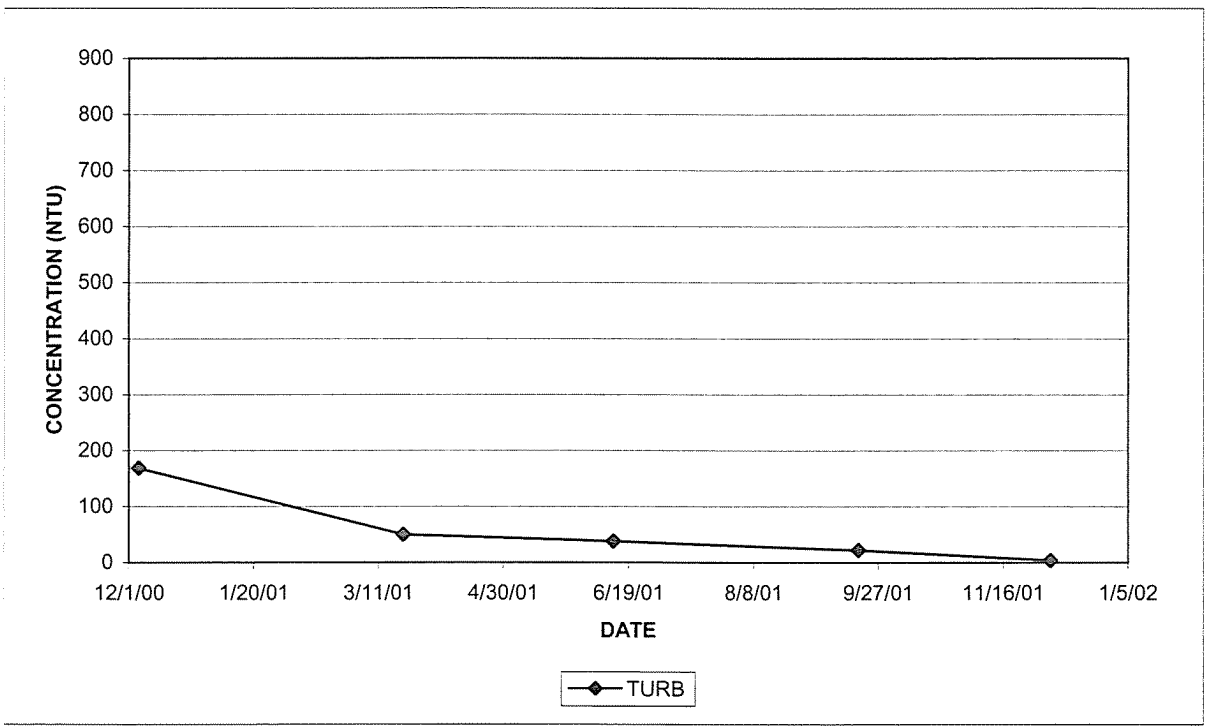
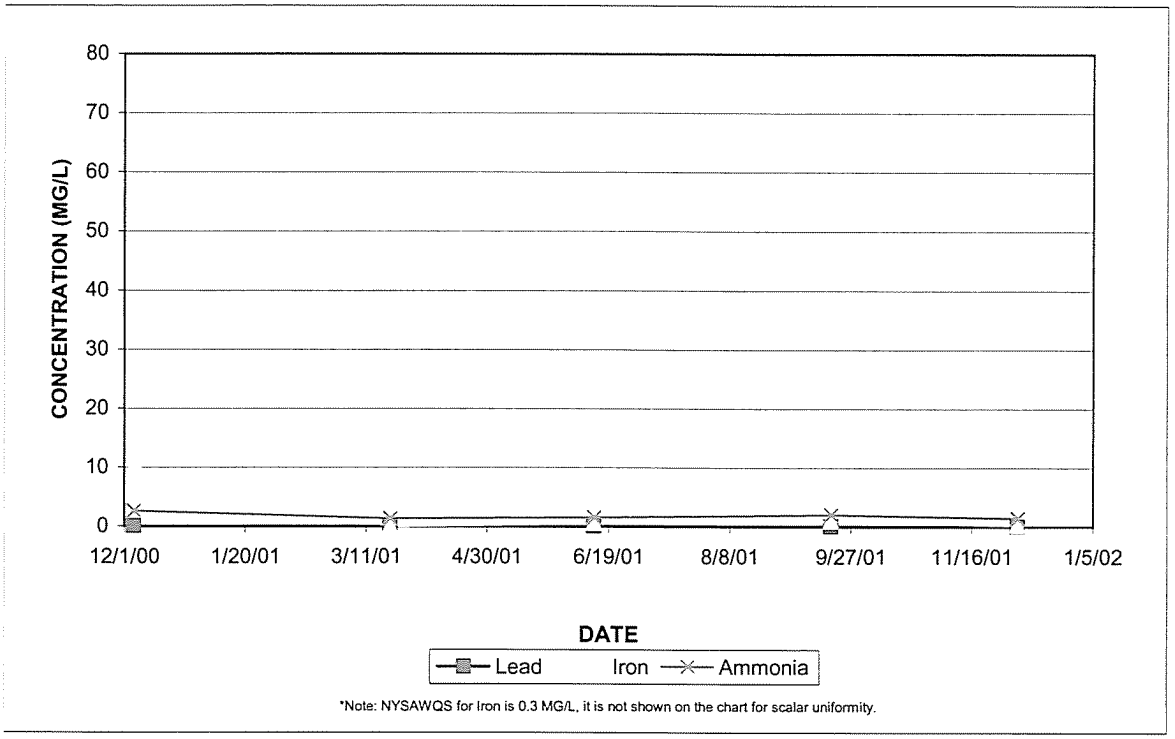
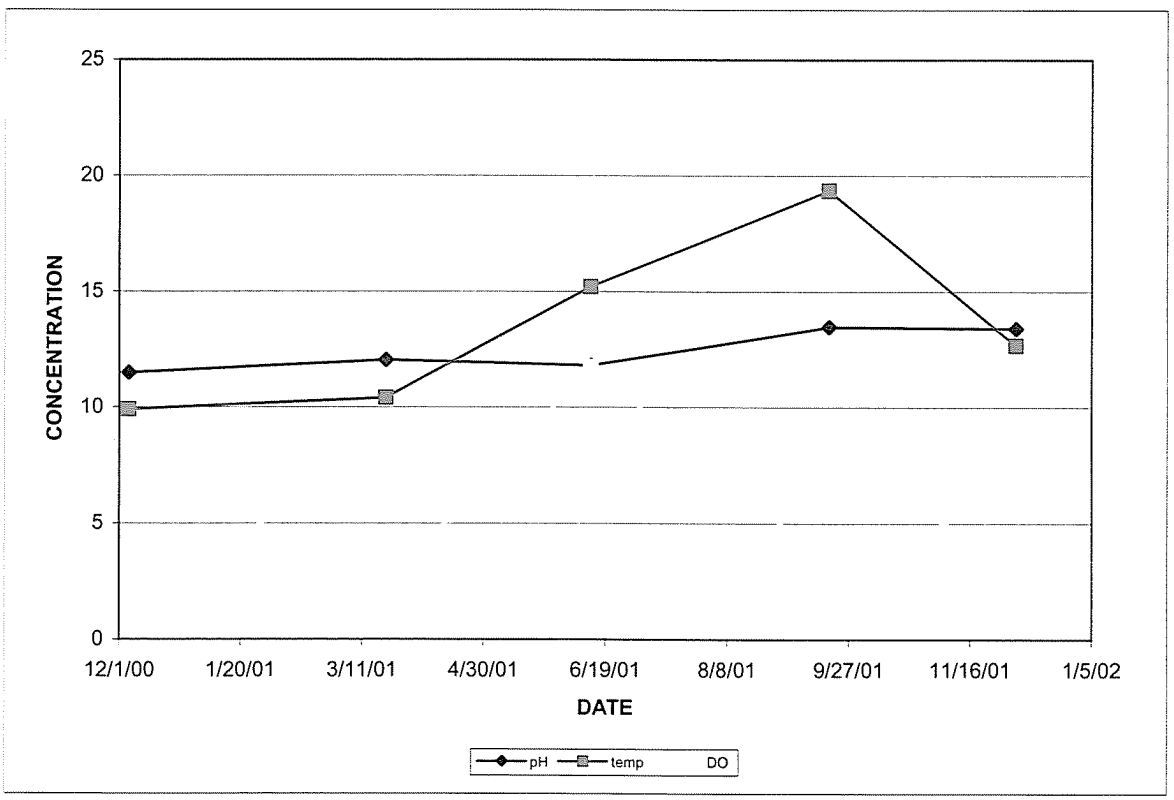
8/8/01
9/27/01
11/16/01
1/5/02
DATE
Phenolics
NYSAWQS Phenolics


900
800
700
600
500
400
300
200
100
0
CONCENTRATION (NTU)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
TURB

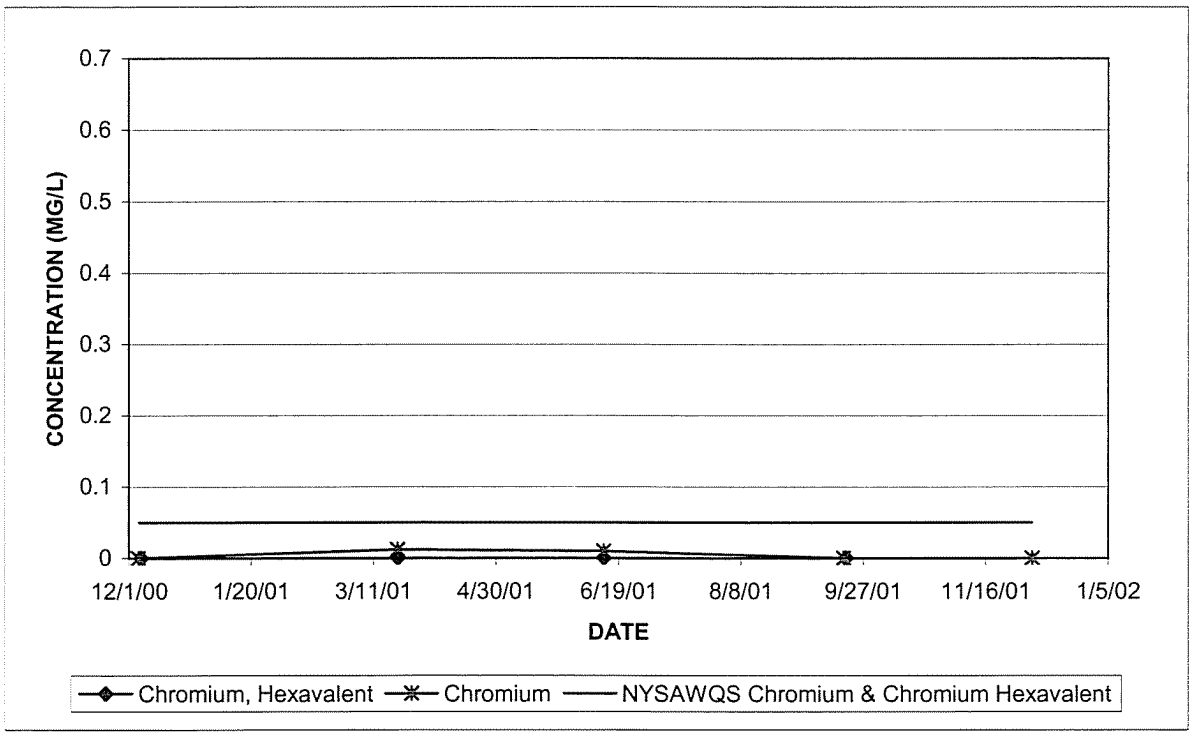
WRL-MW2B



*Note: NYSAWQS for Iron is 0.3 MG/L, it is not shown on the chart for scalar uniformity.



WRL-MW3B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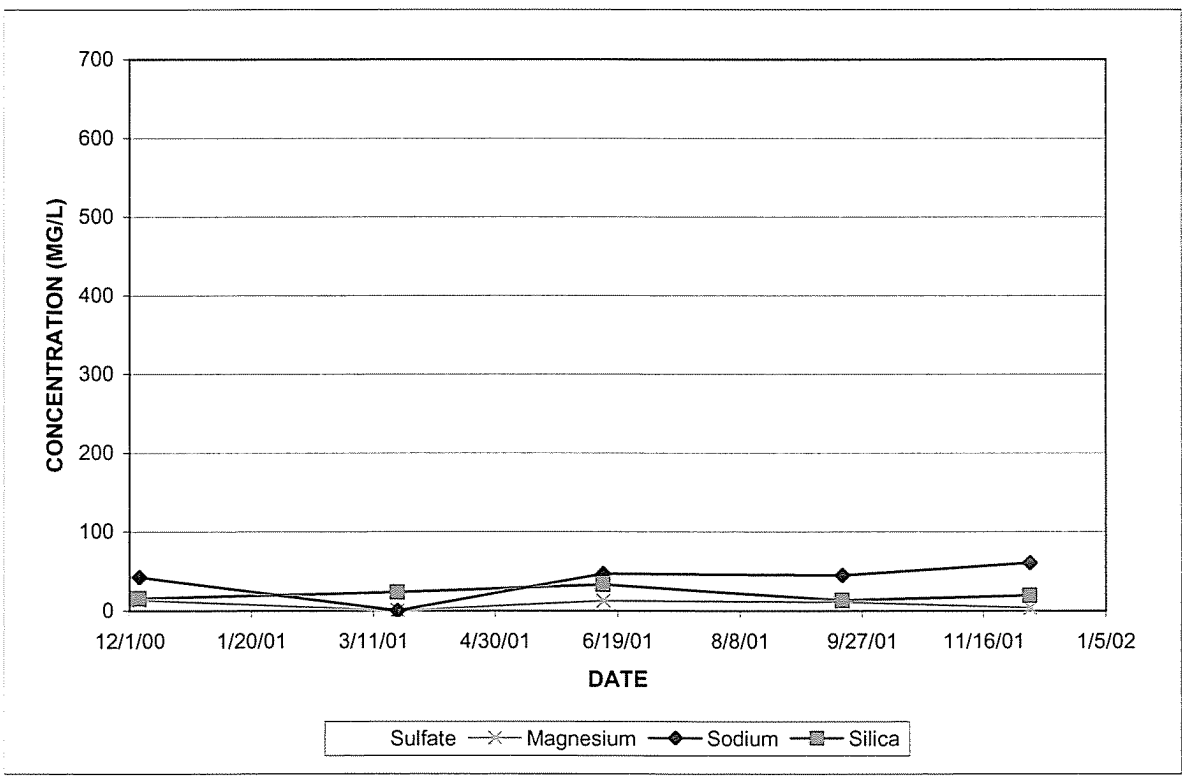
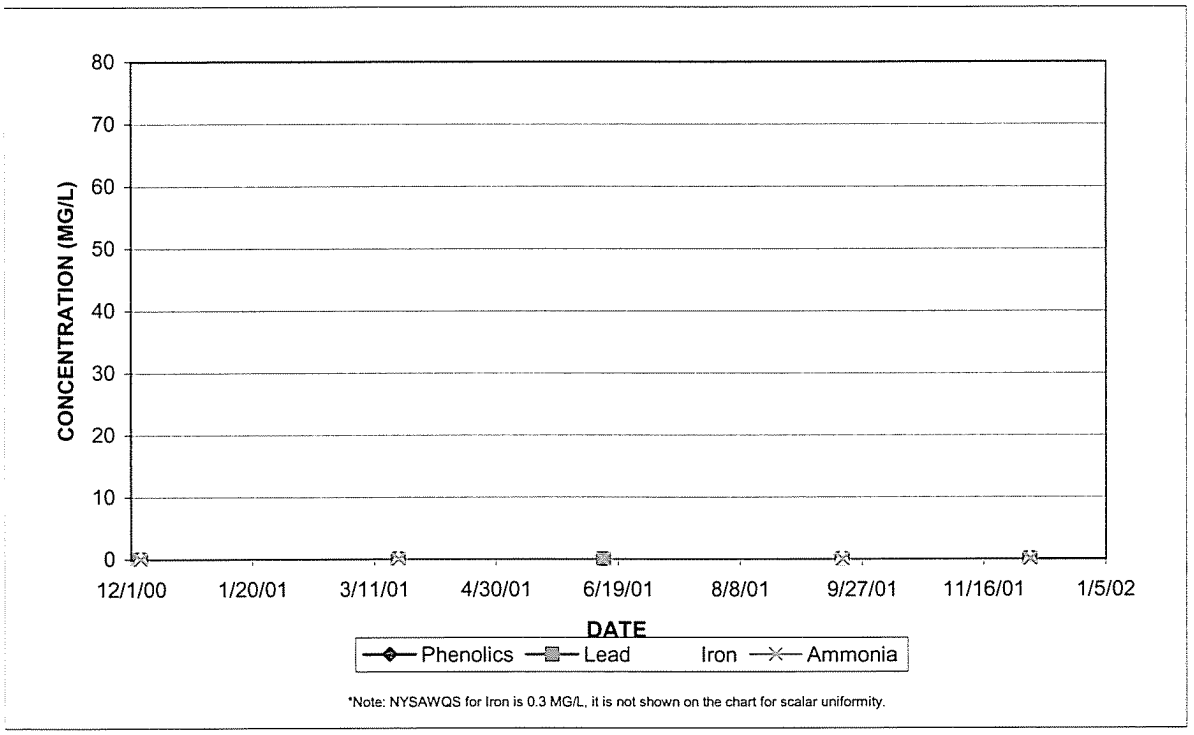
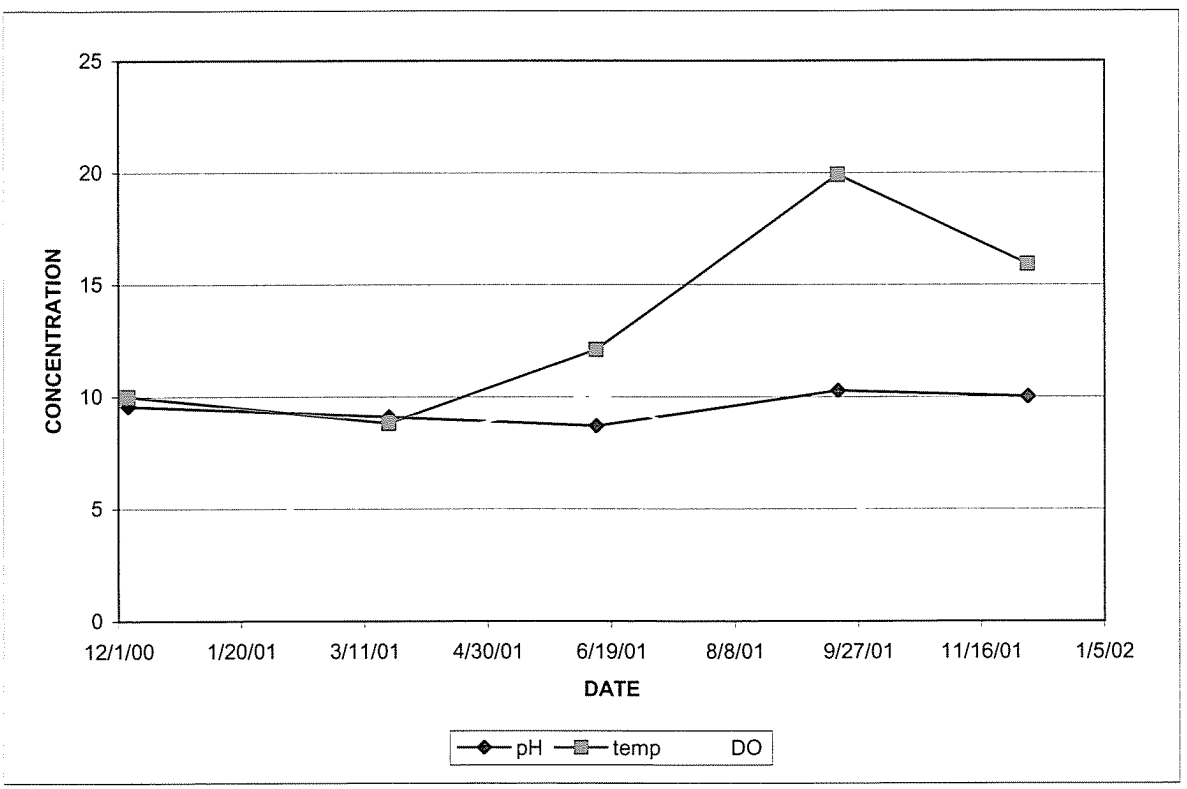
0.6
0.5
0.4
0.3
0.2
0.1
0
CONCENTRATION (MG/L)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
Chromium, Hexavalent
Chromium
NYSAWQS Chromium & Chromium Hexavalent


