FINAL SUPPLEMENTAL REPORT
REVISION 1 AND FEASIBILITY STUDY

TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

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1.0 INTRODUCTION

1.1 PURPOSE OF REPORT

In December, 2004, the New York State Department of Environmental Conservation (NYSDEC) sent a letter to Tonawanda Coke Corporation (TCC) stating that some additional investigation work was required to complete the assessment of the conditions concerning historic waste handling and disposal at the Site. The need for additional investigation was to focus on three historic waste disposal areas that have been inactive since 1978. These areas are identified as Sites 108, 109, and 110 on the TCC property. Figure 1.1 presents a map of the TCC Site in the context of its setting within an industrial area of the City of Tonawanda. The surrounding area includes petroleum storage facilities, steel fabrication shops, and an Allied Chemical plant. Figure 1.2 provides details of the TCC Site itself including the three former disposal areas that are the focus of this investigation.

Following receipt of the letter, TCC and NYSDEC met to discuss the deficiencies identified by NYSDEC in the previous reports and the investigation components that were needed to fill the data gaps so that the assessment of the Site could be deemed complete. TCC prepared a Scope of Work outlining the additional investigation components that would be undertaken to fill the identified data gaps. That Scope of Work was submitted on June 21, 2005 and approved by the NYSDEC on July 5, 2005.

The original report discussing the results of the additional investigation components and summarizing the impact of these results on the overall site conditions assessment was submitted to NYSDEC in April 2006. The NYSDEC reviewed the document and provided comments to TCC. At the direction of NYSDEC, this report has been updated here in to incorporate comparisons of the soil and sediment results to the soil cleanup objectives (SCOs) in 6 NYCRR Part 375-6, Remedial Program Soil Cleanup Objectives, (which were recently revised in December 2006). Specifically, the NYSDEC requested that the data be compared to the restricted residential and industrial land use SCOs under the restricted land use scenarios for protection of public health. In addition to finalizing the investigation documentation for the Site, this report has been updated to also include a Feasibility Study. The Feasibility Study (which is presented in Section 7 of this report) evaluates possible remedial alternatives that could be implemented to address the chemicals found during the investigative studies performed at the Site.

Following review and acceptance of this report by the NYSDEC, it is expected that a Proposed Remedial Action Plan and Record of Decision can be issued for the Site.

1.2 SITE HISTORY

The Tonawanda Coke Plant which is located at 3875 River Road in Tonawanda, New York was owned and operated from 1917 through 1947 by Semet-Solvay Company, a subsidiary of Allied Chemical and Dye Corporation. In 1947, Semet-Solvay Company was merged into Allied Chemical Corporation, which owned and operated the plant until January 27, 1978, when it was sold to TCC.

Manufacturing processes which were used at the plant beginning in 1917 included by-products coking; light oil distillation; ammonia recovery; and benzene, toluene, and xylene extraction. A few areas of the plant Site were used for the disposal of wastes. Materials such as tar sludge, fly ash, and cinders may have been deposited at the rear of the plant (northeast corner of the area east of River Road, now referred to as Site 110) before 1978. In 1973, the Semet-Solvay Division was granted permission by the Erie County Health Department to establish a new refuse disposal area on the west side of River Road (now referred to as Site 108). This Site was eventually filled with refuse, wood, scrap polyethylene, and ceramic saddle packing from refining equipment. An unknown quantity of brick, rubble, and related demolition wastes were also disposed in an area adjacent to River Road in 1977 (Site 109).

1.3 PREVIOUS INVESTIGATIONS

Four major investigations and several other sampling events have been conducted at the Site, focusing primarily on the former on-Site disposal areas.

In July 1982 and May 1983, the United States Geological Survey (USGS) undertook the sampling of a number of inactive hazardous waste disposal sites roughly within a 3-mile wide band along the Niagara River. This sampling program was part of an overall investigation of toxic contaminant entry into the Niagara River. The USGS program involved the collection of two groundwater samples, 10 soil samples and two surface water samples from the TCC Site.

Subsequent to the USGS sampling, four major investigations have been performed over the past 10 years. The results of the four subsequent major studies are presented in the following previously submitted reports:

1. "Tonawanda Coke Corporation
New York State Superfund Phase I Summary Report
November 1983"
Prepared by Recra Research Inc.

This study did not involve the collection of any samples for chemical analyses. The purpose of the study was to calculate a Hazard Ranking System Score for the Site based upon the USGS sample results.

2. "Phase II Site Investigation
Tonawanda Coke Site"
December 1986"
Prepared by Malcolm Pirnie Inc.

The Phase II Site Investigation consisted of the following activities:

i) installation of seven overburden groundwater monitoring wells;

ii) collection of 13 groundwater samples;

iii) installation of 12 test pits;

iv) collection of one composite soil sample from four of the 12 test pits; and

v) collection of eight surface water samples.

3. "Supplemental Site Investigation
Tonawanda Coke Corporation
Tonawanda, New York
July 1990"
Prepared by Conestoga-Rovers & Associates.

The Supplemental Site Investigation consisted of the following activities:

i) installation of 10 overburden groundwater monitoring wells;

ii) collection of 32 groundwater samples;

iii) installation of eight test pits;

iv) collection of four composite soil samples from the test pits;

v) advancement of four boreholes;

vi) collection of two composite samples from the boreholes;

vii) collection of 21 surface water samples; and

viii) collection of 10 sediment samples.

4. "Additional Site Investigation
Tonawanda Coke Corporation
Tonawanda, New York
November 1992"
Prepared by Conestoga-Rovers & Associates.

The Additional Site Investigation consisted of the following activities:

i) installation of three overburden groundwater monitoring wells;

ii) collection of 10 groundwater samples;

iii) installation of nine test pits;

iv) collection of two samples from the test pits;

v) advancement of one borehole;

vi) collection of five surface water samples; and

vii) collection of two sediment samples.

5. "Remedial Investigation
Summary Report"
Tonawanda Coke Corporation
Tonawanda, New York
May 1997
Prepared by Conestoga-Rovers & Associates.

The Summary Report assembled all of the available information from the previous investigations performed at the Site pertaining to groundwater, surface water, soils, and sediments and discussed their significance in regard to potential impact to human health and the environment. Excerpts of text and copies of the tables and figures from the May 1997 Summary Report are presented in Appendix A.

2.0 ADDITIONAL INVESTIGATION WORK COMPLETED IN 2005

The additional investigations specified in the Scope of Work were primarily completed in August 2005. The work was completed by representatives of Conestoga-Rovers & Associates (CRA) with oversight and input being provided in the field by Edward Hampston of the NYSDEC. The input of Mr. Hampston was critical in the selection of the samples that were to be collected and submitted for chemical analysis and for the selection of invasive activity locations such as the test pits.

The 2005 investigation activities were focussed on the three former disposal areas (Sites 108, 109, and 110) and included the following activities. The locations of all sample collection points are presented on Figure 2.1. A summary of the investigation activities is provided in the following subsections.

Site 108

- Excavation of three test pits into the fill material. Each test pit was on the order of 30 feet in length and extended to a depth of about 15 feet terminating in the native soils that underlie the fill material. One soil sample from each test pit was selected and analyzed for chemical constituents. The stratigraphic logs from the test pits are provided in Appendix B.
- Surface soil samples from the upper 2 inches of the soil horizon were collected from 5 locations selected from across Site 108 and analyzed for chemical constituents.
- One new groundwater monitoring well was installed into the deeper portion of the groundwater flow regime adjacent to historic well MW-18. The new well was given the designation MW-18D. Groundwater samples were collected and analyzed from wells MW-7, MW-18, and MW-18D. The details of the well installation are provided in Appendix B.
- Samples of the sediment in the Niagara River were collected from the upper four inches of material at three locations. The first location selected was located approximately 40 feet from the outfall of the drainage ditch that traverses Site 108. The other two samples were collected from points 400 feet and 650 feet upstream of the outfall location. The sampling locations were about 15 feet from the shoreline.

Site 109

- Surface soil samples from the upper 2 inches of the soil horizon were collected from 5 locations selected from across Site 109 and analyzed for chemical constituents.

Site 110

- Surface soil samples from the upper 2 inches of the soil horizon were collected from 5 locations selected from across Site 110 and analyzed for chemical constituents.
- Surface water samples were to have been collected from the wetland area located to the south of Site 110. There was no surface water available in the wetland area at the time of the Site investigation. In conjunction with the NYSDEC personnel at the Site, including NYSDEC wetlands specialist (Ken Roblee), it was agreed that the surface water sampling was unnecessary given the conditions and value of the wetlands.
- An excavation was dug in the vicinity of former well MW-3 and MW-3R to investigate the elevated semi-volatile organic compounds (SVOCs) that had been identified in previous groundwater sampling in this area. The excavation was about 90 feet long and 6 feet deep and followed along parallel to a nearby railroad track. Small amounts of coal tar were occasionally noted in the trench. These pieces of coal tar were removed from the excavated material and recycled through the TCC facility. The excavation was then backfilled with the excavated material.

Background

- In order to have some relevant background information on the condition of surface soils in the area in which the TCC Site resides, samples of surface soils were collected in December 2005 from four locations surrounding the TCC property. Each sample was collected from the upper 2 inches of soil and was analyzed for SVOCs and metals. The four locations were selected in the field with the intent to provide representative data from all four sides of the TCC property and from areas that would have been physically separated from the operation on the TCC property.

Analytical Results

The analytical results from the additional investigation are provided in the attached tables. The historical sample data have also been summarized for completeness.

Table 2.1 Groundwater Analytical Results Summary – August 2005

Table 2.2 Groundwater Analytical Results Summary - Historical

Table 2.3 Soil Analytical Results Summary – August 2005

Table 2.4 Background Surface Soil Analytical Results Summary – December 2005

Table 2.5 Soil Analytical Results Summary – Historical

Table 2.6 Surface Water Analytical Results Summary – Historical

Table 2.7 Sediment Analytical Results Summary – August 2005

Table 2.8 Sediment Analytical Results Summary – Historical

Soil and sediment data have been compared to the 6 NYCRR Part 375-6 Table 375-6.8(b) restricted use SCOs for Protection of Public Health, specifically restricted residential and industrial use.

The analytical results from the 2005 additional investigation program and from the most recent historical sampling events are presented in the following plans that are attached to this report.

Plan 1 Chemical Presence in Groundwater

Plan 2 Chemical Presence in Surface Water

Plan 3 Chemical Presence in Sediment

Plan 4 Chemical Presence in Surface Soil

Plan 5 Chemical Presence in Test Pit Soil Samples

3.0 SITE 108

Site 108 is located on the west side of River Road and extends to the Niagara River as shown on Figure 2.1. Site 108 is heavily overgrown with mature trees, shrubs, and tall grasses. There are no occupied buildings on Site 108. During previous investigation programs conducted at Site 108, 11 test pits, 3 boreholes, and 4 groundwater monitoring wells were installed. Surface water and sediment samples have also been collected. As a result of these investigations, it has been identified that there are some locations and media that have been impacted. However, the majority of these impacts are associated with chemical concentrations that are attached to the soil and are not being released to the Niagara River.

As requested, the primary focus of the additional investigation requested by the NYSDEC involved checking the condition of the surface soils on the Site, the groundwater discharging to the Niagara River through the deeper portion of the overburden, and the sediment quality adjacent to the Site. The results of the investigations performed as part of this study are discussed in the following subsections.

3.1 SURFACE SOILS

Five surface soil samples (SS-1 through SS-5) were collected from Site 108 and were analyzed for VOCs, SVOCs, metals, and cyanide. The surface soil sampling results are presented in Table 2.3. The sample results for SS-1 through SS-5 were below both the industrial and restricted residential SCOs for all VOC compounds.

A total of seven SVOC parameters were detected at concentrations exceeding either the industrial or restricted residential SCOs or both in samples SS-1 through SS-5. The exceeded SVOC parameters were:

- Benzo(a)anthracene;
- Benzo(a)pyrene;
- Benzo(b)fluoranthene;
- Benzo(k)fluoranthene;
- Chrysene;
- Dibenz(a,h)anthracene; and
- Ideno(1,2,3-cd)pyrene.

The concentrations of the detected compounds at location SS-1 were typically about 10 times the background concentration range and generally exceeded both the industrial

and residential SCOs with the exception of benzo(k)fluoranthene and chrysene which only exceeded the restricted residential SCO. Sample SS-2 had the same compounds with exceedances, although the concentrations at SS-2 were typically only 1 to 2 times the background concentration range. At the time that these samples were collected, it was noted that the sampled materials included coke (see sample logs in Appendix B). Consequently, the presence of elevated levels of some of the SVOCs would not be unexpected. Both of these sample locations are at the western end of Site 108, near the Niagara River. The three other samples (SS-3, SS-4, and SS-5) are located further to the east in heavily vegetated areas.

For samples SS-3 and SS-4, SVOC concentrations were consistent with the background concentration range. Only benzo(a)pyrene exceeded the industrial SCO of 1,100 µg/kg in both samples at concentrations of 2,200 µg/kg and 1,300 µg/kg, respectively. All other parameters were below the industrial SCO, while benzo(a)anthracene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene exceeded the restricted residential SCO by less than an order of magnitude.

Similarly at SS-5, benzo(b)fluoranthene was detected at a concentration consistent with site background and below the industrial SCO, but exceeding the restricted residential SCO by less than an order of magnitude.

There were no exceedances of either the industrial or restricted residential SCOs for metals in any of the samples.

In summary, the surface soil samples collected on Site 108 are consistent with background concentration and generally meet the 6 NYCRR Part 375 industrial use SCOs. The only exceedances of Part 375 were observed at SS-1 and SS-2 for SVOC parameters and these samples were collected from exposed fill materials (including coke) near the west end of Site 108.

3.2 TEST PIT SAMPLES

Test pits were excavated through the fill material and into the underlying native soils at three locations in Site 108. This work supplemented the 11 test pits that had been excavated during previous investigations. The locations of the three new test pits (TP-1, TP-2, and TP-3) are shown on Figure 2.1.

The three new test pits were excavated to a depth of 15 feet using a backhoe. Each test pit was about 30 feet long. The location for each test pit was selected in consultation

with Edward Hampston of the NYSDEC. The fill material encountered in each of the test pits was common construction debris including brick, wood, and concrete. These materials were set within a soil matrix. No other types of wastes and no drums were encountered. The construction debris extended to the following depths at each test pit:

- TP-1 2.7 feet;
- TP-2 4.5 feet with some construction debris mixed in sand to 12.5 feet; and
- TP-3 4.0 feet with some construction debris mixed in loam to 12.5 feet.

Copies of the stratigraphic logs of the materials encountered in each test pit are presented in Appendix B. In test pits TP-1 and TP-2, a black vegetative layer was encountered at 13.5 feet and 12.5 feet, respectively. This black vegetative layer had also been encountered in two of the previous test pits (TP-Z and TP-EE). It is believed that this material is the original layer of topsoil/surficial sediment that existed prior to filling of the area with construction debris.

A petroleum-like odor was present in two of the test pits. This occurred at:

- TP-2 at 12.5 feet; and
- TP-3 at 12.5 feet.

One soil sample was collected from each of the test pits and analyzed for VOCs, SVOCs, metals, and cyanide. The samples were collected from the following intervals:

- TP-1 2.7 to 5 feet black silty loam;
- TP-2 14.5 feet black vegetative layer; and
- TP-3 12 feet black sandy loam.

There were no exceedances of 6 NYCRR Part 375 restricted residential or industrial use criteria for any VOCs at any on the three test pit locations, as shown on Table 2.3.

Sample results from TP-1 showed concentrations of five SVOC parameters above the restricted residential SCOs; however, benzo(a)pyrene was the only compound that also exceeded the industrial use SCO. There were no exceedances of either restricted residential or industrial use SCOs for any SVOC parameters at locations TP-2 and TP-3. Detected concentrations of SVOC parameters were consistent with site background.

With regard to metals concentrations, there were no exceedances of either the restricted residential or industrial criteria at locations TP-1 or TP-3. In general, the metal concentrations in TP-2 were the highest of the three test pit samples collected. The concentration of arsenic slightly exceeded both the restricted residential and industrial SCOs. TP-2 also exceeded the restricted residential SCO for cadmium, copper and cyanide; however, all parameters were below the industrial use SCOs.

The cyanide concentrations measured in the test pit soil samples ranged from 3 to 45 ppm. By comparison, the background surface soil cyanide concentrations were 1 ppm or less. It is to be noted that Site 108 is downgradient of the Allied Specialty Chemical Site which has elevated cyanide concentrations.

3.3 GROUNDWATER

Previous groundwater monitoring of Site 108 has shown that there is minimal chemical discharge from the Site into the Niagara River. One data gap identified by the NYSDEC was that there was no groundwater data available at depth in the alluvial material to determine whether chemical discharge to the Niagara River was occurring at depth. The two sentry wells that had been used to determine the chemical loading to the Niagara River (MW-7 and MW-18) were both shallow wells. Consequently, it was agreed to install a well at depth adjacent to MW-18 to assess the conditions at depth. The details of this well installation are provided in Appendix B.

In addition, the two shallow sentry wells along the Niagara River were resampled to provide current information regarding the groundwater quality discharging from Site 108.

The previous sampling events for the shallow sentry wells MW-7 and MW-18 occurred in the period between 1989 and 1992. During that period, the highest total VOC concentrations in those two wells was 8 ppb with most of the sampling events having non detect total VOC concentrations. In the 2005 sampling round, there was only one VOC present in each of these two wells. Trichloroethene was present at an estimated concentration of 6 ppb in MW-7 and cis-1,2-dichloroethene was present at an estimated concentration of 2 ppb in MW-18. The trichloroethene concentration of 6 ppb in MW-7 is essentially equal to the Class GA groundwater criteria of 5 ppb. The 2 ppb of cis-1,2-dichloroethene is below the Class GA criteria. These data for the shallow sentry wells are consistent with the historical VOC data in that the shallow groundwater is clean with regard to VOCs.

For the SVOC analyses, there has never been a detected concentration of any SVOC in well MW-7 or MW-18. The samples collected in 2005 were also non detect for all SVOCs confirming that SVOCs are not present in the shallow groundwater discharging from Site 108 into the Niagara River.

For the metals, there was only one detection of a compound that exceeded its criteria in the 2005 sample that was collected from well MW-7. That exceedance was for sodium at a concentration of 22.2 ppm compared to the Class GA criteria of 20 ppm. Sodium at this concentration essentially meets the criteria. In addition, the allowable concentration for sodium is not a health-based criterion. Similarly, for the groundwater sample collected for well MW-18 in 2005, there was only one compound that exceeded the Class GA criteria and that was iron. Again iron's allowable concentration is not a health based criteria. The concentration of 23.3 ppm in the sample is not a threat to the Niagara River.

Neither of the samples collected from wells MW-7 or MW-18 exceeded the Class GA criteria for cyanide. In addition, the measured concentrations in 2005 are lower than the concentrations measured in previous sampling events at these two wells indicating an ever-improving groundwater condition beneath the Site.

With regard to the new well installed at depth, the results are very similar to those observed in the shallow part of the formation. The deep well (MW-18D) was installed with a 15 foot screen interval that covered the depth of 25 to 40 feet below the ground surface. The sample collected in August 2005 showed that there were no VOCs present that exceeded their Class GA criteria. In fact, only one parameter (carbon disulfide) was even detected and that was at an estimated concentration of 1 ppb. As a result, the total VOC concentration is only 1 ppb.

For the SVOC sample that was collected from MW-18D, there were no SVOCs detected.

For the metal sample that was collected from MW-18D, three parameters were detected at concentrations that exceed the Class GA criteria. These three compounds were iron, manganese, and sodium; none of which have criteria that are health based. The manganese and sodium concentrations were close to the criteria; manganese was present at 0.358 ppm compared to the criteria of 0.3 ppm and sodium was present at 29.1 ppm compared to the criteria of 20 ppm. Iron was present at 11.2 ppm which is above the criteria of 0.3 ppm. Again, none of these criteria are health based.

Based on the results of the resampling of the shallow sentry wells and the newly installed deep well, it has been demonstrated that the groundwater at the downgradient boundary beneath Site 108 meets the Class GA groundwater criteria. The minor

exception to this is for three common elements (iron, manganese, and sodium) that are not health-based parameters of concern.

3.4 SEDIMENTS

Following the submittal of CRA's Remedial Investigation Summary Report (1997), the NYSDEC provided TCC with some additional information concerning sediment quality in the Niagara River in the vicinity of Site 108. Sample data made available were from sampling events that occurred in 1989 and 1993. Two samples were collected in 1989 at locations RW-S3-SED and NYSDEC-A. The locations of these two sample points are unknown. The sample data for these two samples show that the sediment contained:

- No VOC criteria exceedances;
- Total SVOC concentrations ranged from 400 to 935 ppm for 18 to 20 parameters; and
- Metals exceedances for arsenic, chromium, lead, manganese, mercury, and zinc.

The data, as available, are summarized on Plan 3.

In 1993, five sediment samples were collected from the embayment around the area where the on-Site ditch discharges into the Niagara River. The specific locations are shown on Plan 3. The samples were analyzed for VOCs and four of the samples were analyzed for SVOCs. One sample was also analyzed for cyanide. The data from these five sediment samples show that there were:

- No VOC criteria exceedances; and
- Total SVOC concentrations ranged from 53.2 to 2,388 ppm.

In order to further evaluate the conditions in the sediment of the Niagara River, three additional sediment samples were collected during the 2005 investigation. The three samples were collected from the locations shown on Figure 3.1 and are generally described as follows:

- River 1 About 40 feet from the outfall pipe of the ditch that traverses Site 108, about 15 feet off the edge of the bank;
- River 2 About 400 feet upstream of the outfall pipe, about 15 feet off the edge of the bank; and

- River 3 About 650 feet upstream of the outfall pipe near the outfall of the wastewater treatment plant, about 15 feet off the edge of the bank.

The samples collected were analyzed for SVOCs.

The sample collected from the embayment area adjacent to the Site 108 outfall (River-1) had a total SVOC concentration of 293 ppm. Seven SVOCs were present at concentrations that exceed the 6 NYCRR Part 375 restricted residential use criteria. Of those seven, five compounds also exceeded the industrial use criteria. These parameters are the same criteria identified as exceeding 6 NYCRR Part 375 criteria in the surface soils.

These same compounds also exceeded the criteria for the surface soil samples that had been collected from across Site 108. The same compounds were also detected in the background samples collected from the area surrounding the TCC Site. The total SVOC concentration in the River-1 sample (293 ppm) is nearly three times the average background surface soil SVOC concentration (103 ppm) and the average SVOC concentration across Site 108. This would indicate that other sources may be contributing to the presence of SVOCs in the river sediments.

The two sediment samples collected from upstream of the Site 108 outfall area (River-2 and River-3) had no exceedances of either the restricted residential use or industrial use SCOs. The sediment concentrations for several of the SVOCs in these two upstream sediment samples were below the concentrations measured in the background surface soil samples collected from the area surrounding the TCC property. The quality of these upstream sediment samples does indicate that the sediment quality immediately adjacent to the Site 108 outfall has been impacted.

Comparing the outfall area sediment sample data to the on-Site sediment samples collected from local surface water drainage ditches, it can be seen that the concentrations in the embayment area are higher than the concentrations measured in on-Site sediment sampling location SW-5 but lower than that of SW-6. SW-5 is the last sediment sampling station along the on-Site ditch and is within 200 feet of the point of discharge to the Niagara River in the southwest corner of Site 108. SW-6 is located in the northeast corner of Site 108 closest to River Road.

In another comparison, the outfall area sediment concentrations have the same compounds with exceedances as the surface soil sample that was collected from location

SS-1 in the southwest corner of Site 108. However, the concentrations in the sediment sample are lower than the on-Site surface soil concentrations.

3.5 SURFACE WATER

Surface water samples have been collected through the various investigations conducted at the TCC Site. On Site 108, there is one main surface water stream that traverses the Site and discharges into the Niagara River. The surface water sampling that has been conducted on Site 108 has shown that there is minimal chemical presence in the surface water. In fact, there has been only two VOCs and two metals detected in surface water at Site 108, and these parameters (except for toluene) were detected upstream at greater concentrations, indicating that the source is off-Site. There is no unpermitted chemical discharge to the Niagara River via surface water flow from the TCC Site. Two common metals, iron and manganese, are discharged to the Niagara River, but these are contributed from southerly off-Site sources.

The surface water discharge from the remainder of the TCC Site is regulated under a SPDES permit which was last renewed in 2005. Prior to the 2005 renewal, TCC was required to monitor for benzene, toluene, naphthalene, and benzo(a)pyrene. The analytical results for November 2005 show that all the samples were non-detect for all four parameters. Due to the lack of detected compounds, the requirement to monitor the surface water was reduced to just naphthalene and benzo(a)pyrene in the 2005 SPDES permit renewal. As noted in the November 2007 sampling round, the analytical results are still non-detect for both compounds.

Consequently, the surface water discharging from the TCC Site is not having an impact on the water quality or sediment of the Niagara River.

3.6 SUMMARY OF SITE 108

The data collected during the 2005 Site investigation have confirmed the following:

- The surface soils on Site 108 are similar to background conditions with the exception of some exposed fill material along the westernmost edge of the Site, closest to the Niagara River. These soils, which include some coke, exhibit higher concentrations of some SVOCs and metals compared to the other on-Site surface soil samples and to the background surface soil samples.

- The test pit excavations showed that the waste materials placed at the Site are common construction demolition debris. No drums or other waste materials were found. The chemical concentrations in the soil samples collected from the test pits were similar to the background surface soil sample concentrations with the exception that a few of the metals concentrations were slightly higher than those measured in the background samples.
- The groundwater discharging into the Niagara River from beneath Site 108 is essentially clean with only a trace 6 ppb concentration of trichloroethylene being present in one well adjacent to the Niagara River. By the time the groundwater from this well travels the additional distance to reach the Niagara River, it is expected that the groundwater quality would have naturally attenuated and would meet the New York State criteria. There is some evidence of cyanide in the groundwater along the eastern portion of Site 108 but this is related to the upgradient source area identified to be present on a neighboring property. No cyanide reaches the Niagara River. The groundwater is also not affecting the surface water quality leaving the Site.
- The surface water that traverses the Site and discharges into the Niagara River is essentially clean (with the exception of a few upstream sourced compounds) and is having no impact on the surface water or sediment quality of the Niagara River.
- The quality of the sediment in the area immediately adjacent to Site 108's drainage ditch discharge is impaired compared to upstream sediment quality. The chemical compounds present in the embayment area adjacent to the drainage ditch discharge are the same as those seen in the surface soil sample SS-1 which is located immediately adjacent to this area. However, the concentrations in the sediment are lower than those measured in the on-Site soils from SS-1.
- The majority of Site 108 is now heavily vegetated with mature trees, bushes, and tall grasses.
- Based upon the conditions measured, Site 108 is having a minimal effect and is in no way impairing the continued use of the Site as an industrial property.

4.0 SITE 109

Site 109 is located on the east side of River Road and is bounded by the Allied Specialty Chemical Site to the south, the coal fields to the east, and an abandoned manufacturing facility to the north. There are no occupied buildings on Site 109. During previous investigation programs conducted at Site 109, minimal evidence of chemical impacts was found.

The primary focus of the additional investigation requested by the NYSDEC involved checking the condition of the surface soils on the Site.

4.1 SURFACE SOILS

Five surface soil samples (SS-6 through SS-10) were collected from Site 109 and were analyzed for VOCs, SVOCs, metals, and cyanide. The results, presented in Table 2.3, show that there were no exceedances of either restricted residential or industrial use SCOs for any VOC parameters.

Three to seven SVOC parameters were detected at concentrations that exceed either the restricted residential use or industrial use SCOs. The exceeded SVOC parameters are the same as those exceeded at Site 108. There were no exceedances of any SVOC parameters at SS-7 which is the western most sample along River Road at Site 109. SS-6 and SS-8 had three and six exceedances, respectively. These locations are on the north side of Site 109. SS-9 and SS-10 on the south side of Site 109 had seven and five exceedances, respectively. Out of the five samples, the highest concentrations were seen at SS-9. It must be noted that the surface soil sample collected at location SS-9 included coke dust. Given the inclusion of coke dust in the sample collected at SS-9, the presence of elevated concentrations of some of the SVOCs should not be unexpected.

In addition, the area in the vicinity of the SS-9 sampling location has been subject to disturbance in recent years. The soils in this area have been moved and regraded to accommodate the construction of an upgrade to the Site's wastewater treatment system. Consequently, the surface soils in this area of the Site had been recently disturbed.

In summary, the surface soil samples collected from Site 109 are generally consistent with site background conditions. With the exception of SS-9, the concentrations of the exceedances were moderate with only eight of 21 total exceedances identified in the five samples exceeding the industrial use criteria. All other exceedances were of the restricted residential use criteria only.

There were no exceedances of either the restricted residential use or industrial use SCOs for any metals parameters in any of the five surface soil samples collected from Site 109.

4.2 SUMMARY OF SITE 109

The data collected during the 2005 Site investigation have confirmed the following:

- The surface soils on Site 109 are consistent with background concentrations. The one exception to this is the area at the extreme eastern end of Site 109 which has been recently disturbed in conjunction with the construction of an upgrade to TCC's wastewater treatment facility. This sample also included some coke dust in its matrix.

5.0 SITE 110

Site 110 is located in the northeastern corner of the TCC Site. There are no occupied buildings on Site 110. During previous investigation programs conducted at Site 110, six test pits and six groundwater monitoring wells have been installed. In addition, a number of surface water and sediment samples have been collected from adjacent areas to assess the potential impact of Site 110 on these adjacent areas. The previous investigations have shown that there is one area of groundwater impact in the vicinity of well MW-3R. The surface water and sediment data have identified that there are some compounds present in the area to the south of Site 110. No previous surface soil data are available for Site 110.

As a result, the primary focus of the additional investigation requested by the NYSDEC involved checking the condition of the surface soils on the Site, the groundwater and soil conditions in the vicinity of MW-3R, and the surface water to the south of Site 110. These areas of investigation are discussed in the following subsections.