700
600
500
400
300
200
100
0
CONCENTRATION (MG/L)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
Sulfate
Magnesium
Sodium
Silica

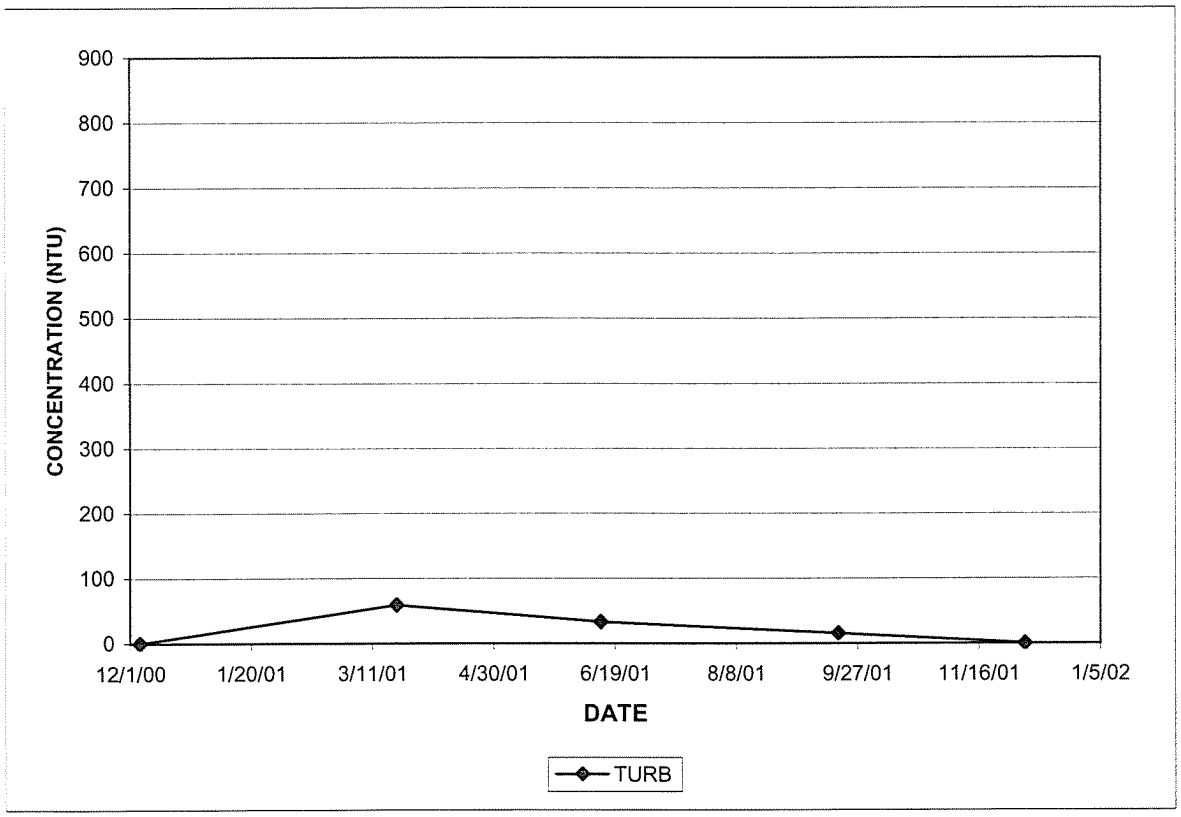
WRL-MW3B



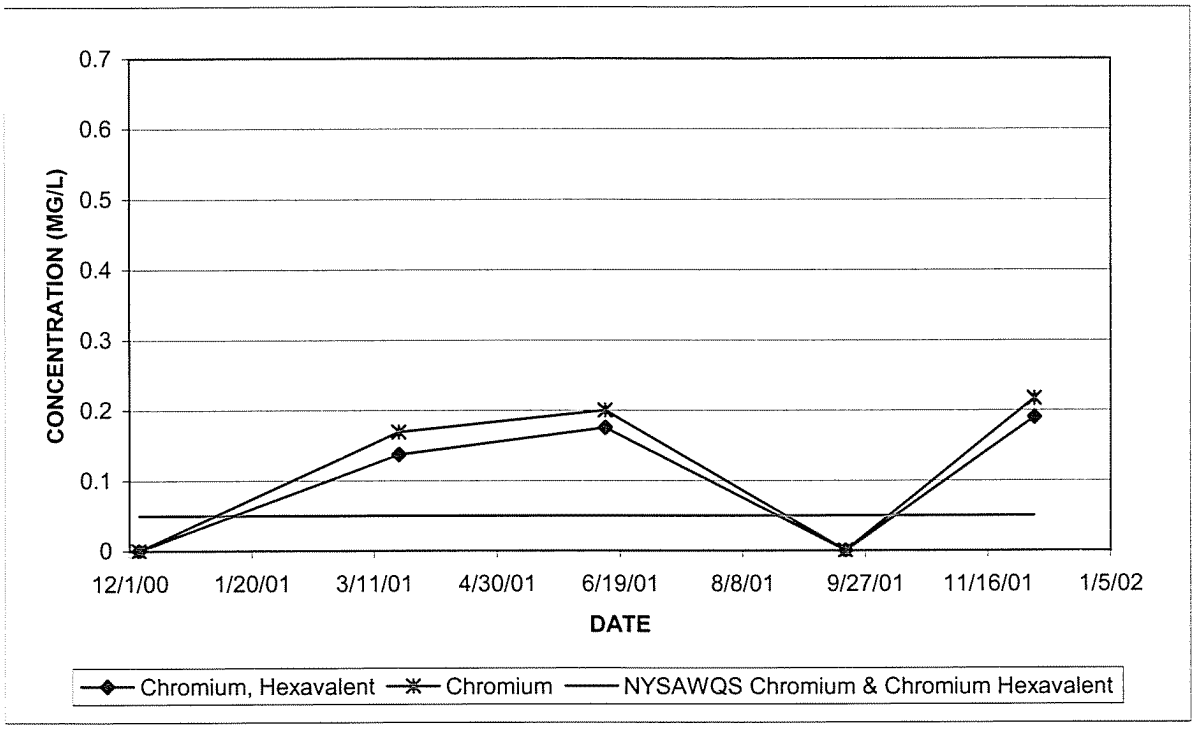
*Note: NYSAWQS for Iron is 0.3 MG/L, it is not shown on the chart for scalar uniformity.

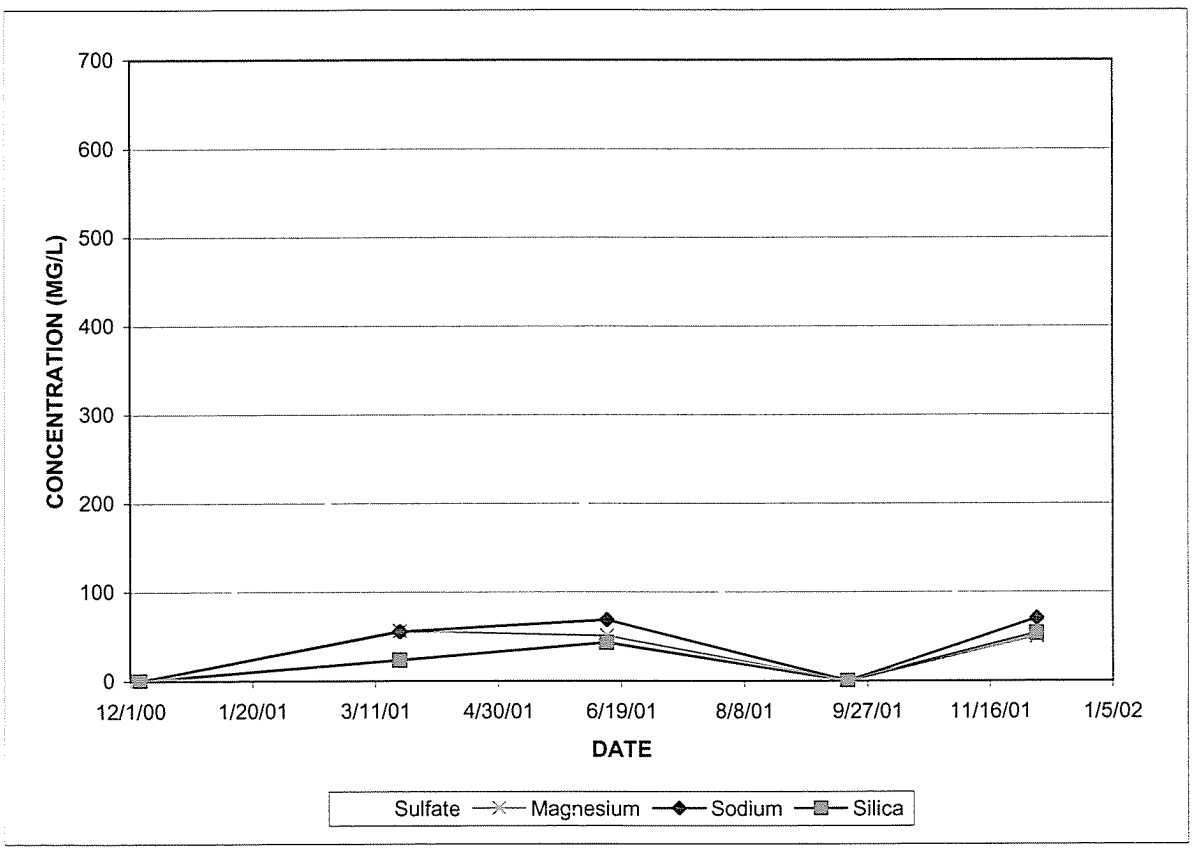


WRL-MW3B

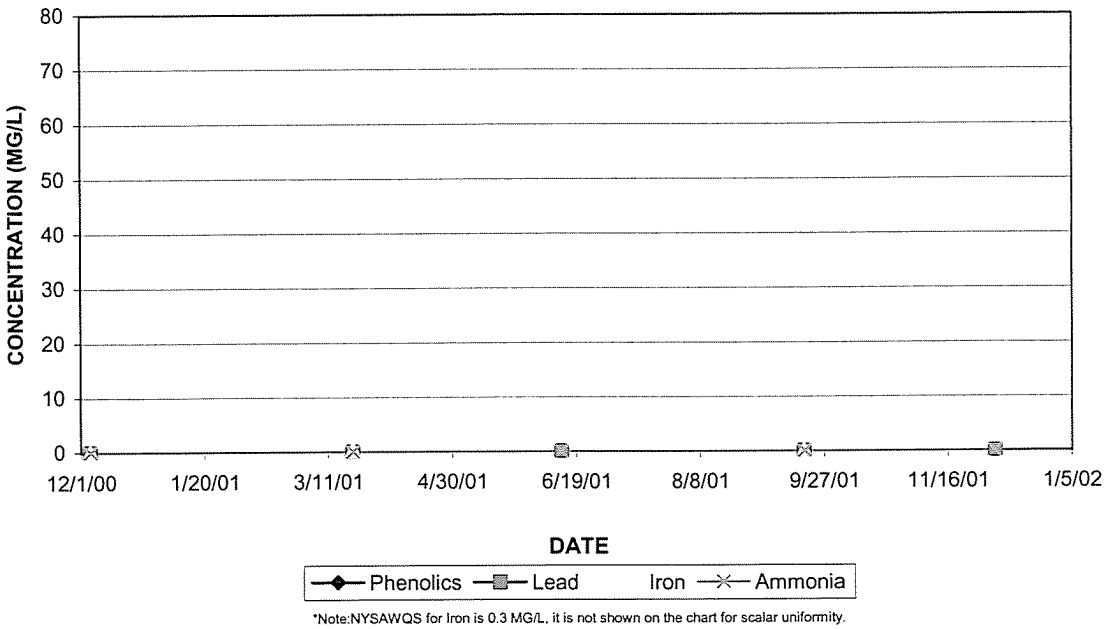

900
800
700
600
500
400
300
200
100
0
CONCENTRATION (NTU)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
TURB

WRL-MW4B

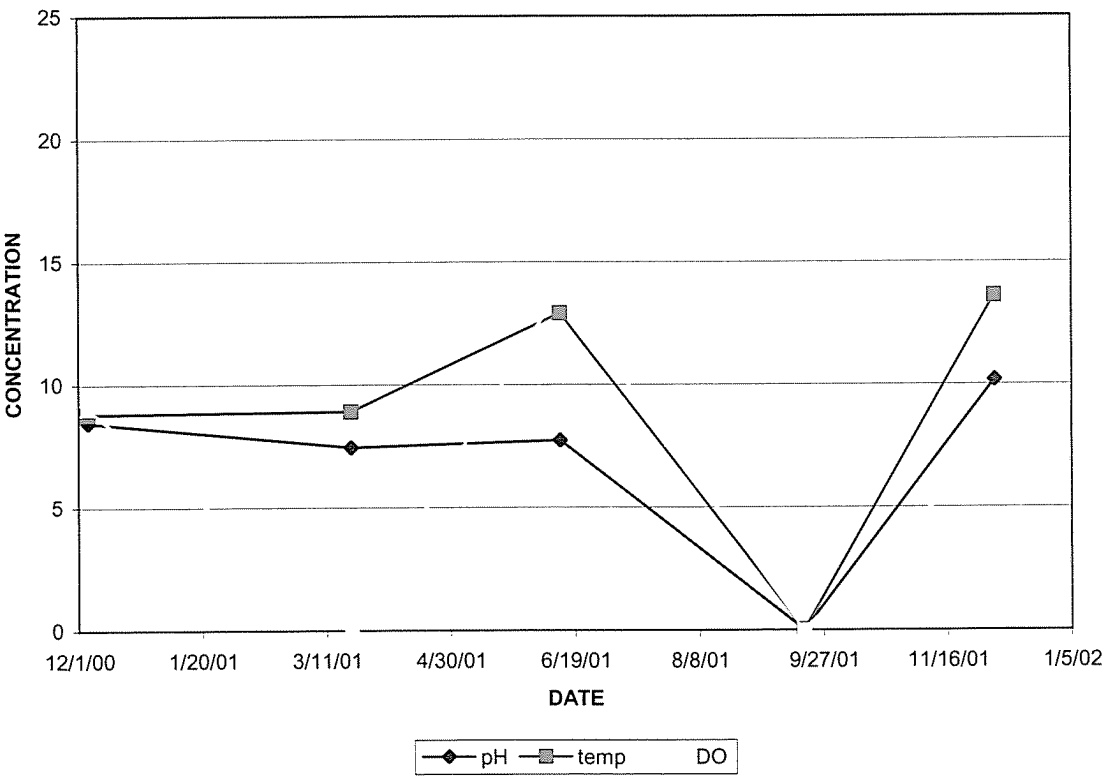

0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
CONCENTRATION (MG/L)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
Chromium, Hexavalent
Chromium
NYSAWQS Chromium & Chromium Hexavalent