5.1 SURFACE SOILS

Five surface soil samples (SS-11 through SS-15) were collected from Site 110 and were analyzed for VOCs, SVOCs, metals, and cyanide. The results, presented in Table 2.3, show that there are no VOCs that exceed either restricted residential use or industrial use SCOs. In fact, only four VOCs were even detected in the surface soils.

The SVOC results were consistent across all five samples collected from Site 110, and the same seven SVOC parameters were exceeded at Sites 108 and 109. Sample SS-14 generally had the lowest SVOC concentrations when compared to the other surface soil samples collected from Site 110. In general, concentrations of the seven SVOC parameters were above site background concentrations, exceeded the restricted residential SCOs, and exceeded the industrial SCOs about 50% of the time.

It is noted in the sample logs that all of the surface soil samples from Site 110 were black and included some coke material except for the sample from SS-14 (which was brown and not noted to include coke material). As a result, the higher SVOC concentrations in these samples should not be unexpected. The SVOC concentrations measured at SS-14 were similar but slightly higher than the concentrations measured to the background surface soil samples. Concentrations of SVOC parameters from sample SS-14 only exceeded the industrial SCOs for one parameter, benzo(a)pyrene.

Out of the five samples, there was only one exceedance of the restricted residential use SCOs for metals parameters. Mercury was detected at SS-15 at 1.0 ppm which slightly exceeds the criteria of 0.81 and is insignificant. All other metals concentrations were below the SCOs.

5.2 SURFACE WATER

CRA was to collect surface water and sediment samples from the two locations sampled in previous investigations that contained the greatest number of chemical exceedances. These were locations SW-11 and SW-14. The previous sampling data had identified that acetone and cyanide were present at concentrations in excess of their criteria.

The selection of the sample locations was also to have been based upon a tour of the wetlands downstream of Site 110. The tour was conducted in August 2005 in conjunction with representatives of the NYSDEC, including Ken Roblee of the Buffalo office. The conditions at the time of the tour are consistent with previous inspections that had been conducted by CRA in the performance of the previous sampling programs. As has been the case in each inspection, it is difficult to find surface water in the area. In this case, no standing surface water was present. In addition, the entire low lying area located along the eastern boundary of the Site is overgrown with phragmites. As noted by Ken Roblee, the extensive growth of phragmites is not a desirable habitat for either animals or birds. It was also noted that the wetlands are of limited value.

Based upon these observations, it was agreed that there was no ability to collect surface water samples from the area and any results would likely also be of limited value. As a result, no further sampling of the area is planned.

The previous data from the five surface water samples collected during CRA's Additional Site Investigation (1992) had shown that:

- All of the VOCs were non detect except for acetone which was detected at one of the five sampling locations. The concentration was 360 ppb which is greater than the guidance value of 50 ppm;
- No SVOCs were detected at concentrations greater than the most stringent MCLs; and
- Iron, manganese, and zinc were present in the surface water samples at concentrations that exceed the MCLs, although these criteria are not health based.

The concentrations of these metals at the most downgradient sampling location were dramatically lower.

These results demonstrate that there are only a few exceedances of surface water criteria in the wetlands area and that they are not health based concerns.

During the walk through with the NYSDEC personnel, it was noted that there is one small area in the middle of the wetland area where the vegetation has been distressed. That area is approximately 200 feet by 200 feet in size and is believed to have been impacted by an oil pipeline release that occurred several years ago.

5.3 MW-3R AREA

Historically, the groundwater data in the vicinity of well MW-3 (later replaced with well MW-3R) had exhibited elevated concentrations of some of the VOCs, SVOCs, metals, and cyanide. The VOC exceedances (1,1,1-trichloroethane and benzene) were detected at concentrations only marginally greater than the criteria. The SVOC exceedances at MW-3 included naphthalene, fluorene, phenanthrene, dibenzofuran, benzo(b)fluoranthene, and benzo(k)fluoranthene. The naphthalene, fluorene, and phenanthrene concentrations were within the same order of magnitude as the most stringent criteria. The metals exceedances included cyanide, aluminum, iron, manganese, and sodium, all of which were about an order of magnitude greater than the Class GA criteria.

As a result of these exceedances, it was decided to perform an excavation in the area of the well to assess the soil conditions in this area. In August 2005, a backhoe was used to excavate a trench approximately 90 feet long and 6 feet deep running parallel to the railway tracks in the vicinity of MW-3R. The excavated material was carefully observed and a small amount of coal tar was found to be present. The coal tar was separated from the excavated material and was taken by TCC personnel for reprocessing through the coking operation. In total, about one quart of coal tar was found.

The excavation and removal process was coordinated in the field between the CRA and NYSDEC personnel. Upon conclusion of the excavation / removal action, the NYSDEC personnel were satisfied with the level of effort taken to address this localized occurrence of elevated chemical concentrations.

5.4 SUMMARY OF SITE 110

The data collected during the 2005 Site investigation have confirmed the following:

- The surface soils on Site 110 are similar to the soils that were collected from the areas surrounding the TCC Site in terms of chemicals present and chemical concentrations with one exception. That exception is that the SVOC concentrations measured in the on-Site surface soils are typically at greater concentrations than the background samples (by factors of 2 to 16). However, these samples included coke material which would account for the elevated SVOC concentrations;
- There is minimal surface water presence in the wetlands area to the south of Site 110. The wetlands are of limited value as a wetland or as a habitat; and
- The excavation and removal action in the vicinity of well MW-3R was successful in eliminating the coal tar material that likely influenced the local groundwater conditions.

6.0 REMEDIAL INVESTIGATION SUMMARY

6.1 SUMMARY OF SITE CONDITIONS

The results of the additional investigations conducted on the TCC Site in 2005 are typically in agreement with the conditions found in previous studies. The significant findings are summarized as follows:

1. The concentrations of the surface soil samples collected from the three Sites on the TCC property are generally similar to the concentrations measured in a series of background surface soil samples that had been collected from areas surrounding the TCC Site for comparison purposes. The results of the surface soil sampling program showed that there were no exceedances of VOCs in any of the surface soil samples. There were some SVOC compounds whose concentrations exceeded the 6 NYCRR Part 375 SCOs; however, SVOC concentrations were consistent with background data in all samples except those where coke material was observed to be present in the samples. The observation of elevated SVOC concentrations in these samples is not unexpected. In, addition, the SVOC parameters that exceeded criteria at each of the three sites, in the river sediments, and in the background samples were identical. With the exception of one detection of mercury above the restricted residential use SCO, all metals parameters were below the applicable SCOs.

   The entire TCC property is contained within a fenced area that is security patrolled 24/7. As a result, all on-Site areas are access restricted.

2. The fill material in Site 108 is common construction demolition debris.
3. The groundwater leaving the TCC Site is clean.
4. The surface water that traverses the Site and discharges into the Niagara River is essentially clean (with the exception of a few upstream sourced compounds) and is having no impact on the surface water or sediment quality of the Niagara River.
5. The sediment in the embayment area adjacent to Site 108's drainage ditch outfall into the Niagara River exhibits exceedances of the same SVOCs that were present in the on-Site surface soil sample collected closest to this location (sample SS-1). However, the concentrations in the sediment samples are lower than those in the on-Site soil sample. The concentrations in the sediments of the drainage ditch just upstream of the outfall location did not have any of these same exceedances when it was sampled.

6. The coal tar that likely caused the exceedance of the groundwater criteria in the vicinity of MW-3R was small in volume (approximately one quart) and has been removed as an interim remedial measure and recycled.

7. The wetlands to the south of Site 110 experience significant periods of intermittent dry cycles. The vegetative material in the wetland and the conditions make the wetlands of limited value.

In conclusion, the requested data have been collected and reported upon. There are a few areas on the TCC Site where elevated concentrations of a few SVOCs exist. Most of these exceedances are most likely related to the presence of coke materials. Nonetheless, these areas are typically limited in size, inaccessible because of either depth or fencing/security, and have no or minimal off-site impacts. The Site is suitable for continued use as an industrial property.

6.2 SUMMARY OF THE NATURE AND EXTENT OF CONTAMINATION AND POTENTIAL EXPOSURE PATHWAYS

Site-related chemicals have been detected in surface soil, subsurface soil, groundwater, surface water and sediment, although many of the measured concentrations are low, either consistent with background conditions or below applicable regulatory criteria.

The results of the remedial investigation indicate that surface soil is the only media impacted at the TCC site. Although some SVOC parameters were identified in subsurface soil samples, conditions are consistent with background, therefore no further actions are necessary to address subsurface soils at the Site. Groundwater impacts were historically identified at MW-3R. These impacts were addressed by conducting an interim remedial measure (IRM) which consisted of removing coal tar from the vicinity of the well. Subsequent groundwater sampling indicated that the IRM was effective in removing the source of the groundwater impacts and no further action is necessary to address groundwater at the site. No significant impacts to surface water or sediments were identified during the remedial investigation. In addition, stormwater runoff from the coal piles is regularly monitored under TCC's State Pollution Discharge Elimination System (SPDES) permit. Any changes in surface water quality will be detected through this monitoring program.

In summary, the only potential contaminant migration pathway which exists at the Site is:

i) Surface Soil

- COCs – SVOCs and Metals
- Potential Exposure Pathways - worker or trespasser direct contact

7.0 FEASIBILITY STUDY

7.1 POTENTIAL STANDARDS, CRITERIA, AND GUIDELINES

7.1.1 TYPES AND APPLICABILITY

Applicable or relevant and appropriate Standards, Criteria, and Guidelines (SCGs) are used to develop remedial action objectives (RAOs) and to scope and formulate remedial action technologies and alternatives. SCGs may include Federal Applicable or Relevant and Appropriate Requirements (ARARs) or standards if they are more stringent than State standards. SCGs are categorized as:

i) chemical-specific requirements that define acceptable exposure levels and may, therefore, be used in establishing preliminary remediation goals;

ii) location-specific requirements that may set restrictions on activities without specific locations, such as floodplains or wetlands; and/or

iii) action-specific requirements which may set controls or restrictions for particular treatment and disposal activities related to the management of hazardous wastes.

Potential SCGs are described in the following subsections.

7.1.1.1 CHEMICAL-SPECIFIC SCGs

Chemical-specific SCGs define health- or risk-based concentration limits in various environmental media for hazardous substances and contaminants. Concentration limits provide protective cleanup levels or may be used as a basis for estimating appropriate cleanup levels for the COCs in the designated media. Chemical-specific SCGs may be used to determine treatment system discharge requirements or disposal restrictions for remedial activities and/or to assess the effectiveness or suitability of a remedial alternative. Chemical-specific SCGs are generally promulgated standards or other ARARs. Applicable or relevant and appropriate guidance values may be appropriate where a promulgated standard for a particular substance is not available.

Potential chemical-specific SCGs that may apply to surface soil at the Site are described in the subsections that follow.

7.1.1.1.1 SURFACE SOIL

For the purpose of the FS, potential chemical-specific SCGs for surface soils consist of the NYSDEC Soil Cleanup Objectives (SCOs). The NYSDEC SCOs are stipulated in 6 NYCRR Part 375-6 Environmental Remediation Programs Soil Cleanup Objectives. The SCGs for the chemical compounds detected in Site surface soils at concentrations exceeding standards are presented in Table 7.1.

7.1.1.2 ACTION-SPECIFIC SCGs

Action-specific SCGs are determined by the particular remedial activities that are selected for the Site cleanup. Action-specific requirements establish controls or restrictions on the design, implementation, and performance of remedial activities. Following the development of remedial alternatives, action-specific SCGs that specify performance levels, actions, technologies, or specific levels for discharged or residual chemicals provide a means for assessing the feasibility and effectiveness of the remedial activities.

The action-specific SCGs that may be applicable to potential Site remedial technologies are presented in Table 7.2.

7.1.1.3 LOCATION-SPECIFIC SCGs

Potential location-specific SCGs are requirements that set restrictions on activities depending on the physical and environmental characteristics of the Site or its immediate surroundings.

Potential location-specific SCGs that may be applicable to potential Site remedial technologies are the Town of Tonawanda zoning ordinances and building codes.

7.2 REMEDIAL ACTION GOALS AND OBJECTIVES

7.2.1 REMEDIAL ACTION GOALS

The primary goals of any remedial action are that:

i) it be protective of human health and the environment;

ii) it maintains protection over time; and

iii) it minimizes untreated waste (NCP).

The remedy selection process will be performed in a manner consistent with the NYSDEC approved RI/FS Work Plan, the USEPA guidance document "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" dated October 1988 (USEPA Guidance), NYSDEC "TAGM HWR-90-4030: Selection of Remedial Actions at Inactive Hazardous Waste Sites", dated May 15, 1990 (NYSDEC TAGM), and any other appropriate USEPA and NYSDEC technical and administrative documents.

7.2.2 REMEDIAL ACTION OBJECTIVES

The USEPA Guidance states "*Remedial action objectives consist of medium-specific or operable-unit specific goals for protecting human health and the environment. The objectives should be as specific as possible but not so specific that the range of alternatives that can be developed is unduly limited.*" RAOs established for the protection of human health and the environment should specify:

i) the contaminants and media of concern;

ii) the exposure routes and receptors; and

iii) an acceptable contaminant level or range of levels for each exposure route.

Based on the results of the RI, the remedial actions evaluated for the Site in this FS address on-Site surface soil impacted by COCs. The following RAOs have been established for Site media:

i) to eliminate or mitigate all significant threats to the public health and to the environment presented by the disposal or release of hazardous waste at the Site;

ii) to prevent unacceptable exposure of human receptors to SVOCs in surface soil.

7.3 GENERAL RESPONSE ACTIONS AND IDENTIFICATION OF REMEDIAL TECHNOLOGIES

General response actions are remedial approaches encompassing those actions that will satisfy the RAOs. General response actions may include treatment, containment, excavation, disposal, institutional controls, or a combination of these, if required, to address varied Site environmental problems and to be effective in meeting all of the RAOs. The general response actions and remedial technologies evaluated for each medium of concern at the Site are described in the following subsections and listed in Table 7.3.

7.3.1 SURFACE SOIL

7.3.1.1 NO ACTION

The No Action response is primarily used as a basis for comparison with other alternatives. Under the No Action response, no additional measures are taken to improve environmental conditions at the Site. This response does not reduce the volume, mobility, or toxicity of the hazardous constituents of the Site media.

7.3.1.2 INSTITUTIONAL CONTROL

The institutional control response is not intended to reduce the toxicity, mobility, or volume of hazardous site constituents, but to reduce the potential for human and wildlife exposure to those constituents. Options may include initiation of institutional controls to restrict or limit the use of the Site or the contaminated media and/or development of protective work procedures to reduce the potential for exposure of workers to Site contaminants during ground intrusive construction activities.

7.3.1.3 CONTAINMENT TECHNOLOGIES

Containment technologies for surface soils consist of physical containment. The containment response does not reduce the volume or toxicity of the contaminants in the Site media. The purpose of this response is to reduce contaminant mobility, and in doing so, minimize exposure and reduce potential hazards at the Site. Periodic monitoring in the way of inspection is necessary to insure that containment is maintained.

The soil containment technology identified as potentially applicable to the Site is the use of a permeable surface barrier (cap) to prevent exposure to contaminants in Site surface soils.

7.3.1.4 COLLECTION TECHNOLOGIES

Collection technologies reduce the mass of contaminants present to a greater or lesser degree, dependent on the aggressiveness of the collection effort. Use of the collection technologies reduces the mobility and toxicity of Site contaminants by removal and disposition at a secure location. These technologies provide no treatment of contaminated media but may be used in conjunction with a disposal and/or treatment option to meet the Site-specific goals and objectives.

The collection technology identified as potentially applicable to surface soil at the Site is excavation of impacted soil.

7.3.1.5 EX SITU TREATMENT TECHNOLOGIES

The purpose of a treatment technology is to reduce the volume, toxicity and/or mobility of Site contaminants. Remedial treatment technologies include biological, physical, chemical, and thermal processes or some combination of those processes (e.g., physical/thermal treatment).

The treatment technologies identified as potentially applicable to excavated surface soils at the Site are thermal desorption and incineration.

7.3.1.5.1 THERMAL DESORPTION

Thermal desorption is a physical treatment method for excavated soils. Thermal desorption does not result in reduction of the volume or toxicity of the Site contaminants. To thermally treat the SVOCs in Site surface soils, excavated soil would be heated to high temperature to volatilize water and the COCs. The resultant vapors would then be transported in a carrier gas or by vacuum extraction to a treatment system.

Dewatering of soils may be required to achieve acceptable soil moisture content prior to treatment.

7.3.1.5.2 INCINERATION

Incineration is a potential physical/chemical treatment method for excavated soils. Organic chemical compounds present in excavated soils would be destroyed through volatilization and combustion. Off gases and combustion residuals may require treatment.

7.3.1.6 DISPOSAL TECHNOLOGIES

Disposal technologies involve off-Site or on-Site disposal of contaminated media or products of treatment processes. Disposal technologies do not usually involve reduction of contaminant volume or toxicity, but are primarily intended to reduce contaminant mobility. On-Site disposal options include the construction of a landfill cell with disposal of the contaminated media in the cell. Off-Site disposal options include disposal at a permitted TSDF. Off-Site disposal options normally involve transportation of the waste to the TSDF.

7.4 INITIAL SCREENING OF REMEDIAL TECHNOLOGIES

Prior to developing a list of remedial alternatives potentially applicable at the Site for detailed analysis and comparison, all identified available and appropriate technologies are screened. The identified technologies described in Section 7.3.1 have been screened utilizing the following criteria:

i) short- and long-term effectiveness;

ii) implementability;

iii) relative cost; and

iv) short-term risk.

The initial screening of remedial technologies and process options is designed to determine their applicability to the Site and eliminate those technologies that technically cannot be implemented.

The results of the initial screening of the remedial technologies assembled to address the general response actions presented in Section 7.3 and listed in Table 7.3, are shown on Tables 7.4 and 7.5.

In summary, the technologies listed below are retained for assembly into remedial alternatives and further evaluation.

7.4.1 SURFACE SOIL

The following technologies are retained for further evaluation. These technologies may be used individually or in combination.

i) No Further Action;

ii) Institutional Control;

iii) Containment through Capping;

iv) Collection through Excavation; and

v) Off-Site Disposal of Excavated Soil.

7.5 DETAILED ANALYSES OF RETAINED REMEDIAL ALTERNATIVES

Remedial alternatives for Site surface soils were developed in Section 7.4 for possible application at the Site. These alternatives are subject to a detailed analysis using the evaluation criteria outlined in USEPA guidance. The evaluation criteria are as follows:

i) overall protection of human health and the environment;

ii) compliance with ARARs/SCGs;

iii) reduction of toxicity, mobility, or volume;

iv) short-term effectiveness;

v) long-term effectiveness and permanence;

vi) implementability;

vii) cost; and

viii) community acceptance.

The criterion of community acceptance cannot be evaluated at the feasibility study stage because it is based upon public comments regarding the Site remedy. Consequently, no further discussion of this criterion is provided in this FS.

The remaining seven criteria are divided into two primary groups, namely threshold criteria and balancing criteria.

The threshold criteria include compliance with applicable SCGs and overall protection of human health and the environment. With the exception of the No Action alternative, all remedial alternatives must meet the threshold criteria to be eligible for further consideration.

The remaining five evaluation criteria are considered the balancing criteria. Each of the remedial alternatives is assessed and analyzed on a comparative basis using these evaluation criteria. Ultimately, a remedial action plan is proposed that incorporates the alternatives, which provides the best solution with respect to the balancing criteria.

The detailed analysis of retained alternatives has been performed in a manner consistent with the applicable regulations. The analyses are described in detail in the following subsections. Backup information for the cost estimates is presented in Appendix C.

7.5.1 SURFACE SOIL

The surface soil remedial technologies retained following the initial screening have been assembled into the following alternatives for detailed analysis:

i) Surface Soil Alternative 1: No Action;

ii) Surface Soil Alternative 2: Institutional Control;

iii) Surface Soil Alternative 3: Capping with Institutional Control; and

iv) Surface Soil Alternative 4: Excavation with Off-Site Disposal and Institutional Control.

Each of the surface soil remedial alternatives is evaluated in detail in the following subsections.

7.5.1.1 SURFACE SOIL ALTERNATIVE 1: NO ACTION

7.5.1.1.1 DESCRIPTION

Surface Soil Alternative 1 (SS Alternative 1), No Action, provides no active remedial measures to improve environmental conditions at the Site. Natural degradation would reduce COC concentrations in surface soil over the long term. No remedial actions, institutional controls, or monitoring would be conducted.

7.5.1.1.2 ASSESSMENT

Overall Protection of Human Health and the Environment: Because no additional remedial measures are implemented with SS Alternative 1, the potential future risk to human health and the environment would not be reduced beyond that which would be achieved through natural degradation processes (biodegradation and natural physical processes).

The apparent source of COCs in surface soil is historic disposal activities as well as continued use of the Site for industrial purposes (coke manufacturing); therefore, SS Alternative 1 will be protective of human health and the environment in the future.

Compliance with SCGs: SS Alternative 1 would not achieve the chemical-specific SCGs which apply to surface soil. Since no remedial action would be implemented, no action-specific or location-specific SCGs apply to SS Alternative 1.

Reduction of Toxicity, Mobility, or Volume: SS Alternative 1 provides no active reduction of toxicity, mobility, or volume of the COCs. However, over the long term, the volume and toxicity of COCs in surface soil will be reduced by natural degradation processes.

Short-Term Effectiveness: SS Alternative 1 requires no remedial actions. There would be no additional short-term risks posed to the community, the workers, or the environment as a result of the implementation of this alternative.

Long-Term Effectiveness and Permanence: Over time, through natural degradation processes, SS Alternative 1 will achieve the RAOs applicable to surface soil.

Implementability: Because there are no remedial actions being undertaken, the implementability criterion is not applicable.

Cost: Because there are no remedial actions, institutional controls, or monitoring being undertaken, there are no costs associated with SS Alternative 1. The cost summary is presented in Table 7.6.

7.5.1.2 SURFACE SOIL ALTERNATIVE 2: INSTITUTIONAL CONTROL

7.5.1.2.1 DESCRIPTION

Surface Soil Alternative 2 (SS Alternative 2), Institutional Control, consists of the implementation of institutional controls to restrict exposure to contaminated surface soil at Sites 108, 109, and 110. Specifically,

i) the entire TCC facility is already enclosed with fencing and is patrolled by security 24 hours per day, 7 day per week;

ii) safe work practices and definitions of levels of PPE for specific work activities would be developed and implemented for maintenance or construction activities conducted in the area; and

iii) a Deed Restriction would be recorded. The deed restriction would put third parties on notice of certain land use restrictions. The restriction or restrictive

covenants would be drafted in accordance with applicable and relevant State and municipal legal codes.

7.5.1.2.2 ASSESSMENT

Overall Protection of Human Health and the Environment: The combination of a physical barrier (fencing) and effective deed restrictions would be protective of human health by preventing incidental exposure to the subject soils. The potential future risk to the environment using SS Alternative 2 would not be reduced beyond that which will be achieved through natural attenuation.

Compliance with SCGs: SS Alternative 2 would not achieve the chemical-specific SCGs which apply to surface soil. No action-specific SCGs apply to Alternative 2. The potentially applicable location-specific SCGs for this Alternative are the Town of Tonawanda ordinances and building codes.

Reduction of Toxicity, Mobility, or Volume: SS Alternative 2 provides no active reduction of toxicity, mobility, or volume of the COCs. However, over the long term, the volume and toxicity of COCs in surface soil will be reduced by natural degradation processes.

Short-Term Effectiveness: No additional short-term risk to the community or the environment would be posed as a result of the implementation of SS Alternative 2. Risk to workers installing fencing around the area would be mitigated through the implementation of safe work practices and proper PPE.

Long-Term Effectiveness and Permanence: The institutional controls established for SS Alternative 2 would make this Alternative effective in the long term as long as they are enforced and maintained.

Implementability: SS Alternative 2 is highly implementable since the entire TCC facility is already fenced and patrolled by security. Also, there is no foreseeable potential change in land use for the TCC property or surrounding properties.

Cost: The estimated 30-year present worth cost for SS Alternative 2, given an estimated life of fencing of 25 years (or replacement once in a 30-year period) is $227,100. The cost summary is presented in Table 7.7.

7.5.1.3 SURFACE SOIL ALTERNATIVE 3: CAPPING WITH INSTITUTIONAL CONTROL

7.5.1.3.1 DESCRIPTION

Surface Soil Alternative 3 (SS Alternative 3), Capping, includes:

i) construction of a permeable cover (cap) over surface soils containing SVOCs at concentrations exceeding SCGs; and

ii) implementation of institutional controls to restrict exposure to contaminated subsurface soil.

The estimated areas to be capped in SS Alternative 3 are shown on Figure 1.2. Prior to placing the cap, the area would be cleared and graded as necessary to maintain drainage and the area would be covered with filter fabric to provide a visual separation between the soil and the imported cover. Impacted surface soils would not be removed from the three areas. The cap would consist of 1 foot of imported, clean, granular fill placed over the entire area containing impacted soil. Four inches of topsoil would be placed on top of the fill and the area revegetated. A long-term O&M program, comprising periodic inspections and routine maintenance activities, would be implemented to maintain the long-term integrity of the cap.

The institutional controls implemented as part of SS Alternative 3 consist of:

i) safe work practices and definitions of levels of PPE for specific work activities developed and implemented for maintenance or construction activities conducted in the area; and

ii) a Deed Restriction or Record Notice would be added as an addendum to an existing deed for the property. The deed restriction would inform the property owner of the Site history and restricted land use on the property. Deed restrictions would also require the property owner to obtain regulatory approvals before performing construction activities in the area in which the subject soils are located. Any future conveyance of the property would be subject to these restrictions. The restriction or restrictive covenants would be drafted in accordance with applicable and relevant State and municipal legal codes to be enforceable.

7.5.1.3.2 ASSESSMENT

Overall Protection of Human Health and the Environment: SS Alternative 3 would be protective of human health by preventing potential incidental exposure to contaminated soil. SS Alternative 3 would be protective of the environment by reducing the future potential transport of soil impacted with SVOCs to off-Site areas as a result of wind dispersion, surface runoff, or other mechanical means.

Compliance with SCGs: SS Alternative 3 will comply with the chemical-specific SCGs which apply to surface soil by covering the existing surface soil with clean, imported fill; however, impacted soil would still be present on Site. Therefore, the chemical specific SCGs applying to the subsurface soils may not be achieved.

The potentially applicable action-specific SCGs for this Alternative are those listed in Table 7.2 under the following headings:

i) Capping;

ii) Construction of New Landfill on Site;

iii) Surface Water Control;

iv) Treatment (in a unit);

v) Waste Pile; and

vi) Closure with Waste in Place.

These SCGs would be satisfied by SS Alternative 3.

The potentially applicable location-specific SCGs for this Alternative are the Town of Tonawanda zoning ordinances and building codes.

Reduction of Toxicity, Mobility, or Volume: SS Alternative 3 provides no active reduction in toxicity or volume of COCs in surface soil. Mobility of SVOCs in surface soil would be reduced through the mitigation of transport of soil from the area. Over the long term, the volume and toxicity of SVOCs in surface soil would be reduced by natural degradation processes.

Short-Term Effectiveness: The permeable cap would be constructed using standard techniques. Short-term hazards to workers would be mitigated through proper work and health and safety procedures. The short-term effectiveness of SS Alternative 3 would be almost immediate upon completion of the construction of the cap, since direct exposure of human receptors to surface soils exhibiting chemical concentrations

exceeding SCGs would immediately be prevented. No additional short-term risks would be posed to the community or the environment by SS Alternative 3.

Long-Term Effectiveness and Permanence: The enforcement of the institutional controls to be established for SS Alternative 3 and implementation of a long-term O&M program would make this Alternative effective in the long term. In addition, the incremental risk attributable to surface soils would be further reduced over the long term as a result of the natural degradation processes of SVOCs in the surface soils.

Cost: The estimated 30-year present worth cost for SS Alternative 3, including the estimated annual repairs to the cap, is $2,746,200. The cost summary is presented in Table 7.8.

7.5.1.4 SURFACE SOIL ALTERNATIVE 4: EXCAVATION WITH OFF-SITE DISPOSAL AND INSTITUTIONAL CONTROL

7.5.1.4.1 DESCRIPTION

Surface Soil Alternative 4 (SS Alternative 4) includes:

i) excavation of surface soil at Sites 108, 109, and 110 exhibiting SVOC concentrations exceeding SCGs;

ii) off-Site disposal of the excavated soil at a permitted landfill; and

iii) implementation of institutional controls to restrict exposure to contaminated subsurface soil.

The estimated area from which surface soil would be excavated is shown on Figure 1.2. Additional surface soil sampling and analyses may be required prior to commencement of the excavation activities to further define the horizontal extent of the excavation.

The surface soils would be excavated to a depth sufficient to allow sufficient backfill to cover the remaining soil and maintain surface water drainage. For the purpose of this FS, it is assumed that soils would be removed from the area to a depth of 1foot. Excavated soils would be transported to an off-Site, permitted TSDF for treatment (if required) and disposal.

Following completion of the excavation activities, the bottom of the excavation would be covered with filter fabric to provide a visual separation between the remaining soil and

the imported cover. The excavation would then be backfilled with a minimum of 1 foot of clean, imported, granular fill and regraded as necessary to promote drainage. The filled area will be covered with 4 inches of topsoil and revegetated.

Excavated soil likely would be removed from the Site concurrently with the excavation activities.

7.5.1.4.2 ASSESSMENT

Overall Protection of Human Health and the Environment: SS Alternative 4 would be protective of human health by preventing potential incidental exposure to contaminated soil. SS Alternative 4 would be protective of the environment by reducing the future potential transport of soil impacted with SVOCs to off-Site areas as a result of wind dispersion, surface runoff, or other mechanical means.

Compliance with SCGs: SS Alternative 4 would achieve the chemical-specific SCGs which apply to surface soil. However, the chemical-specific SCGs applying to subsurface soils may not be achieved.

The potentially applicable action-specific SCGs for this Alternative are those listed in Table 7.2 under the following headings:

i) Capping;
ii) Container Storage;
iii) Excavation;
iv) Surface Water Control;
v) Waste Pile;
vi) Closure with Waste in Place; and
vii) Transporting Hazardous Waste Off Site.

These SCGs would be satisfied by SS Alternative 4.

The potentially applicable location-specific SCGs for this Alternative are the Town of Tonawanda zoning ordinances and building codes.

Reduction of Toxicity, Mobility, or Volume: SS Alternative 4 provides a reduction in toxicity and volume of COCs by removing some of the impacted soil from the Site.

Their potential impact is then transferred to the disposal Site where it would be expected that better controls are in place to address this potential.

Short-Term Effectiveness: Surface soil excavation and backfill can be completed using standard techniques. Short-term hazards to workers would be mitigated through proper work and health and safety procedures. The short-term effectiveness of SS Alternative 4 would be almost immediate upon completion since the potential for direct exposure of human receptors to surface soils would be eliminated immediately. Dust control and community air monitoring programs would be implemented during construction activities to control short-term risks posed to the community by SS Alternative 4.

Long-Term Effectiveness and Permanence: SS Alternative 4 is a permanent solution to prevent exposure to contaminated surface soils. The enforcement of the institutional controls to be established for SS Alternative 4 would make this Alternative effective to prevent exposure to chemicals in remaining impacted subsurface soils, if present.

Cost: The estimated 30-year present worth cost for SS Alternative 4 is $17,018,100, assuming that the excavated materials are classified hazardous and are landfilled without pretreatment. The cost summary is presented in Table 7.9. The cost of SS Alternative 4 is highly dependent upon i) the volume of soil excavated; and ii) whether the excavated soil is a hazardous waste for disposal. Disposal costs range between approximately $60/ton for non-hazardous material and $400/ton for hazardous material requiring pretreatment and disposal in a secure (Subtitle C) landfill. With this range of disposal costs, SS Alternative 4 is estimated to cost between approximately $8,802,700 and $33,091,900.

7.6 COMPARATIVE ANALYSES OF REMEDIAL ALTERNATIVES

The purpose of the comparative analysis is to identify the relative advantages and disadvantages of each Alternative evaluated in detail in the previous sections. The detailed evaluation assessed each remedial Alternative independently. The comparison of remedial alternatives in this section evaluates the relative performance of each Alternative with respect to the detailed evaluation criteria: overall protection of human health and the environment, compliance with SCGs, short term effectiveness, long-term effectiveness and permanence, reduction of toxicity, mobility, and volume, implementability and cost.

7.6.1 COMPARATIVE ANALYSIS OF REMEDIAL ALTERNATIVES FOR SURFACE SOIL

Table 7.10 presents a ranking of each of the surface soil remedial alternatives included in the detailed analysis presented in Section 7.5. Discussions of the relative advantages and disadvantages of the alternatives are presented in the following subsections.

7.6.1.1 OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

The surface soil remedial alternatives are ranked as follows relative to overall protection of human health and the environment:

i. SS Alternative 4, Excavation and Disposal;
ii. SS Alternative 3, Capping with Institutional Control;
iii. SS Alternative 2, Institutional Control and Fencing; and
iv. SS Alternative 1, No Further Action.

SS Alternative 4, Excavation and Disposal, provides the highest overall protection of human health and the environment. Excavation of surface soils with disposal in accordance with applicable regulations will eliminate potential impacts on human health through removal and potential impacts to the environment through transport to off-Site areas. Subsurface soil exhibiting chemical presence may be left in place; however, it would be covered with the permeable backfill preventing incidental contact.

SS Alternative 3, Capping with Institutional Control, is protective although the impacted soils will remain in place. Potential incidental exposure to the soils or transport from the area will be eliminated because the soils will not be exposed. The institutional controls will mitigate worker exposure through safe work practices.

SS Alternative 2, Institutional Control and Fencing, will be protective of human health through the enforcement of institutional controls and restriction of access to the area in which the impacted soils are located. No additional protection of the environment will be afforded by SS Alternative 2.

SS Alternative 1, No Further Action, provides no further protection to human health or the environment, other than that the Site already has restricted access and the workers on the Site are trained in health and safety. The health and safety training covers the topic of handling and awareness of coke products that are the probable cause of the chemical compounds found during the studies conducted for this Site.

7.6.1.2 COMPLIANCE WITH SCGs

The surface soil remedial alternatives are ranked as follows relative to compliance with SCGs:

i. SS Alternative 4, Excavation and Disposal;
ii. SS Alternative 3, Capping with Institutional Control; and
iii. SS Alternative 2, Institutional Control and Fencing and SS Alternative 1, No Further Action.

SS Alternative 4, Excavation and Disposal, will comply with the chemical-specific SCGs for surface soil by removing the surface soils from the Site. Underlying soil would be covered with clean, imported fill.

SS Alternative 3, Capping with Institutional Control, will comply with the chemical-specific SCGs for surface soil by covering the existing surface soil with clean, imported fill.

Neither SS Alternative 1 (No Further Action) nor SS Alternative 2 (Institutional Control and Fencing) will comply with the chemical-specific SCGs.

All surface soil alternatives will comply with the applicable action- and location-specific SCGs, where such exist.

7.6.1.3 REDUCTION OF TOXICITY, MOBILITY, AND VOLUME

The surface soil remedial alternatives are ranked as follows regarding reduction of toxicity, mobility, and volume:

i. SS Alternative 4, Excavation and Disposal;
ii. SS Alternative 3, Capping with Institutional Control; and
iii. SS Alternative 2, Institutional Control and Fencing and SS Alternative 1, No Further Action.

SS Alternative 4, Excavation and Disposal, will reduce the mobility and volume of COCs in surface soils by removal from the Site. Toxicity will be reduced through proper disposal at a TSDF.

SS Alternative 3, Capping with Institutional Control, will result in reduction in mobility of COCs in surface soil but will not affect the toxicity or volume.

Neither SS Alternative 1, No Further Action, nor SS Alternative 2, Institutional Control and Fencing, will actively reduce the toxicity, mobility, or volume of the COCs in surface soil.

7.6.1.4 SHORT-TERM EFFECTIVENESS

The surface soil remedial alternatives are ranked as follows regarding short-term effectiveness:

i. SS Alternative 1, No Further Action and SS Alternative 2, Institutional Control and Fencing;
ii. SS Alternative 3, Capping with Institutional Control; and
iii. SS Alternative 4, Excavation and Disposal.

No risk to the community, workers, or the environment would be presented by the implementation of SS Alternative 1, No Further Action. There would also be no risks by

the implementation of SS Alternative 2, Institutional Controls and Fencing since the entire TCC facility is already fenced. A minimal risk may be present at the time of fence repair or replacement. However, these risks can be mitigated through proper work procedures.

A low risk to community, workers, or the environment would be presented by SS Alternative 3, Capping with Institutional Control. However, these risks can be mitigated through proper work procedures.

The greatest risk to the community, workers, or the environment would be presented by the implementation of SS Alternative 4, Excavation and Disposal. All these risks can be minimized through the implementation of proper work procedures and community monitoring plans.

7.6.1.5 LONG-TERM EFFECTIVENESS AND PERMANENCE

The surface soil remedial alternatives are ranked as follows relative to long-term effectiveness and permanence:

i. SS Alternative 4, Excavation and Disposal;
ii. SS Alternative 3, Capping with Institutional Control and SS Alternative 2, Institutional Control and Fencing; and
iii. SS Alternative 1, No Further Action.

SS Alternative 4, Excavation and Disposal, provides both long-term effectiveness and permanence through removal of the impacted surface soil from the Site.

SS Alternative 3, Capping with Institutional Control, is similar to SS Alternative 4 in that it can provide long-term effectiveness. However, SS Alternative 3 does not provide a permanent remedy, as the impacted soil will remain in place. Risks associated with the remaining soil will be mitigated through the maintenance of the cap and enforcement of the institutional controls for protection of workers required to perform subsurface activities in the area. Likewise, SS Alternative 2, Institutional Control and Fencing, can provide long-term effectiveness by preventing incidental contact with impacted surface soil. However, SS Alternative 2 does not provide a permanent remedy.

No long-term effectiveness or permanence is provided by SS Alternative 1, No Further Action.

7.6.1.6 IMPLEMENTABILITY

The surface soil remedial alternatives are ranked as follows for implementability:

i. SS Alternative 1, No Further Action;
ii. SS Alternative 2, Institutional Control and Fencing;
iii. SS Alternative 3, Capping with Institutional Control; and
iv. SS Alternative 4, Excavation and Disposal.

SS Alternative 1 would be the most implementable since there would be no further work involved.

SS Alternative 2 would also be highly implementable since the entire TCC facility is already fenced.

The implementability of the other alternatives is primarily dependent upon the complexity of the construction activities. Variables include the area to be capped and the volume of soil to be excavated and the size of the area to be restored. In addition, the need to minimize impacts to the on-going coke production at the TCC facility would be imperative to allow the TCC to remain a viable industry in the community.

These considerations make SS Alternatives 3 and 4 more difficult to implement.

7.6.1.7 COST

The cost associated with the implementation of the surface soil remedial alternatives is lowest for SS Alternative 1, No Further Action ($0). The costs of SS Alternatives 2 through 4 are $219,350, $2,746,200, and $17,018,100, respectively. There is a high degree of uncertainty associated with the cost of SS Alternative 4, Excavation and Disposal. These uncertainties include, the unknown characterization of the excavated materials for disposal, and the handling of excavated soils and water should the excavation have to be conducted during wet periods.

7.7 RECOMMENDED REMEDIAL ALTERNATIVE

The remedial Surface Soil Alternative recommended for the Site is Alternative 2, Institutional Control and Fencing. The reasons for this are:

- the potential risks associated with the chemicals found on the Site are minimal;
- the Site is already fenced and therefore protected from trespassers;
- the Site is zoned Industrial and is expected to remain as such;
- the chemicals found on the Site are primarily related to the residual presence of the coke product that is manufactured on the Site by TCC;
- the TCC workers are trained in the proper handling and management of the final product (coke) and therefore are familiar with the chemicals that will be present in the coke, regardless of where it is found on the Site.

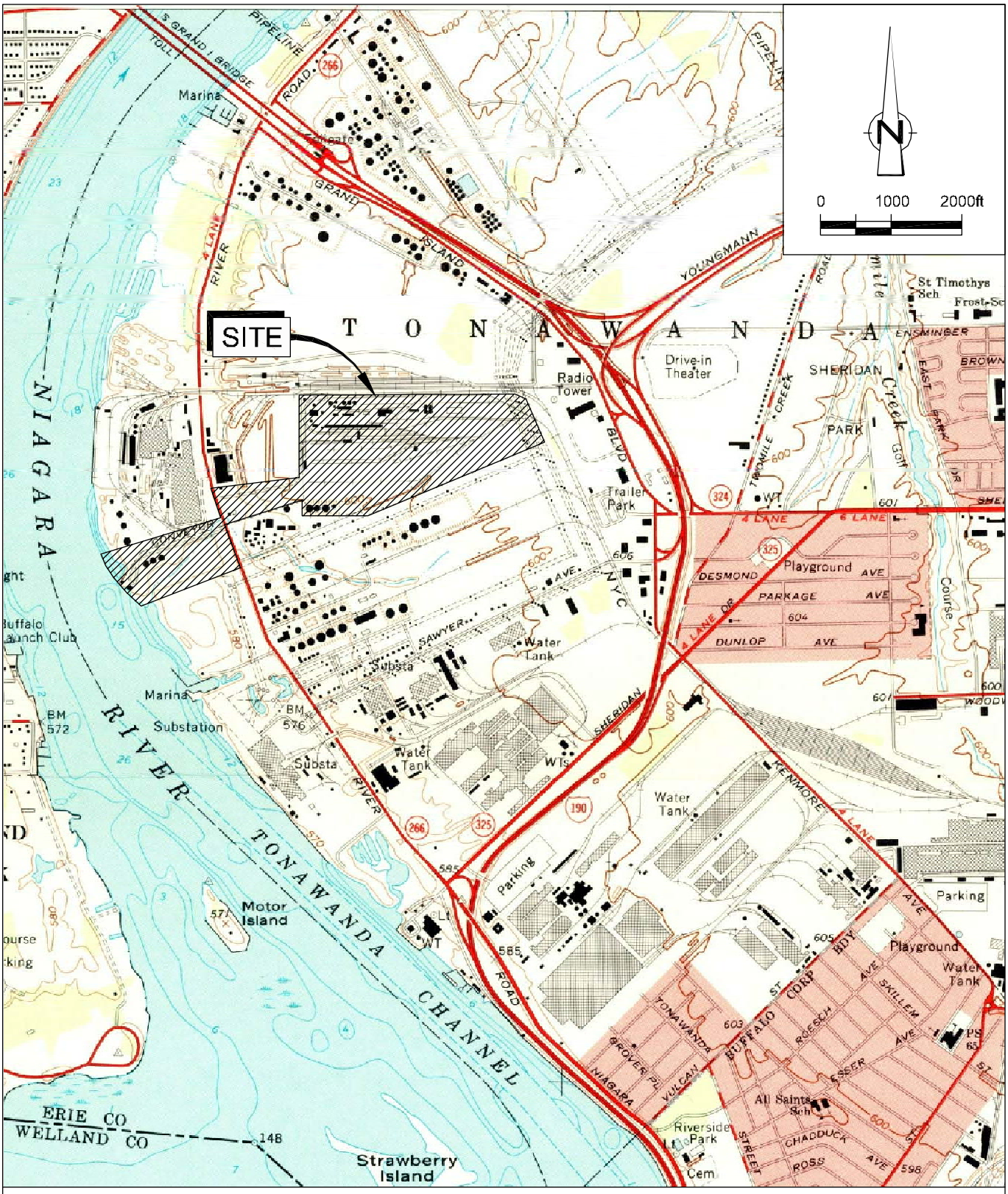
The conditions of the surface soils at the Site are consistent with background conditions. In addition, the Site continues to operate as an industrial coke manufacturing facility and will for the foreseeable future. This proposed remedy meets the RAOs and is protective of human health and the environment.

The total estimated cost of the recommended remedial Alternative is $219,350.

8.0 REFERENCES

- NYSDEC, "Technical and Guidance Memorandum #4030, Selection of Remedial Actions at Inactive Hazardous Waste Sites," May 15, 1990.
- 6 NYCRR Part 375, “Environmental Remediation Programs Subpart 375-6 Remedial Program Soil Cleanup Objectives.”
- 6 NYCRR Part 701, "Classifications-surface Waters and Groundwaters."
- New York State Department of Environmental Conservation, “Technical Guidance for Screening of Contaminated Sediments,” November 22, 1993.
- New York State Department of Environmental Conservation, "DAR-1 AGC/SGC Tables," December 22, 2003.
- Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, Reissued June 1998 [TOGS 1.1.1]
- Federal Remediation Technologies Roundtable, "Remediation Technologies Screening Matrix and Reference Guide," Version 4.0.
- Recra Research Inc., “Tonawanda Coke Corporation, New York State Superfund Phase I Summary Report,” November 1983.
- Malcolm Pirnie Inc. “Phase II Investigation Tonawanda Coke Site,” December 1986.
- Conestoga-Rovers & Associates Inc., “Supplemental Site Investigation Tonawanda Coke Corporation, Tonawanda, New York,” July 1990.
- Conestoga-Rovers & Associates, Inc., “Additional Site Investigation Tonawanda Coke Corporation, Tonawanda, New York,” November 1992.
- Conestoga-Rovers & Associates, Inc., “Remedial Investigation Summary Report Tonawanda Coke Corporation, Tonawanda, New York,” May 1996.

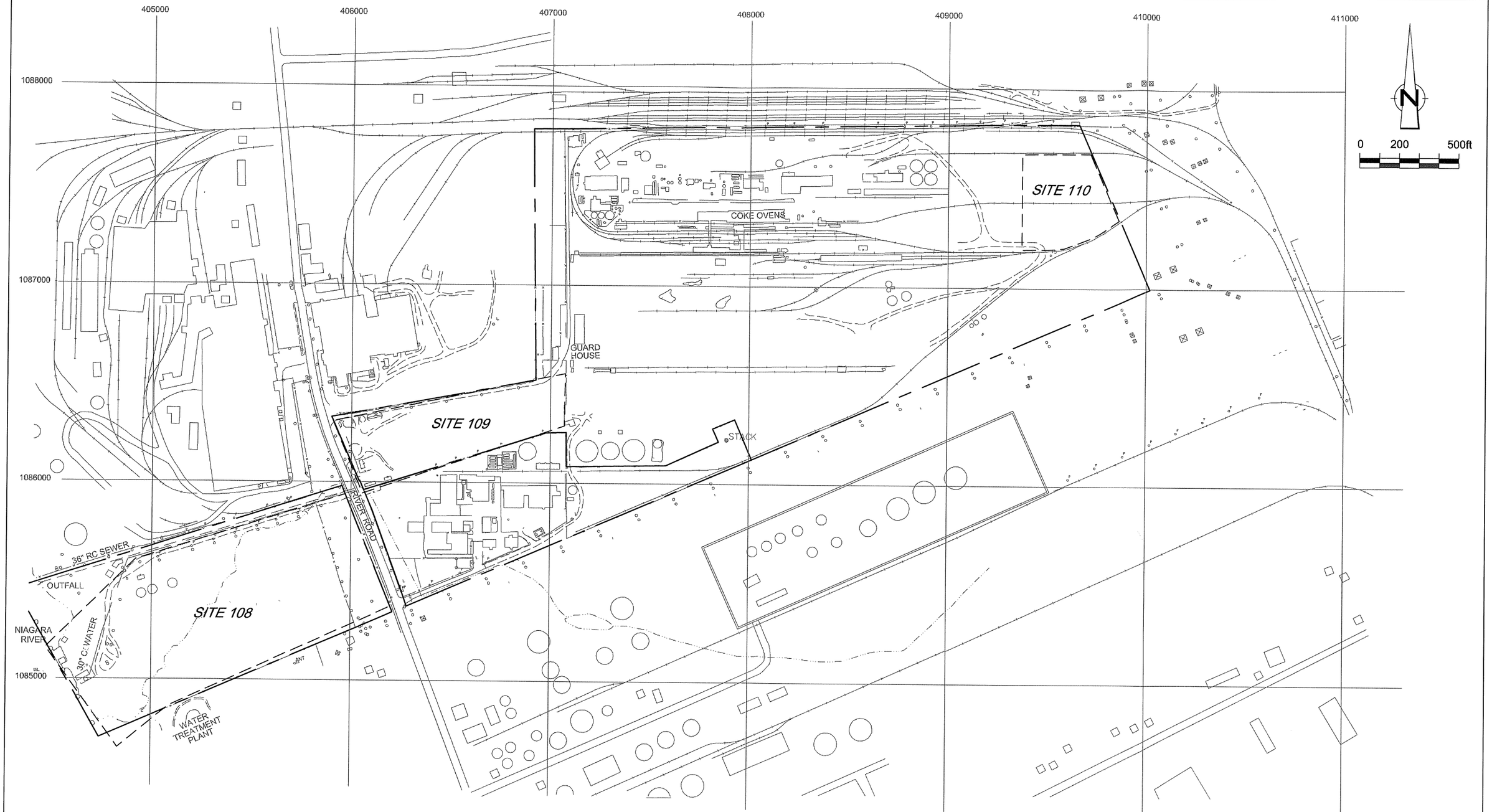
FIGURES



SOURCE: USGS QUADRANGLE MAP;
BUFFALO NW, NEW YORK

figure 1.1

SITE LOCATION
FINAL SUPPLEMENTAL REPORT
Tonawanda Coke Corporation



LEGEND

SITE 108 SITE LOCATION

figure 1.2

SITE PLAN
FINAL SUPPLEMENTAL REPORT
Tonawanda Coke Corporation

02428-00(010)GN-BU002 DEC 11/2007

405000
406000
407000
408000
409000
410000
411000
1088000
1087000
1086000
1085000

N

0 200 500ft

004
003
001
002

SS-15
SS-14
SS-13
SS-12
SS-11
SITE 110
MW3R

COKE OVENS
GUARD HOUSE
STACK

SS-8
SS-6
SITE 109
SS-9
SS-10
SS-7

ALLIED CHEMICAL
RIVER ROAD

TP-1
SS-3
36" RC SEWER
OUTFALL
SITE 108
SS-2
SS-4
SS-5
TP-2
TP-3
NIAGARA RIVER
30" C.I. WATER
SS-1
RIVER 1
WATER TREATMENT PLANT

RIVER 2
~30ft. SOUTH
RIVER 3
~125ft. SOUTH

LEGEND

SITE 108 — SITE LOCATION

SS10 — SURFACE SOIL SAMPLE LOCATION (AUGUST 2005)

001 — BACKGROUND SURFACE SOIL SAMPLE LOCATION (AUGUST 2005)

RIVER 1 — RIVER SEDIMENT SAMPLE LOCATION (2005)

TP-1 — TEST PIT LOCATION (AUGUST 2005)

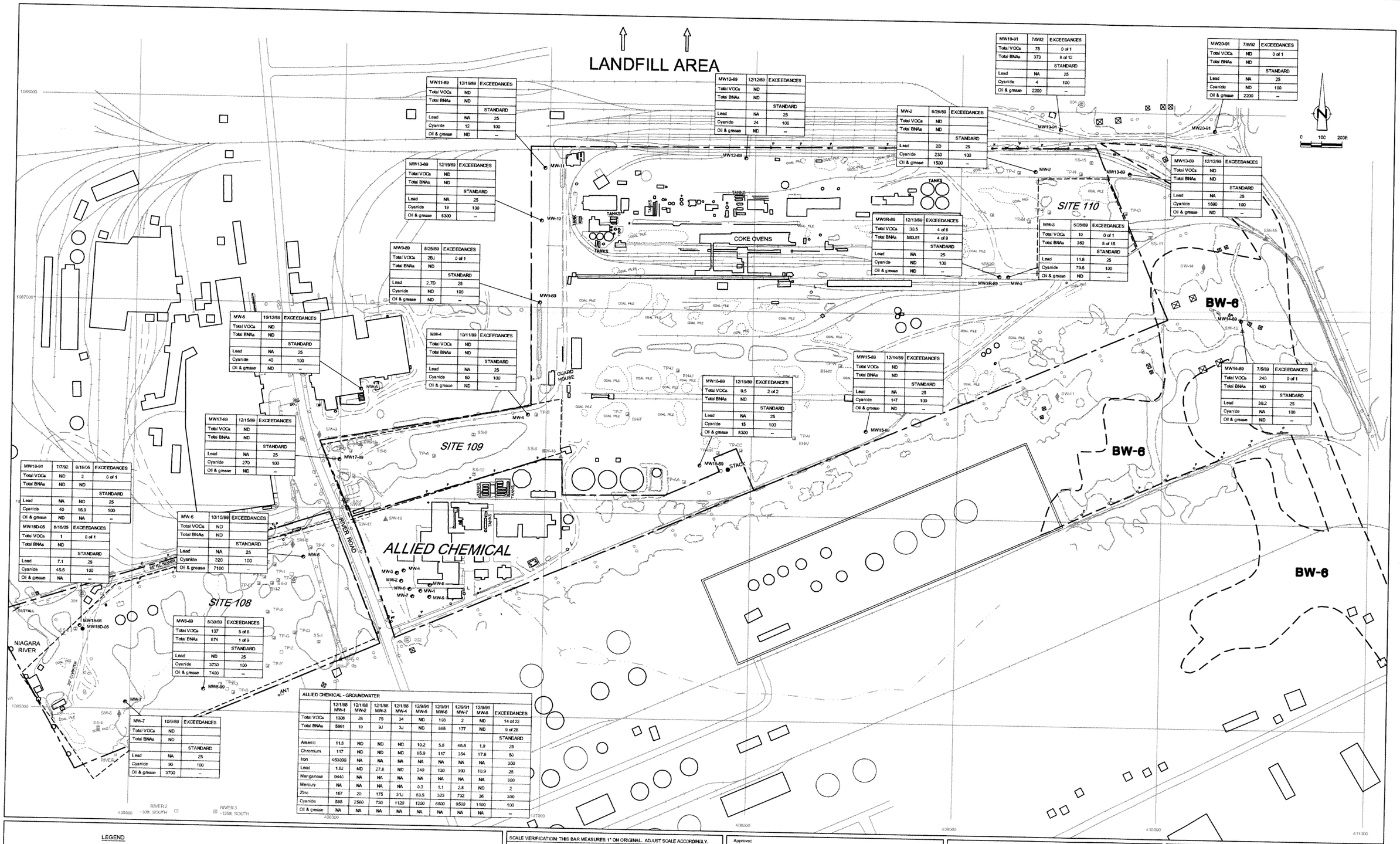
PROPERTY LINE

figure 2.1

INVESTIGATION LOCATIONS
FINAL SUPPLEMENTAL REPORT
Tonawanda Coke Corporation

02428-00(010)GN-BU003 DEC 11/2007

PLANS



MW11-89	12/19/89	EXCEEDANCES
Total VOCs	ND	
Total BNAs	ND	
		STANDARD
Lead	NA	25
Cyanide	12	100
Oil & grease	ND	–

MW12-89	12/12/89	EXCEEDANCES
Total VOCs	ND	
Total BNAs	ND	
		STANDARD
Lead	NA	25
Cyanide	24	100
Oil & grease	ND	–

MW19-91	7/6/92	EXCEEDANCES
Total VOCs	76	0 of 1
Total BNAs	373	8 of 12
		STANDARD
Lead	NA	25
Cyanide	4	100
Oil & grease	2200	–

MW20-91	7/6/92	EXCEEDANCES
Total VOCs	ND	0 of 1
Total BNAs	ND	
		STANDARD
Lead	NA	25
Cyanide	ND	100
Oil & grease	2200	–

MW2	8/28/89	EXCEEDANCES
Total VOCs	ND	
Total BNAs	ND	
		STANDARD
Lead	20	25
Cyanide	230	100
Oil & grease	1500	–

MW13-89	12/12/89	EXCEEDANCES
Total VOCs	ND	
Total BNAs	ND	
		STANDARD
Lead	NA	25
Cyanide	1690	100
Oil & grease	ND	–

MW3R-89	12/13/89	EXCEEDANCES
Total VOCs	33.5	4 of 6
Total BNAs	583.61	4 of 9
		STANDARD
Lead	NA	25
Cyanide	ND	100
Oil & grease	ND	–

MW-3	5/26/89	EXCEEDANCES
Total VOCs	10	0 of 1
Total BNAs	360	5 of 15
		STANDARD
Lead	11.8	25
Cyanide	79.6	100
Oil & grease	ND	–

MW9-89	8/25/89	EXCEEDANCES
Total VOCs	28J	0 of 1
Total BNAs	ND	
		STANDARD
Lead	2.7D	25
Cyanide	ND	100
Oil & grease	ND	–

MW-5	10/12/89	EXCEEDANCES
Total VOCs	ND	
Total BNAs	ND	
		STANDARD
Lead	NA	25
Cyanide	40	100
Oil & grease	ND	–

MW-4	10/11/89	EXCEEDANCES
Total VOCs	ND	
Total BNAs	ND	
		STANDARD
Lead	NA	25
Cyanide	50	100
Oil & grease	ND	–

MW15-89	12/14/89	EXCEEDANCES
Total VOCs	ND	
Total BNAs	ND	
		STANDARD
Lead	NA	25
Cyanide	147	100
Oil & grease	ND	–

MW16-89	12/19/89	EXCEEDANCES
Total VOCs	9.5	2 of 2
Total BNAs	ND	
		STANDARD
Lead	NA	25
Cyanide	15	100
Oil & grease	5300	–

MW17-89	12/15/89	EXCEEDANCES
Total VOCs	ND	
Total BNAs	ND	
		STANDARD
Lead	NA	25
Cyanide	270	100
Oil & grease	ND	–

MW18-91	7/7/92	8/16/05	EXCEEDANCES
Total VOCs	ND	2	0 of 1
Total BNAs	ND	ND	
			STANDARD
Lead	NA	ND	25
Cyanide	40	18.9	100
Oil & grease	ND	NA	–

MW18D-05	8/16/05	EXCEEDANCES
Total VOCs	1	0 of 1
Total BNAs	ND	
		STANDARD
Lead	7.1	25
Cyanide	45.6	100
Oil & grease	NA	–

MW-6	10/10/89	EXCEEDANCES
Total VOCs	ND	
Total BNAs	ND	
		STANDARD
Lead	NA	25
Cyanide	320	100
Oil & grease	7100	–

MW6-89	5/30/89	EXCEEDANCES
Total VOCs	137	5 of 8
Total BNAs	874	1 of 9
		STANDARD
Lead	ND	25
Cyanide	3730	100
Oil & grease	7400	–

MW-7	10/9/89	EXCEEDANCES
Total VOCs	ND	
Total BNAs	ND	
		STANDARD
Lead	NA	25
Cyanide	90	100
Oil & grease	3700	–

ALLIED CHEMICAL - GROUNDWATER

	12/1/88 MW-1	12/1/88 MW-2	12/1/88 MW-3	12/1/88 MW-4	12/9/91 MW-5	12/9/91 MW-6	12/9/91 MW-7	12/9/91 MW-8	EXCEEDANCES
Total VOCs	1308	28	75	34	ND	193	2	ND	14 of 22
Total BNAs	5991	19	9J	3J	ND	888	177	ND	9 of 28
									STANDARD
Arsenic	11.6	ND	ND	ND	10.2	5.8	46.6	1.9	25
Chromium	117	ND	ND	ND	85.9	117	354	17.8	50
Iron	463000	NA	NA	NA	NA	NA	NA	NA	300
Lead	1.6J	ND	27.8	ND	240	130	390	10.9	25
Manganese	9440	NA	NA	NA	NA	NA	NA	NA	300
Mercury	NA	NA	NA	NA	0.3	1.1	2.8	ND	2
Zinc	167	20	175	31J	83.5	323	732	36	300
Cyanide	585	2580	730	1120	1200	6530	9500	1100	100
Oil & grease	NA	NA	NA	NA	NA	NA	NA	NA	–

LEGEND

- DISPOSAL AREA BOUNDARY
- PROPERTY LINE
- SITE 109 — LANDFILL IDENTIFICATION
- WETLANDS AREA
- MW18-91 — MONITORING WELL LOCATION
- MW18D-05 — 2005 MONITORING WELL LOCATION

SCALE VERIFICATION: THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

No	Revision	Date	Initial

Approved:

NOTES:

CONCENTRATIONS AND STANDARDS REPORTED IN µg/L.