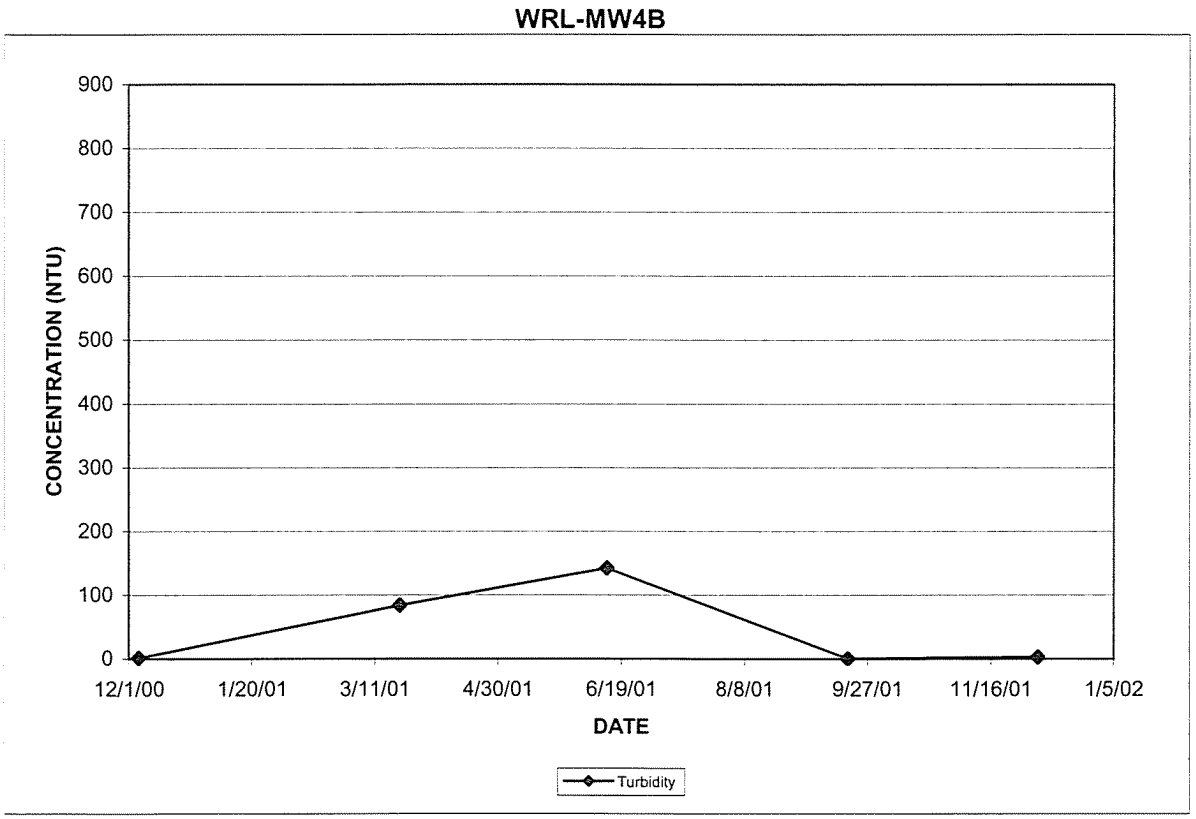

700
600
500
400
300
200
100
0
CONCENTRATION (MG/L)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
Sulfate
Magnesium
Sodium
Silica

WRL-MW4B

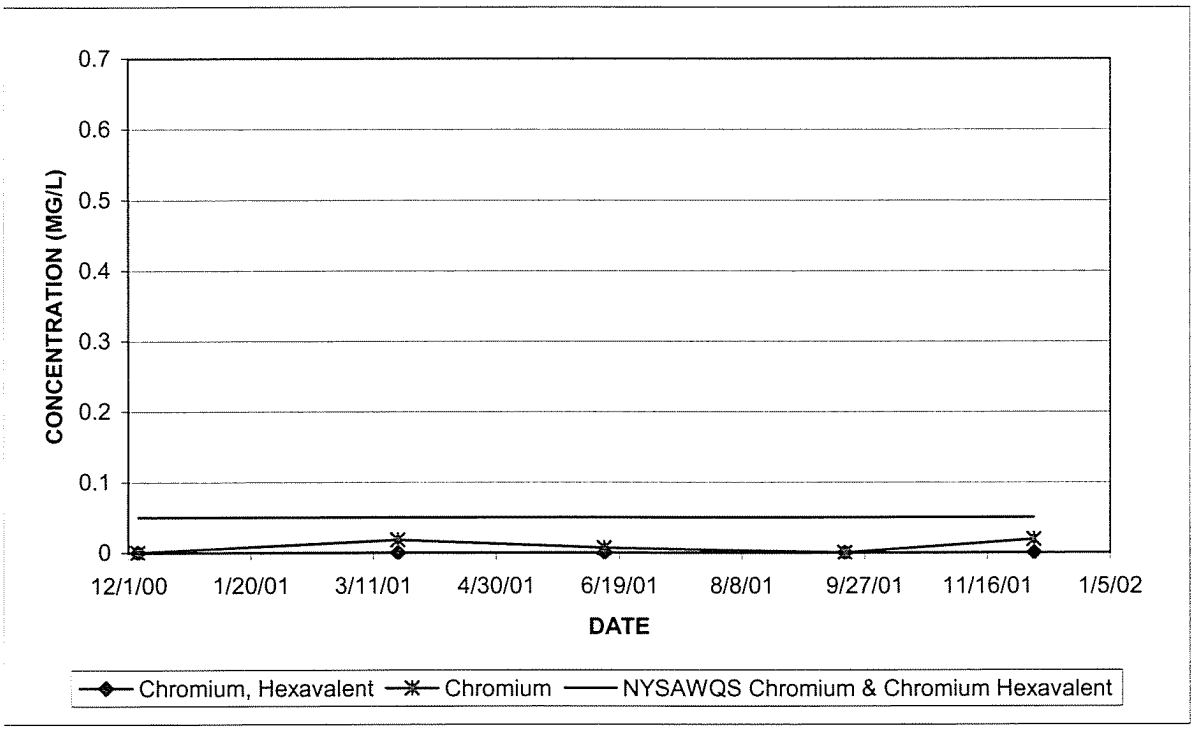


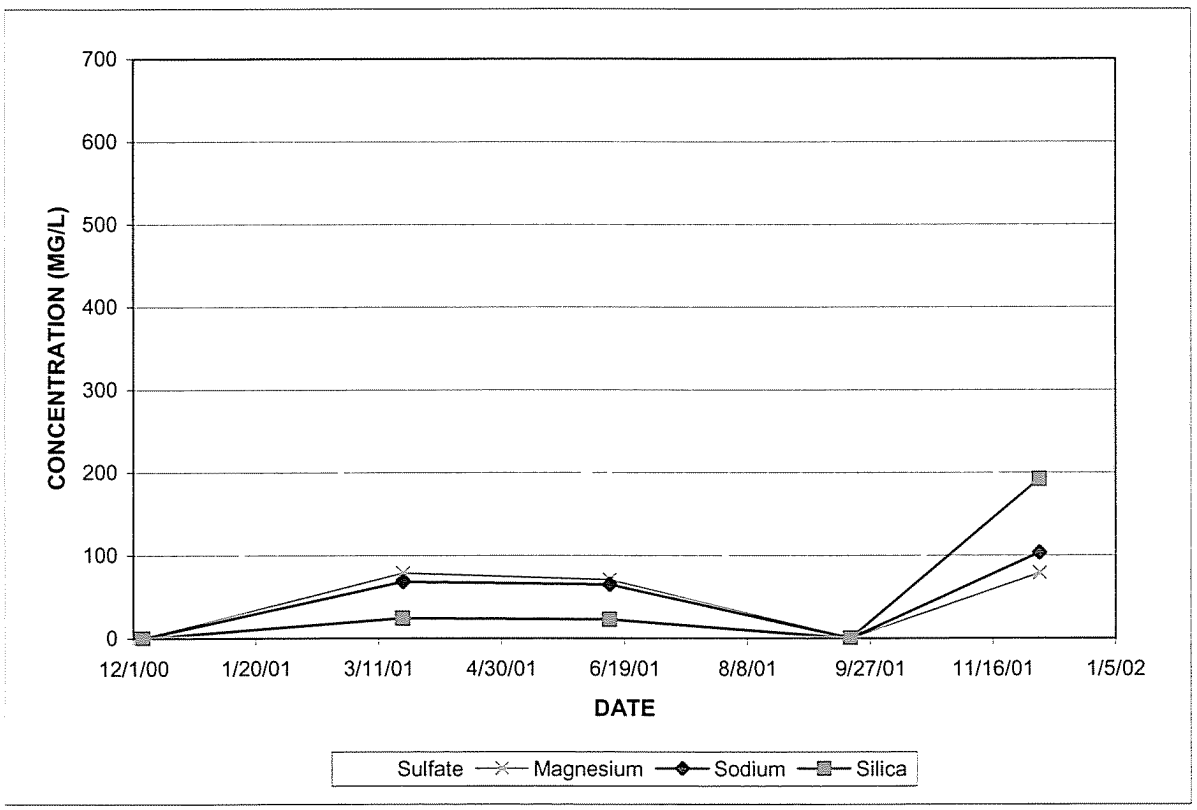
*Note:NYSAWQS for Iron is 0.3 MG/L, it is not shown on the chart for scalar uniformity.



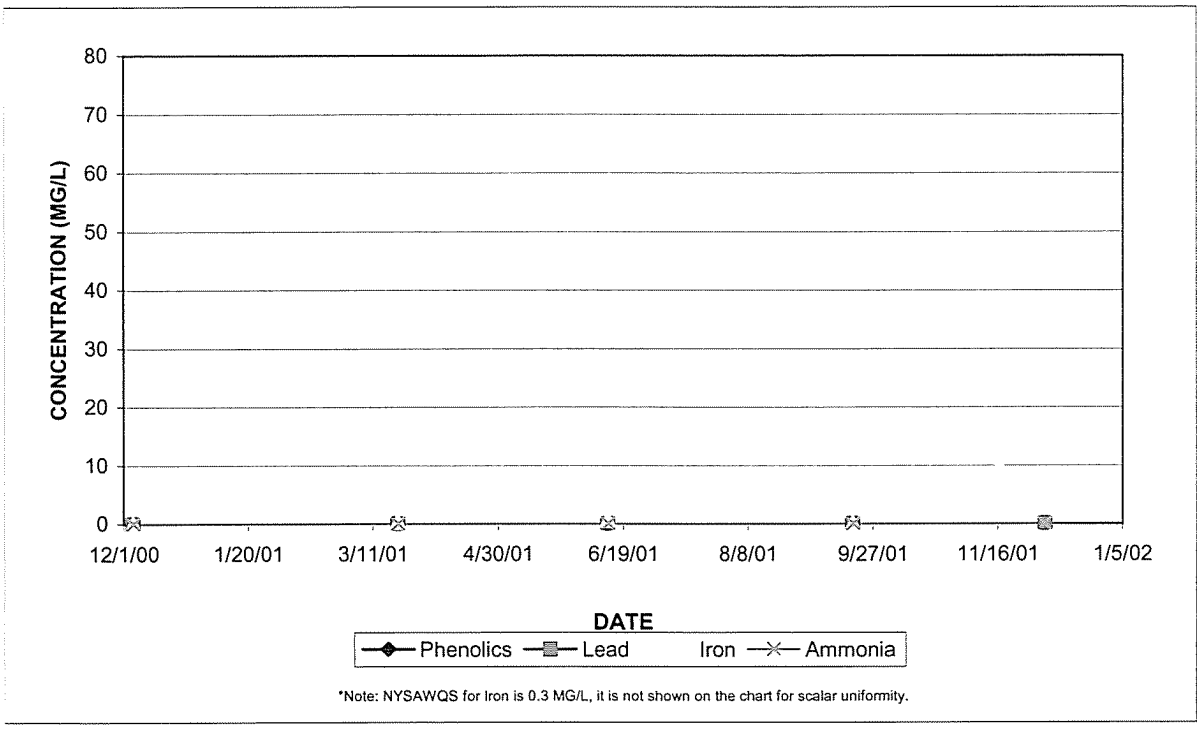

WRL-MW4B
900
800
700
600
500
400
300
200
100
0
CONCENTRATION (NTU)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
Turbidity

WRL-MW5B

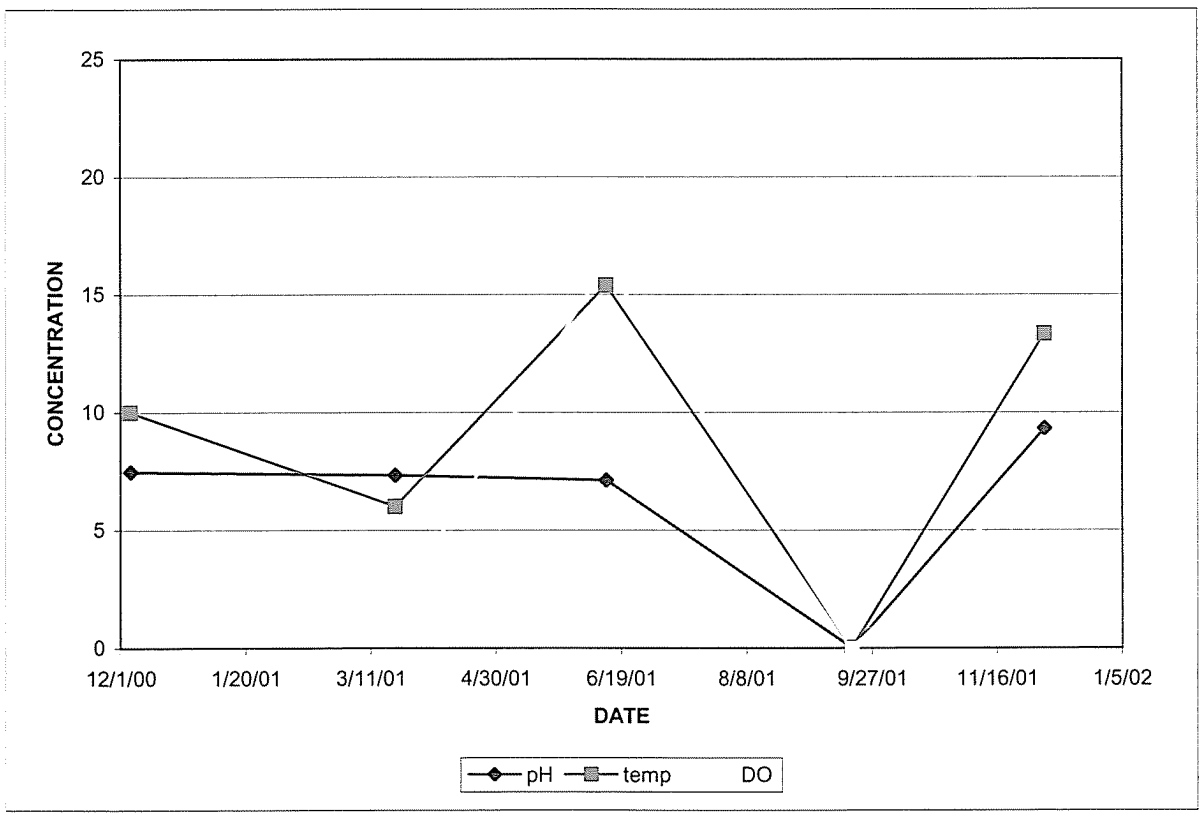

0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
CONCENTRATION (MG/L)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
Chromium, Hexavalent
Chromium
NYSAWQS Chromium & Chromium Hexavalent

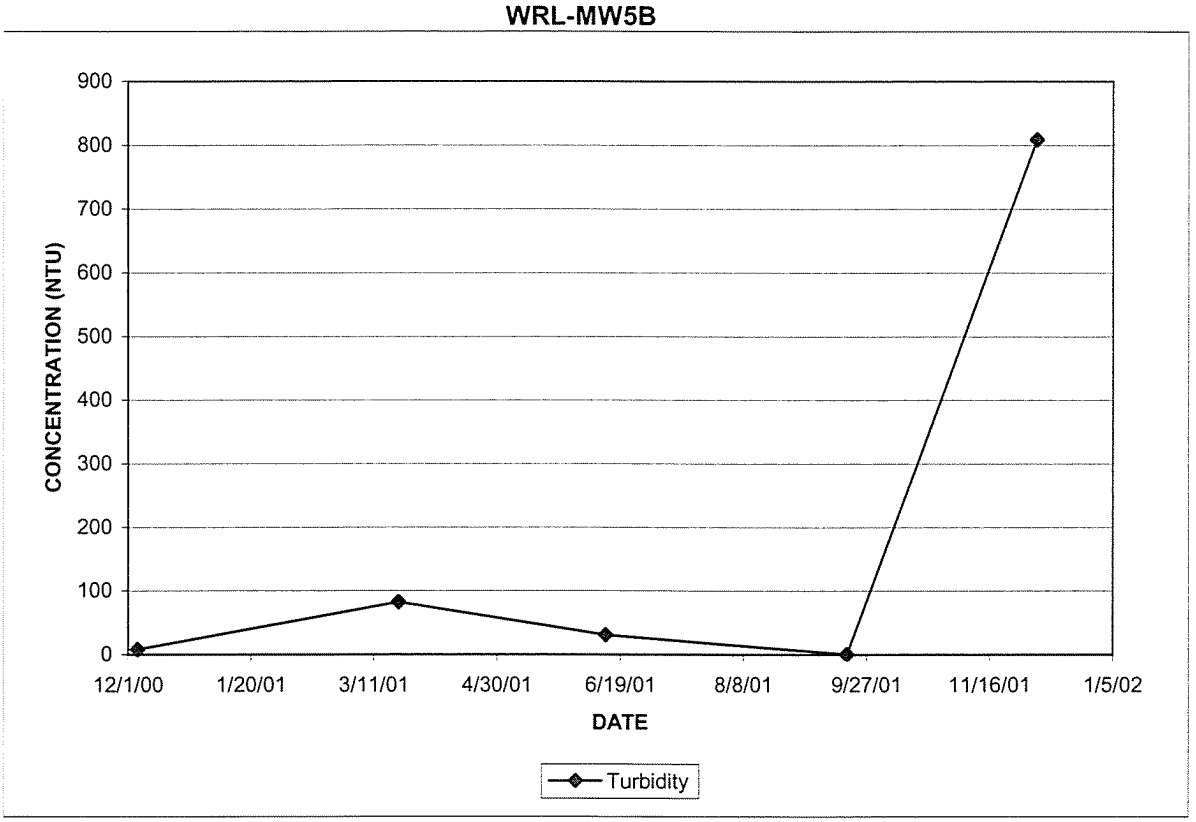

700
600
500
400
300
200
100
0
CONCENTRATION (MG/L)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
Sulfate
Magnesium
Sodium
Silica