EXCEEDANCES: NUMBER OF STANDARDS EXCEEDANCES PER NUMBER OF DETECTIONS.

NA: NOT ANALYZED

ND: NOT DETECTED AT OR ABOVE DETECTION LIMIT.

– : NO STANDARD AVAILABLE

TONAWANDA COKE CORPORATION

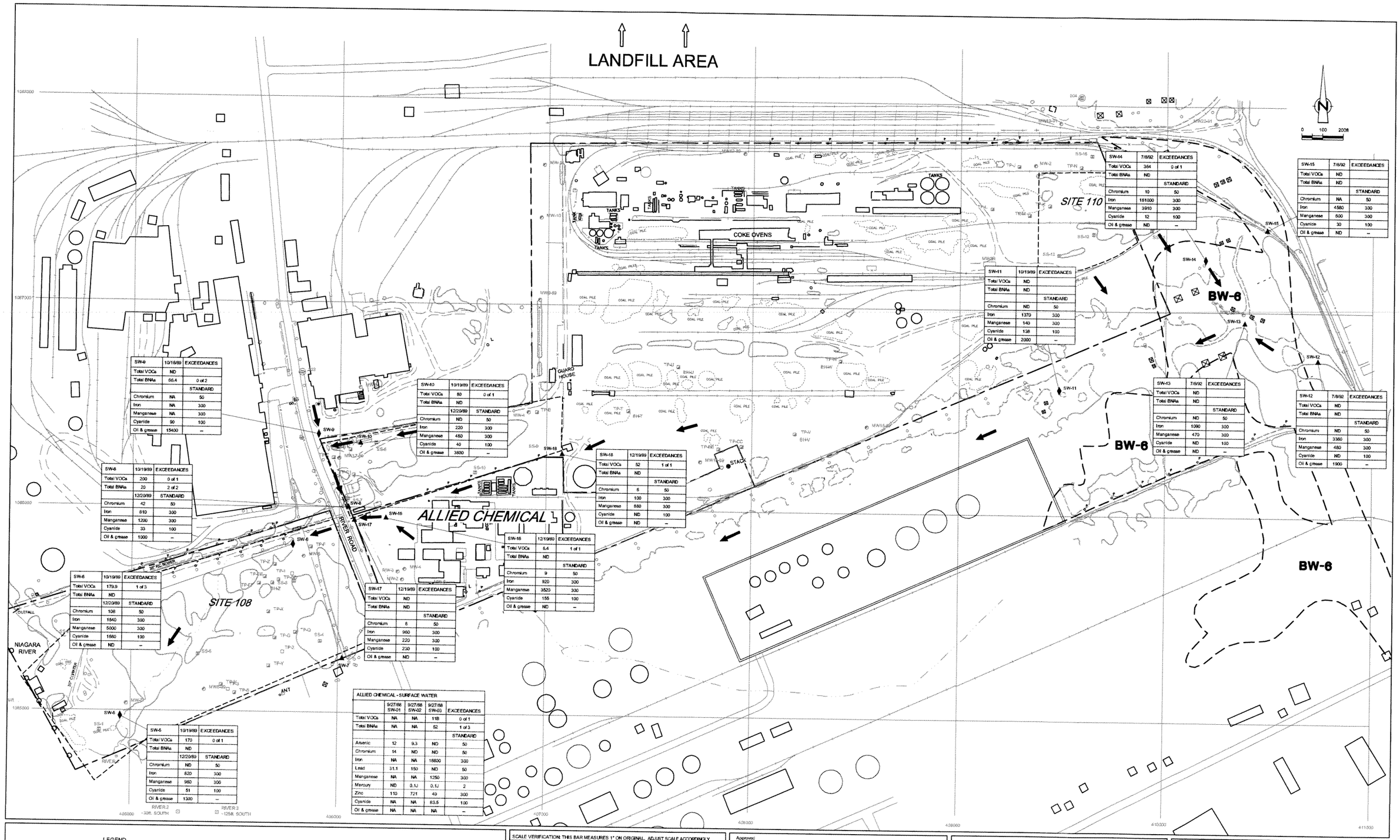
FINAL SUPPLEMENTAL REPORT

CHEMICAL PRESENCE IN GROUNDWATER

CONESTOGA-ROVERS & ASSOCIATES

Source Reference:			Date: APRIL 2008
Project Manager: J. KAY	Reviewed By: J. KAY	Designed By:	Drawn By:
Scale: AS SHOWN	Project No: 02428-00	Report No: 010	Drawing No: 1

02428-00(010)GN-BU004 DEC 11/2007



SW-9	10/16/89	EXCEEDANCES
Total VOCs	ND	
Total BNAs	66.4	0 of 2
		STANDARD
Chromium	NA	50
Iron	NA	300
Manganese	NA	300
Cyanide	90	100
Oil & grease	15400	--

SW-8	10/19/89	EXCEEDANCES
Total VOCs	200	0 of 1
Total BNAs	20	2 of 2
	12/20/89	STANDARD
Chromium	42	50
Iron	810	300
Manganese	1200	300
Cyanide	33	100
Oil & grease	1000	--

SW-6	10/19/89	EXCEEDANCES
Total VOCs	179.9	1 of 5
Total BNAs	ND	
	12/20/89	STANDARD
Chromium	108	50
Iron	1540	300
Manganese	5000	300
Cyanide	1560	100
Oil & grease	ND	--

SW-5	10/19/89	EXCEEDANCES
Total VOCs	170	0 of 1
Total BNAs	ND	
	12/20/89	STANDARD
Chromium	ND	50
Iron	820	300
Manganese	960	300
Cyanide	51	100
Oil & grease	1300	--

SW-10	10/19/89	EXCEEDANCES
Total VOCs	80	0 of 1
Total BNAs	ND	
	12/20/89	STANDARD
Chromium	ND	50
Iron	220	300
Manganese	450	300
Cyanide	40	100
Oil & grease	3800	--

SW-18	12/19/89	EXCEEDANCES
Total VOCs	52	1 of 1
Total BNAs	ND	
		STANDARD
Chromium	6	50
Iron	100	300
Manganese	580	300
Cyanide	ND	100
Oil & grease	ND	--

SW-16	12/19/89	EXCEEDANCES
Total VOCs	6.4	1 of 1
Total BNAs	ND	
		STANDARD
Chromium	9	50
Iron	920	300
Manganese	3520	300
Cyanide	155	100
Oil & grease	ND	--

SW-17	12/19/89	EXCEEDANCES
Total VOCs	ND	
Total BNAs	ND	
		STANDARD
Chromium	6	50
Iron	960	300
Manganese	220	300
Cyanide	230	100
Oil & grease	ND	--

ALLIED CHEMICAL - SURFACE WATER				
	9/27/88 SW-01	9/27/88 SW-02	9/27/88 SW-03	EXCEEDANCES
Total VOCs	NA	NA	118	0 of 1
Total BNAs	NA	NA	52	1 of 3
				STANDARD
Arsenic	12	9.3	ND	50
Chromium	14	ND	ND	50
Iron	NA	NA	16800	300
Lead	31.1	150	ND	50
Manganese	NA	NA	1250	300
Mercury	ND	0.1J	0.1J	2
Zinc	110	721	49	300
Cyanide	NA	NA	63.5	100
Oil & grease	NA	NA	NA	--

SW-14	7/8/92	EXCEEDANCES
Total VOCs	364	0 of 1
Total BNAs	ND	
		STANDARD
Chromium	10	50
Iron	161000	300
Manganese	3910	300
Cyanide	12	100
Oil & grease	ND	--

SW-11	10/19/89	EXCEEDANCES
Total VOCs	ND	
Total BNAs	ND	
		STANDARD
Chromium	ND	50
Iron	1370	300
Manganese	140	300
Cyanide	138	100
Oil & grease	2000	--

SW-15	7/8/92	EXCEEDANCES
Total VOCs	ND	
Total BNAs	ND	
		STANDARD
Chromium	NA	50
Iron	4580	300
Manganese	600	300
Cyanide	30	100
Oil & grease	ND	--

SW-13	7/8/92	EXCEEDANCES
Total VOCs	ND	
Total BNAs	ND	
		STANDARD
Chromium	ND	50
Iron	1090	300
Manganese	470	300
Cyanide	ND	100
Oil & grease	ND	--

SW-12	7/8/92	EXCEEDANCES
Total VOCs	ND	
Total BNAs	ND	
		STANDARD
Chromium	ND	50
Iron	3360	300
Manganese	480	300
Cyanide	ND	100
Oil & grease	1900	--

LEGEND

- DISPOSAL AREA BOUNDARY
- PROPERTY LINE
- SITE 109 LANDFILL IDENTIFICATION
- WETLANDS AREA
- ▲ SW-10 SURFACE WATER SEDIMENT SAMPLE LOCATION
- ♦ SW-5 SURFACE WATER SAMPLE LOCATION
- SURFACE WATER FLOW DIRECTION

SCALE VERIFICATION: THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

No	Revision	Date	Initial

Approved

NOTES:

CONCENTRATIONS AND STANDARDS REPORTED IN µg/L.

EXCEEDANCES: NUMBER OF STANDARDS EXCEEDANCES PER NUMBER OF DETECTIONS.

NA: NOT ANALYZED

ND: NOT DETECTED AT OR ABOVE DETECTION LIMIT.

-- : NO STANDARD AVAILABLE

TONAWANDA COKE CORPORATION

FINAL SUPPLEMENTAL REPORT

CHEMICAL PRESENCE IN SURFACE WATER

CONESTOGA-ROVERS & ASSOCIATES

Source Reference:			Date: DECEMBER 2007
Project Manager: J. KAY	Reviewed By: J. KAY	Designed By:	Drawn By:
Scale: AS SHOWN	Project No: 02428-00	Report No: 010	Drawing No: 2

02428-00(010)GN-BU005 DEC 11/2007

LANDFILL AREA

SITE 109

SITE 108

SITE 110

ALLIED CHEMICAL

BW-6

BW-6

BW-6

COKE OVENS

TANKS

GUARD HOUSE

STACK

RIVER ROAD

NIAGARA RIVER

OUTFALL

WATER TREATMENT PLANT

RIVER 1

RIVER 2 ~30ft. SOUTH

RIVER 3 ~125ft. SOUTH

NYSDEC-A	4/11/89	EXCEEDANCES
Total VOCs	0.043	0 of 3
Total BNAs	400.7	8 of 20
		CRITERIA @ 1%C
Arsenic	8.7	6
Chromium	46.7	26
Iron	35100	2.0%
Lead	61.6	31
Manganese	738	460
Mercury	0.86	0.15
Zinc	267E	120
Cyanide	4.7	--
Oil & grease	NA	--

NYSDEC-A	8/8/89	EXCEEDANCES
Total VOCs	0.031	0 of 5
Total BNAs	935.3	5 of 18
		CRITERIA @ 1%C
Arsenic	5.5	6
Chromium	12.9	26
Iron	30500	2.0%
Lead	283	31
Manganese	510	460
Mercury	5.2	0.15
Zinc	154	120
Cyanide	4.5	--
Oil & grease	NA	--

SW-9	12/20/89 (mg/kg)	EXCEEDANCES
Total VOCs	2.29	0 of 3
Total BNAs	2.12	0 of 1
Oil & Grease	17.6	--

SW-14	7/8/92 (mg/kg)	EXCEEDANCES
Total VOCs	2.62	0 of 1
Total BNAs	46.29	4 of 10
Cyanide	30.3	--

SW-11	7/8/92 (mg/kg)	EXCEEDANCES
Total VOCs	0.0519	0 of 2
Total BNAs	2.12	0 of 5
Cyanide	2.4	--

SW-6	12/20/89 (mg/kg)	EXCEEDANCES
Total VOCs	3.18	0 of 6
Total BNAs	594.2	7 of 8
Oil & Grease	31.7	--

SW-5	12/20/89 (mg/kg)	EXCEEDANCES
Total VOCs	5.43	0 of 4
Total BNAs	17.97	0 of 2
Oil & Grease	4060	--

SED-01	7/1/93 (mg/kg)	EXCEEDANCES
Total VOCs	0.0224	0 of 10
Total BNAs	53.21	4 of 19

SED-02	7/1/93 (mg/kg)	EXCEEDANCES
Total VOCs	0.035	0 of 9
Total BNAs	105.26	10 of 20

SED-03	7/1/93 (mg/kg)	EXCEEDANCES
Total VOCs	0.0405	0 of 9
Total BNAs	783.1	10 of 20

SED-04	7/1/93 (mg/kg)	EXCEEDANCES
Total VOCs	0.0643	0 of 7
Total BNAs	2387.63	10 of 21

SED-05	7/1/93 (mg/kg)	EXCEEDANCES
Total VOCs	0.0342	0 of 6

RIVER-1	8/17/05 (mg/kg)	EXCEEDANCES
Total BNAs	282.59	7 of 25

RIVER-2	8/17/05 (mg/kg)	EXCEEDANCES
Total BNAs	5.7	0 of 12

RIVER-3	8/17/05 (mg/kg)	EXCEEDANCES
Total BNAs	8.71	0 of 14

ALLIED CHEMICAL - SEDIMENTS

	9/27/88 SD-01	9/27/88 SD-02	9/27/88 SD-03	EXCEEDANCES
Total VOCs	NA	NA	0.247	0 of 5
Total BNAs	NA	NA	4.38J	0 of 1
				CRITERIA @ 1%C
Arsenic	9.3	24.2	16.4	6
Chromium	25.7	67.4	40.4	26
Iron	NA	NA	27700	2.0%
Lead	72.3	804	123	31
Manganese	NA	NA	491	460
Mercury	0.33	4	0.42	0.15
Zinc	164	4280	211	120
Cyanide	NA	NA	3.6	--
Oil & grease	NA	NA	NA	--

LEGEND

DISPOSAL AREA BOUNDARY

PROPERTY LINE

SITE 109 LANDFILL IDENTIFICATION

WETLANDS AREA

RIVER 1 2005 RIVER SEDIMENT SAMPLE

SW-5 SURFACE WATER SAMPLE LOCATION

SURFACE WATER FLOW DIRECTION

SCALE VERIFICATION: THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

No	Revision	Date	Initial

Approved

NOTES:

CONCENTRATIONS AND STANDARDS REPORTED IN µg/g.

EXCEEDANCES: NUMBER OF STANDARDS EXCEEDANCES PER NUMBER OF DETECTIONS.

NA: NOT ANALYZED

ND: NOT DETECTED AT OR ABOVE DETECTION LIMIT.

-- : NO STANDARD AVAILABLE

TONAWANDA COKE CORPORATION

FINAL SUPPLEMENTAL REPORT

CHEMICAL PRESENCE IN SEDIMENT

CONESTOGA-ROVERS & ASSOCIATES

Source Reference:			Date: DECEMBER 2007
Project Manager: J. KAY	Reviewed By: J. KAY	Designed By:	Drawn By:
Scale: AS SHOWN	Project No: 02428-00	Report No: 010	Drawing No: 3

02428-00(010)GN-BU006 DEC 11/2007

LANDFILL AREA

004	DEC/05 (mg/kg)	EXCEEDANCES
Total BNAs	7.5	0 of 19
Cyanide	ND	—

SS-15	AUG/05 (mg/kg)	EXCEEDANCES
Total VOCs	0.017	0 of 2
Total BNAs	186.5	7 of 27
Cyanide	3.2	—

SS-14	AUG/05 (mg/kg)	EXCEEDANCES
Total VOCs	0.159	0 of 4
Total BNAs	87.5	5 of 24
Cyanide	4	—

SS-13	AUG/05 (mg/kg)	EXCEEDANCES
Total VOCs	0.014	0 of 1
Total BNAs	138.1	6 of 25
Cyanide	1.4	—

SS-11	AUG/05 (mg/kg)	EXCEEDANCES
Total VOCs	0.06	0 of 1
Total BNAs	213.3	7 of 28
Cyanide	5.1 J	—

SS-12	AUG/05 (mg/kg)	EXCEEDANCES
Total VOCs	0.043	0 of 1
Total BNAs	137.5	7 of 27
Cyanide	3.9 J	—

003	DEC/05 (mg/kg)	EXCEEDANCES
Total BNAs	59	5 of 22
Cyanide	0.97	—

SS-6	AUG/05 (mg/kg)	EXCEEDANCES
Total VOCs	0.165	0 of 4
Total BNAs	13.6	3 of 22
Cyanide	ND	—

SS-4	AUG/05 (mg/kg)	EXCEEDANCES
Total VOCs	0.333	0 of 2
Total BNAs	49.7	6 of 25
Cyanide	0.6 J	—

SS-7	AUG/05 (mg/kg)	EXCEEDANCES
Total VOCs	0.178	0 of 6
Total BNAs	8.2	0 of 21
Cyanide	ND	—

SS-3	AUG/05 (mg/kg)	EXCEEDANCES
Total VOCs	0.229	0 of 6
Total BNAs	24.3	5 of 19
Cyanide	2.0 J	—

SS-9	AUG/05 (mg/kg)	EXCEEDANCES
Total VOCs	0.062	0 of 3
Total BNAs	534	7 of 28
Cyanide	ND	—

001	DEC/05 (mg/kg)	EXCEEDANCES
Total BNAs	30.2	1 of 29
Cyanide	1.2	—

SS-10	AUG/05 (mg/kg)	EXCEEDANCES
Total VOCs	0.316	0 of 6
Total BNAs	28.3	5 of 24
Cyanide	ND	—

SS-2	AUG/05 (mg/kg)	EXCEEDANCES
Total VOCs	0.061	0 of 1
Total BNAs	120.3	7 of 29
Cyanide	1.0 J	—

002	DEC/05 (mg/kg)	EXCEEDANCES
Total BNAs	0.67	0 of 14
Cyanide	ND	—

SS-5	AUG/05 (mg/kg)	EXCEEDANCES
Total VOCs	0.19	0 of 6
Total BNAs	10.5	1 of 22
Cyanide	1.9 J	—

SS-1	AUG/05 (mg/kg)	EXCEEDANCES
Total VOCs	0.041	0 of 2
Total BNAs	567.3	7 of 21
Cyanide	2.8 J	—

SITE 109

SITE 110

SITE 108

ALLIED CHEMICAL

COKE OVENS

TANKS

STACK

RIVER ROAD

NIAGARA RIVER

OUTFALL

WATER TREATMENT PLANT

BW-6

BW-6

BW-6

0 100 200ft

LEGEND

- DISPOSAL AREA BOUNDARY
- PROPERTY LINE
- SITE 109 — LANDFILL IDENTIFICATION
- WETLANDS AREA
- SS10 — 2005 SURFACE SOIL SAMPLING LOCATION
- 901 — 2005 OFF-SITE BACKGROUND SURFACE SOIL SAMPLE LOCATION

SCALE VERIFICATION "THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

No	Revision	Date	Initial

Approved

NOTES:

CONCENTRATIONS AND STANDARDS REPORTED IN µg/g.

EXCEEDANCES: NUMBER OF STANDARDS EXCEEDANCES PER NUMBER OF DETECTIONS.

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— : NO STANDARD AVAILABLE

TONAWANDA COKE CORPORATION

FINAL SUPPLEMENTAL REPORT

CHEMICAL PRESENCE IN SURFACE SOIL

CONESTOGA-ROVERS & ASSOCIATES

Source Reference:			Date: DECEMBER 2007
Project Manager: J. KAY	Reviewed By: J. KAY	Designed By:	Drawn By:
Scale: AS SHOWN	Project No: 02428-00	Report No: 010	Drawing No: 4

02428-00(010)GN-BU007 DEC 11/2007

LANDFILL AREA

SITE 110

SITE 109

SITE 108

ALLIED CHEMICAL

BW-6

BW-6

BW-6

COKE OVENS

TANKS

GUARD HOUSE

STACK

RIVER ROAD

NIAGARA RIVER

OUTFALL

WATER TREATMENT PLANT

TP-1	AUG/05 (mg/kg)	EXCEEDANCES
Total VOCs	0.196	0 of 7
Total BNAs	34.5	5 of 25
Cyanide	3.7	—

TP-2	AUG/05 (mg/kg)	EXCEEDANCES
Total VOCs	5.981	0 of 10
Total BNAs	15.3	0 of 18
Cyanide	45.1	—

TP-3	AUG/05 (mg/kg)	EXCEEDANCES
Total VOCs	0.26	0 of 7
Total BNAs	5.4	0 of 16
Cyanide	7.8	—

LEGEND

DISPOSAL AREA BOUNDARY — TP-1 2005 TEST PIT LOCATION

PROPERTY LINE

SITE 109 LANDFILL IDENTIFICATION

WETLANDS AREA

SCALE VERIFICATION: THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

No	Revision	Date	Initial

Approved:

NOTES:

CONCENTRATIONS AND STANDARDS REPORTED IN µg/g.

EXCEEDANCES: NUMBER OF STANDARDS EXCEEDANCES PER NUMBER OF DETECTIONS.

NA: NOT ANALYZED

ND: NOT DETECTED AT OR ABOVE DETECTION LIMIT.

– : NO STANDARD AVAILABLE

TONAWANDA COKE CORPORATION

FINAL SUPPLEMENTAL REPORT

CHEMICAL PRESENCE IN TEST PIT SOIL SAMPLES

CONESTOGA-ROVERS & ASSOCIATES

Source Reference:			Date: DECEMBER 2007
Project Manager: J. KAY	Reviewed By: J. KAY	Designed By:	Drawn By:
Scale: AS SHOWN	Project No: 02428-00	Report No: 010	Drawing No: 5

02428-000103GN-BU006 DEC 11/2007

TABLES

TABLE 2.1

GROUNDWATER ANALYTICAL RESULTS SUMMARY - AUGUST 2005
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*MW-7*	*MW-18-91*	*MW-18D-05*	*MW-18D-05*
Sample ID:				*WG-2428-081805-027*	*WG-2428-081605-004*	*WG-2428-081605-002*	*WG-2428-081605-003*
Sample Date:				*8/18/2005*	*8/16/2005*	*8/16/2005*	*8/16/2005*
							Duplicate
Parameter	*Units*	*Ambient Water Quality Standards (GA)*	*Ambient Water Quality Guidance Values (GA)*				
		a	*b*				
Volatiles							
1,1,1-Trichloroethane	µg/L	5	-	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	µg/L	5	-	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	µg/L	1	-	5 UJ	5 UJ	5 UJ	5 UJ
1,1-Dichloroethane	µg/L	5	-	5 UJ	5 UJ	5 UJ	5 UJ
1,1-Dichloroethene	µg/L	5	-	5 UJ	5 UJ	5 UJ	5 UJ
1,2,4-Trichlorobenzene	µg/L	5	-	5 U	5 U	5 U	5 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	0.04	-	5 U	5 U	5 U	5 U
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	0.0006	-	5 U	5 U	5 U	5 U
1,2-Dichlorobenzene	µg/L	3	-	5 U	5 U	5 U	5 U
1,2-Dichloroethane	µg/L	0.6	-	5 UJ	5 UJ	5 UJ	5 UJ
1,2-Dichloropropane	µg/L	5	-	5 UJ	5 UJ	5 UJ	5 UJ
1,3-Dichlorobenzene	µg/L	3	-	5 U	5 U	5 U	5 U
1,4-Dichlorobenzene	µg/L	3	-	5 U	5 U	5 U	5 U
2-Butanone (Methyl Ethyl Ketone)	µg/L	-	50	10 U	10 U	10 U	10 U
2-Hexanone	µg/L	-	50	10 U	10 U	10 U	10 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	-	-	10 U	10 U	10 U	10 U
Acetone	µg/L	-	50	10 U	10 U	10 U	10 U
Benzene	µg/L	1	-	5 UJ	5 UJ	5 UJ	5 UJ
Bromodichloromethane	µg/L	-	50	5 UJ	5 UJ	5 UJ	5 UJ
Bromoform	µg/L	-	50	5 U	5 U	5 U	5 U
Bromomethane (Methyl Bromide)	µg/L	5	-	5 U	5 U	5 U	5 U
Carbon disulfide	µg/L	-	60	5 U	5 U	1 J	5 U
Carbon tetrachloride	µg/L	5	-	5 U	5 U	5 U	5 U
Chlorobenzene	µg/L	5	-	5 U	5 U	5 U	5 U
Chloroethane	µg/L	5	-	5 UJ	5 UJ	5 UJ	5 UJ
Chloroform (Trichloromethane)	µg/L	7	-	5 UJ	5 UJ	5 UJ	5 UJ
Chloromethane (Methyl Chloride)	µg/L	5	-	5 UJ	5 UJ	5 UJ	5 UJ
cis-1,2-Dichloroethene	µg/L	5	-	5 UJ	2 J	5 UJ	5 UJ
cis-1,3-Dichloropropene	µg/L	-	-	5 UJ	5 UJ	5 UJ	5 UJ
Cyclohexane	µg/L	-	-	5 U	5 U	5 U	5 U
Dibromochloromethane	µg/L	-	50	5 U	5 U	5 U	5 U
Dichlorodifluoromethane (CFC-12)	µg/L	5	-	5 UJ	5 UJ	5 UJ	5 UJ
Ethylbenzene	µg/L	5	-	5 U	5 U	5 U	5 U
Isopropylbenzene	µg/L	5	-	5 U	5 U	5 U	5 U
Methyl acetate	µg/L	-	-	5 U	5 U	5 U	5 U
Methyl cyclohexane	µg/L	-	-	5 U	5 U	5 U	5 U
Methyl Tert Butyl Ether	µg/L	-	10	5 U	5 U	5 U	5 U
Methylene chloride	µg/L	5	-	5 UJ	5 UJ	5 UJ	5 UJ
Styrene	µg/L	5	-	5 U	5 U	5 U	5 U
Tetrachloroethene	µg/L	5	-	5 U	5 U	5 U	5 U
Toluene	µg/L	5	-	5 U	5 U	5 U	5 U
trans-1,2-Dichloroethene	µg/L	5	-	5 UJ	5 UJ	5 UJ	5 UJ
trans-1,3-Dichloropropene	µg/L	-	-	5 U	5 U	5 U	5 U
Trichloroethene	µg/L	5	-	6 J[a]	5 U	5 U	5 U
Trichlorofluoromethane (CFC-11)	µg/L	5	-	5 UJ	5 UJ	5 UJ	5 UJ
Trifluorotrichloroethane (Freon 113)	µg/L	5	-	5 U	5 U	5 U	5 U
Vinyl chloride	µg/L	2	-	5 UJ	5 UJ	5 UJ	5 UJ
Xylene (total)	µg/L	-	-	5 U	5 U	5 U	5 U
Total VOCs	µg/L	-	-	6	2	1	ND

TABLE 2.1

GROUNDWATER ANALYTICAL RESULTS SUMMARY - AUGUST 2005
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*MW-7*	*MW-18-91*	*MW-18D-05*	*MW-18D-05*
Sample ID:				*WG-2428-081805-027*	*WG-2428-081605-004*	*WG-2428-081605-002*	*WG-2428-081605-003*
Sample Date:				*8/18/2005*	*8/16/2005*	*8/16/2005*	*8/16/2005*
							Duplicate
Parameter	*Units*	*Ambient Water Quality Standards (GA)*	*Ambient Water Quality Guidance Values (GA)*				
		a	*b*				
Semi-Volatiles							
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether)	µg/L	5	-	10 U	10 U	10 U	10 U
2,4,5-Trichlorophenol	µg/L	-	-	25 U	25 U	25 U	25 U
2,4,6-Trichlorophenol	µg/L	-	-	10 U	10 U	10 U	10 U
2,4-Dichlorophenol	µg/L	5	-	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	µg/L	-	50	10 U	10 U	10 U	10 U
2,4-Dinitrophenol	µg/L	-	10	25 U	25 U	25 U	25 U
2,4-Dinitrotoluene	µg/L	5	-	10 U	10 U	10 U	10 U
2,6-Dinitrotoluene	µg/L	5	-	10 U	10 U	10 U	10 U
2-Chloronaphthalene	µg/L	-	10	10 U	10 U	10 U	10 U
2-Chlorophenol	µg/L	-	-	10 U	10 U	10 U	10 U
2-Methylnaphthalene	µg/L	-	-	10 U	10 U	10 U	10 U
2-Methylphenol	µg/L	-	-	10 U	10 U	10 U	10 U
2-Nitroaniline	µg/L	5	-	25 U	25 U	25 U	25 U
2-Nitrophenol	µg/L	-	-	10 U	10 U	10 U	10 U
3,3'-Dichlorobenzidine	µg/L	5	-	10 U	10 U	10 U	10 U
3-Nitroaniline	µg/L	5	-	25 U	25 U	25 U	25 U
4,6-Dinitro-2-methylphenol	µg/L	-	-	25 U	25 U	25 U	25 U
4-Bromophenyl phenyl ether	µg/L	-	-	10 U	10 U	10 U	10 U
4-Chloro-3-methylphenol	µg/L	-	-	10 U	10 U	10 U	10 U
4-Chloroaniline	µg/L	5	-	10 U	10 U	10 U	10 U
4-Chlorophenyl phenyl ether	µg/L	-	-	10 U	10 U	10 U	10 U
4-Methylphenol	µg/L	-	-	10 U	10 U	10 U	10 U
4-Nitroaniline	µg/L	5	-	25 U	25 U	25 U	25 U
4-Nitrophenol	µg/L	-	-	25 U	25 U	25 U	25 U
Acenaphthene	µg/L	-	20	10 U	10 U	10 U	10 U
Acenaphthylene	µg/L	-	-	10 U	10 U	10 U	10 U
Acetophenone	µg/L	-	-	10 U	10 U	10 U	10 U
Anthracene	µg/L	-	50	10 U	10 U	10 U	10 U
Atrazine	µg/L	7.5	-	10 U	10 U	10 U	10 U
Benzaldehyde	µg/L	-	-	10 U	10 U	10 U	10 U
Benzo(a)anthracene	µg/L	-	0.002	10 U	10 U	10 U	10 U
Benzo(a)pyrene	µg/L	ND	-	10 U	10 U	10 U	10 U
Benzo(b)fluoranthene	µg/L	-	0.002	10 U	10 U	10 U	10 U
Benzo(g,h,i)perylene	µg/L	-	-	10 U	10 U	10 U	10 U
Benzo(k)fluoranthene	µg/L	-	0.002	10 U	10 U	10 U	10 U
Biphenyl	µg/L	5	-	10 U	10 U	10 U	10 U
bis(2-Chloroethoxy)methane	µg/L	5	-	10 U	10 U	10 U	10 U
bis(2-Chloroethyl)ether	µg/L	1	-	10 U	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	µg/L	5	-	10 U	10 U	10 U	10 U
Butyl benzylphthalate	µg/L	-	50	10 U	10 U	10 U	10 U
Caprolactam	µg/L	-	-	10 U	10 U	10 U	10 U
Carbazole	µg/L	-	-	10 U	10 U	10 U	10 U
Chrysene	µg/L	-	0.002	10 U	10 U	10 U	10 U
Dibenz(a,h)anthracene	µg/L	-	-	10 U	10 U	10 U	10 U
Dibenzofuran	µg/L	-	-	10 U	10 U	10 U	10 U
Diethyl phthalate	µg/L	-	50	10 U	10 U	10 U	10 U
Dimethyl phthalate	µg/L	-	50	10 U	10 U	10 U	10 U
Di-n-butylphthalate	µg/L	50	-	10 U	10 U	10 U	10 U
Di-n-octyl phthalate	µg/L	-	50	10 U	10 U	10 U	10 U
Fluoranthene	µg/L	-	50	10 U	10 U	10 U	10 U
Fluorene	µg/L	-	50	10 U	10 U	10 U	10 U
Hexachlorobenzene	µg/L	0.04	-	10 U	10 U	10 U	10 U
Hexachlorobutadiene	µg/L	0.5	-	10 U	10 U	10 U	10 U
Hexachlorocyclopentadiene	µg/L	5	-	10 U	10 U	10 U	10 U
Hexachloroethane	µg/L	5	-	10 U	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	µg/L	-	0.002	10 U	10 U	10 U	10 U
Isophorone	µg/L	-	50	10 U	10 U	10 U	10 U