WRL-MW5B

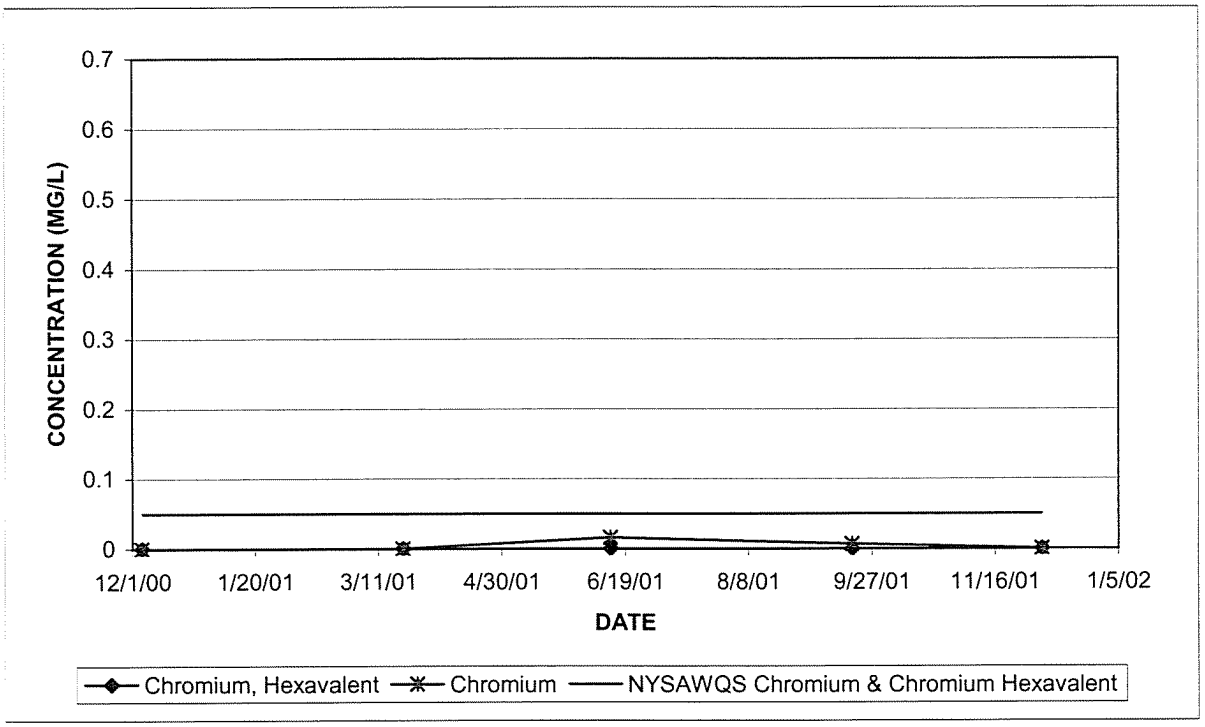


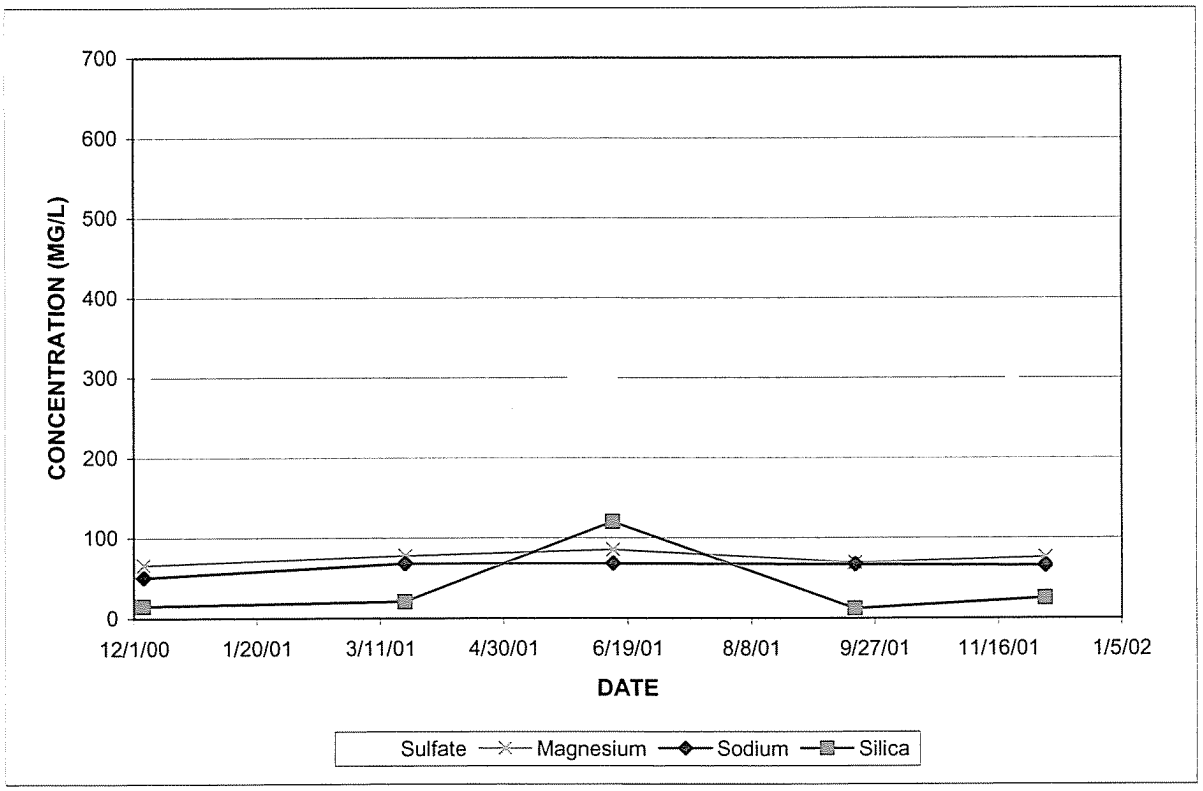
*Note: NYSAWQS for Iron is 0.3 MG/L, it is not shown on the chart for scalar uniformity.



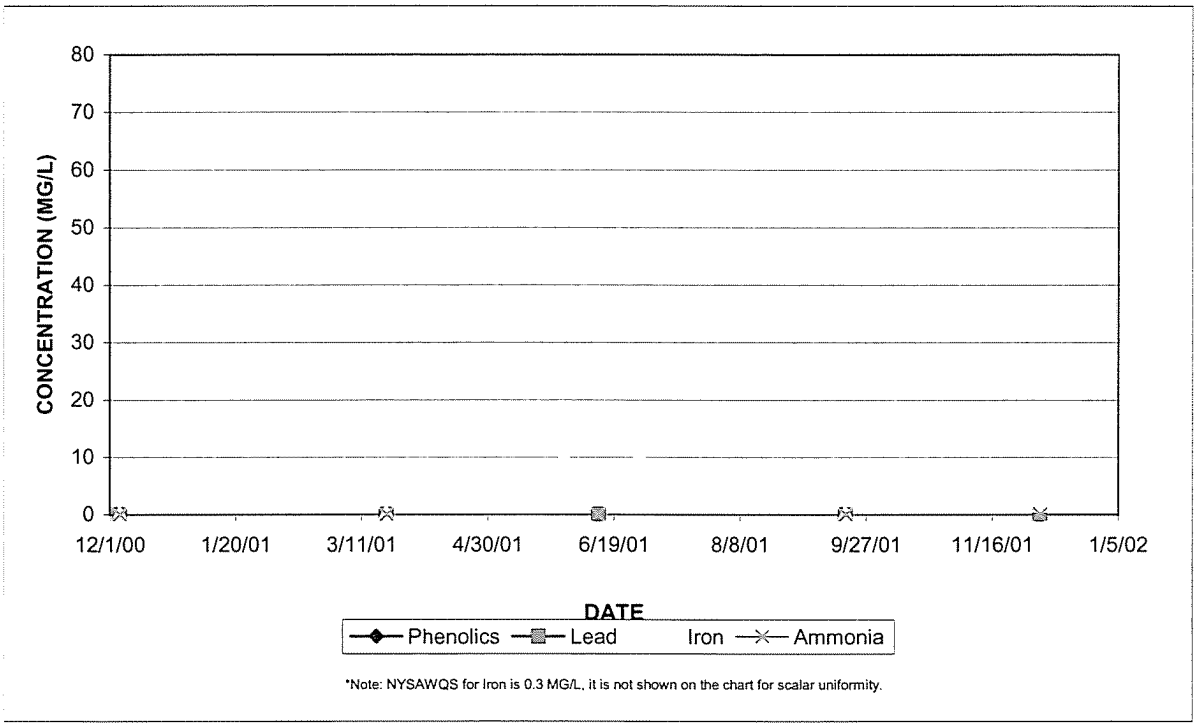

WRL-MW5B
900
800
700
600
500
400
300
200
100
0
CONCENTRATION (NTU)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
Turbidity

WRL-MW6B

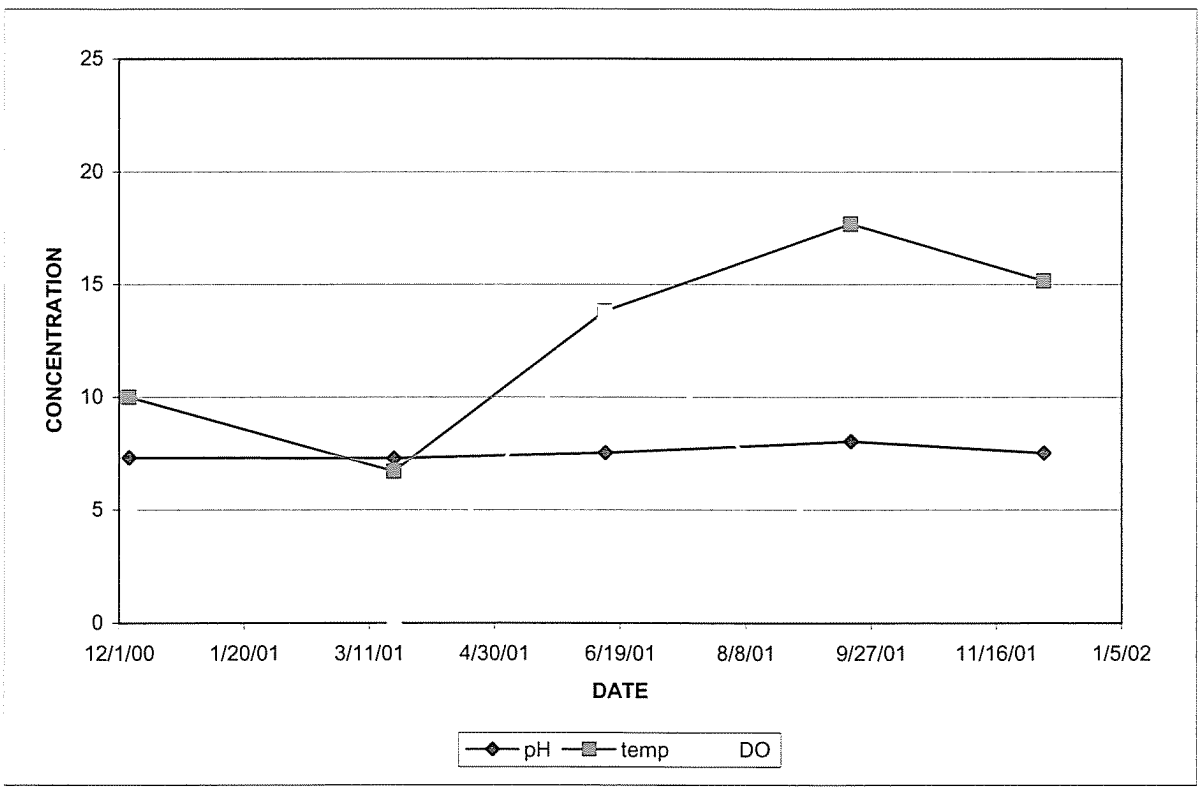

0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
CONCENTRATION (MG/L)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
Chromium, Hexavalent
Chromium
NYSAWQS Chromium & Chromium Hexavalent

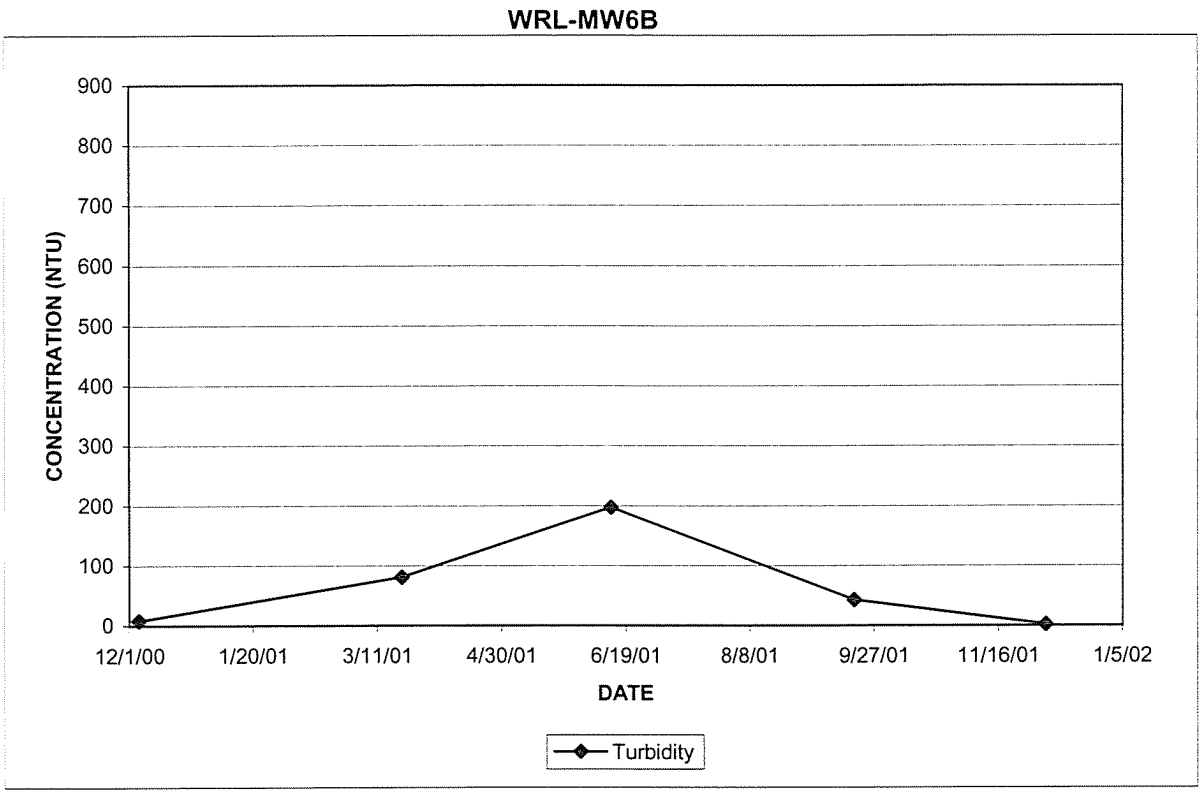

700
600
500
400
300
200
100
0
CONCENTRATION (MG/L)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
Sulfate
Magnesium
Sodium
Silica