TABLE 2.1

GROUNDWATER ANALYTICAL RESULTS SUMMARY - AUGUST 2005
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*MW-7*	*MW-18-91*	*MW-18D-05*	*MW-18D-05*
Sample ID:				*WG-2428-081805-027*	*WG-2428-081605-004*	*WG-2428-081605-002*	*WG-2428-081605-003*
Sample Date:				*8/18/2005*	*8/16/2005*	*8/16/2005*	*8/16/2005*
							Duplicate
Parameter	*Units*	*Ambient Water Quality Standards (GA)*	*Ambient Water Quality Guidance Values (GA)*				
		a	*b*				
Naphthalene	µg/L	-	10	10 U	10 U	10 U	10 U
Nitrobenzene	µg/L	0.4	-	10 U	10 U	10 U	10 U
N-Nitrosodi-n-propylamine	µg/L	-	-	10 U	10 U	10 U	10 U
N-Nitrosodiphenylamine	µg/L	-	50	10 U	10 U	10 U	10 U
Pentachlorophenol	µg/L	1	-	25 U	25 U	25 U	25 U
Phenanthrene	µg/L	-	50	10 U	10 U	10 U	10 U
Phenol	µg/L	1	-	10 U	10 U	10 U	10 U
Pyrene	µg/L	-	50	10 U	10 U	10 U	10 U
Total SVOCs	µg/L	-	-	ND	ND	ND	ND
Metals							
Aluminum	mg/L	-	-	0.0092 U	0.268	3.07	3.13
Antimony	mg/L	0.003	-	0.0033 U	0.0033 U	0.0033 U	0.0033 U
Arsenic	mg/L	0.025	-	0.0056 U	0.0056 U	0.0056 U	0.0056 U
Barium	mg/L	1	-	0.0543	0.0273	0.0739	0.0754
Beryllium	mg/L	-	0.003	0.0171 U	0.0171 U	0.0171 U	0.0171 U
Cadmium	mg/L	0.005	-	0.00037 U	0.00037 U	0.00037 U	0.00037 U
Calcium	mg/L	-	-	186	101	257	255
Chromium Total	mg/L	0.05	-	0.0014	0.0091	0.0075	0.0116
Cobalt	mg/L	-	-	0.0014	0.0011 U	0.0041	0.0047
Copper	mg/L	0.2	-	0.0053	0.00098 U	0.0032	0.0051
Iron	mg/L	0.3	-	0.238	**23.3[a]**	**11.2[a]**	**11.4[a]**
Lead	mg/L	0.025	-	0.0012 U	0.0012 U	0.0077	0.0064
Magnesium	mg/L	-	35	32	0.204	28.7	29.2
Manganese	mg/L	0.3	-	0.202	0.192	**0.358[a]**	**0.377[a]**
Mercury	mg/L	0.0007	-	0.00010 U	0.00010 U	0.00011	0.00010
Nickel	mg/L	0.1	-	0.0126	0.0060	0.0107	0.0132
Potassium	mg/L	-	-	3.3	16.3	11	12.5
Selenium	mg/L	0.01	-	0.0054 U	0.0054 U	0.0054 U	0.0054 U
Silver	mg/L	0.05	-	0.0036 U	0.0036 U	0.0036 U	0.0036 U
Sodium	mg/L	20	-	**22.2[a]**	12.8	**29.1[a]**	**32.9[a]**
Thallium	mg/L	-	0.0005	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Vanadium	mg/L	-	-	0.159	0.0058	0.0070	0.0081
Zinc	mg/L	-	2	0.0241	0.0160	0.0447	0.0525
General Chemistry							
Cyanide (total)	mg/L	0.2	-	0.0156	0.0169	0.0481	0.0430

Notes:

J Estimated
U Not present at or above the associated value.
UJ Estimated reporting limit.

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*MW-1*	*MW-1*	*MW-2*	*MW-2*	*MW-2*	*MW-2*	*MW-2*	*MW-2*
Sample ID:				*MW-1*	*MW-1*	*MW-2*	*MW-2*	*W-2428-DT-004*	*W-2428-DT-004 (filt)*	*W-2428-DT-005*	*W-2428-DT-005 (filt)*
Sample Date:				*11/1/1985*	*8/1/1986*	*11/1/1985*	*8/1/1986*	*6/28/1989*	*6/28/1989*	*6/28/1989*	*6/28/1989*
										Duplicate	*Duplicate*
Parameter	*Units*	*Ambient Water Quality Standards (GA)*	*Ambient Water Quality Guidance Values (GA)*								
		a	*b*								
Volatiles											
1,1,1-Trichloroethane	µg/L	5	-	-	-	-	-	5 U	-	5 U	-
1,1,2,2-Tetrachloroethane	µg/L	5	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	µg/L	1	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	µg/L	5	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	µg/L	5	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/L	5	-	-	-	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	0.04	-	-	-	-	-	-	-	-	-
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	0.0006	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	µg/L	3	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	µg/L	0.6	-	-	-	-	-	-	-	-	-
1,2-Dichloroethene (total)	µg/L	-	5	-	-	-	-	5 U	-	5 U	-
1,2-Dichloropropane	µg/L	5	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	µg/L	3	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	µg/L	3	-	-	NA	-	5.0 U	-	-	-	-
2-Butanone (Methyl Ethyl Ketone)	µg/L	-	50	-	-	-	-	-	-	-	-
2-Hexanone	µg/L	-	50	-	-	-	-	-	-	-	-
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	-	-	-	-	-	-	-	-	-	-
Acetone	µg/L	-	50	-	-	-	-	10 U	-	10 U	-
Benzene	µg/L	1	-	5.0 U	NA	5.0 U	5.0 U	5 U	-	5 U	-
Bromodichloromethane	µg/L	-	50	-	-	-	-	-	-	-	-
Bromoform	µg/L	-	50	-	-	-	-	-	-	-	-
Bromomethane (Methyl Bromide)	µg/L	5	-	-	-	-	-	-	-	-	-
Carbon disulfide	µg/L	-	60	-	-	-	-	-	-	-	-
Carbon tetrachloride	µg/L	5	-	-	-	-	-	-	-	-	-
Chlorobenzene	µg/L	5	-	-	NA	-	5.0 U	-	-	-	-
Chloroethane	µg/L	5	-	-	-	-	-	-	-	-	-
Chloroform (Trichloromethane)	µg/L	7	-	-	-	-	-	-	-	-	-
Chloromethane (Methyl Chloride)	µg/L	5	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	µg/L	5	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	µg/L	-	-	-	-	-	-	-	-	-	-
Cyclohexane	µg/L	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	µg/L	-	50	-	-	-	-	-	-	-	-
Dichlorodifluoromethane (CFC-12)	µg/L	5	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/L	5	-	-	-	-	-	5 U	-	5 U	-
Isopropylbenzene	µg/L	5	-	-	-	-	-	-	-	-	-
Methyl acetate	µg/L	-	-	-	-	-	-	-	-	-	-
Methyl cyclohexane	µg/L	-	-	-	-	-	-	-	-	-	-
Methyl Tert Butyl Ether	µg/L	-	10	-	-	-	-	-	-	-	-
Methylene chloride	µg/L	5	-	-	-	-	-	5 U	-	5 U	-
m-Xylene/Chlorobenzene	µg/L	-	-	5.0 U	-	5.0 U	-	-	-	-	-
o-Xylene	µg/L	5	-	5.0 U	-	5.0 U	-	-	-	-	-
p-Xylene	µg/L	5	-	5.0 U	-	5.0 U	-	-	-	-	-
Styrene	µg/L	5	-	-	-	-	-	-	-	-	-
Tetrachloroethene	µg/L	5	-	-	-	-	-	-	-	-	-
Toluene	µg/L	5	-	5.0 U	NA	5.0 U	5.0 U	5 U	-	5 U	-
trans-1,2-Dichloroethene	µg/L	5	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	µg/L	-	-	-	-	-	-	-	-	-	-
Trichloroethene	µg/L	5	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane (CFC-11)	µg/L	5	-	-	-	-	-	-	-	-	-
Trifluorotrichloroethane (Freon 113)	µg/L	5	-	-	-	-	-	-	-	-	-
Vinyl chloride	µg/L	2	-	-	-	-	-	-	-	-	-
Xylene (total)	µg/L	-	-	-	NA	-	15.0 U	5 U	-	5 U	-

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*MW-1*	*MW-1*	*MW-2*	*MW-2*	*MW-2*	*MW-2*	*MW-2*	*MW-2*
Sample ID:				*MW-1*	*MW-1*	*MW-2*	*MW-2*	*W-2428-DT-004*	*W-2428-DT-004 (filt)*	*W-2428-DT-005*	*W-2428-DT-005 (filt)*
Sample Date:				*11/1/1985*	*8/1/1986*	*11/1/1985*	*8/1/1986*	*6/28/1989*	*6/28/1989*	*6/28/1989 Duplicate*	*6/28/1989 Duplicate*
Parameter	*Units*	*Ambient Water Quality Standards (GA)* *a*	*Ambient Water Quality Guidance Values (GA)* *b*								
Total VOCs	µg/L	-	-	ND	-	ND	ND	ND	-	ND	-
Semi-Volatiles											
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether)	µg/L	5	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	µg/L	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	µg/L	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	µg/L	5	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	µg/L	-	50	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	µg/L	-	10	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	µg/L	5	-	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	µg/L	5	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	µg/L	-	10	-	-	-	-	NA	-	NA	-
2-Chlorophenol	µg/L	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	µg/L	-	-	-	-	-	-	10 U	-	10 U	-
2-Methylphenol	µg/L	-	-	-	-	-	-	-	-	-	-
2-Nitroaniline	µg/L	5	-	-	-	-	-	-	-	-	-
2-Nitrophenol	µg/L	-	-	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	µg/L	5	-	-	-	-	-	-	-	-	-
3-Nitroaniline	µg/L	5	-	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	µg/L	-	-	-	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	µg/L	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	µg/L	-	-	-	-	-	-	-	-	-	-
4-Chloroaniline	µg/L	5	-	-	-	-	-	-	-	-	-
4-Chlorophenyl phenyl ether	µg/L	-	-	-	-	-	-	-	-	-	-
4-Methylphenol	µg/L	-	-	-	-	-	-	-	-	-	-
4-Nitroaniline	µg/L	5	-	-	-	-	-	-	-	-	-
4-Nitrophenol	µg/L	-	-	-	-	-	-	-	-	-	-
Acenaphthene	µg/L	-	20	7.0 U	-	6.2 U	-	10 U	-	10 U	-
Acenaphthylene	µg/L	-	-	12.0 U	NA	11.0 U	44.0 U	10 U	-	10 U	-
Acetophenone	µg/L	-	-	-	-	-	-	-	-	-	-
Anthracene	µg/L	-	50	14.0 U	-	15.0 U	-	10 U	-	10 U	-
Atrazine	µg/L	7.5	-	-	-	-	-	-	-	-	-
Benzaldehyde	µg/L	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	µg/L	-	0.002	-	-	-	-	10 U	-	10 U	-
Benzo(a)pyrene	µg/L	ND	-	26.0 U	-	24.0 U	-	10 U	-	10 U	-
Benzo(b)fluoranthene	µg/L	-	0.002	-	-	-	-	10 U	-	10 U	-
Benzo(b)fluoranthene/ Benzo(k)fluoranthene	µg/L	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	µg/L	-	-	65.0 U	-	59.0 U	-	NA	-	NA	-
Benzo(k)fluoranthene	µg/L	-	0.002	-	-	-	-	10 U	-	10 U	-
Biphenyl	µg/L	5	-	-	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	µg/L	5	-	-	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	µg/L	1	-	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate	µg/L	5	-	-	-	-	-	-	-	-	-
Butyl benzylphthalate	µg/L	-	50	-	-	-	-	-	-	-	-
Caprolactam	µg/L	-	-	-	-	-	-	-	-	-	-
Carbazole	µg/L	-	-	-	-	-	-	-	-	-	-
Chrysene	µg/L	-	0.002	21.0 U	-	19.0 U	-	10 U	-	10 U	-
Dibenz(a,h)anthracene	µg/L	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	µg/L	-	-	-	-	-	-	10 U	-	10 U	-
Diethyl phthalate	µg/L	-	50	-	-	-	-	-	-	-	-
Dimethyl phthalate	µg/L	-	50	-	-	-	-	-	-	-	-
Di-n-butylphthalate	µg/L	50	-	-	-	-	-	-	-	-	-
Di-n-octyl phthalate	µg/L	-	50	-	-	-	-	-	-	-	-
Fluoranthene	µg/L	-	50	14.0 U	NA	12.0 U	27.0 U	10 U	-	10 U	-

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*MW-1*	*MW-1*	*MW-2*	*MW-2*	*MW-2*	*MW-2*	*MW-2*	*MW-2*
Sample ID:				*MW-1*	*MW-1*	*MW-2*	*MW-2*	*W-2428-DT-004*	*W-2428-DT-004 (filt)*	*W-2428-DT-005*	*W-2428-DT-005 (filt)*
Sample Date:				*11/1/1985*	*8/1/1986*	*11/1/1985*	*8/1/1986*	*6/28/1989*	*6/28/1989*	*6/28/1989*	*6/28/1989*
										Duplicate	*Duplicate*
Parameter	*Units*	*Ambient Water Quality Standards (GA)*	*Ambient Water Quality Guidance Values (GA)*								
		a	*b*								
Fluorene	µg/L	-	50	14.0 U	NA	12.0 U	50.0 U	10 U	-	10 U	-
Hexachlorobenzene	µg/L	0.04	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/L	0.5	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	µg/L	5	-	-	-	-	-	-	-	-	-
Hexachloroethane	µg/L	5	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	µg/L	-	0.002	250.0 U	-	229.0 U	-	NA	-	NA	-
Isophorone	µg/L	-	50	-	-	-	-	-	-	-	-
Naphthalene	µg/L	-	10	13.0 U	-	10.0 U	-	10 U	-	10 U	-
Nitrobenzene	µg/L	0.4	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	µg/L	-	-	-	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	µg/L	-	50	-	-	-	-	-	-	-	-
Pentachlorophenol	µg/L	1	-	-	-	-	-	-	-	-	-
Phenanthrene	µg/L	-	50	12.0 U	-	15.0 U	-	10 U	-	10 U	-
Phenol	µg/L	1	-	-	-	-	-	-	-	-	-
Pyrene	µg/L	-	50	24.0 U	-	22.0 U	-	10 U	-	10 U	-
Total SVOCs	µg/L	-	-	ND	-	ND	ND	ND	-	ND	-
Metals											
Aluminum	mg/L	-	-	-	-	-	-	0.163	0.0230 U	0.226	0.0351
Antimony	mg/L	0.003	-	-	-	-	-	-	-	-	-
Arsenic	mg/L	0.025	-	-	-	-	-	0.0019	0.0036	0.0021	0.0038
Barium	mg/L	1	-	-	-	-	-	0.0489	0.0470	0.0513	0.0470
Beryllium	mg/L	-	0.003	-	-	-	-	0.00050 U	0.00070 U	0.00050 U	0.00070 U
Cadmium	mg/L	0.005	-	-	-	-	-	-	-	-	-
Calcium	mg/L	-	-	-	-	-	-	120	149	120	140
Chromium Total	mg/L	0.05	-	-	-	-	-	0.0046	0.0062 U	0.0038	0.0062 U
Chromium VI (Hexavalent)	mg/L	0.05	-	-	-	-	-	0.01 U	-	NA	-
Cobalt	mg/L	-	-	-	-	-	-	0.0037	0.0092	0.0033 U	0.0090
Copper	mg/L	0.2	-	-	-	-	-	0.0073 U	0.0072 U	0.0073 U	0.0072 U
Iron	mg/L	0.3	-	-	-	-	-	**6.13[a]**	**15.8[a]**	**6.29[a]**	**14.1[a]**
Lead	mg/L	0.025	-	-	-	-	-	0.0020	0.0011 U	0.00090 U	0.0011 U
Magnesium	mg/L	-	35	-	-	-	-	12.7 E	15.4 E	12.7 E	14.6 E
Manganese	mg/L	0.3	-	-	-	-	-	**0.801[a]**	**1.51[a]**	**0.894[a]**	**1.33[a]**
Mercury	mg/L	0.0007	-	-	-	-	-	0.00020 U	0.00020 UX	0.00020 U	0.00020 UX
Nickel	mg/L	0.1	-	-	-	-	-	0.0186 U	0.0358 U	0.0186 U	0.0358 U
Potassium	mg/L	-	-	-	-	-	-	2.81	6.19	2.46	6.2
Selenium	mg/L	0.01	-	-	-	-	-	0.010 UE	0.0160 U	0.010 UE	0.0160 U
Silver	mg/L	0.05	-	-	-	-	-	0.0049 U	0.0057 U	0.0049 U	0.0057 U
Sodium	mg/L	20	-	-	-	-	-	10.7	12.5	10.5	11.8
Thallium	mg/L	-	0.0005	-	-	-	-	-	-	-	-
Vanadium	mg/L	-	-	-	-	-	-	0.0026 U	0.0081	0.0026 U	0.0078
Zinc	mg/L	-	2	-	-	-	-	0.0640	0.0280	0.0316	0.0265

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*MW-1*	*MW-1*	*MW-2*	*MW-2*	*MW-2*	*MW-2*	*MW-2*	*MW-2*
Sample ID:				*MW-1*	*MW-1*	*MW-2*	*MW-2*	*W-2428-DT-004*	*W-2428-DT-004 (filt)*	*W-2428-DT-005*	*W-2428-DT-005 (filt)*
Sample Date:				*11/1/1985*	*8/1/1986*	*11/1/1985*	*8/1/1986*	*6/28/1989*	*6/28/1989*	*6/28/1989*	*6/28/1989*
										Duplicate	*Duplicate*
Parameter	*Units*	*Ambient Water Quality Standards (GA)*	*Ambient Water Quality Guidance Values (GA)*								
		a	*b*								
General Chemistry											
Cyanide (free)	mg/L	-	-	0.038	-	0.042	-	-	-	-	-
Cyanide (total)	mg/L	0.2	-	**0.730**[a]	NS	**0.740**[a]	**0.500**[a]	**0.23**[a]	-	**0.259**[a]	-
Oil and Grease	mg/L	-	-	-	-	-	-	1.5	-	1 U	-
Phenolics (Total)	mg/L	0.001	-	0.010 U	NA	**0.060**[a]	0.010 U	-	-	-	-
Total Organic Halides (TOX)	mg/L	-	-	0.00062	NA	0.010	0.00273	-	-	-	-

Notes:

C	The associated data is estimated due to outlying calibration data.
E	The associated data is estimated due to outlying surrogate recoveries or to chemical and/or physical interferences.
J	Estimated.
NA	Parameter not analyzed.
NS	No sample.
R	Unusable data due to holding time exceedance.
U	Not present at or above the associated value.
UJ	Estimated reporting limit.
W	Indicates low spike recoveries and may reflect a low bias in results.
X	The associated data is estimated due to holding time exceedences.
Y	The associated data is unusable due to spike recoveries.
*	Also present in laboratory/reagent blank, indicating possible/probable laboratory contamination.
**	High quantifiable limits due to the necessary dilution of the sample.
- -	Not applicable.

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*MW-2*	*MW-2*	*MW-2*	*MW-3*	*MW-3*	*MW-3*	*MW-3*	*MW-3*	*MW-3*	*MW-3*	*MW-3R-89*
Sample ID:		*W-2428-DT-006*	*W-2428-DT-006 (filt)*	*W-2428-DT-017*	*MW-3*	*MW-3*	*W-2428-DT-007*	*W-2428-DT-007 (filt)*	*W-2428-DT-008*	*W-2428-DT-008 (filt)*	*W-2428-DT-032*	*W-2428-DT-033*
Sample Date:		*6/28/1989*	*6/28/1989*	*10/11/1989*	*11/1/1985*	*8/1/1986*	*6/28/1989*	*6/28/1989*	*6/28/1989*	*6/28/1989*	*10/18/1989*	*10/18/1989*
		Duplicate	*Duplicate*						*Duplicate*	*Duplicate*		
Parameter	*Units*											
Volatiles												
1,1,1-Trichloroethane	µg/L	5 U	-	1.0 U	-	-	7[a]	-	8[a]	-	12.2[a]	11.4 E[a]
1,1,2,2-Tetrachloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethene (total)	µg/L	5 U	-	1.0 U	-	-	5 U	-	5 U	-	1.0 U	1.0 U
1,2-Dichloropropane	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	µg/L	-	-	-	-	29.0[a]	-	-	-	-	-	-
2-Butanone (Methyl Ethyl Ketone)	µg/L	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone	µg/L	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	-	-	-	-	-	-	-	-	-	-	-
Acetone	µg/L	10 U	-	NA	-	-	10 U	-	10 U	-	NA	NA
Benzene	µg/L	5 U	-	1.0 U	84.0[a]	6.7[a]	5 U	-	5 U	-	2.71 E[a]	2.41 E[a]
Bromodichloromethane	µg/L	-	-	-	-	-	-	-	-	-	-	-
Bromoform	µg/L	-	-	-	-	-	-	-	-	-	-	-
Bromomethane (Methyl Bromide)	µg/L	-	-	-	-	-	-	-	-	-	-	-
Carbon disulfide	µg/L	-	-	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	µg/L	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	µg/L	-	-	-	-	22.0[a]	-	-	-	-	-	-
Chloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	-
Chloroform (Trichloromethane)	µg/L	-	-	-	-	-	-	-	-	-	-	-
Chloromethane (Methyl Chloride)	µg/L	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	µg/L	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Cyclohexane	µg/L	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	µg/L	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane (CFC-12)	µg/L	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/L	5 U	-	1.0 U	-	-	5 U	-	5 U	-	1.66 E	1.0 U
Isopropylbenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Methyl acetate	µg/L	-	-	-	-	-	-	-	-	-	-	-
Methyl cyclohexane	µg/L	-	-	-	-	-	-	-	-	-	-	-
Methyl Tert Butyl Ether	µg/L	-	-	-	-	-	-	-	-	-	-	-
Methylene chloride	µg/L	5 U	-	NA	-	-	5 U	-	5 U	-	NA	NA
m-Xylene/Chlorobenzene	µg/L	-	-	-	62.0	-	-	-	-	-	-	-
o-Xylene	µg/L	-	-	-	36.0[a]	-	-	-	-	-	-	-
p-Xylene	µg/L	-	-	-	19.0[a]	-	-	-	-	-	-	-
Styrene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Toluene	µg/L	5 U	-	1.0 U	59.0[a]	11.0[a]	5 U	-	5 U	-	1.0 U	1.10 E
trans-1,2-Dichloroethene	µg/L	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane (CFC-11)	µg/L	-	-	-	-	-	-	-	-	-	-	-
Trifluorotrichloroethane (Freon 113)	µg/L	-	-	-	-	-	-	-	-	-	-	-
Vinyl chloride	µg/L	-	-	-	-	-	-	-	-	-	-	-
Xylene (total)	µg/L	5 U	-	1.0 U	-	45.0	5 U	-	5 U	-	1.0 U	2.34 E

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*MW-2*	*MW-2*	*MW-2*	*MW-3*	*MW-3*	*MW-3*	*MW-3*	*MW-3*	*MW-3*	*MW-3*	*MW-3R-89*
Sample ID:		*W-2428-DT-006*	*W-2428-DT-006 (filt)*	*W-2428-DT-017*	*MW-3*	*MW-3*	*W-2428-DT-007*	*W-2428-DT-007 (filt)*	*W-2428-DT-008*	*W-2428-DT-008 (filt)*	*W-2428-DT-032*	*W-2428-DT-033*
Sample Date:		*6/28/1989*	*6/28/1989*	*10/11/1989*	*11/1/1985*	*8/1/1986*	*6/28/1989*	*6/28/1989*	*6/28/1989*	*6/28/1989*	*10/18/1989*	*10/18/1989*
		Duplicate	*Duplicate*						*Duplicate*	*Duplicate*		
Parameter	***Units***											
Total VOCs	µg/L	ND	-	ND	260	113.7	7	-	8	-	16.57	17.25
Semi-Volatiles												
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether)	µg/L	-	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	µg/L	-	-	-	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	µg/L	-	-	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	µg/L	NA	-	3 U	-	-	NA	-	NA	-	3 U	**16.7 E[b]**
2-Chlorophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	µg/L	10 U	-	3 U	-	-	25	-	10 U	-	3.71	57.1 E
2-Methylphenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
2-Nitroaniline	µg/L	-	-	-	-	-	-	-	-	-	-	-
2-Nitrophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	µg/L	-	-	-	-	-	-	-	-	-	-	-
3-Nitroaniline	µg/L	-	-	-	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	µg/L	-	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
4-Chloroaniline	µg/L	-	-	-	-	-	-	-	-	-	-	-
4-Chlorophenyl phenyl ether	µg/L	-	-	-	-	-	-	-	-	-	-	-
4-Methylphenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
4-Nitroaniline	µg/L	-	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	µg/L	10 U	-	3 U	**59.0[b]**	-	10 U	-	10 U	-	19.2	**55.5 E[b]**
Acenaphthylene	µg/L	10 U	-	3 U	450.0	146.0	30	-	31	-	62.1	64.0 E
Acetophenone	µg/L	-	-	-	-	-	-	-	-	-	-	-
Anthracene	µg/L	10 U	-	3 U	**173.0[b]**	-	10 U	-	10 U	-	17.1	**55.0 E[b]**
Atrazine	µg/L	-	-	-	-	-	-	-	-	-	-	-
Benzaldehyde	µg/L	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	µg/L	10 U	-	3 U	-	-	10 U	-	10 U	-	3 U	**52.7 E[b]**
Benzo(a)pyrene	µg/L	10 U	-	3 U	**95.0[a]**	-	10 U	-	10 U	-	3 U	28.8 E
Benzo(b)fluoranthene	µg/L	10 U	-	3 U	-	-	**15[b]**	-	10 U	-	3 U	**49.2 E[b]**
Benzo(b)fluoranthene/Benzo(k)fluoranthene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	µg/L	NA	-	3 U	78.0	-	NA	-	NA	-	3 U	3 U
Benzo(k)fluoranthene	µg/L	10 U	-	3 U	-	-	**15[b]**	-	10 U	-	3 U	**49.2 E[b]**
Biphenyl	µg/L	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	µg/L	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	µg/L	-	-	-	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate	µg/L	-	-	-	-	-	-	-	-	-	-	-
Butyl benzylphthalate	µg/L	-	-	-	-	-	-	-	-	-	-	-
Caprolactam	µg/L	-	-	-	-	-	-	-	-	-	-	-
Carbazole	µg/L	-	-	-	-	-	-	-	-	-	-	-
Chrysene	µg/L	10 U	-	3 U	**9.0[b]**	-	10 U	-	10 U	-	3 U	**32.6 E[b]**
Dibenz(a,h)anthracene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	µg/L	10 U	-	NA	-	-	34	-	37	-	NA	NA
Diethyl phthalate	µg/L	-	-	-	-	-	-	-	-	-	-	-
Dimethyl phthalate	µg/L	-	-	-	-	-	-	-	-	-	-	-
Di-n-butylphthalate	µg/L	-	-	-	-	-	-	-	-	-	-	-
Di-n-octyl phthalate	µg/L	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	µg/L	10 U	-	3 U	**400.0[b]**	37.0	34	-	16	-	21.3	**90.9 E[b]**

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*MW-2*	*MW-2*	*MW-2*	*MW-3*	*MW-3*	*MW-3*	*MW-3*	*MW-3*	*MW-3*	*MW-3*	*MW-3R-89*
Sample ID:		*W-2428-DT-006*	*W-2428-DT-006 (filt)*	*W-2428-DT-017*	*MW-3*	*MW-3*	*W-2428-DT-007*	*W-2428-DT-007 (filt)*	*W-2428-DT-008*	*W-2428-DT-008 (filt)*	*W-2428-DT-032*	*W-2428-DT-033*
Sample Date:		*6/28/1989*	*6/28/1989*	*10/11/1989*	*11/1/1985*	*8/1/1986*	*6/28/1989*	*6/28/1989*	*6/28/1989*	*6/28/1989*	*10/18/1989*	*10/18/1989*
		Duplicate	*Duplicate*						*Duplicate*	*Duplicate*		
Parameter	*Units*											
Fluorene	µg/L	10 U	-	3 U	**99.0[b]**	**110.0[b]**	45	-	49	-	**112[b]**	**124 E[b]**
Hexachlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Hexachloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	µg/L	NA	-	3 U	**95.0[b]**	-	NA	-	NA	-	3 U	3 U
Isophorone	µg/L	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	µg/L	10 U	-	3 U	**4540.0[b]**	-	**73[b]**	-	**100[b]**	-	3 U	**459 E[b]**
Nitrobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	µg/L	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	µg/L	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	µg/L	10 U	-	3 U	**1100.0[b]**	-	29	-	38	-	**148[b]**	**264 E[b]**
Phenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
Pyrene	µg/L	10 U	-	3 U	**302.0[b]**	-	21	-	15	-	11.2	**69.3 E[b]**
Total SVOCs	µg/L	ND	-	ND	7400	293	321	-	286	-	394.61	1468
Metals												
Aluminum	mg/L	0.0985	0.0230 U	-	-	-	0.172	0.0230 U	0.104	0.0230 U	-	-
Antimony	mg/L	-	-	-	-	-	-	-	-	-	-	-
Arsenic	mg/L	0.0014	0.0033	-	-	-	0.0032	0.0031	0.0014	0.0032	-	-
Barium	mg/L	0.0494	0.0428	-	-	-	0.0431	0.0404	0.0407	0.0418	-	-
Beryllium	mg/L	0.00050 U	0.00070 U	-	-	-	0.00050 U	0.00070 U	0.00050 U	0.00070 U	-	-
Cadmium	mg/L	-	-	-	-	-	-	-	-	-	-	-
Calcium	mg/L	123	140	-	-	-	131	125	130	124	-	-
Chromium Total	mg/L	0.0038 U	0.0062 U	-	-	-	0.0038	0.0062 U	0.0038 U	0.0062 U	-	-
Chromium VI (Hexavalent)	mg/L	NA	-	0.01 U	-	-	0.01 U	-	0.01 U	-	0.01 U	0.01 U
Cobalt	mg/L	0.0033 U	0.0092	-	-	-	0.0033 U	0.0053	0.0033 U	0.0039 U	-	-
Copper	mg/L	0.0073 U	0.0072 U	-	-	-	0.0094	0.0072 U	0.0073 U	0.0072 U	-	-
Iron	mg/L	**5.39[a]**	**14.8[a]**	-	-	-	**3.3[a]**	**2.7[a]**	**2.9[a]**	**2.59[a]**	-	-
Lead	mg/L	0.00090 UW	0.0011 U	-	-	-	0.0118	0.0011 U	0.00090 U	0.0011 U	-	-
Magnesium	mg/L	12.8 E	14.4 E	-	-	-	19.5 E	18 E	19.4 E	18 E	-	-
Manganese	mg/L	**0.846[a]**	**1.42[a]**	-	-	-	**1.07[a]**	**1.05[a]**	**1.04[a]**	**1.04[a]**	-	-
Mercury	mg/L	0.00020 U	0.00020 UX	-	-	-	0.00020 U	0.00020 UX	0.00020 U	0.00020 UX	-	-
Nickel	mg/L	0.0186 U	0.0358 U	-	-	-	0.0186 U	0.0358 U	0.0186 U	0.0358 U	-	-
Potassium	mg/L	1.95	5.97	-	-	-	6	10.2	6.85	10.7	-	-
Selenium	mg/L	0.010 UY	0.0160 U	-	-	-	0.0050 U	0.0160 U	0.010 U	0.0160 U	-	-
Silver	mg/L	0.0049 U	0.0057 U	-	-	-	0.0049 U	0.0057 U	0.0049 U	0.0057 U	-	-
Sodium	mg/L	10	12.1	-	-	-	**29.5[a]**	**28.9[a]**	**29.8[a]**	**28.1[a]**	-	-
Thallium	mg/L	-	-	-	-	-	-	-	-	-	-	-
Vanadium	mg/L	0.0026 U	0.0082	-	-	-	0.0026 U	0.0046	0.0026 U	0.0050	-	-
Zinc	mg/L	0.0571	0.0372	-	-	-	0.143	0.024	0.167	0.0167	-	-

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*MW-2*	*MW-2*	*MW-2*	*MW-3*	*MW-3*	*MW-3*	*MW-3*	*MW-3*	*MW-3*	*MW-3*	*MW-3R-89*
Sample ID:		*W-2428-DT-006*	*W-2428-DT-006 (filt)*	*W-2428-DT-017*	*MW-3*	*MW-3*	*W-2428-DT-007*	*W-2428-DT-007 (filt)*	*W-2428-DT-008*	*W-2428-DT-008 (filt)*	*W-2428-DT-032*	*W-2428-DT-033*
Sample Date:		*6/28/1989*	*6/28/1989*	*10/11/1989*	*11/1/1985*	*8/1/1986*	*6/28/1989*	*6/28/1989*	*6/28/1989*	*6/28/1989*	*10/18/1989*	*10/18/1989*
		Duplicate	*Duplicate*						*Duplicate*	*Duplicate*		
Parameter	*Units*											
General Chemistry												
Cyanide (free)	mg/L	-	-	-	0.018	-	-	-	-	-	-	-
Cyanide (total)	mg/L	**0.254[a]**	-	**0.62[a]**	0.196	0.120	0.0796	-	0.0790	-	**0.22[a]**	0.12
Oil and Grease	mg/L	1 U	-	3.5	-	-	1 U	-	1 U	-	1 U	4.8
Phenolics (Total)	mg/L	-	-	-	**0.520[a]**	**0.050[a]**	-	-	-	-	-	-
Total Organic Halides (TOX)	mg/L	-	-	-	0.0610	0.0113	-	-	-	-	-	-

Notes:

C	The associated data is estimated due to outlying calibration data.
E	The associated data is estimated due to outlying surrogate recoveries or to chemical and/or physical interferences.
J	Estimated.
NA	Parameter not analyzed.
NS	No sample.
R	Unusable data due to holding time exceedance.
U	Not present at or above the associated value.
UJ	Estimated reporting limit.
W	Indicates low spike recoveries and may reflect a low bias in results.
X	The associated data is estimated due to holding time exceedences.
Y	The associated data is unusable due to spike recoveries.
*	Also present in laboratory/reagent blank, indicating possible/probable laboratory contamination.
**	High quantifiable limits due to the necessary dilution of the sample.
--	Not applicable.

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*MW-3R-89*	*MW-3R-89*	*MW-4*	*MW-4*	*MW-4*	*MW-4*	*MW-5*	*MW-5*	*MW-5*	*MW-5*	*MW-6*	*MW-6*
Sample ID:		*W-2428-DT-034*	*W-2428-DT-049*	*MW-4*	*MW-4*	*W-2428-DT-015*	*W-2428-DT-058*	*MW-5*	*MW-5*	*W-2428-DT-019*	*W-2428-DT-053*	*MW-6*	*MW-6*
Sample Date:		*10/18/1989*	*12/13/1989*	*11/1/1985*	*8/1/1986*	*10/11/1989*	*12/15/1989*	*11/1/1985*	*8/1/1986*	*10/12/1989*	*12/13/1989*	*11/1/1985*	*8/1/1986*
		Duplicate											
Parameter	*Units*												
Volatiles													
1,1,1-Trichloroethane	µg/L	**10.6 E[a]**	**12.2[a]**	-	-	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	-
1,1,2,2-Tetrachloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethene (total)	µg/L	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	-
1,2-Dichloropropane	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	µg/L	-	-	-	5.0 U	-	-	-	5.0 U	-	-	-	5.0 U
2-Butanone (Methyl Ethyl Ketone)	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	µg/L	NA	NA	-	-	NA	NA	-	-	NA	NA	-	-
Benzene	µg/L	**2.46 E[a]**	**2.08[a]**	5.0 U	5.0 U	1.0 U	1.0 U	5.0 U	5.0 U	1.0 U	1.0 U	10 U	5.0 U
Bromodichloromethane	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane (Methyl Bromide)	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Carbon disulfide	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	µg/L	-	-	-	5.0 U	-	-	-	5.0 U	-	-	-	5.0 U
Chloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform (Trichloromethane)	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Chloromethane (Methyl Chloride)	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Cyclohexane	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane (CFC-12)	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/L	1.80 E	1.13	-	-	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	-
Isopropylbenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Methyl acetate	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Methyl cyclohexane	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Tert Butyl Ether	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Methylene chloride	µg/L	NA	**6.96 *[a]**	-	-	NA	5 U	-	-	NA	**8.04 *[a]**	-	-
m-Xylene/Chlorobenzene	µg/L	-	-	5.0 U	-	-	-	5.0 U	-	-	-	10 U	-
o-Xylene	µg/L	-	-	5.0 U	-	-	-	5.0 U	-	-	-	NA	-
p-Xylene	µg/L	-	-	5.0 U	-	-	-	5.0 U	-	-	-	NA	-
Styrene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	µg/L	1.44 E	1.24	5.0 U	5.0 U	1.0 U	1.0 U	5.0 U	5.0 U	1.0 U	1.0 U	10 U	5.0 U
trans-1,2-Dichloroethene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane (CFC-11)	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Trifluorotrichloroethane (Freon 113)	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl chloride	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Xylene (total)	µg/L	6.35 E	6.89	-	15.0 U	1.0 U	1.0 U	-	15.0 U	1.0 U	1.0 U	-	15.0 U

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*MW-3R-89*	*MW-3R-89*	*MW-4*	*MW-4*	*MW-4*	*MW-4*	*MW-5*	*MW-5*	*MW-5*	*MW-5*	*MW-6*	*MW-6*
Sample ID:		*W-2428-DT-034*	*W-2428-DT-049*	*MW-4*	*MW-4*	*W-2428-DT-015*	*W-2428-DT-058*	*MW-5*	*MW-5*	*W-2428-DT-019*	*W-2428-DT-053*	*MW-6*	*MW-6*
Sample Date:		*10/18/1989*	*12/13/1989*	*11/1/1985*	*8/1/1986*	*10/11/1989*	*12/15/1989*	*11/1/1985*	*8/1/1986*	*10/12/1989*	*12/13/1989*	*11/1/1985*	*8/1/1986*
		Duplicate											
Parameter	***Units***												
Total VOCs	µg/L	22.65	30.5	ND	ND	ND	ND	ND	ND	ND	8.04	ND	ND
Semi-Volatiles													
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether)	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	µg/L	**21.8 E[b]**	9.34	-	-	3 U	3 U	-	-	3 U	3 U	-	-
2-Chlorophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	µg/L	80.6 E	33.5	-	-	3 U	3 U	-	-	3 U	3 U	-	-
2-Methylphenol	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitroaniline	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitrophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
3-Nitroaniline	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloroaniline	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
4-Chlorophenyl phenyl ether	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
4-Methylphenol	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitroaniline	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	µg/L	**72.3 E[b]**	**34.2[b]**	6.0 U	-	3 U	3 U	3.0 U	-	3 U	3 U	10 U	-
Acenaphthylene	µg/L	83.1 E	40.1	11.0 U	41.0 U	3 U	3 U	5.0 U	45.0 U	3 U	3 U	10 U	42.0 U
Acetophenone	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	µg/L	36.8 E	12.9	27.0 U	-	3 U	3 U	12.0 U	-	3 U	3 U	10 U	-
Atrazine	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Benzaldehyde	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	µg/L	**35.0 E[b]**	3 U	-	-	3 U	3 U	-	-	3 U	3 U	-	-
Benzo(a)pyrene	µg/L	13.2 E	3 U	58.0 U	-	3 U	3 U	24.0 U	-	3 U	3 U	10 U	-
Benzo(b)fluoranthene	µg/L	**27.0 E[b]**	3 U	-	-	3 U	3 U	-	-	3 U	3 U	-	-
Benzo(b)fluoranthene/Benzo(k)fluoranthene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	µg/L	3 U	3 U	59.0 U	-	3 U	3 U	24.0 U	-	3 U	3 U	25 U	-
Benzo(k)fluoranthene	µg/L	**27.0 E[b]**	3 U	-	-	3 U	3 U	-	-	3 U	3 U	-	-
Biphenyl	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Butyl benzylphthalate	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Caprolactam	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Carbazole	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	µg/L	**18.8 E[b]**	3 U	**88.0[b]**	-	3 U	3 U	19.0 U	-	3 U	3 U	10 U	-
Dibenz(a,h)anthracene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	µg/L	NA	NA	-	-	NA	NA	-	-	NA	NA	-	-
Diethyl phthalate	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Dimethyl phthalate	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-butylphthalate	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-octyl phthalate	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	µg/L	**77.0 E[b]**	12.9	16.0 U	24.0 U	3 U	3 U	12.0 U	27.0 U	3 U	3 U	10 U	25.0 U

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*MW-3R-89*	*MW-3R-89*	*MW-4*	*MW-4*	*MW-4*	*MW-4*	*MW-5*	*MW-5*	*MW-5*	*MW-5*	*MW-6*	*MW-6*
Sample ID:		*W-2428-DT-034*	*W-2428-DT-049*	*MW-4*	*MW-4*	*W-2428-DT-015*	*W-2428-DT-058*	*MW-5*	*MW-5*	*W-2428-DT-019*	*W-2428-DT-053*	*MW-6*	*MW-6*
Sample Date:		*10/18/1989*	*12/13/1989*	*11/1/1985*	*8/1/1986*	*10/11/1989*	*12/15/1989*	*11/1/1985*	*8/1/1986*	*10/12/1989*	*12/13/1989*	*11/1/1985*	*8/1/1986*
		Duplicate											
Parameter	*Units*												
Fluorene	µg/L	**154 E[b]**	**61.2[b]**	26.0 U	46.0 U	3 U	3 U	12.0 U	51.0 U	3 U	3 U	10 U	48.0 U
Hexachlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Hexachloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	µg/L	3 U	3 U	229.0 U	-	3 U	3 U	229.0 U	-	3 U	3 U	25 U	-
Isophorone	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	µg/L	**486 E[b]**	**404[b]**	36.0 U	-	3 U	3 U	6.0 U	-	3 U	3 U	10 U	-
Nitrobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	µg/L	**287 E[b]**	**76.8[b]**	11.0 U	-	3 U	3 U	11.0 U	-	3 U	3 U	10 U	-
Phenol	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	µg/L	**70.2 E[b]**	8.21	22.0 U	-	3 U	3 U	22.0 U	-	3 U	3 U	10 U	-
Total SVOCs	µg/L	1489.8	693.15	88	ND	ND	ND	ND	ND	ND	ND	ND	ND
Metals													
Aluminum	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	mg/L	-	-	-	-	-	-	-	-	-	-	0.013	-
Barium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Beryllium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Chromium Total	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Chromium VI (Hexavalent)	mg/L	0.01 U	0.01 U	-	-	0.01 U	0.01 U	-	-	0.01 U	0.01 U	-	-
Cobalt	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Copper	mg/L	-	-	-	-	-	-	-	-	-	-	0.02	-
Iron	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	mg/L	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Potassium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Silver	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Thallium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	mg/L	-	-	-	-	-	-	-	-	-	-	0.18	-

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*MW-3R-89*	*MW-3R-89*	*MW-4*	*MW-4*	*MW-4*	*MW-4*	*MW-5*	*MW-5*	*MW-5*	*MW-5*	*MW-6*	*MW-6*
Sample ID:		*W-2428-DT-034*	*W-2428-DT-049*	*MW-4*	*MW-4*	*W-2428-DT-015*	*W-2428-DT-058*	*MW-5*	*MW-5*	*W-2428-DT-019*	*W-2428-DT-053*	*MW-6*	*MW-6*
Sample Date:		*10/18/1989*	*12/13/1989*	*11/1/1985*	*8/1/1986*	*10/11/1989*	*12/15/1989*	*11/1/1985*	*8/1/1986*	*10/12/1989*	*12/13/1989*	*11/1/1985*	*8/1/1986*
		Duplicate											
Parameter	*Units*												
General Chemistry													
Cyanide (free)	mg/L	-	-	0.011	-	-	-	0.013	-	-	-	NA	-
Cyanide (total)	mg/L	0.16	0.01 U	0.021	0.030	0.06	0.03	0.030	0.043	0.04	0.044	0.189	0.198
Oil and Grease	mg/L	3.9	1 U	-	-	1 U	1 U	-	-	1 U	1 U	-	-
Phenolics (Total)	mg/L	-	-	0.010 U	0.010 U	-	-	0.010 U	0.010 U	-	-	0.025 U	0.010 U
Total Organic Halides (TOX)	mg/L	-	-	0.00190	0.00601	-	-	0.00019	0.00207	-	-	NA	0.00059

Notes:

C	The associated data is estimated due to outlying calibration data.
E	The associated data is estimated due to outlying surrogate recoveries or to chemical and/or physical interferences.
J	Estimated.
NA	Parameter not analyzed.
NS	No sample.
R	Unusable data due to holding time exceedance.
U	Not present at or above the associated value.
UJ	Estimated reporting limit.
W	Indicates low spike recoveries and may reflect a low bias in results.
X	The associated data is estimated due to holding time exceedences.
Y	The associated data is unusable due to spike recoveries.
*	Also present in laboratory/reagent blank, indicating possible/probable laboratory contamination.
**	High quantifiable limits due to the necessary dilution of the sample.
- -	Not applicable.

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*MW-6*	*MW-6*	*MW-7*	*MW-7*	*MW-7*	*MW-7*	*MW-7*	*MW-7*	*MW-7*	*MW-7*	*MW-7*	*MW-8-89*
Sample ID:		*W-2428-DT-014*	*W-2428-DT-055*	*MW-7*	*MW-7*	*W-2428-DT-012*	*W-2428-DT-013*	*W-2428-DT-051*	*W-2428-DT-052*	*MW-7*	*MW-7 dup.*	*WG-2428-081805-027*	*W-2428-DT-009*
Sample Date:		*10/10/1989*	*12/13/1989*	*11/1/1985*	*8/1/1986*	*10/9/1989*	*10/9/1989* *Duplicate*	*12/13/1989*	*12/13/1989* *Duplicate*	*7/7/1992*	*7/7/1992* *Duplicate*	*8/18/2005*	*6/28/1989*
Parameter	*Units*												
Volatiles													
1,1,1-Trichloroethane	µg/L	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U	-	-	5 U	-
1,1,2,2-Tetrachloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	5 U	-
1,1,2-Trichloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	5 UJ	-
1,1-Dichloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	5 UJ	-
1,1-Dichloroethene	µg/L	-	-	-	-	-	-	-	-	-	-	5 UJ	-
1,2,4-Trichlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	5 U	-
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	-	-	-	-	-	-	-	-	-	-	5 U	-
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	-	-	-	-	-	-	-	-	-	-	5 U	-
1,2-Dichlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	5 U	-
1,2-Dichloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	5 UJ	-
1,2-Dichloroethene (total)	µg/L	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	-
1,2-Dichloropropane	µg/L	-	-	-	-	-	-	-	-	-	-	5 UJ	-
1,3-Dichlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	5 U	-
1,4-Dichlorobenzene	µg/L	-	-	-	5.0 U	-	-	-	-	-	-	5 U	-
2-Butanone (Methyl Ethyl Ketone)	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
2-Hexanone	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
Acetone	µg/L	NA	NA	-	-	NA	NA	NA	NA	50 U	50 U	10 U	-
Benzene	µg/L	1.0 U	1.0 U	10 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	5 UJ	-
Bromodichloromethane	µg/L	-	-	-	-	-	-	-	-	-	-	5 UJ	-
Bromoform	µg/L	-	-	-	-	-	-	-	-	-	-	5 U	-
Bromomethane (Methyl Bromide)	µg/L	-	-	-	-	-	-	-	-	-	-	5 U	-
Carbon disulfide	µg/L	-	-	-	-	-	-	-	-	-	-	5 U	-
Carbon tetrachloride	µg/L	-	-	-	-	-	-	-	-	-	-	5 U	-
Chlorobenzene	µg/L	-	-	-	5.0 U	-	-	-	-	-	-	5 U	-
Chloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	5 UJ	-
Chloroform (Trichloromethane)	µg/L	-	-	-	-	-	-	-	-	-	-	5 UJ	-
Chloromethane (Methyl Chloride)	µg/L	-	-	-	-	-	-	-	-	-	-	5 UJ	-
cis-1,2-Dichloroethene	µg/L	-	-	-	-	-	-	-	-	-	-	5 UJ	-
cis-1,3-Dichloropropene	µg/L	-	-	-	-	-	-	-	-	-	-	5 UJ	-
Cyclohexane	µg/L	-	-	-	-	-	-	-	-	-	-	5 U	-
Dibromochloromethane	µg/L	-	-	-	-	-	-	-	-	-	-	5 U	-
Dichlorodifluoromethane (CFC-12)	µg/L	-	-	-	-	-	-	-	-	-	-	5 UJ	-
Ethylbenzene	µg/L	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U	-	-	5 U	-
Isopropylbenzene	µg/L	-	-	-	-	-	-	-	-	-	-	5 U	-
Methyl acetate	µg/L	-	-	-	-	-	-	-	-	-	-	5 U	-
Methyl cyclohexane	µg/L	-	-	-	-	-	-	-	-	-	-	5 U	-
Methyl Tert Butyl Ether	µg/L	-	-	-	-	-	-	-	-	-	-	5 U	-
Methylene chloride	µg/L	NA	5 U	-	-	NA	NA	5 U	**5.61** [a]	-	-	5 UJ	-
m-Xylene/Chlorobenzene	µg/L	-	-	10 U	-	-	-	-	-	-	-	-	-
o-Xylene	µg/L	-	-	NA	-	-	-	-	-	-	-	-	-
p-Xylene	µg/L	-	-	NA	-	-	-	-	-	-	-	-	-
Styrene	µg/L	-	-	-	-	-	-	-	-	-	-	5 U	-
Tetrachloroethene	µg/L	-	-	-	-	-	-	-	-	-	-	5 U	-
Toluene	µg/L	1.0 U	1.0 U	10 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	5 U	-
trans-1,2-Dichloroethene	µg/L	-	-	-	-	-	-	-	-	-	-	5 UJ	-
trans-1,3-Dichloropropene	µg/L	-	-	-	-	-	-	-	-	-	-	5 U	-
Trichloroethene	µg/L	-	-	-	-	-	-	-	-	-	-	**6 J** [a]	-
Trichlorofluoromethane (CFC-11)	µg/L	-	-	-	-	-	-	-	-	-	-	5 UJ	-
Trifluorotrichloroethane (Freon 113)	µg/L	-	-	-	-	-	-	-	-	-	-	5 U	-
Vinyl chloride	µg/L	-	-	-	-	-	-	-	-	-	-	5 UJ	-
Xylene (total)	µg/L	1.0 U	1.0 U	-	15.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-	5 U	-

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*MW-6*	*MW-6*	*MW-7*	*MW-7*	*MW-7*	*MW-7*	*MW-7*	*MW-7*	*MW-7*	*MW-7*	*MW-7*	*MW-8-89*
Sample ID:		*W-2428-DT-014*	*W-2428-DT-055*	*MW-7*	*MW-7*	*W-2428-DT-012*	*W-2428-DT-013*	*W-2428-DT-051*	*W-2428-DT-052*	*MW-7*	*MW-7 dup.*	*WG-2428-081805-027*	*W-2428-DT-009*
Sample Date:		*10/10/1989*	*12/13/1989*	*11/1/1985*	*8/1/1986*	*10/9/1989*	*10/9/1989* Duplicate	*12/13/1989*	*12/13/1989* Duplicate	*7/7/1992*	*7/7/1992* Duplicate	*8/18/2005*	*6/28/1989*
Parameter	*Units*												
Total VOCs	µg/L	ND	ND	ND	ND	ND	ND	ND	5.61	ND	ND	6	-
Semi-Volatiles													
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether)	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
2,4,5-Trichlorophenol	µg/L	-	-	-	-	-	-	-	-	-	-	25 U	-
2,4,6-Trichlorophenol	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
2,4-Dichlorophenol	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
2,4-Dimethylphenol	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
2,4-Dinitrophenol	µg/L	-	-	-	-	-	-	-	-	-	-	25 U	-
2,4-Dinitrotoluene	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
2,6-Dinitrotoluene	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
2-Chloronaphthalene	µg/L	3 U	3 U	-	-	3 U	3 U	3 U	3 U	-	-	10 U	-
2-Chlorophenol	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
2-Methylnaphthalene	µg/L	3 U	3 U	-	-	3 U	3 U	3 U	3 U	-	-	10 U	-
2-Methylphenol	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
2-Nitroaniline	µg/L	-	-	-	-	-	-	-	-	-	-	25 U	-
2-Nitrophenol	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
3,3'-Dichlorobenzidine	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
3-Nitroaniline	µg/L	-	-	-	-	-	-	-	-	-	-	25 U	-
4,6-Dinitro-2-methylphenol	µg/L	-	-	-	-	-	-	-	-	-	-	25 U	-
4-Bromophenyl phenyl ether	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
4-Chloro-3-methylphenol	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
4-Chloroaniline	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
4-Chlorophenyl phenyl ether	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
4-Methylphenol	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
4-Nitroaniline	µg/L	-	-	-	-	-	-	-	-	-	-	25 U	-
4-Nitrophenol	µg/L	-	-	-	-	-	-	-	-	-	-	25 U	-
Acenaphthene	µg/L	3 U	3 U	10 U	-	3 U	3 U	3 U	3 U	-	-	10 U	-
Acenaphthylene	µg/L	3 U	3 U	10 U	43.0 U	3 U	3 U	3 U	3 U	10 U	10 U	10 U	-
Acetophenone	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
Anthracene	µg/L	3 U	3 U	10 U	-	3 U	3 U	3 U	3 U	10 U	10 U	10 U	-
Atrazine	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
Benzaldehyde	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
Benzo(a)anthracene	µg/L	3 U	3 U	-	-	3 U	3 U	3 U	3 U	10 U	10 U	10 U	-
Benzo(a)pyrene	µg/L	3 U	3 U	10 U	-	3 U	3 U	3 U	3 U	10 U	10 U	10 U	-
Benzo(b)fluoranthene	µg/L	3 U	3 U	-	-	3 U	3 U	3 U	3 U	-	-	10 U	-
Benzo(b)fluoranthene/ Benzo(k)fluoranthene	µg/L	-	-	-	-	-	-	-	-	10 U	10 U	-	-
Benzo(g,h,i)perylene	µg/L	3 U	3 U	25 U	-	3 U	3 U	3 U	3 U	-	-	10 U	-
Benzo(k)fluoranthene	µg/L	3 U	3 U	-	-	3 U	3 U	3 U	3 U	-	-	10 U	-
Biphenyl	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
bis(2-Chloroethoxy)methane	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
bis(2-Chloroethyl)ether	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
bis(2-Ethylhexyl)phthalate	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
Butyl benzylphthalate	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
Caprolactam	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
Carbazole	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
Chrysene	µg/L	3 U	3 U	10 U	-	3 U	3 U	3 U	3 U	10 U	10 U	10 U	-
Dibenz(a,h)anthracene	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
Dibenzofuran	µg/L	NA	NA	-	-	NA	NA	NA	NA	10 U	10 U	10 U	-
Diethyl phthalate	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
Dimethyl phthalate	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
Di-n-butylphthalate	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
Di-n-octyl phthalate	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
Fluoranthene	µg/L	3 U	3 U	10 U	26.0 U	3 U	3 U	3 U	3 U	10 U	10 U	10 U	-

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*MW-6*	*MW-6*	*MW-7*	*MW-7*	*MW-7*	*MW-7*	*MW-7*	*MW-7*	*MW-7*	*MW-7*	*MW-7*	*MW-8-89*
Sample ID:		*W-2428-DT-014*	*W-2428-DT-055*	*MW-7*	*MW-7*	*W-2428-DT-012*	*W-2428-DT-013*	*W-2428-DT-051*	*W-2428-DT-052*	*MW-7*	*MW-7 dup.*	*WG-2428-081805-027*	*W-2428-DT-009*
Sample Date:		*10/10/1989*	*12/13/1989*	*11/1/1985*	*8/1/1986*	*10/9/1989*	*10/9/1989*	*12/13/1989*	*12/13/1989*	*7/7/1992*	*7/7/1992*	*8/18/2005*	*6/28/1989*
							Duplicate		*Duplicate*		*Duplicate*		
Parameter	*Units*												
Fluorene	µg/L	3 U	3 U	10 U	49.0 U	3 U	3 U	3 U	3 U	10 U	10 U	10 U	-
Hexachlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
Hexachlorobutadiene	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
Hexachlorocyclopentadiene	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
Hexachloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
Indeno(1,2,3-cd)pyrene	µg/L	3 U	3 U	25 U	-	3 U	3 U	3 U	3 U	-	-	10 U	-
Isophorone	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
Naphthalene	µg/L	3 U	3 U	10 U	-	3 U	3 U	3 U	3 U	-	-	10 U	-
Nitrobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
N-Nitrosodi-n-propylamine	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
N-Nitrosodiphenylamine	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
Pentachlorophenol	µg/L	-	-	-	-	-	-	-	-	-	-	25 U	-
Phenanthrene	µg/L	3 U	3 U	10 U	-	3 U	3 U	3 U	3 U	10 U	10 U	10 U	-
Phenol	µg/L	-	-	-	-	-	-	-	-	-	-	10 U	-
Pyrene	µg/L	3 U	3 U	10 U	-	3 U	3 U	3 U	3 U	10 U	10 U	10 U	-
Total SVOCs	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-
Metals													
Aluminum	mg/L	-	-	-	-	-	-	-	-	-	-	0.0092 U	0.139
Antimony	mg/L	-	-	-	-	-	-	-	-	-	-	0.0033 U	-
Arsenic	mg/L	-	-	0.022	-	-	-	-	-	-	-	0.0056 U	0.0012 U
Barium	mg/L	-	-	-	-	-	-	-	-	-	-	0.0543	0.0378 E
Beryllium	mg/L	-	-	-	-	-	-	-	-	-	-	0.0171 U	**0.0036**[b]
Cadmium	mg/L	-	-	-	-	-	-	-	-	-	-	0.00037 U	-
Calcium	mg/L	-	-	-	-	-	-	-	-	-	-	186	599 E
Chromium Total	mg/L	-	-	-	-	-	-	-	-	-	-	0.0014	0.0090
Chromium VI (Hexavalent)	mg/L	NA	0.01 U	-	-	0.01 U	0.01 U	0.01 U	0.05	-	-	-	-
Cobalt	mg/L	-	-	-	-	-	-	-	-	-	-	0.0014	0.0231
Copper	mg/L	-	-	0.01 U	-	-	-	-	-	-	-	0.0053	0.0073 U
Iron	mg/L	-	-	-	-	-	-	-	-	-	-	0.238	**31.2 E**[a]
Lead	mg/L	-	-	-	-	-	-	-	-	-	-	0.0012 U	0.00090 U
Magnesium	mg/L	-	-	-	-	-	-	-	-	-	-	32	**53.3 E**[b]
Manganese	mg/L	-	-	-	-	-	-	-	-	-	-	0.202	**2.34 E**[a]
Mercury	mg/L	-	-	-	-	-	-	-	-	-	-	0.00010 U	0.00020 U
Nickel	mg/L	-	-	0.05	-	-	-	-	-	-	-	0.0126	0.0186 U
Potassium	mg/L	-	-	-	-	-	-	-	-	-	-	3.3	22.3
Selenium	mg/L	-	-	-	-	-	-	-	-	-	-	0.0054 U	0.010 U
Silver	mg/L	-	-	-	-	-	-	-	-	-	-	0.0036 U	0.0054
Sodium	mg/L	-	-	-	-	-	-	-	-	-	-	**22.2**[a]	**80.3 E**[a]
Thallium	mg/L	-	-	-	-	-	-	-	-	-	-	0.0050 U	-
Vanadium	mg/L	-	-	-	-	-	-	-	-	-	-	0.159	0.0778
Zinc	mg/L	-	-	0.14	-	-	-	-	-	-	-	0.0241	0.0834 E

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*MW-6*	*MW-6*	*MW-7*	*MW-7*	*MW-7*	*MW-7*	*MW-7*	*MW-7*	*MW-7*	*MW-7*	*MW-7*	*MW-8-89*
Sample ID:		*W-2428-DT-014*	*W-2428-DT-055*	*MW-7*	*MW-7*	*W-2428-DT-012*	*W-2428-DT-013*	*W-2428-DT-051*	*W-2428-DT-052*	*MW-7*	*MW-7 dup.*	*WG-2428-081805-027*	*W-2428-DT-009*
Sample Date:		*10/10/1989*	*12/13/1989*	*11/1/1985*	*8/1/1986*	*10/9/1989*	*10/9/1989*	*12/13/1989*	*12/13/1989*	*7/7/1992*	*7/7/1992*	*8/18/2005*	*6/28/1989*
							Duplicate		*Duplicate*		*Duplicate*		
Parameter	*Units*												
General Chemistry													
Cyanide (free)	mg/L	-	-	NA	-	-	-	-	-	-	-	-	-
Cyanide (total)	mg/L	**0.32[a]**	**0.3[a]**	0.089	0.064	0.09	0.07	0.167	0.17	0.037	0.026	0.0156	-
Oil and Grease	mg/L	7.1	1 U	-	-	3.7	1 U	1 U	1 U	1 U	1 U	-	-
Phenolics (Total)	mg/L	-	-	0.025 U	0.010 U	-	-	-	-	-	-	-	-
Total Organic Halides (TOX)	mg/L	-	-	NA	0.00093	-	-	-	-	-	-	-	-

Notes:

C	The associated data is estimated due to outlying calibration data.
E	The associated data is estimated due to outlying surrogate recoveries or to chemical and/or physical interferences.
J	Estimated.
NA	Parameter not analyzed.
NS	No sample.
R	Unusable data due to holding time exceedance.
U	Not present at or above the associated value.
UJ	Estimated reporting limit.
W	Indicates low spike recoveries and may reflect a low bias in results.
X	The associated data is estimated due to holding time exceedences.
Y	The associated data is unusable due to spike recoveries.
*	Also present in laboratory/reagent blank, indicating possible/probable laboratory contamination.
**	High quantifiable limits due to the necessary dilution of the sample.
- -	Not applicable.