WRL-MW6B

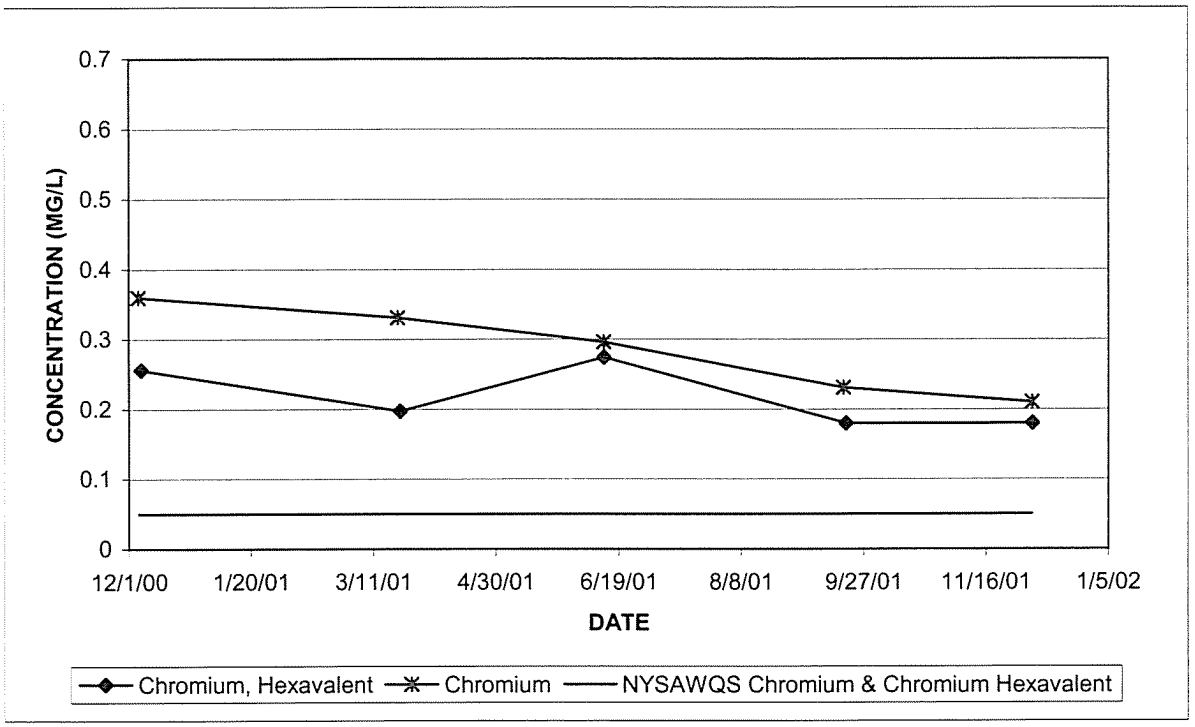


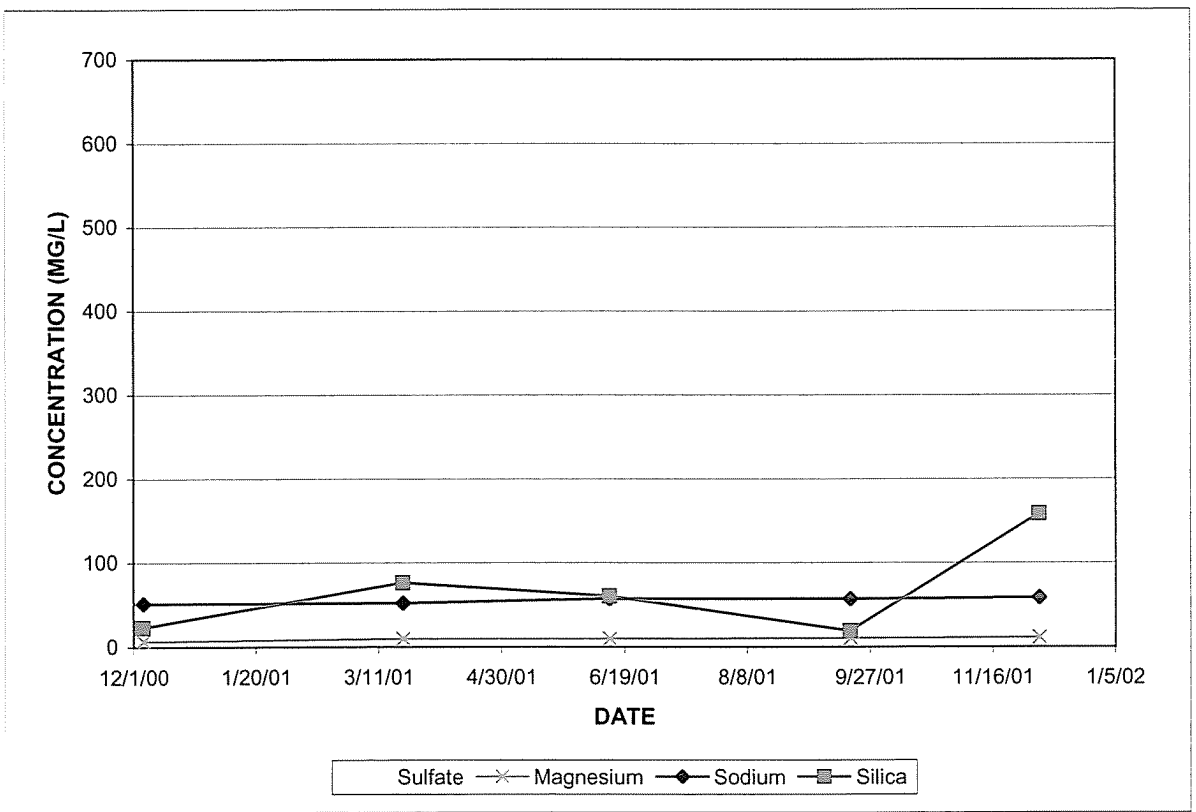
*Note: NYSAWQS for Iron is 0.3 MG/L, it is not shown on the chart for scalar uniformity.



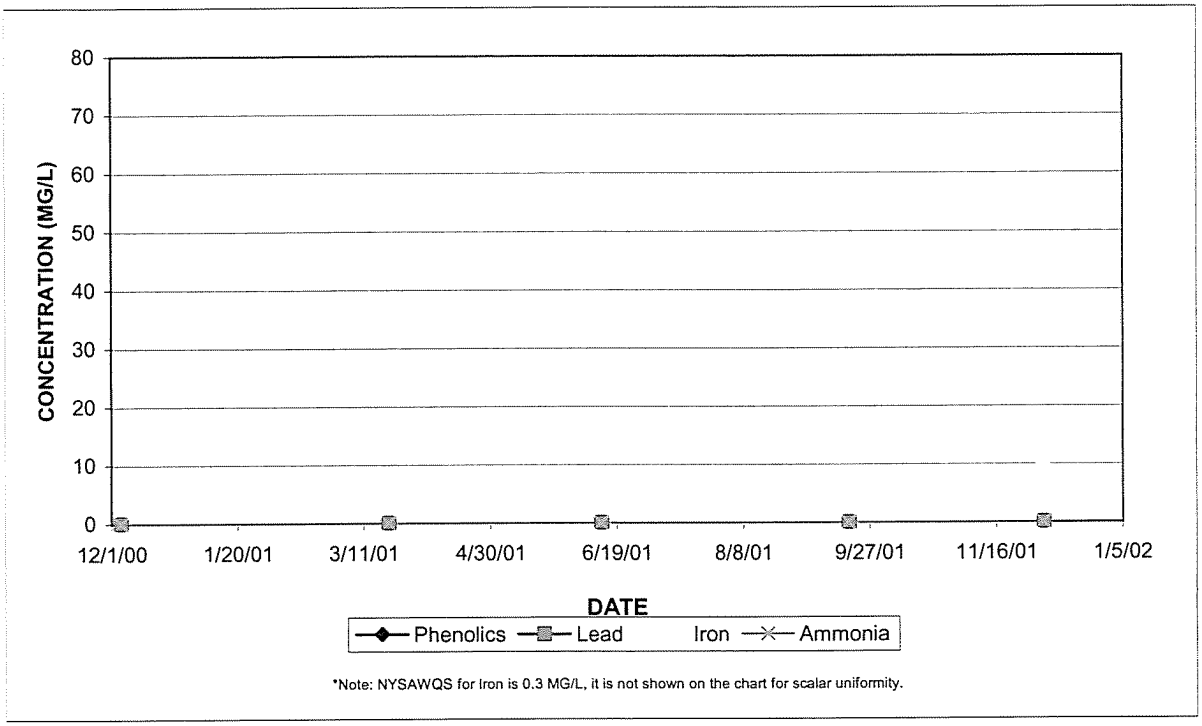

WRL-MW6B
900
800
700
600
500
400
300
200
100
0
CONCENTRATION (NTU)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
Turbidity

WRL-MW7B

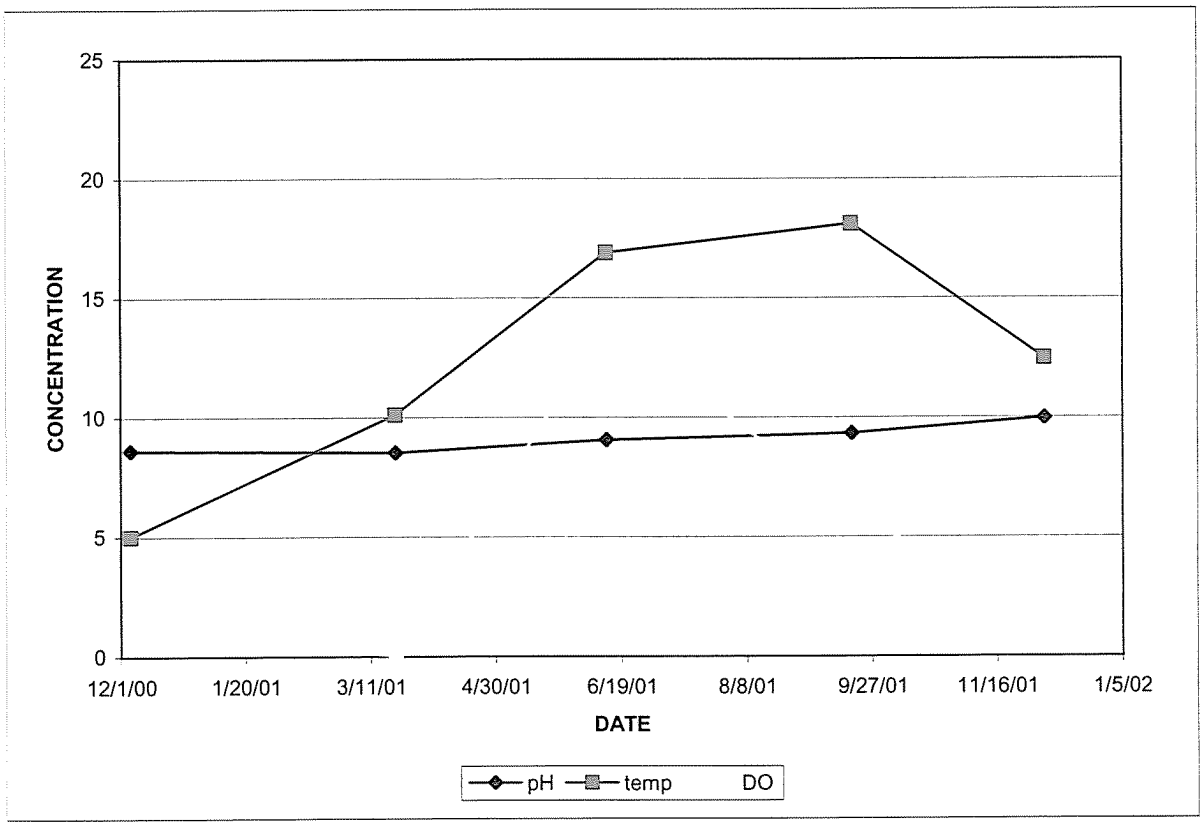

0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
CONCENTRATION (MG/L)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
Chromium, Hexavalent
Chromium
NYSAWQS Chromium & Chromium Hexavalent

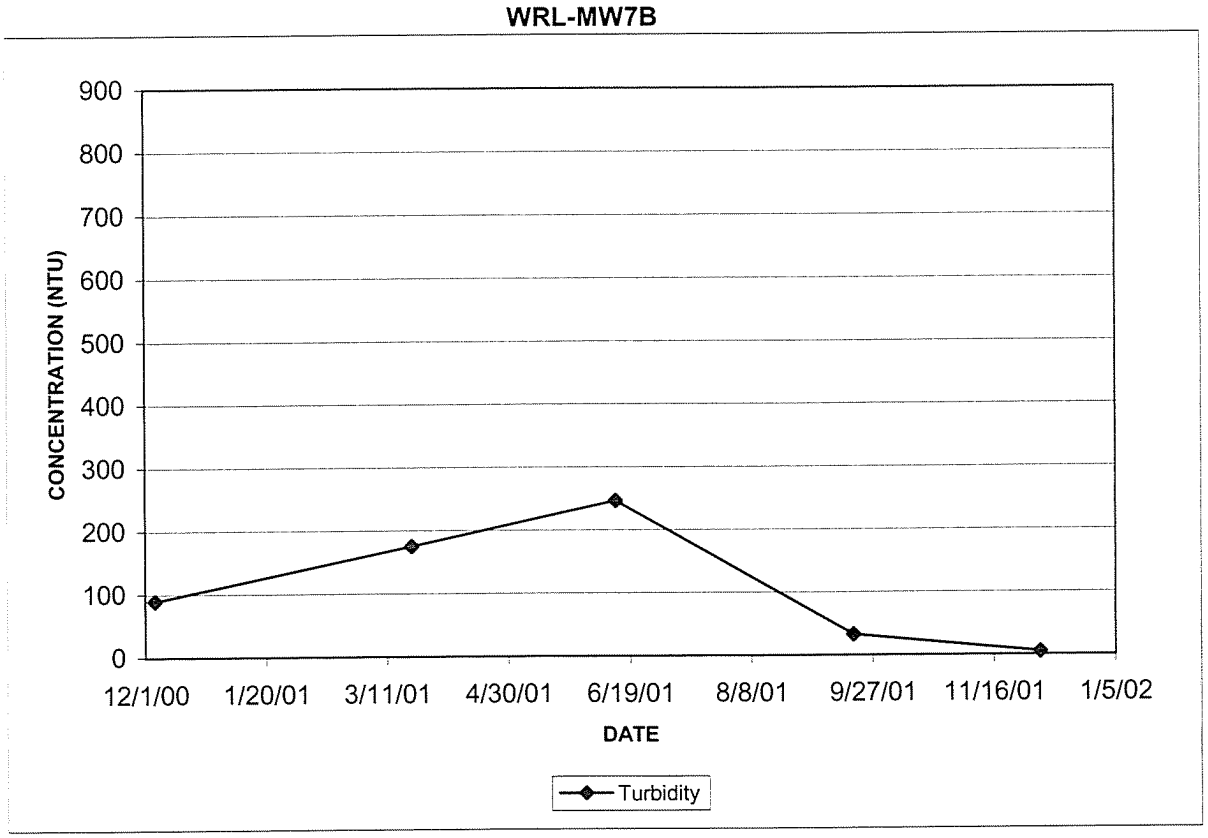

700
600
500
400
300
200
100
0
CONCENTRATION (MG/L)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
Sulfate
Magnesium
Sodium
Silica

WRL-MW7B

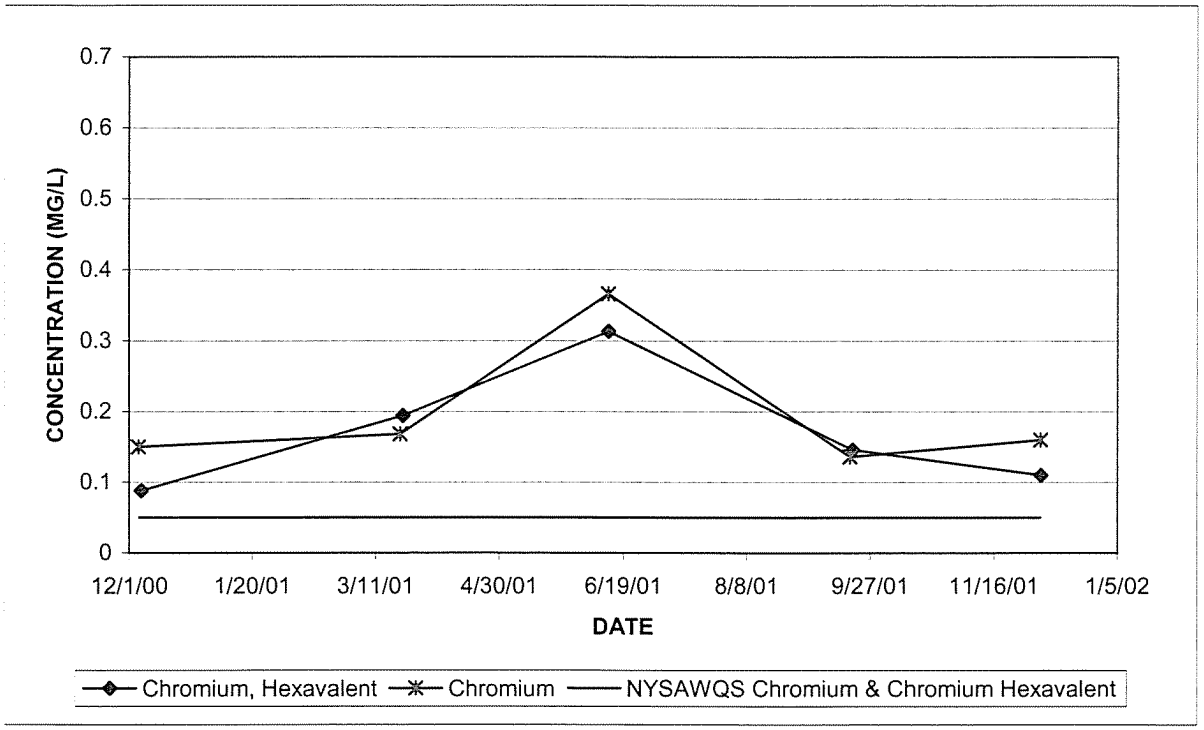


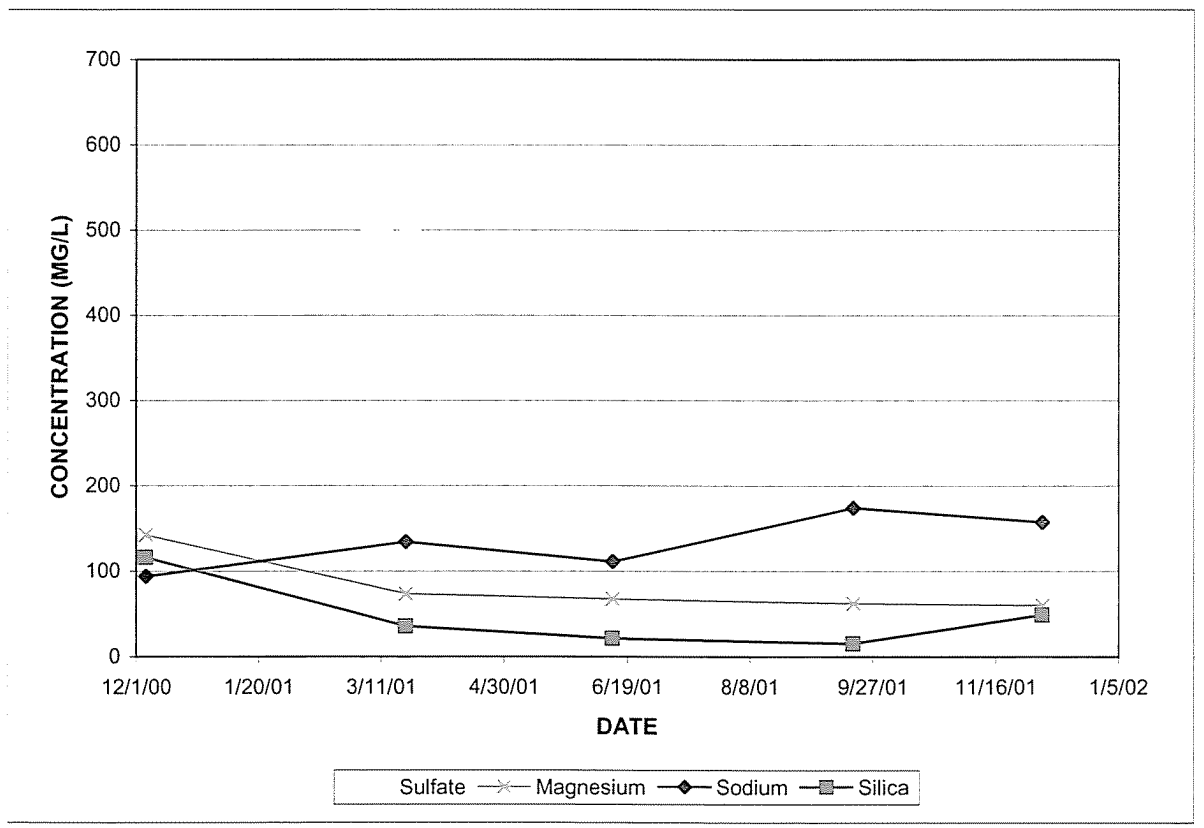
*Note: NYSAWQS for Iron is 0.3 MG/L, it is not shown on the chart for scalar uniformity.