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*MW-8-89*	*MW-8-89*	*MW-9-89*	*MW-9-89*	*MW-9-89*	*MW-10-89*	*MW-11-89*	*MW-11-89*	*MW-11-89*	*MW-12-89*	*MW-12-89*
Sample ID:		*W-2428-DT-009 (filt)*	*W-2428-DT-009*	*W-2428-DT-001*	*W-2428-DT-001 (filt)*	*W-2428-DT-061*	*W-2428-DT-060*	*W-2428-DT-026*	*W-2428-DT-059*	*MW11-89*	*W-2428-DT-030*	*W-2428-DT-048*
Sample Date:		*6/28/1989*	*6/30/1989*	*6/26/1989*	*6/26/1989*	*12/19/1989*	*12/19/1989*	*10/17/1989*	*12/19/1989*	*7/9/1992*	*10/18/1989*	*12/12/1989*
Parameter	*Units*											
Volatiles												
1,1,1-Trichloroethane	µg/L	-	5 U	5 U	-	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethene (total)	µg/L	-	6[b]	5 U	-	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	1.0 U
1,2-Dichloropropane	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-
2-Butanone (Methyl Ethyl Ketone)	µg/L	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone	µg/L	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	-	-	-	-	-	-	-	-	-	-	-
Acetone	µg/L	-	34 *	10 U	-	NA	NA	NA	NA	685[b]	NA	NA
Benzene	µg/L	-	41[a]	5 U	-	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	1.0 U
Bromodichloromethane	µg/L	-	-	-	-	-	-	-	-	-	-	-
Bromoform	µg/L	-	-	-	-	-	-	-	-	-	-	-
Bromomethane (Methyl Bromide)	µg/L	-	-	-	-	-	-	-	-	-	-	-
Carbon disulfide	µg/L	-	-	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	µg/L	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Chloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	-
Chloroform (Trichloromethane)	µg/L	-	-	-	-	-	-	-	-	-	-	-
Chloromethane (Methyl Chloride)	µg/L	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	µg/L	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Cyclohexane	µg/L	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	µg/L	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane (CFC-12)	µg/L	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/L	-	8[a]	5 U	-	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	1.0 U
Isopropylbenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Methyl acetate	µg/L	-	-	-	-	-	-	-	-	-	-	-
Methyl cyclohexane	µg/L	-	-	-	-	-	-	-	-	-	-	-
Methyl Tert Butyl Ether	µg/L	-	-	-	-	-	-	-	-	-	-	-
Methylene chloride	µg/L	-	5 U	5 U	-	5 U	5 U	NA	5 U	-	NA	5 U
m-Xylene/Chlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	µg/L	-	-	-	-	-	-	-	-	-	-	-
p-Xylene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Styrene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Toluene	µg/L	-	16[a]	5 U	-	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	1.0 U
trans-1,2-Dichloroethene	µg/L	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane (CFC-11)	µg/L	-	-	-	-	-	-	-	-	-	-	-
Trifluorotrichloroethane (Freon 113)	µg/L	-	-	-	-	-	-	-	-	-	-	-
Vinyl chloride	µg/L	-	-	-	-	-	-	-	-	-	-	-
Xylene (total)	µg/L	-	27	5 U	-	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	1.0 U

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*MW-8-89*	*MW-8-89*	*MW-9-89*	*MW-9-89*	*MW-9-89*	*MW-10-89*	*MW-11-89*	*MW-11-89*	*MW-11-89*	*MW-12-89*	*MW-12-89*
Sample ID:		*W-2428-DT-009 (filt)*	*W-2428-DT-009*	*W-2428-DT-001*	*W-2428-DT-001 (filt)*	*W-2428-DT-061*	*W-2428-DT-060*	*W-2428-DT-026*	*W-2428-DT-059*	*MW11-89*	*W-2428-DT-030*	*W-2428-DT-048*
Sample Date:		*6/28/1989*	*6/30/1989*	*6/26/1989*	*6/26/1989*	*12/19/1989*	*12/19/1989*	*10/17/1989*	*12/19/1989*	*7/9/1992*	*10/18/1989*	*12/12/1989*
Parameter	*Units*											
Total VOCs	µg/L	-	132	ND	-	ND	ND	ND	ND	685	ND	ND
Semi-Volatiles												
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether)	µg/L	-	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	µg/L	-	-	-	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	µg/L	-	-	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	µg/L	-	NA	NA	-	3 U	3 U	3 U	3 U	-	3 U	3 U
2-Chlorophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	µg/L	-	19	10 U	-	3 U	3 U	3 U	3 U	-	3 U	3 U
2-Methylphenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
2-Nitroaniline	µg/L	-	-	-	-	-	-	-	-	-	-	-
2-Nitrophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	µg/L	-	-	-	-	-	-	-	-	-	-	-
3-Nitroaniline	µg/L	-	-	-	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	µg/L	-	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
4-Chloroaniline	µg/L	-	-	-	-	-	-	-	-	-	-	-
4-Chlorophenyl phenyl ether	µg/L	-	-	-	-	-	-	-	-	-	-	-
4-Methylphenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
4-Nitroaniline	µg/L	-	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	µg/L	-	10 U	10 U	-	3 U	3 U	3 U	3 U	-	3 U	3 U
Acenaphthylene	µg/L	-	10 U	10 U	-	3 U	3 U	3 U	3 U	10 U	3 U	3 U
Acetophenone	µg/L	-	-	-	-	-	-	-	-	-	-	-
Anthracene	µg/L	-	10 U	10 U	-	3 U	3 U	3 U	3 U	10 U	3 U	3 U
Atrazine	µg/L	-	-	-	-	-	-	-	-	-	-	-
Benzaldehyde	µg/L	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	µg/L	-	10 U	10 U	-	3 U	3 U	3 U	3 U	10 U	3 U	3 U
Benzo(a)pyrene	µg/L	-	10 U	10 U	-	3 U	3 U	3 U	3 U	10 U	3 U	3 U
Benzo(b)fluoranthene	µg/L	-	10 U	10 U	-	3 U	3 U	4.26[b]	3 U	-	3 U	3 U
Benzo(b)fluoranthene/Benzo(k)fluoranthene	µg/L	-	-	-	-	-	-	-	-	10 U	-	-
Benzo(g,h,i)perylene	µg/L	-	NA	NA	-	3 U	3 U	3 U	3 U	-	3 U	3 U
Benzo(k)fluoranthene	µg/L	-	10 U	10 U	-	3 U	3 U	4.26[b]	3 U	-	3 U	3 U
Biphenyl	µg/L	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	µg/L	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	µg/L	-	-	-	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate	µg/L	-	-	-	-	-	-	-	-	-	-	-
Butyl benzylphthalate	µg/L	-	-	-	-	-	-	-	-	-	-	-
Caprolactam	µg/L	-	-	-	-	-	-	-	-	-	-	-
Carbazole	µg/L	-	-	-	-	-	-	-	-	-	-	-
Chrysene	µg/L	-	10 U	10 U	-	3 U	3 U	3 U	3 U	10 U	3 U	3 U
Dibenz(a,h)anthracene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	µg/L	-	10 U	10 U	-	NA	NA	NA	NA	10 U	NA	NA
Diethyl phthalate	µg/L	-	-	-	-	-	-	-	-	-	-	-
Dimethyl phthalate	µg/L	-	-	-	-	-	-	-	-	-	-	-
Di-n-butylphthalate	µg/L	-	-	-	-	-	-	-	-	-	-	-
Di-n-octyl phthalate	µg/L	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	µg/L	-	10 U	10 U	-	3 U	3 U	8.76	3 U	10 U	3 U	3 U

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*MW-8-89*	*MW-8-89*	*MW-9-89*	*MW-9-89*	*MW-9-89*	*MW-10-89*	*MW-11-89*	*MW-11-89*	*MW-11-89*	*MW-12-89*	*MW-12-89*
Sample ID:		*W-2428-DT-009 (filt)*	*W-2428-DT-009*	*W-2428-DT-001*	*W-2428-DT-001 (filt)*	*W-2428-DT-061*	*W-2428-DT-060*	*W-2428-DT-026*	*W-2428-DT-059*	*MW11-89*	*W-2428-DT-030*	*W-2428-DT-048*
Sample Date:		*6/28/1989*	*6/30/1989*	*6/26/1989*	*6/26/1989*	*12/19/1989*	*12/19/1989*	*10/17/1989*	*12/19/1989*	*7/9/1992*	*10/18/1989*	*12/12/1989*
Parameter	***Units***											
Fluorene	µg/L	-	10 U	10 U	-	3 U	3 U	3 U	3 U	10 U	3 U	3 U
Hexachlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Hexachloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	µg/L	-	NA	NA	-	3 U	3 U	3 U	3 U	-	3 U	3 U
Isophorone	µg/L	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	µg/L	-	**1900**[b]	10 U	-	3 U	3 U	3 U	3 U	-	3 U	3 U
Nitrobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	µg/L	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	µg/L	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	µg/L	-	10 U	10 U	-	3 U	3 U	3 U	3 U	10 U	3 U	3 U
Phenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
Pyrene	µg/L	-	10 U	10 U	-	3 U	3 U	3 U	3 U	10 U	10.4 R	3 U
Total SVOCs	µg/L	-	1919	ND	-	ND	ND	17.28	ND	ND	10.4 R	ND
Metals												
Aluminum	mg/L	0.166	-	5.19	0.0491	-	-	-	-	-	-	-
Antimony	mg/L	-	-	-	-	-	-	-	-	-	-	-
Arsenic	mg/L	0.0012 U	-	0.0061	0.0046	-	-	-	-	-	-	-
Barium	mg/L	0.0394	-	0.177	0.0807	-	-	-	-	-	-	-
Beryllium	mg/L	0.00070 U	-	0.00050 U	0.00070 U	-	-	-	-	-	-	-
Cadmium	mg/L	-	-	-	-	-	-	-	-	-	-	-
Calcium	mg/L	626	-	162	161	-	-	-	-	-	-	-
Chromium Total	mg/L	0.0062 U	-	0.0042	0.0062 U	-	-	-	-	-	-	-
Chromium VI (Hexavalent)	mg/L	-	0.01 U	0.02 X	-	0.01 U	0.01	0.01 U	0.01 U	-	0.01 U	0.01 U
Cobalt	mg/L	0.0176	-	0.0033 U	0.0039 U	-	-	-	-	-	-	-
Copper	mg/L	0.0072 U	-	0.0073 U	0.0072 U	-	-	-	-	-	-	-
Iron	mg/L	**33.1**[a]	-	**7.63**[a]	0.0523	-	-	-	-	-	-	-
Lead	mg/L	0.0014	-	0.0027	0.0011 UW	-	-	-	-	-	-	-
Magnesium	mg/L	**55.6**[b]	-	28.6 E	28.5 E	-	-	-	-	-	-	-
Manganese	mg/L	**2.43**[a]	-	**1.85**[a]	**1.54**[a]	-	-	-	-	-	-	-
Mercury	mg/L	0.00020 UR	-	0.00020 U	0.00032 X	-	-	-	-	-	-	-
Nickel	mg/L	0.0358 U	-	0.0302	0.0358 U	-	-	-	-	-	-	-
Potassium	mg/L	17.8	-	2.68	5.91	-	-	-	-	-	-	-
Selenium	mg/L	0.0160 U	-	**0.0116 C**[a]	0.0160 UW	-	-	-	-	-	-	-
Silver	mg/L	0.0057 U	-	0.0049 U	0.0057 U	-	-	-	-	-	-	-
Sodium	mg/L	**82.6**[a]	-	7.36 C	10.1	-	-	-	-	-	-	-
Thallium	mg/L	-	-	-	-	-	-	-	-	-	-	-
Vanadium	mg/L	0.0640	-	0.0104	0.0092	-	-	-	-	-	-	-
Zinc	mg/L	0.0879	-	0.0602	0.0192	-	-	-	-	-	-	-

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*MW-8-89*	*MW-8-89*	*MW-9-89*	*MW-9-89*	*MW-9-89*	*MW-10-89*	*MW-11-89*	*MW-11-89*	*MW-11-89*	*MW-12-89*	*MW-12-89*
Sample ID:		*W-2428-DT-009 (filt)*	*W-2428-DT-009*	*W-2428-DT-001*	*W-2428-DT-001 (filt)*	*W-2428-DT-061*	*W-2428-DT-060*	*W-2428-DT-026*	*W-2428-DT-059*	*MW11-89*	*W-2428-DT-030*	*W-2428-DT-048*
Sample Date:		*6/28/1989*	*6/30/1989*	*6/26/1989*	*6/26/1989*	*12/19/1989*	*12/19/1989*	*10/17/1989*	*12/19/1989*	*7/9/1992*	*10/18/1989*	*12/12/1989*
Parameter	*Units*											
General Chemistry												
Cyanide (free)	mg/L	-	-	-	-	-	-	-	-	-	-	-
Cyanide (total)	mg/L	-	3.73[a]	0.010 U	-	0.03	0.019	0.01	0.012	0.004	0.03	0.024
Oil and Grease	mg/L	-	7.4	1 U	-	1 U	6.3	1 U	1 U	8.3	1 U	1 U
Phenolics (Total)	mg/L	-	-	-	-	-	-	-	-	-	-	-
Total Organic Halides (TOX)	mg/L	-	-	-	-	-	-	-	-	-	-	-

Notes:

C	The associated data is estimated due to outlying calibration data.
E	The associated data is estimated due to outlying surrogate recoveries or to chemical and/or physical interferences.
J	Estimated.
NA	Parameter not analyzed.
NS	No sample.
R	Unusable data due to holding time exceedance.
U	Not present at or above the associated value.
UJ	Estimated reporting limit.
W	Indicates low spike recoveries and may reflect a low bias in results.
X	The associated data is estimated due to holding time exceedences.
Y	The associated data is unusable due to spike recoveries.
*	Also present in laboratory/reagent blank, indicating possible/probable laboratory contamination.
**	High quantifiable limits due to the necessary dilution of the sample.
- -	Not applicable.

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*MW-13-89*	*MW-13-89*	*MW-13-89*	*MW-14-89*	*MW-14-89*	*MW-14-89*	*MW-14-89*	*MW-14-89*	*MW-15-89*	*MW-15-89*	*MW-16-89*
Sample ID:		*W-2428-DT-016*	*W-2428-DT-046*	*W-2428-DT-047*	*W-2428-DT-010*	*W-2428-DT-010 (filt)*	*W-2428-DT-010*	*W-2428-DT-063*	*MW14-89*	*W-2428-DT-025*	*W-2428-DT-054*	*W-2428-DT-020*
Sample Date:		*10/17/1989*	*12/12/1989*	*12/12/1989 Duplicate*	*6/26/1989*	*6/26/1989*	*7/5/1989*	*12/20/1989*	*7/10/1992*	*10/17/1989*	*12/14/1989*	*10/17/1989*
Parameter	*Units*											
Volatiles												
1,1,1-Trichloroethane	µg/L	1.0 U	1.0 U	1.0 U	-	-	10 U	1.0 U	-	10 U	1.0 U	10 U
1,1,2,2-Tetrachloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethene (total)	µg/L	1.0 U	1.0 U	1.0 U	-	-	10 U	1.0 U	-	10 U	1.0 U	10 U
1,2-Dichloropropane	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-
2-Butanone (Methyl Ethyl Ketone)	µg/L	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone	µg/L	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	-	-	-	-	-	-	-	-	-	-	-
Acetone	µg/L	NA	NA	NA	-	-	**240**[b]	NA	50 U	NA	NA	NA
Benzene	µg/L	1.0 U	1.0 U	1.0 U	-	-	10 U	1.0 U	-	10 U	1.0 U	10 U
Bromodichloromethane	µg/L	-	-	-	-	-	-	-	-	-	-	-
Bromoform	µg/L	-	-	-	-	-	-	-	-	-	-	-
Bromomethane (Methyl Bromide)	µg/L	-	-	-	-	-	-	-	-	-	-	-
Carbon disulfide	µg/L	-	-	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	µg/L	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Chloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	-
Chloroform (Trichloromethane)	µg/L	-	-	-	-	-	-	-	-	-	-	-
Chloromethane (Methyl Chloride)	µg/L	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	µg/L	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Cyclohexane	µg/L	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	µg/L	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane (CFC-12)	µg/L	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/L	1.0 U	1.0 U	1.0 U	-	-	10 U	1.0 U	-	10 U	1.0 U	10 U
Isopropylbenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Methyl acetate	µg/L	-	-	-	-	-	-	-	-	-	-	-
Methyl cyclohexane	µg/L	-	-	-	-	-	-	-	-	-	-	-
Methyl Tert Butyl Ether	µg/L	-	-	-	-	-	-	-	-	-	-	-
Methylene chloride	µg/L	NA	5 U	5 U	-	-	10 U	**5.15** [a,b]	-	NA	5 U	NA
m-Xylene/Chlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	µg/L	-	-	-	-	-	-	-	-	-	-	-
p-Xylene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Styrene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Toluene	µg/L	1.0 U	1.0 U	1.0 U	-	-	10 U	1.0 U	-	10 U	1.0 U	10 U
trans-1,2-Dichloroethene	µg/L	-	-	-	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane (CFC-11)	µg/L	-	-	-	-	-	-	-	-	-	-	-
Trifluorotrichloroethane (Freon 113)	µg/L	-	-	-	-	-	-	-	-	-	-	-
Vinyl chloride	µg/L	-	-	-	-	-	-	-	-	-	-	-
Xylene (total)	µg/L	1.0 U	1.0 U	1.0 U	-	-	10 U	1.0 U	-	10 U	1.0 U	10 U

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*MW-13-89*	*MW-13-89*	*MW-13-89*	*MW-14-89*	*MW-14-89*	*MW-14-89*	*MW-14-89*	*MW14-89*	*MW-15-89*	*MW-15-89*	*MW-16-89*
Sample ID:		*W-2428-DT-016*	*W-2428-DT-046*	*W-2428-DT-047*	*W-2428-DT-010*	*W-2428-DT-010 (filt)*	*W-2428-DT-010*	*W-2428-DT-063*		*W-2428-DT-025*	*W-2428-DT-054*	*W-2428-DT-020*
Sample Date:		*10/17/1989*	*12/12/1989*	*12/12/1989*	*6/26/1989*	*6/26/1989*	*7/5/1989*	*12/20/1989*	*7/10/1992*	*10/17/1989*	*12/14/1989*	*10/17/1989*
				Duplicate								
Parameter	*Units*											
Total VOCs	µg/L	ND	ND	ND	-	-	240	5.15	ND	ND	ND	ND
Semi-Volatiles												
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether)	µg/L	-	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	µg/L	-	-	-	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	µg/L	-	-	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	µg/L	3 U	3 U	3 U	-	-	NA	3 U	-	3.47	3 U	3 U
2-Chlorophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	µg/L	3 U	3 U	3 U	-	-	10 U	3 U	-	4.69	3 U	3 U
2-Methylphenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
2-Nitroaniline	µg/L	-	-	-	-	-	-	-	-	-	-	-
2-Nitrophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	µg/L	-	-	-	-	-	-	-	-	-	-	-
3-Nitroaniline	µg/L	-	-	-	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	µg/L	-	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
4-Chloroaniline	µg/L	-	-	-	-	-	-	-	-	-	-	-
4-Chlorophenyl phenyl ether	µg/L	-	-	-	-	-	-	-	-	-	-	-
4-Methylphenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
4-Nitroaniline	µg/L	-	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	µg/L	3 U	3 U	3 U	-	-	10 U	3 U	-	3 U	3 U	3 U
Acenaphthylene	µg/L	3 U	3 U	3 U	-	-	10 U	3 U	10 U	3 U	3 U	3 U
Acetophenone	µg/L	-	-	-	-	-	-	-	-	-	-	-
Anthracene	µg/L	3 U	3 U	3 U	-	-	10 U	3 U	10 U	3 U	3 U	3 U
Atrazine	µg/L	-	-	-	-	-	-	-	-	-	-	-
Benzaldehyde	µg/L	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	µg/L	3 U	3 U	3 U	-	-	10 U	3 U	10 U	**17.2**[b]	3 U	3 U
Benzo(a)pyrene	µg/L	3 U	3 U	3 U	-	-	10 U	3 U	10 U	**12.4**[a]	3 U	3 U
Benzo(b)fluoranthene	µg/L	3 U	3 U	3 U	-	-	10 U	3 U	-	**19.0**[b]	3 U	3 U
Benzo(b)fluoranthene/ Benzo(k)fluoranthene	µg/L	-	-	-	-	-	-	-	10 U	-	-	-
Benzo(g,h,i)perylene	µg/L	3 U	3 U	3 U	-	-	NA	3 U	-	9.17	3 U	3 U
Benzo(k)fluoranthene	µg/L	3 U	3 U	3 U	-	-	10 U	3 U	-	**19.0**[b]	3 U	3 U
Biphenyl	µg/L	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	µg/L	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	µg/L	-	-	-	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate	µg/L	-	-	-	-	-	-	-	-	-	-	-
Butyl benzylphthalate	µg/L	-	-	-	-	-	-	-	-	-	-	-
Caprolactam	µg/L	-	-	-	-	-	-	-	-	-	-	-
Carbazole	µg/L	-	-	-	-	-	-	-	-	-	-	-
Chrysene	µg/L	3 U	3 U	3 U	-	-	10 U	3 U	10 U	**10.5**[b]	3 U	3 U
Dibenz(a,h)anthracene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	µg/L	NA	NA	NA	-	-	10 U	NA	10 U	NA	NA	NA
Diethyl phthalate	µg/L	-	-	-	-	-	-	-	-	-	-	-
Dimethyl phthalate	µg/L	-	-	-	-	-	-	-	-	-	-	-
Di-n-butylphthalate	µg/L	-	-	-	-	-	-	-	-	-	-	-
Di-n-octyl phthalate	µg/L	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	µg/L	3 U	3 U	3 U	-	-	10 U	3 U	10 U	30.9	3 U	3 U

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*MW-13-89*	*MW-13-89*	*MW-13-89*	*MW-14-89*	*MW-14-89*	*MW-14-89*	*MW-14-89*	*MW-14-89*	*MW-15-89*	*MW-15-89*	*MW-16-89*
Sample ID:		*W-2428-DT-016*	*W-2428-DT-046*	*W-2428-DT-047*	*W-2428-DT-010*	*W-2428-DT-010 (filt)*	*W-2428-DT-010*	*W-2428-DT-063*	*MW14-89*	*W-2428-DT-025*	*W-2428-DT-054*	*W-2428-DT-020*
Sample Date:		*10/17/1989*	*12/12/1989*	*12/12/1989 Duplicate*	*6/26/1989*	*6/26/1989*	*7/5/1989*	*12/20/1989*	*7/10/1992*	*10/17/1989*	*12/14/1989*	*10/17/1989*
Parameter	*Units*											
Fluorene	µg/L	3 U	3 U	3 U	-	-	10 U	3 U	10 U	6.49	3 U	3 U
Hexachlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Hexachloroethane	µg/L	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	µg/L	3 U	3 U	3 U	-	-	NA	3 U	-	**14.3[b]**	3 U	3 U
Isophorone	µg/L	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	µg/L	3 U	3 U	3 U	-	-	10 U	3 U	-	7.46	3 U	3 U
Nitrobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	µg/L	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	µg/L	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	µg/L	3 U	3 U	3 U	-	-	10 U	3 U	10 U	15.6	3 U	3 U
Phenol	µg/L	-	-	-	-	-	-	-	-	-	-	-
Pyrene	µg/L	3 U	3 U	3 U	-	-	10 U	3 U	10 U	18.8	3 U	3 U
Total SVOCs	µg/L	ND	ND	ND	-	-	ND	ND	ND	188.98	ND	ND
Metals												
Aluminum	mg/L	-	-	-	8.77	0.0402	-	-	-	-	-	-
Antimony	mg/L	-	-	-	-	-	-	-	-	-	-	-
Arsenic	mg/L	-	-	-	0.0036	0.0017	-	-	-	-	-	-
Barium	mg/L	-	-	-	0.145 E	0.0625 E	-	-	-	-	-	-
Beryllium	mg/L	-	-	-	**0.0037[b]**	0.00050 U	-	-	-	-	-	-
Cadmium	mg/L	-	-	-	-	-	-	-	-	-	-	-
Calcium	mg/L	-	-	-	196 E	132	-	-	-	-	-	-
Chromium Total	mg/L	-	-	-	0.0233	0.0038 U	-	-	-	-	-	-
Chromium VI (Hexavalent)	mg/L	0.01 U	0.01 U	0.01 U	-	-	0.02 X	0.01 U	-	0.01 U	0.01 U	0.01 U
Cobalt	mg/L	-	-	-	0.0122	0.0042	-	-	-	-	-	-
Copper	mg/L	-	-	-	0.0102	0.0245	-	-	-	-	-	-
Iron	mg/L	-	-	-	**11.5 E[a]**	0.028	-	-	-	-	-	-
Lead	mg/L	-	-	-	0.0058 E	0.0045 U	-	-	-	-	-	-
Magnesium	mg/L	-	-	-	**57.2 E[b]**	34.5	-	-	-	-	-	-
Manganese	mg/L	-	-	-	**3.55 E[a]**	**1.08[a]**	-	-	-	-	-	-
Mercury	mg/L	-	-	-	0.00020 U	0.00020 U	-	-	-	-	-	-
Nickel	mg/L	-	-	-	**0.153[a]**	0.0326	-	-	-	-	-	-
Potassium	mg/L	-	-	-	5.63	1.74 U	-	-	-	-	-	-
Selenium	mg/L	-	-	-	0.010 U	0.010 UC	-	-	-	-	-	-
Silver	mg/L	-	-	-	0.0049 U	0.0049 U	-	-	-	-	-	-
Sodium	mg/L	-	-	-	**188 E[a]**	**151[a]**	-	-	-	-	-	-
Thallium	mg/L	-	-	-	-	-	-	-	-	-	-	-
Vanadium	mg/L	-	-	-	0.0385	0.0072	-	-	-	-	-	-
Zinc	mg/L	-	-	-	0.0721 E	0.0212	-	-	-	-	-	-

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*MW-13-89*	*MW-13-89*	*MW-13-89*	*MW-14-89*	*MW-14-89*	*MW-14-89*	*MW-14-89*	*MW-14-89*	*MW-15-89*	*MW-15-89*	*MW-16-89*
Sample ID:		*W-2428-DT-016*	*W-2428-DT-046*	*W-2428-DT-047*	*W-2428-DT-010*	*W-2428-DT-010 (filt)*	*W-2428-DT-010*	*W-2428-DT-063*	*MW14-89*	*W-2428-DT-025*	*W-2428-DT-054*	*W-2428-DT-020*
Sample Date:		*10/17/1989*	*12/12/1989*	*12/12/1989 Duplicate*	*6/26/1989*	*6/26/1989*	*7/5/1989*	*12/20/1989*	*7/10/1992*	*10/17/1989*	*12/14/1989*	*10/17/1989*
Parameter	*Units*											
General Chemistry												
Cyanide (free)	mg/L	-	-	-	-	-	-	-	-	-	-	-
Cyanide (total)	mg/L	**2.75**[a]	**1.69**[a]	**1.72**[a]	-	-	0.0484	0.021	0.008	**0.25**[a]	0.147	0.01
Oil and Grease	mg/L	1 U	1 U	1 U	-	-	1 U	NS	1 U	2.2	1 U	5.5
Phenolics (Total)	mg/L	-	-	-	-	-	-	-	-	-	-	-
Total Organic Halides (TOX)	mg/L	-	-	-	-	-	-	-	-	-	-	-

Notes:

C	The associated data is estimated due to outlying calibration data.
E	The associated data is estimated due to outlying surrogate recoveries or to chemical and/or physical interferences.
J	Estimated.
NA	Parameter not analyzed.
NS	No sample.
R	Unusable data due to holding time exceedance.
U	Not present at or above the associated value.
UJ	Estimated reporting limit.
W	Indicates low spike recoveries and may reflect a low bias in results.
X	The associated data is estimated due to holding time exceedences.
Y	The associated data is unusable due to spike recoveries.
*	Also present in laboratory/reagent blank, indicating possible/probable laboratory contamination.
**	High quantifiable limits due to the necessary dilution of the sample.
--	Not applicable.