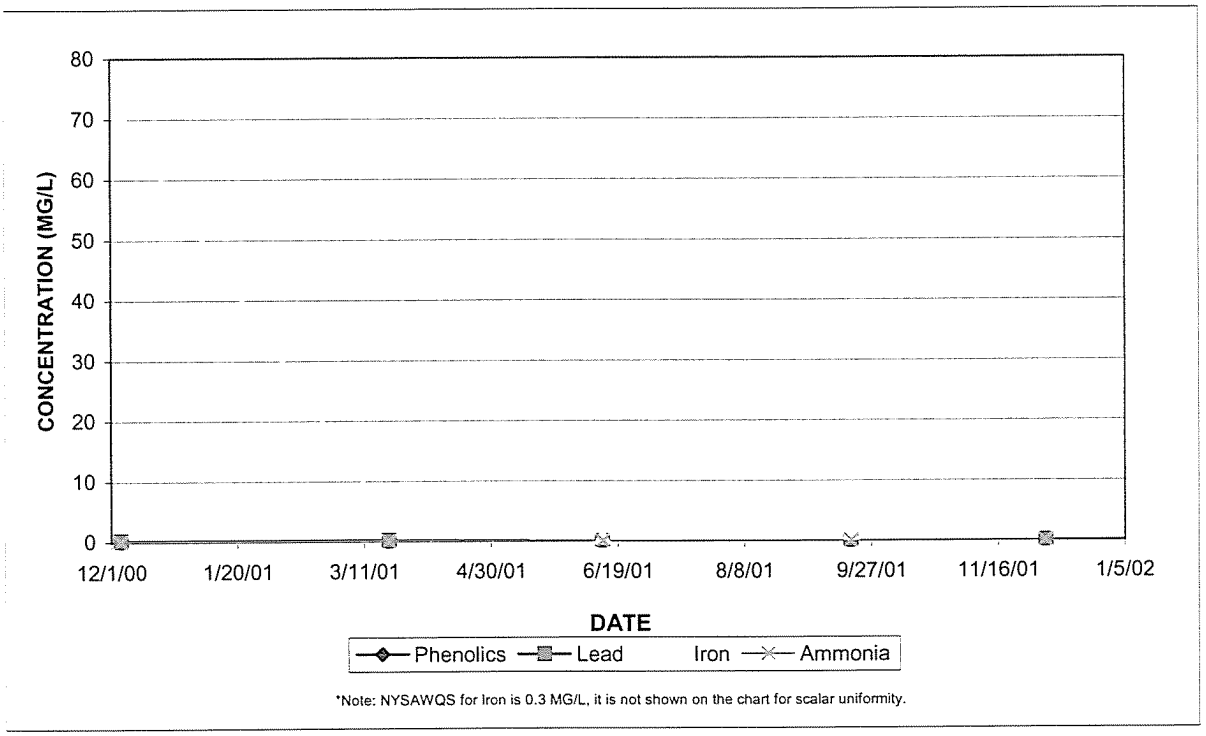

WRL-MW7B
900
800
700
600
500
400
300
200
100
0
CONCENTRATION (NTU)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
Turbidity

WRL-MW8B

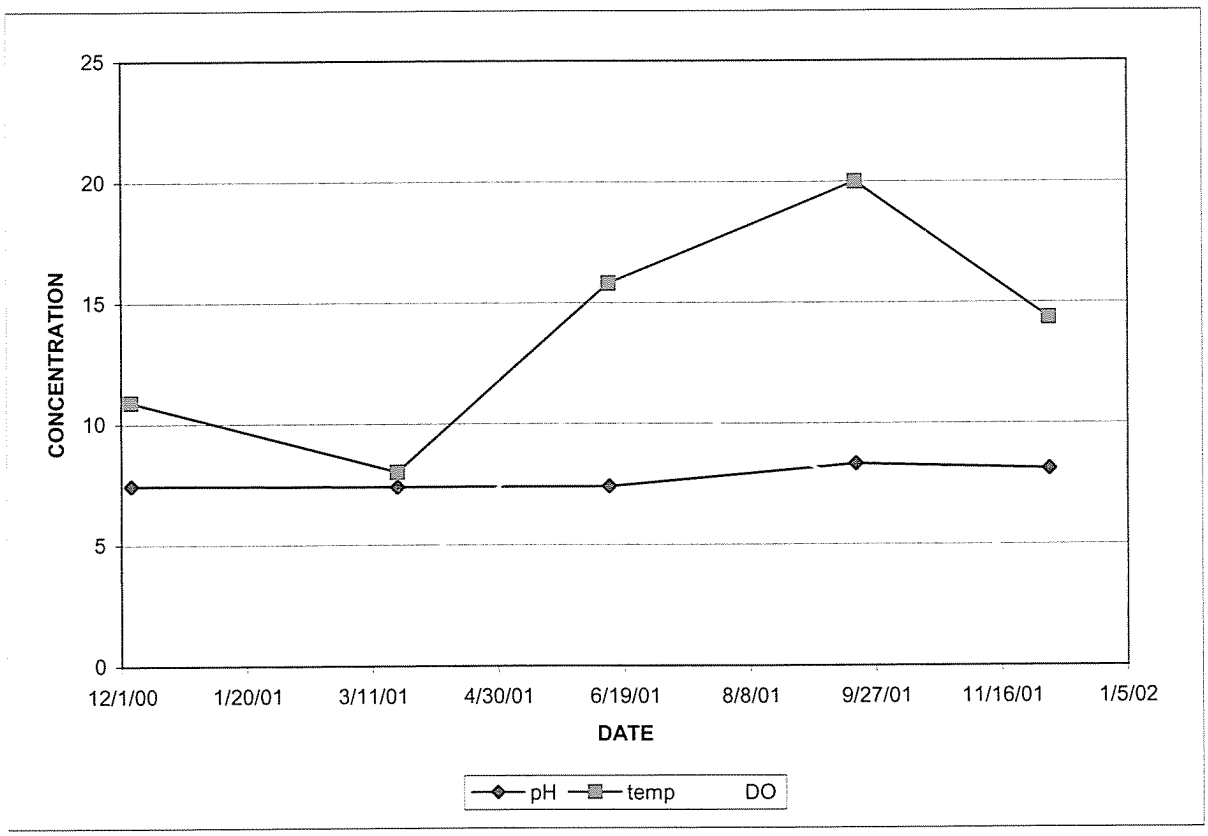

0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
CONCENTRATION (MG/L)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
Chromium, Hexavalent
Chromium
NYSAWQS Chromium & Chromium Hexavalent


700
600
500
400
300
200
100
0
CONCENTRATION (MG/L)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
Sulfate
Magnesium
Sodium
Silica

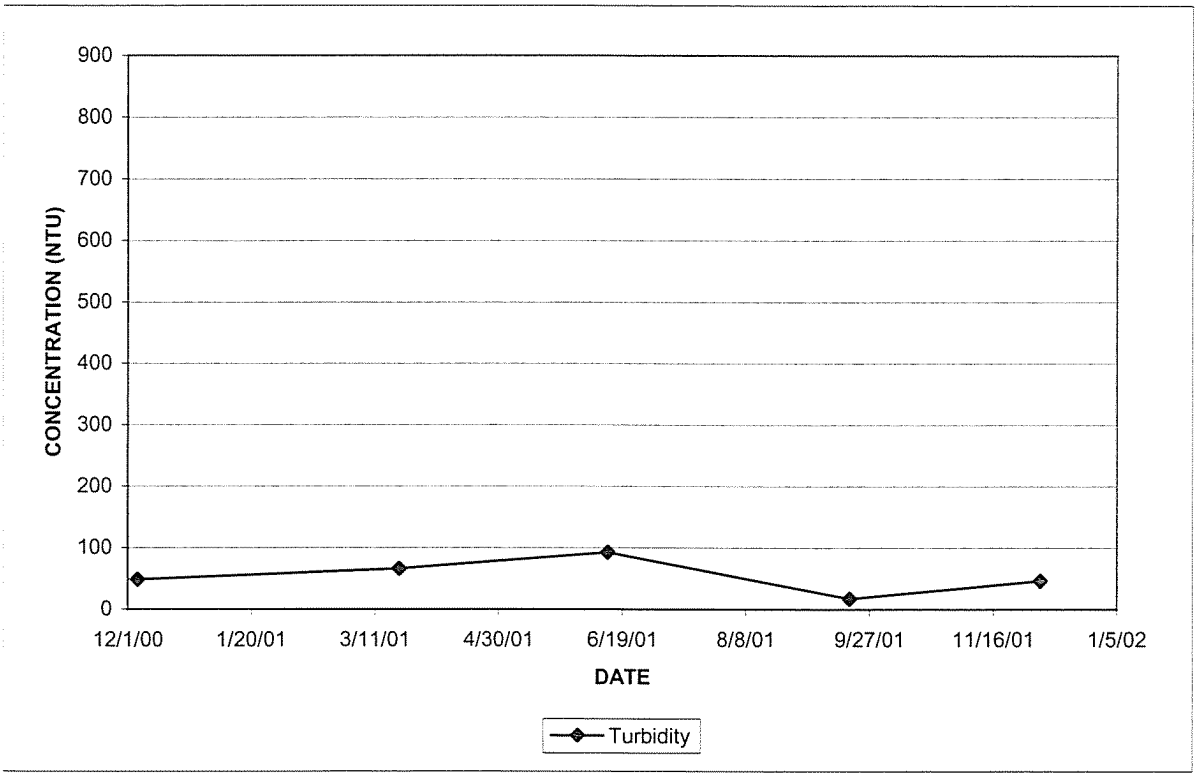
WRL-MW8B



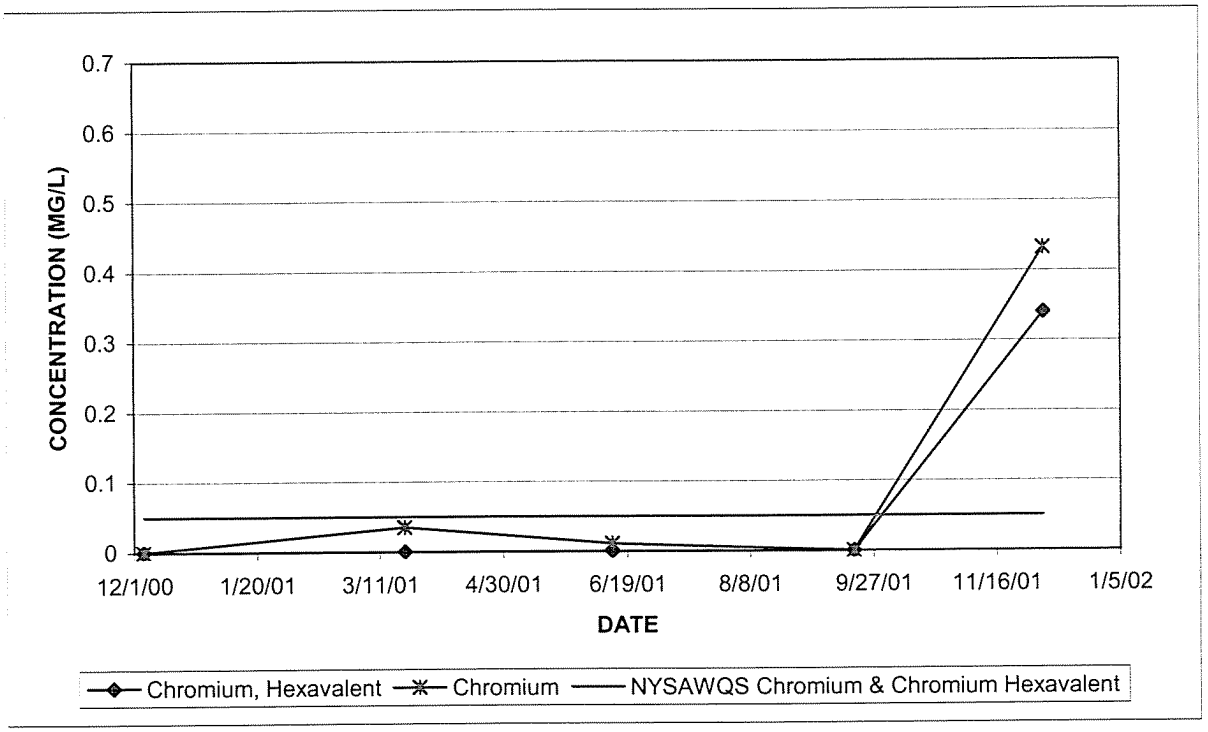
*Note: NYSAWQS for Iron is 0.3 MG/L, it is not shown on the chart for scalar uniformity.

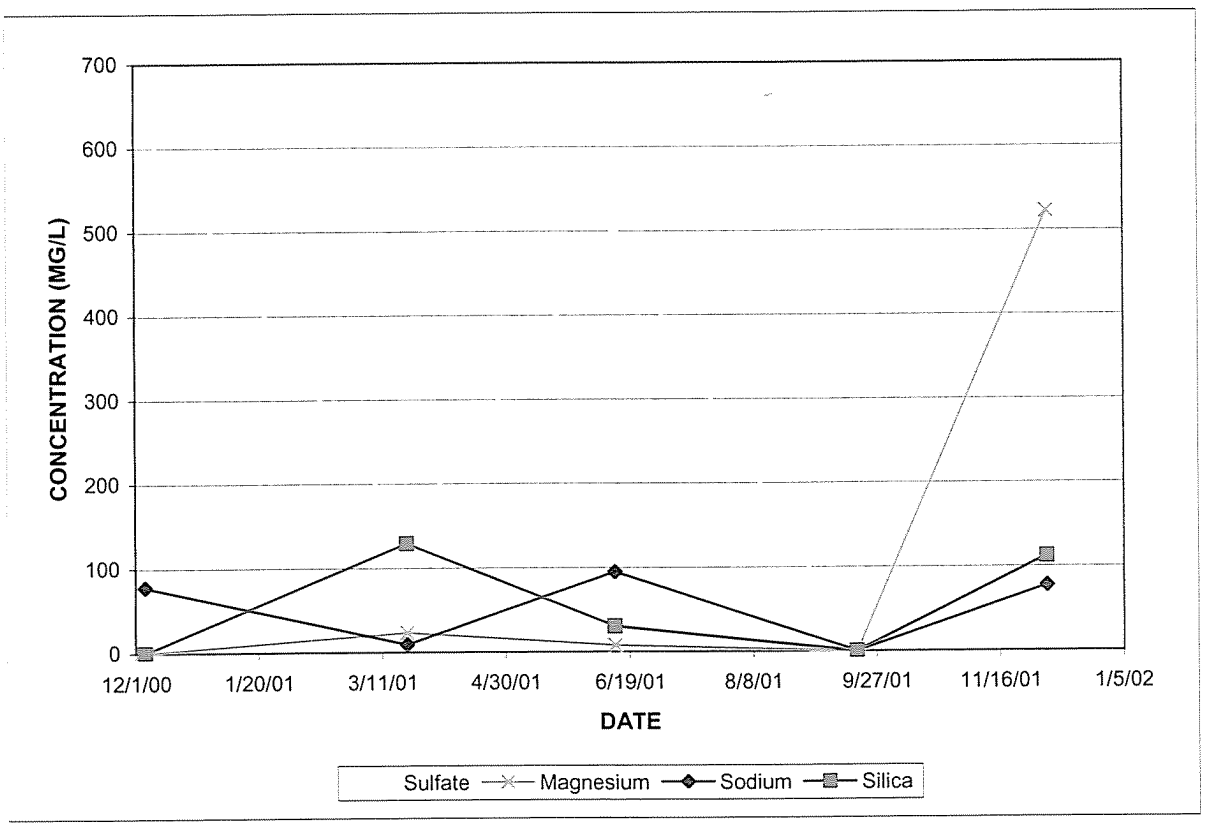


WRL-MW8B

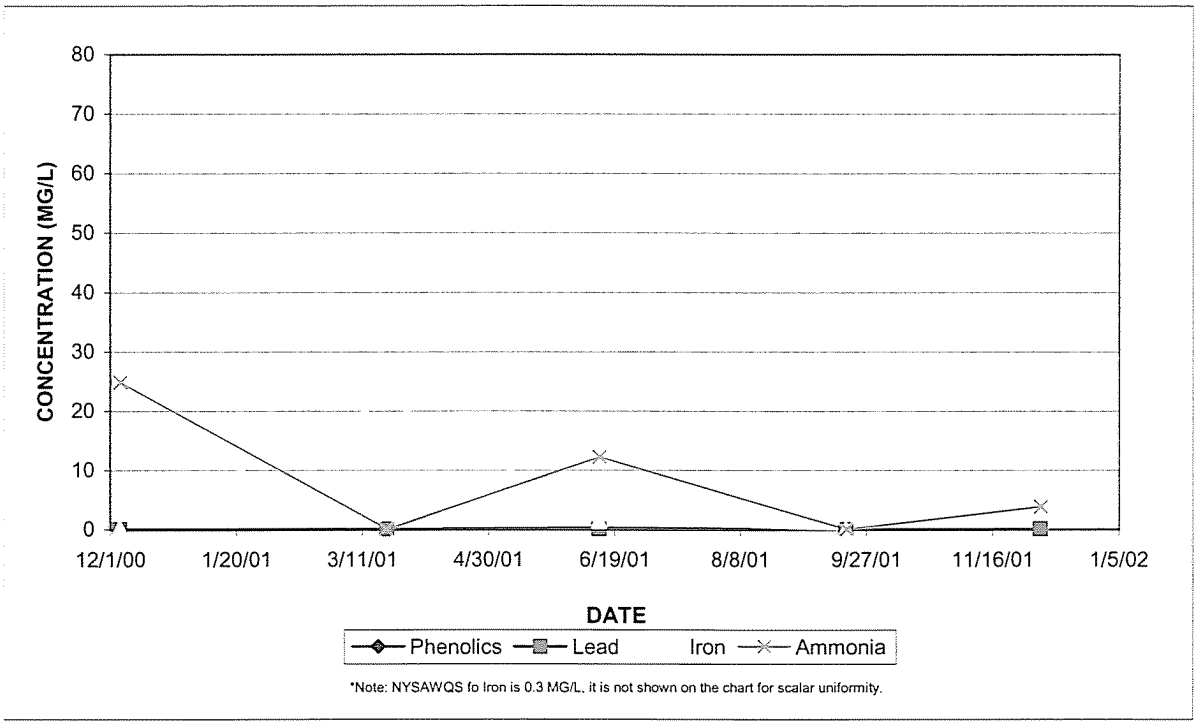

900
800
700
600
500
400
300
200
100
0
CONCENTRATION (NTU)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
Turbidity

WRL-SS1


0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
CONCENTRATION (MG/L)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
Chromium, Hexavalent
Chromium
NYSAWQS Chromium & Chromium Hexavalent

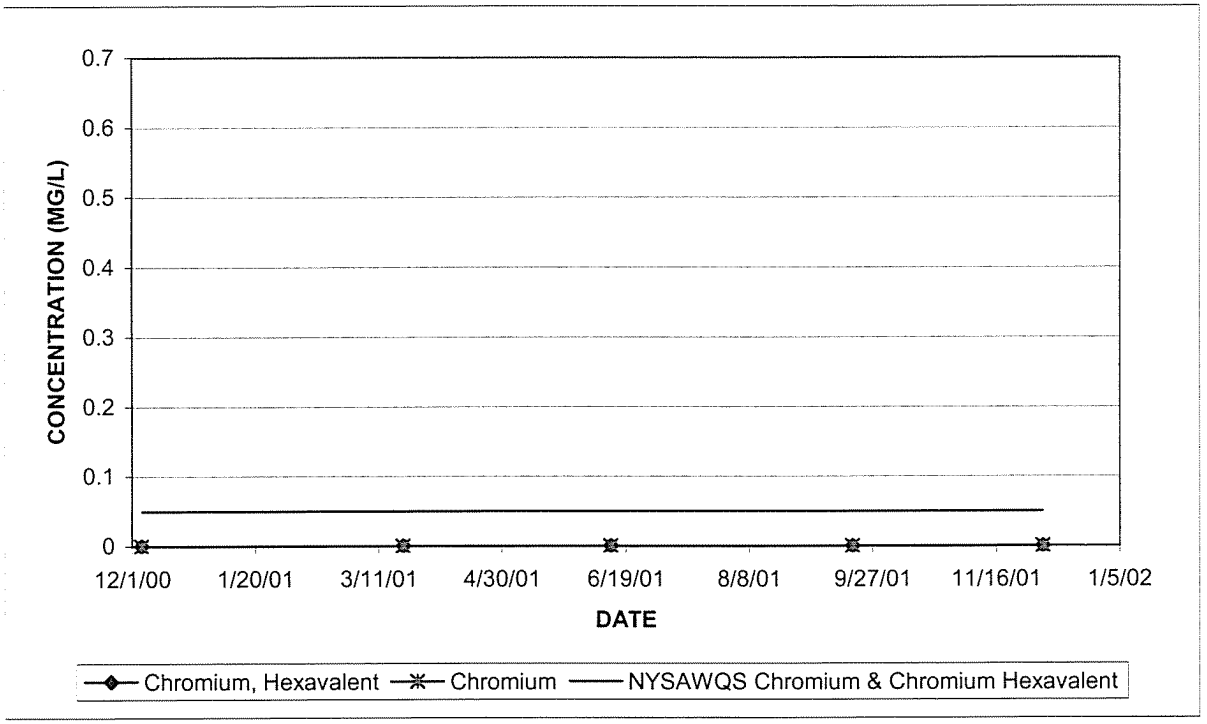

700
600
500
400
300
200
100
0
CONCENTRATION (MG/L)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
Sulfate
Magnesium
Sodium
Silica

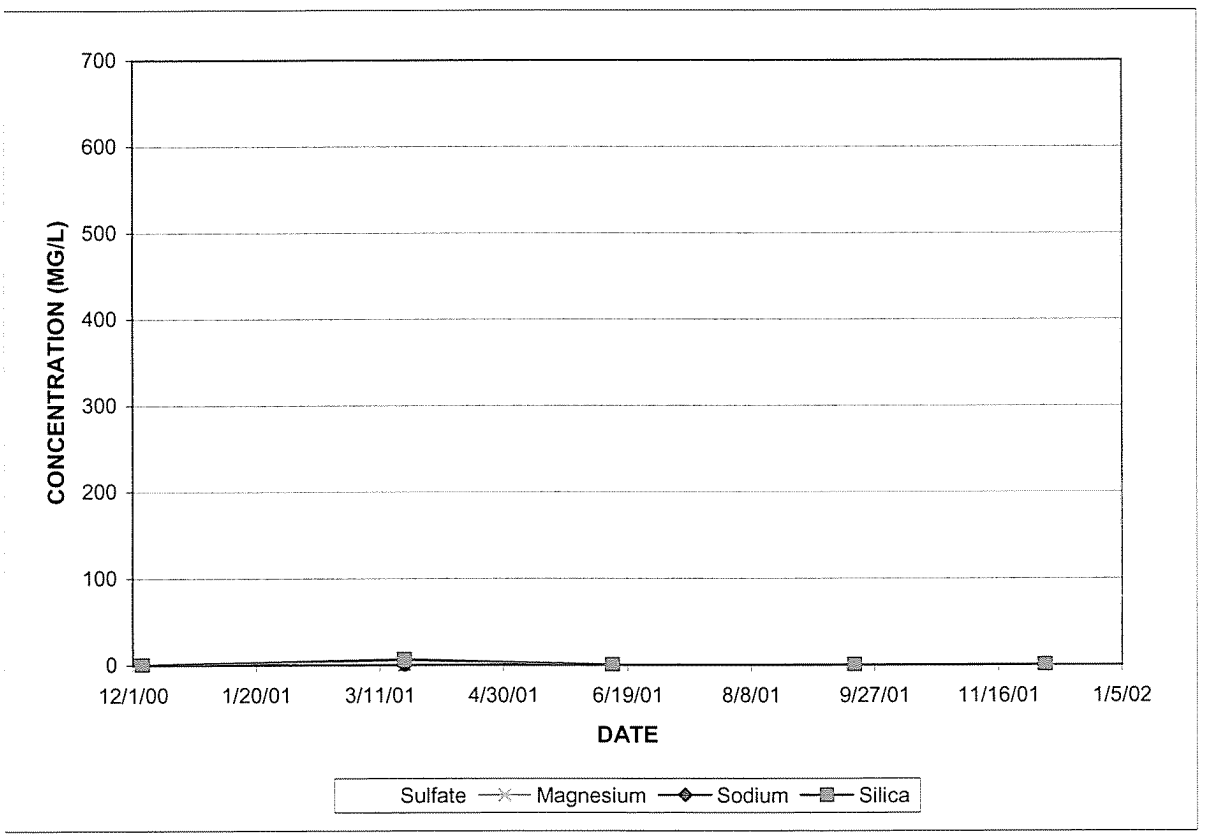
WRL-SS1



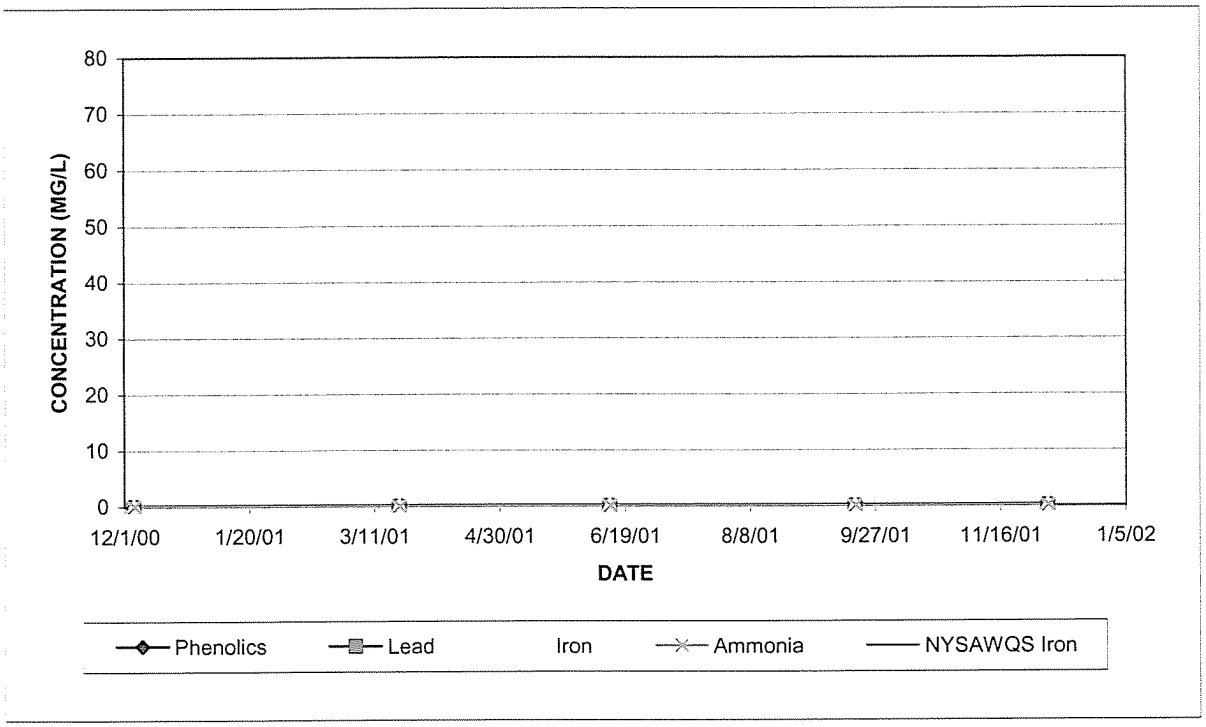
*Note: NYSAWQS fo Iron is 0.3 MG/L, it is not shown on the chart for scalar uniformity.

WRL-SW1

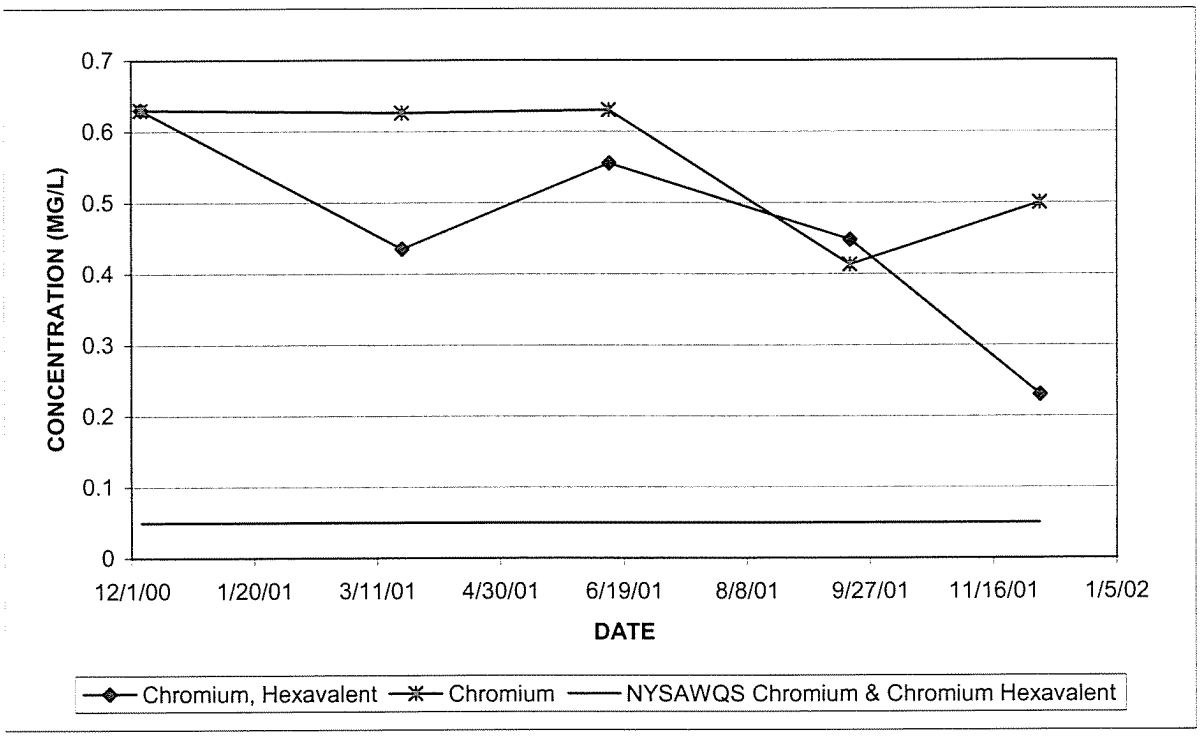

0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
CONCENTRATION (MG/L)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
Chromium, Hexavalent
Chromium
NYSAWQS Chromium & Chromium Hexavalent

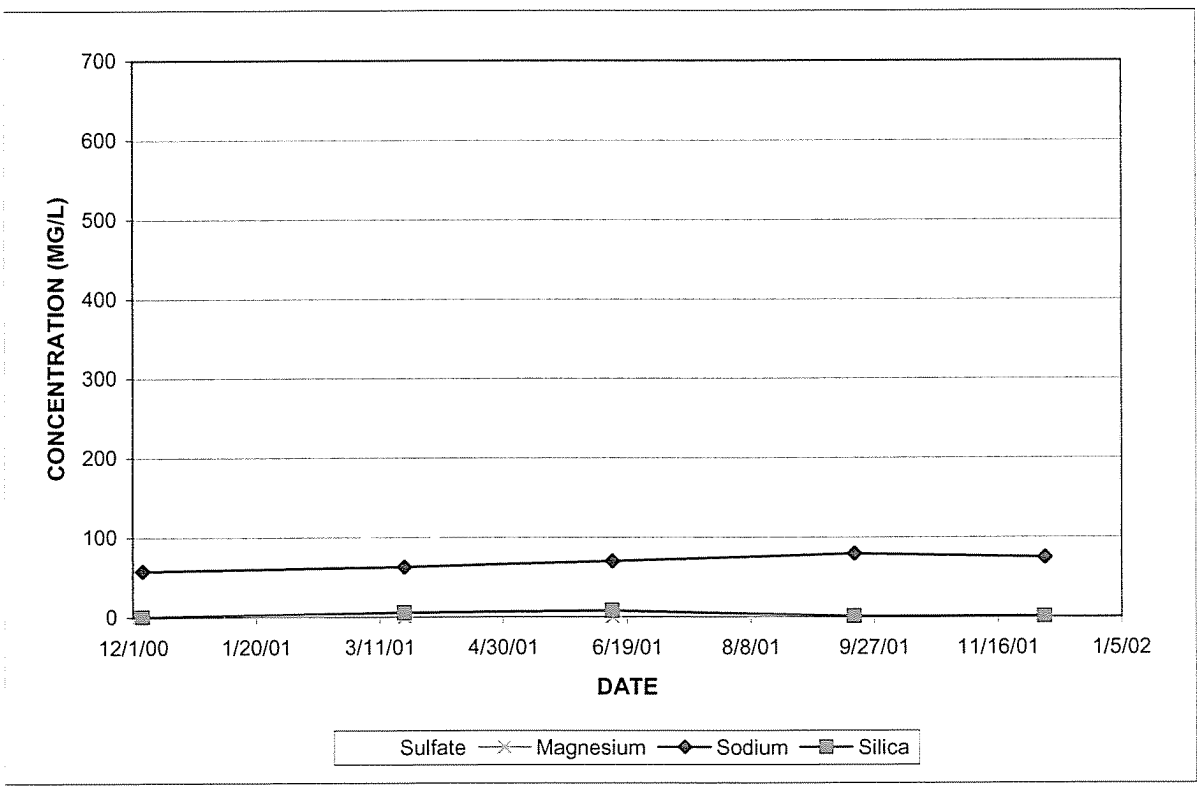

700
600
500
400
300
200
100
0
CONCENTRATION (MG/L)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
Sulfate
Magnesium
Sodium
Silica

WRL-SW1

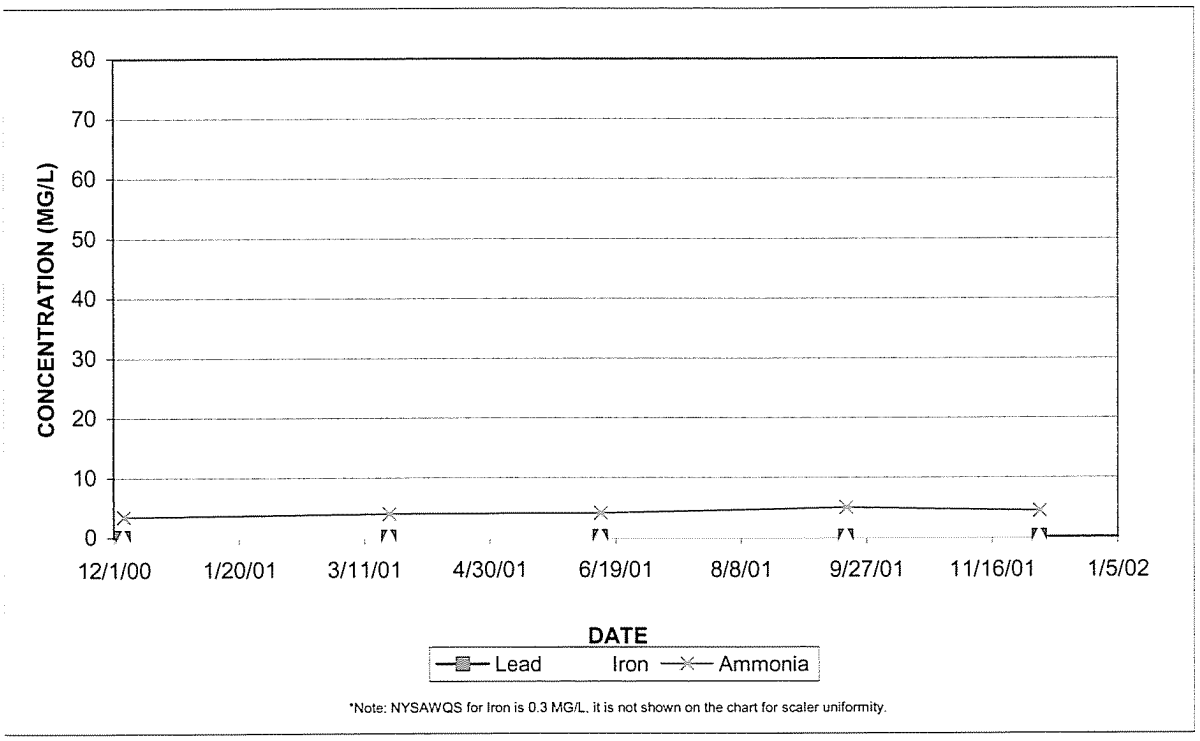

80
70
60
50
40
30
20
10
0
CONCENTRATION (MG/L)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
Phenolics
Lead
Iron
Ammonia
NYSAWQS Iron

WRL-L1

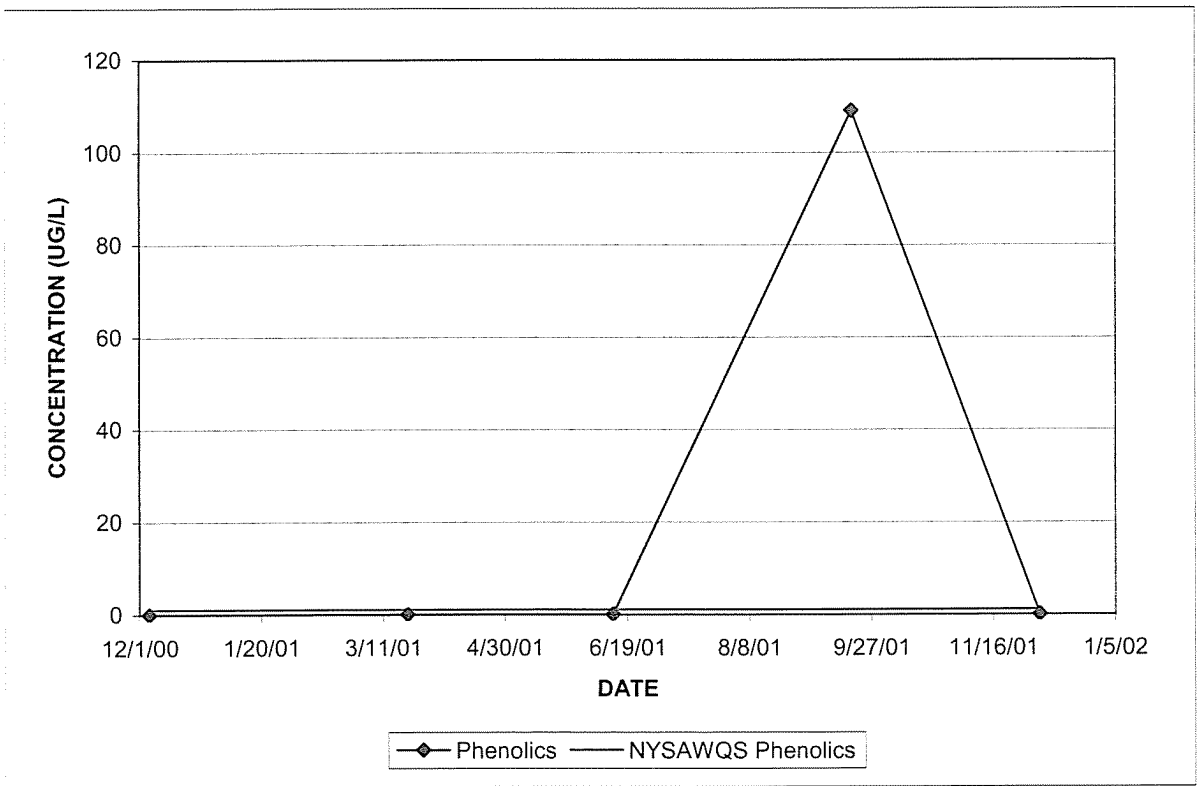

0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
CONCENTRATION (MG/L)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
Chromium, Hexavalent
Chromium
NYSAWQS Chromium & Chromium Hexavalent


700
600
500
400
300
200
100
0
CONCENTRATION (MG/L)
12/1/00
1/20/01
3/11/01
4/30/01
6/19/01
8/8/01
9/27/01
11/16/01
1/5/02
DATE
Sulfate
Magnesium
Sodium
Silica

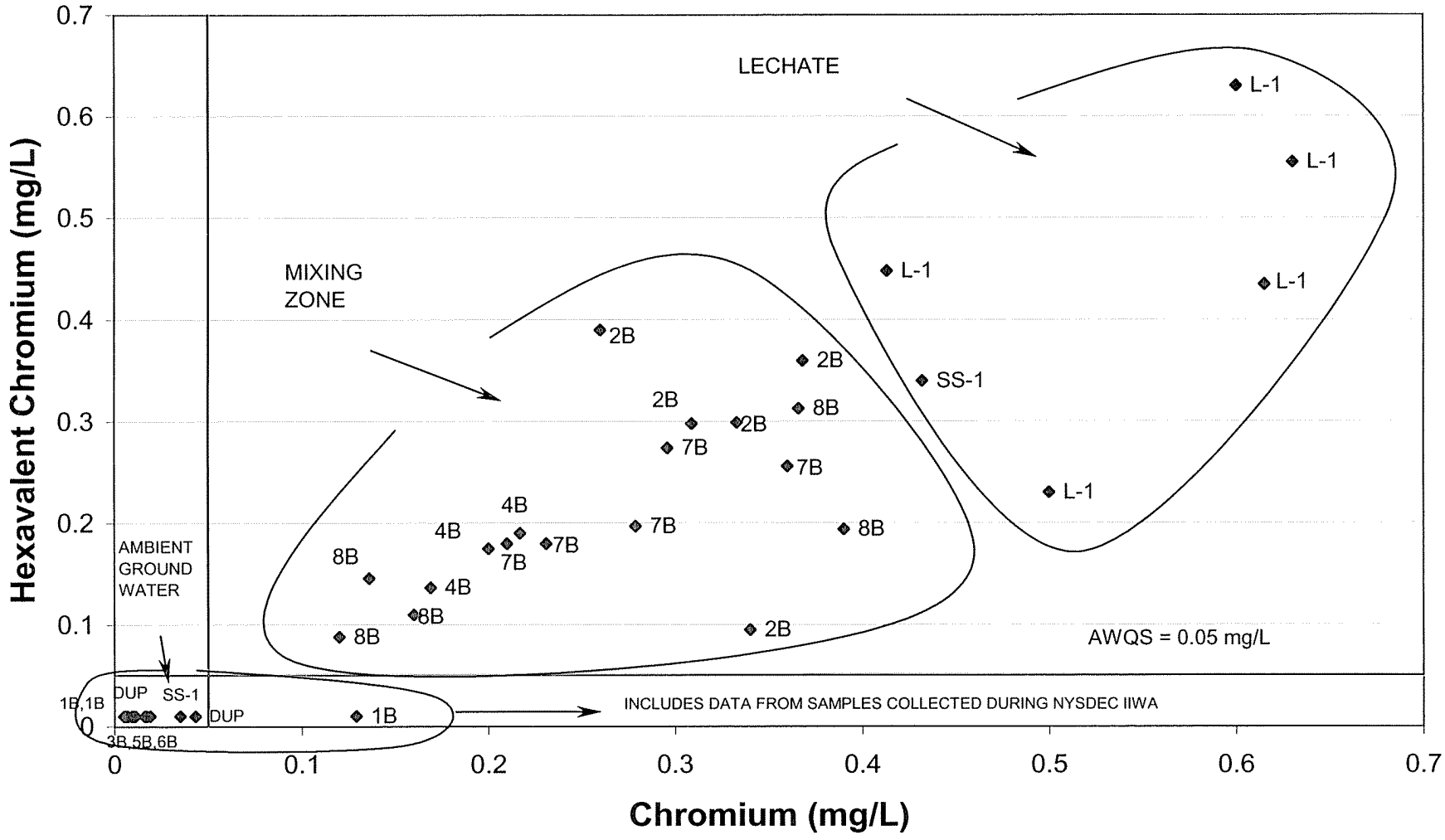
WRL-L1



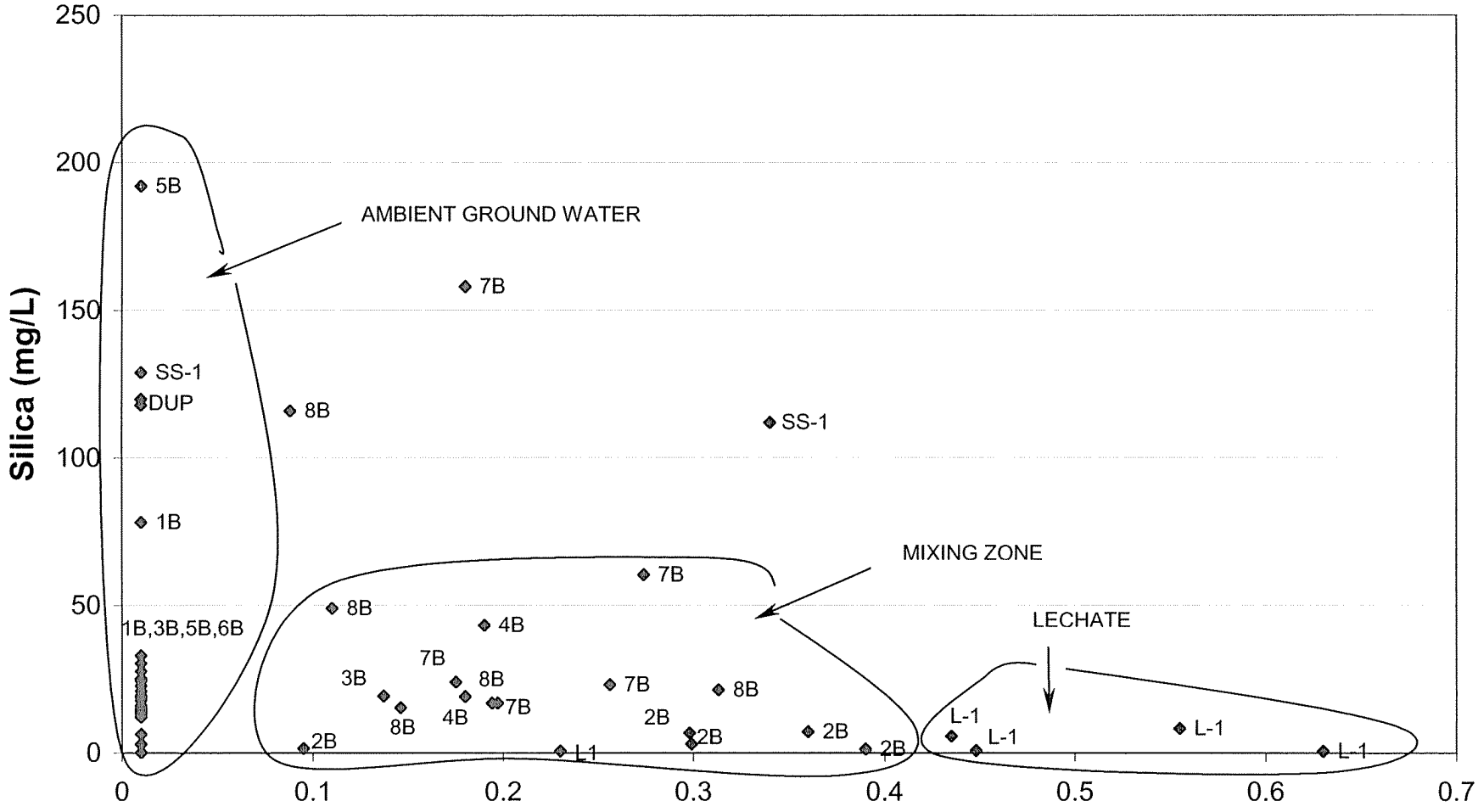
*Note: NYSAWQS for Iron is 0.3 MG/L, it is not shown on the chart for scaler uniformity.



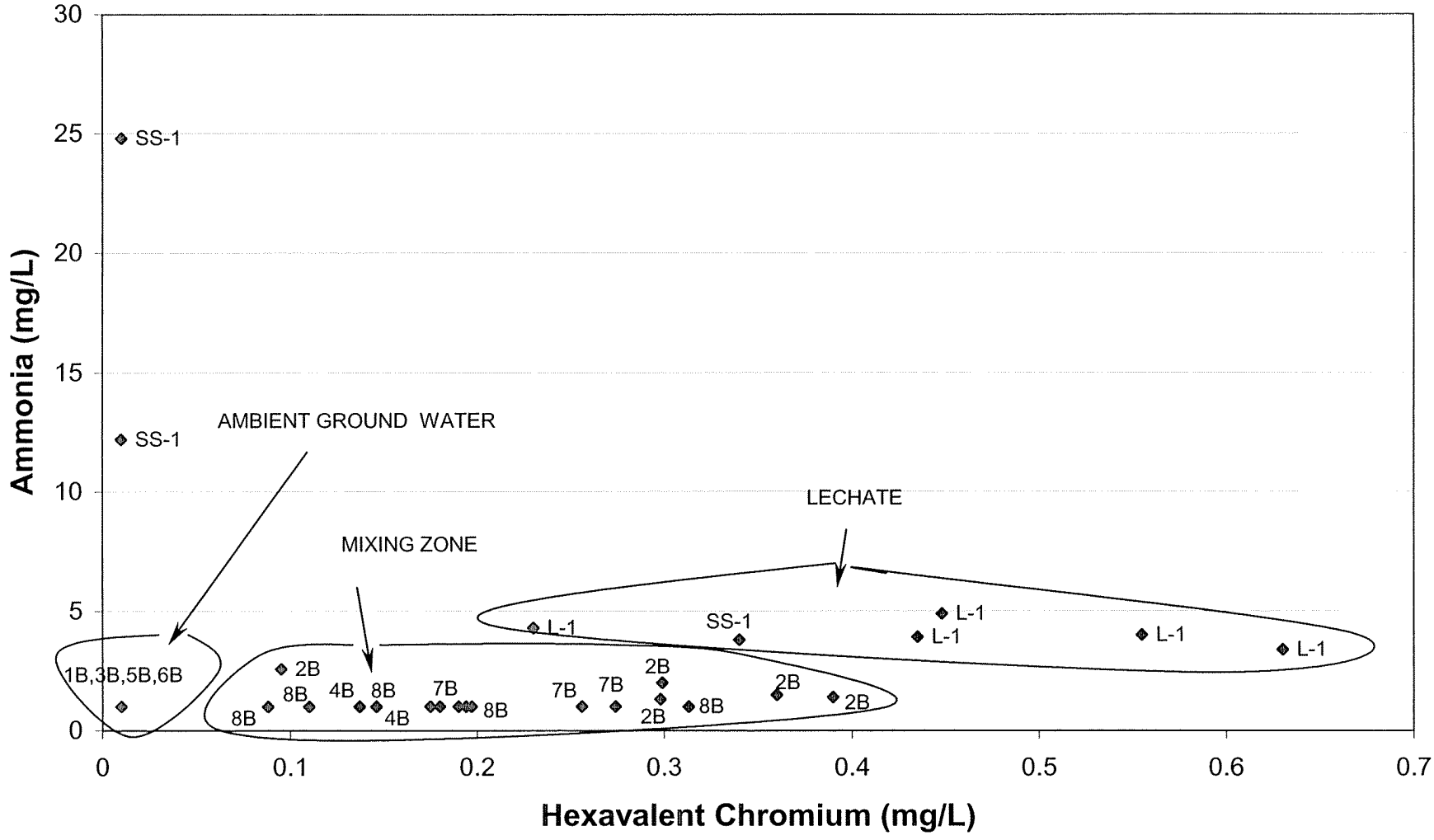
Hexavalent Chromium vs Chromium



Hexavalent Chromium vs Silica



Hexavalent Chromium vs Ammonia



Ammonia vs Sodium