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*MW-16-89*	*MW-16-89*	*MW-16-89*	*MW-17-89*	*MW-17-89*	*MW-17-89*	*MW-17-89*	*MW-18-91*	*MW-18-91*	*MW-18-91*
Sample ID:		*W-2428-DT-062*	*MW16-89*	*MW16-89*	*W-2428-DT-002*	*W-2428-DT-002 (filt)*	*W-2428-DT-002*	*W-2428-DT-057*	*MW18-91*	*MW18-91*	*WG-2428-081605-004*
Sample Date:		*12/19/1989*	*7/16/1991*	*7/9/1992*	*6/26/1989*	*6/26/1989*	*6/27/1989*	*12/15/1989*	*7/16/1991*	*7/7/1992*	*8/16/2005*
Parameter	*Units*										
Volatiles											
1,1,1-Trichloroethane	µg/L	1.0 U	-	-	-	-	5 U	1.0 U	-	-	5 U
1,1,2,2-Tetrachloroethane	µg/L	-	-	-	-	-	-	-	-	-	5 U
1,1,2-Trichloroethane	µg/L	-	-	-	-	-	-	-	-	-	5 UJ
1,1-Dichloroethane	µg/L	-	-	-	-	-	-	-	-	-	5 UJ
1,1-Dichloroethene	µg/L	-	-	-	-	-	-	-	-	-	5 UJ
1,2,4-Trichlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	5 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	-	-	-	-	-	-	-	-	-	5 U
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	-	-	-	-	-	-	-	-	-	5 U
1,2-Dichlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	5 U
1,2-Dichloroethane	µg/L	-	-	-	-	-	-	-	-	-	5 UJ
1,2-Dichloroethene (total)	µg/L	1.0 U	-	-	-	-	5 U	1.0 U	-	-	-
1,2-Dichloropropane	µg/L	-	-	-	-	-	-	-	-	-	5 UJ
1,3-Dichlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	5 U
1,4-Dichlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	5 U
2-Butanone (Methyl Ethyl Ketone)	µg/L	-	-	-	-	-	-	-	-	-	10 U
2-Hexanone	µg/L	-	-	-	-	-	-	-	-	-	10 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	-	-	-	-	-	-	-	-	-	10 U
Acetone	µg/L	NA	-	50 U	-	-	36 *	NA	-	50 U	10 U
Benzene	µg/L	3.76[a]	-	-	-	-	5 U	1.0 U	-	-	5 UJ
Bromodichloromethane	µg/L	-	-	-	-	-	-	-	-	-	5 UJ
Bromoform	µg/L	-	-	-	-	-	-	-	-	-	5 U
Bromomethane (Methyl Bromide)	µg/L	-	-	-	-	-	-	-	-	-	5 U
Carbon disulfide	µg/L	-	-	-	-	-	-	-	-	-	5 U
Carbon tetrachloride	µg/L	-	-	-	-	-	-	-	-	-	5 U
Chlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	5 U
Chloroethane	µg/L	-	-	-	-	-	-	-	-	-	5 UJ
Chloroform (Trichloromethane)	µg/L	-	-	-	-	-	-	-	-	-	5 UJ
Chloromethane (Methyl Chloride)	µg/L	-	-	-	-	-	-	-	-	-	5 UJ
cis-1,2-Dichloroethene	µg/L	-	-	-	-	-	-	-	7.68[a]	-	2 J
cis-1,3-Dichloropropene	µg/L	-	-	-	-	-	-	-	-	-	5 UJ
Cyclohexane	µg/L	-	-	-	-	-	-	-	-	-	5 U
Dibromochloromethane	µg/L	-	-	-	-	-	-	-	-	-	5 U
Dichlorodifluoromethane (CFC-12)	µg/L	-	-	-	-	-	-	-	-	-	5 UJ
Ethylbenzene	µg/L	1.0 U	-	-	-	-	5 U	1.0 U	-	-	5 U
Isopropylbenzene	µg/L	-	-	-	-	-	-	-	-	-	5 U
Methyl acetate	µg/L	-	-	-	-	-	-	-	-	-	5 U
Methyl cyclohexane	µg/L	-	-	-	-	-	-	-	-	-	5 U
Methyl Tert Butyl Ether	µg/L	-	-	-	-	-	-	-	-	-	5 U
Methylene chloride	µg/L	5.74 *[a]	-	-	-	-	5 U	5 U	-	-	5 UJ
m-Xylene/Chlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-
o-Xylene	µg/L	-	-	-	-	-	-	-	-	-	-
p-Xylene	µg/L	-	-	-	-	-	-	-	-	-	-
Styrene	µg/L	-	-	-	-	-	-	-	-	-	5 U
Tetrachloroethene	µg/L	-	-	-	-	-	-	-	-	-	5 U
Toluene	µg/L	1.0 U	-	-	-	-	5 U	1.0 U	-	-	5 U
trans-1,2-Dichloroethene	µg/L	-	-	-	-	-	-	-	-	-	5 UJ
trans-1,3-Dichloropropene	µg/L	-	-	-	-	-	-	-	-	-	5 U
Trichloroethene	µg/L	-	-	-	-	-	-	-	-	-	5 U
Trichlorofluoromethane (CFC-11)	µg/L	-	-	-	-	-	-	-	-	-	5 UJ
Trifluorotrichloroethane (Freon 113)	µg/L	-	-	-	-	-	-	-	-	-	5 U
Vinyl chloride	µg/L	-	-	-	-	-	-	-	-	-	5 UJ
Xylene (total)	µg/L	1.0 U	-	-	-	-	5 U	1.0 U	-	-	5 U

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*MW-16-89*	*MW-16-89*	*MW-16-89*	*MW-17-89*	*MW-17-89*	*MW-17-89*	*MW-17-89*	*MW-18-91*	*MW-18-91*	*MW-18-91*
Sample ID:		*W-2428-DT-062*	*MW16-89*	*MW16-89*	*W-2428-DT-002*	*W-2428-DT-002 (filt)*	*W-2428-DT-002*	*W-2428-DT-057*	*MW18-91*	*MW18-91*	*WG-2428-081605-004*
Sample Date:		*12/19/1989*	*7/16/1991*	*7/9/1992*	*6/26/1989*	*6/26/1989*	*6/27/1989*	*12/15/1989*	*7/16/1991*	*7/7/1992*	*8/16/2005*
Parameter	*Units*										
Total VOCs	µg/L	9.5	-	ND	-	-	36	ND	7.68	ND	2
Semi-Volatiles											
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether)	µg/L	-	-	-	-	-	-	-	-	-	10 U
2,4,5-Trichlorophenol	µg/L	-	-	-	-	-	-	-	-	-	25 U
2,4,6-Trichlorophenol	µg/L	-	-	-	-	-	-	-	-	-	10 U
2,4-Dichlorophenol	µg/L	-	-	-	-	-	-	-	-	-	10 U
2,4-Dimethylphenol	µg/L	-	-	-	-	-	-	-	-	-	10 U
2,4-Dinitrophenol	µg/L	-	-	-	-	-	-	-	-	-	25 U
2,4-Dinitrotoluene	µg/L	-	-	-	-	-	-	-	-	-	10 U
2,6-Dinitrotoluene	µg/L	-	-	-	-	-	-	-	-	-	10 U
2-Chloronaphthalene	µg/L	3 U	-	-	-	-	NA	3 U	-	-	10 U
2-Chlorophenol	µg/L	-	-	-	-	-	-	-	-	-	10 U
2-Methylnaphthalene	µg/L	3 U	-	-	-	-	10 U	3 U	-	-	10 U
2-Methylphenol	µg/L	-	-	-	-	-	-	-	-	-	10 U
2-Nitroaniline	µg/L	-	-	-	-	-	-	-	-	-	25 U
2-Nitrophenol	µg/L	-	-	-	-	-	-	-	-	-	10 U
3,3'-Dichlorobenzidine	µg/L	-	-	-	-	-	-	-	-	-	10 U
3-Nitroaniline	µg/L	-	-	-	-	-	-	-	-	-	25 U
4,6-Dinitro-2-methylphenol	µg/L	-	-	-	-	-	-	-	-	-	25 U
4-Bromophenyl phenyl ether	µg/L	-	-	-	-	-	-	-	-	-	10 U
4-Chloro-3-methylphenol	µg/L	-	-	-	-	-	-	-	-	-	10 U
4-Chloroaniline	µg/L	-	-	-	-	-	-	-	-	-	10 U
4-Chlorophenyl phenyl ether	µg/L	-	-	-	-	-	-	-	-	-	10 U
4-Methylphenol	µg/L	-	-	-	-	-	-	-	-	-	10 U
4-Nitroaniline	µg/L	-	-	-	-	-	-	-	-	-	25 U
4-Nitrophenol	µg/L	-	-	-	-	-	-	-	-	-	25 U
Acenaphthene	µg/L	3 U	-	-	-	-	10 U	3 U	5 U	-	10 U
Acenaphthylene	µg/L	3 U	-	10 U	-	-	10 U	3 U	5 U	10 U	10 U
Acetophenone	µg/L	-	-	-	-	-	-	-	-	-	10 U
Anthracene	µg/L	3 U	-	10 U	-	-	10 U	3 U	5 U	10 U	10 U
Atrazine	µg/L	-	-	-	-	-	-	-	-	-	10 U
Benzaldehyde	µg/L	-	-	-	-	-	-	-	-	-	10 U
Benzo(a)anthracene	µg/L	3 U	-	10 U	-	-	10 U	3 U	5 U	10 U	10 U
Benzo(a)pyrene	µg/L	3 U	-	10 U	-	-	10 U	3 U	5 U	10 U	10 U
Benzo(b)fluoranthene	µg/L	3 U	-	-	-	-	10 U	3 U	-	-	10 U
Benzo(b)fluoranthene/Benzo(k)fluoranthene	µg/L	-	-	10 U	-	-	-	-	5 U	10 U	-
Benzo(g,h,i)perylene	µg/L	3 U	-	-	-	-	NA	3 U	5 U	-	10 U
Benzo(k)fluoranthene	µg/L	3 U	-	-	-	-	10 U	3 U	-	-	10 U
Biphenyl	µg/L	-	-	-	-	-	-	-	-	-	10 U
bis(2-Chloroethoxy)methane	µg/L	-	-	-	-	-	-	-	-	-	10 U
bis(2-Chloroethyl)ether	µg/L	-	-	-	-	-	-	-	-	-	10 U
bis(2-Ethylhexyl)phthalate	µg/L	-	-	-	-	-	-	-	-	-	10 U
Butyl benzylphthalate	µg/L	-	-	-	-	-	-	-	-	-	10 U
Caprolactam	µg/L	-	-	-	-	-	-	-	-	-	10 U
Carbazole	µg/L	-	-	-	-	-	-	-	-	-	10 U
Chrysene	µg/L	3 U	-	10 U	-	-	10 U	3 U	5 U	10 U	10 U
Dibenz(a,h)anthracene	µg/L	-	-	-	-	-	-	-	5 U	-	10 U
Dibenzofuran	µg/L	NA	-	10 U	-	-	10 U	NA	-	10 U	10 U
Diethyl phthalate	µg/L	-	-	-	-	-	-	-	-	-	10 U
Dimethyl phthalate	µg/L	-	-	-	-	-	-	-	-	-	10 U
Di-n-butylphthalate	µg/L	-	-	-	-	-	-	-	-	-	10 U
Di-n-octyl phthalate	µg/L	-	-	-	-	-	-	-	-	-	10 U
Fluoranthene	µg/L	3 U	-	10 U	-	-	10 U	3 U	5 U	10 U	10 U

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*MW-16-89*	*MW-16-89*	*MW-16-89*	*MW-17-89*	*MW-17-89*	*MW-17-89*	*MW-17-89*	*MW-18-91*	*MW-18-91*	*MW-18-91*
Sample ID:		*W-2428-DT-062*	*MW16-89*	*MW16-89*	*W-2428-DT-002*	*W-2428-DT-002 (filt)*	*W-2428-DT-002*	*W-2428-DT-057*	*MW18-91*	*MW18-91*	*WG-2428-081605-004*
Sample Date:		*12/19/1989*	*7/16/1991*	*7/9/1992*	*6/26/1989*	*6/26/1989*	*6/27/1989*	*12/15/1989*	*7/16/1991*	*7/7/1992*	*8/16/2005*
Parameter	***Units***										
Fluorene	µg/L	3 U	-	10 U	-	-	10 U	3 U	5 U	10 U	10 U
Hexachlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	10 U
Hexachlorobutadiene	µg/L	-	-	-	-	-	-	-	-	-	10 U
Hexachlorocyclopentadiene	µg/L	-	-	-	-	-	-	-	-	-	10 U
Hexachloroethane	µg/L	-	-	-	-	-	-	-	-	-	10 U
Indeno(1,2,3-cd)pyrene	µg/L	3 U	-	-	-	-	NA	3 U	5 U	-	10 U
Isophorone	µg/L	-	-	-	-	-	-	-	-	-	10 U
Naphthalene	µg/L	3 U	-	-	-	-	10 U	3 U	5 U	-	10 U
Nitrobenzene	µg/L	-	-	-	-	-	-	-	-	-	10 U
N-Nitrosodi-n-propylamine	µg/L	-	-	-	-	-	-	-	-	-	10 U
N-Nitrosodiphenylamine	µg/L	-	-	-	-	-	-	-	-	-	10 U
Pentachlorophenol	µg/L	-	-	-	-	-	-	-	-	-	25 U
Phenanthrene	µg/L	3 U	-	10 U	-	-	10 U	3 U	5 U	10 U	10 U
Phenol	µg/L	-	-	-	-	-	-	-	-	-	10 U
Pyrene	µg/L	3 U	-	10 U	-	-	10 U	3 U	5 U	10 U	10 U
Total SVOCs	µg/L	ND	-	ND	-	-	ND	ND	ND	ND	ND
Metals											
Aluminum	mg/L	-	-	-	0.127	0.0265	-	-	-	-	0.268
Antimony	mg/L	-	-	-	-	-	-	-	-	-	0.0033 U
Arsenic	mg/L	-	0.01	-	0.0049	0.0093	-	-	-	-	0.0056 U
Barium	mg/L	-	-	-	0.0929	0.0939	-	-	-	-	0.0273
Beryllium	mg/L	-	-	-	0.00050 U	0.00070 U	-	-	-	-	0.0171 U
Cadmium	mg/L	-	**0.019[a]**	-	-	-	-	-	-	-	0.00037 U
Calcium	mg/L	-	361	-	199	207	-	-	-	-	101
Chromium Total	mg/L	-	0.025	-	0.0038 U	0.0062 U	-	-	-	-	0.0091
Chromium VI (Hexavalent)	mg/L	0.01	-	-	-	-	0.02 X	0.01 U	-	-	-
Cobalt	mg/L	-	-	-	0.0033 U	0.0055	-	-	-	-	0.0011 U
Copper	mg/L	-	0.157	-	0.0073 U	0.0072 U	-	-	-	-	0.00098 U
Iron	mg/L	-	**160[a]**	-	**5.33[a]**	**3.3[a]**	-	-	-	-	**23.3[a]**
Lead	mg/L	-	0.006	-	0.0009 U	0.0011 U	-	-	-	-	0.0012 U
Magnesium	mg/L	-	**183[b]**	-	**56.1 E[b]**	**58.6 E[b]**	-	-	-	-	0.204
Manganese	mg/L	-	**11.2[a]**	-	**0.847[a]**	**1.05[a]**	-	-	-	-	0.192
Mercury	mg/L	-	0.0007	-	0.00020 U	0.00020 UX	-	-	-	-	0.00010 U
Nickel	mg/L	-	0.073	-	0.0520	0.0641	-	-	-	-	0.0060
Potassium	mg/L	-	5.88	-	9.68	13.4	-	-	-	-	16.3
Selenium	mg/L	-	-	-	0.010 UC	0.0160 U	-	-	-	-	0.0054 U
Silver	mg/L	-	0.016	-	0.0049 U	0.0057 U	-	-	-	-	0.0036 U
Sodium	mg/L	-	**183[a]**	-	**137 C[a]**	**142[a]**	-	-	-	-	12.8
Thallium	mg/L	-	-	-	-	-	-	-	-	-	0.0050 U
Vanadium	mg/L	-	0.004	-	0.0030	0.0076	-	-	-	-	0.0058
Zinc	mg/L	-	0.03	-	0.0463	0.0118	-	-	-	-	0.0160

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*MW-16-89*	*MW-16-89*	*MW-16-89*	*MW-17-89*	*MW-17-89*	*MW-17-89*	*MW-17-89*	*MW-18-91*	*MW-18-91*	*MW-18-91*
Sample ID:		*W-2428-DT-062*	*MW16-89*	*MW16-89*	*W-2428-DT-002*	*W-2428-DT-002 (filt)*	*W-2428-DT-002*	*W-2428-DT-057*	*MW18-91*	*MW18-91*	*WG-2428-081605-004*
Sample Date:		*12/19/1989*	*7/16/1991*	*7/9/1992*	*6/26/1989*	*6/26/1989*	*6/27/1989*	*12/15/1989*	*7/16/1991*	*7/7/1992*	*8/16/2005*
Parameter	*Units*										
General Chemistry											
Cyanide (free)	mg/L	-	-	-	-	-	-	-	-	-	-
Cyanide (total)	mg/L	0.015	-	0.006	-	-	0.0138	**0.27[a]**	0.036	0.04	0.0169
Oil and Grease	mg/L	1 U	-	9.1	-	-	U	1 U	3.8	1 U	-
Phenolics (Total)	mg/L	-	-	-	-	-	-	-	-	-	-
Total Organic Halides (TOX)	mg/L	-	-	-	-	-	-	-	-	-	-

Notes:

C	The associated data is estimated due to outlying calibration data.
E	The associated data is estimated due to outlying surrogate recoveries or to chemical and/or physical interferences.
J	Estimated.
NA	Parameter not analyzed.
NS	No sample.
R	Unusable data due to holding time exceedance.
U	Not present at or above the associated value.
UJ	Estimated reporting limit.
W	Indicates low spike recoveries and may reflect a low bias in results.
X	The associated data is estimated due to holding time exceedences.
Y	The associated data is unusable due to spike recoveries.
*	Also present in laboratory/reagent blank, indicating possible/probable laboratory contamination.
**	High quantifiable limits due to the necessary dilution of the sample.
- -	Not applicable.

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*MW-18D-05*	*MW-18D-05*	*MW-19-91*	*MW-19-91*	*MW-20-91*
Sample ID:		*WG-2428-081605-002*	*WG-2428-081605-003*	*MW19-91*	*MW19-91*	*MW20-91*
Sample Date:		*8/16/2005*	*8/16/2005*	*7/18/1991*	*7/6/1992*	*7/6/1992*
			Duplicate			
Parameter	*Units*					
Volatiles						
1,1,1-Trichloroethane	µg/L	5 U	5 U	-	-	-
1,1,2,2-Tetrachloroethane	µg/L	5 U	5 U	-	-	-
1,1,2-Trichloroethane	µg/L	5 UJ	5 UJ	-	-	-
1,1-Dichloroethane	µg/L	5 UJ	5 UJ	-	-	-
1,1-Dichloroethene	µg/L	5 UJ	5 UJ	-	-	-
1,2,4-Trichlorobenzene	µg/L	5 U	5 U	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	5 U	5 U	-	-	-
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	5 U	5 U	-	-	-
1,2-Dichlorobenzene	µg/L	5 U	5 U	-	-	-
1,2-Dichloroethane	µg/L	5 UJ	5 UJ	-	-	-
1,2-Dichloroethene (total)	µg/L	-	-	-	-	-
1,2-Dichloropropane	µg/L	5 UJ	5 UJ	-	-	-
1,3-Dichlorobenzene	µg/L	5 U	5 U	-	-	-
1,4-Dichlorobenzene	µg/L	5 U	5 U	-	-	-
2-Butanone (Methyl Ethyl Ketone)	µg/L	10 U	10 U	-	-	-
2-Hexanone	µg/L	10 U	10 U	-	-	-
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/L	10 U	10 U	-	-	-
Acetone	µg/L	10 U	10 U	-	76[b]	50 U
Benzene	µg/L	5 UJ	5 UJ	-	-	-
Bromodichloromethane	µg/L	5 UJ	5 UJ	-	-	-
Bromoform	µg/L	5 U	5 U	-	-	-
Bromomethane (Methyl Bromide)	µg/L	5 U	5 U	-	-	-
Carbon disulfide	µg/L	1 J	5 U	-	-	-
Carbon tetrachloride	µg/L	5 U	5 U	-	-	-
Chlorobenzene	µg/L	5 U	5 U	-	-	-
Chloroethane	µg/L	5 UJ	5 UJ	-	-	-
Chloroform (Trichloromethane)	µg/L	5 UJ	5 UJ	-	-	-
Chloromethane (Methyl Chloride)	µg/L	5 UJ	5 UJ	-	-	-
cis-1,2-Dichloroethene	µg/L	5 UJ	5 UJ	1 U	-	-
cis-1,3-Dichloropropene	µg/L	5 UJ	5 UJ	-	-	-
Cyclohexane	µg/L	5 U	5 U	-	-	-
Dibromochloromethane	µg/L	5 U	5 U	-	-	-
Dichlorodifluoromethane (CFC-12)	µg/L	5 UJ	5 UJ	-	-	-
Ethylbenzene	µg/L	5 U	5 U	-	-	-
Isopropylbenzene	µg/L	5 U	5 U	-	-	-
Methyl acetate	µg/L	5 U	5 U	-	-	-
Methyl cyclohexane	µg/L	5 U	5 U	-	-	-
Methyl Tert Butyl Ether	µg/L	5 U	5 U	-	-	-
Methylene chloride	µg/L	5 UJ	5 UJ	-	-	-
m-Xylene/Chlorobenzene	µg/L	-	-	-	-	-
o-Xylene	µg/L	-	-	-	-	-
p-Xylene	µg/L	-	-	-	-	-
Styrene	µg/L	5 U	5 U	-	-	-
Tetrachloroethene	µg/L	5 U	5 U	-	-	-
Toluene	µg/L	5 U	5 U	-	-	-
trans-1,2-Dichloroethene	µg/L	5 UJ	5 UJ	-	-	-
trans-1,3-Dichloropropene	µg/L	5 U	5 U	-	-	-
Trichloroethene	µg/L	5 U	5 U	-	-	-
Trichlorofluoromethane (CFC-11)	µg/L	5 UJ	5 UJ	-	-	-
Trifluorotrichloroethane (Freon 113)	µg/L	5 U	5 U	-	-	-
Vinyl chloride	µg/L	5 UJ	5 UJ	-	-	-
Xylene (total)	µg/L	5 U	5 U	-	-	-

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*MW-18D-05*	*MW-18D-05*	*MW-19-91*	*MW-19-91*	*MW-20-91*
Sample ID:		*WG-2428-081605-002*	*WG-2428-081605-003*	*MW19-91*	*MW19-91*	*MW20-91*
Sample Date:		*8/16/2005*	*8/16/2005*	*7/18/1991*	*7/6/1992*	*7/6/1992*
			Duplicate			
Parameter	***Units***					
Total VOCs	µg/L	1	ND	ND	76	ND
Semi-Volatiles						
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether)	µg/L	10 U	10 U	-	-	-
2,4,5-Trichlorophenol	µg/L	25 U	25 U	-	-	-
2,4,6-Trichlorophenol	µg/L	10 U	10 U	-	-	-
2,4-Dichlorophenol	µg/L	10 U	10 U	-	-	-
2,4-Dimethylphenol	µg/L	10 U	10 U	-	-	-
2,4-Dinitrophenol	µg/L	25 U	25 U	-	-	-
2,4-Dinitrotoluene	µg/L	10 U	10 U	-	-	-
2,6-Dinitrotoluene	µg/L	10 U	10 U	-	-	-
2-Chloronaphthalene	µg/L	10 U	10 U	-	-	-
2-Chlorophenol	µg/L	10 U	10 U	-	-	-
2-Methylnaphthalene	µg/L	10 U	10 U	-	-	-
2-Methylphenol	µg/L	10 U	10 U	-	-	-
2-Nitroaniline	µg/L	25 U	25 U	-	-	-
2-Nitrophenol	µg/L	10 U	10 U	-	-	-
3,3'-Dichlorobenzidine	µg/L	10 U	10 U	-	-	-
3-Nitroaniline	µg/L	25 U	25 U	-	-	-
4,6-Dinitro-2-methylphenol	µg/L	25 U	25 U	-	-	-
4-Bromophenyl phenyl ether	µg/L	10 U	10 U	-	-	-
4-Chloro-3-methylphenol	µg/L	10 U	10 U	-	-	-
4-Chloroaniline	µg/L	10 U	10 U	-	-	-
4-Chlorophenyl phenyl ether	µg/L	10 U	10 U	-	-	-
4-Methylphenol	µg/L	10 U	10 U	-	-	-
4-Nitroaniline	µg/L	25 U	25 U	-	-	-
4-Nitrophenol	µg/L	25 U	25 U	-	-	-
Acenaphthene	µg/L	10 U	10 U	80 U[a,a]	-	-
Acenaphthylene	µg/L	10 U	10 U	80 U[a,a]	16	10 U
Acetophenone	µg/L	10 U	10 U	-	-	-
Anthracene	µg/L	10 U	10 U	**174**[b]	17	10 U
Atrazine	µg/L	10 U	10 U	-	-	-
Benzaldehyde	µg/L	10 U	10 U	-	-	-
Benzo(a)anthracene	µg/L	10 U	10 U	**493**[b]	**31**[b]	10 U
Benzo(a)pyrene	µg/L	10 U	10 U	**563**[a]	**29**[a]	10 U
Benzo(b)fluoranthene	µg/L	10 U	10 U	-	-	-
Benzo(b)fluoranthene/ Benzo(k)fluoranthene	µg/L	-	-	418	26	10 U
Benzo(g,h,i)perylene	µg/L	10 U	10 U	714	-	-
Benzo(k)fluoranthene	µg/L	10 U	10 U	-	-	-
Biphenyl	µg/L	10 U	10 U	-	-	-
bis(2-Chloroethoxy)methane	µg/L	10 U	10 U	-	-	-
bis(2-Chloroethyl)ether	µg/L	10 U	10 U	-	-	-
bis(2-Ethylhexyl)phthalate	µg/L	10 U	10 U	-	-	-
Butyl benzylphthalate	µg/L	10 U	10 U	-	-	-
Caprolactam	µg/L	10 U	10 U	-	-	-
Carbazole	µg/L	10 U	10 U	-	-	-
Chrysene	µg/L	10 U	10 U	**478**[b]	**31**[b]	10 U
Dibenz(a,h)anthracene	µg/L	10 U	10 U	405	-	-
Dibenzofuran	µg/L	10 U	10 U	-	11	10 U
Diethyl phthalate	µg/L	10 U	10 U	-	-	-
Dimethyl phthalate	µg/L	10 U	10 U	-	-	-
Di-n-butylphthalate	µg/L	10 U	10 U	-	-	-
Di-n-octyl phthalate	µg/L	10 U	10 U	-	-	-
Fluoranthene	µg/L	10 U	10 U	**805**[b]	**57**[b]	10 U

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*MW-18D-05*	*MW-18D-05*	*MW-19-91*	*MW-19-91*	*MW-20-91*
Sample ID:		*WG-2428-081605-002*	*WG-2428-081605-003*	*MW19-91*	*MW19-91*	*MW20-91*
Sample Date:		*8/16/2005*	*8/16/2005*	*7/18/1991*	*7/6/1992*	*7/6/1992*
			Duplicate			
Parameter	*Units*					
Fluorene	µg/L	10 U	10 U	**117[b]**	17	10 U
Hexachlorobenzene	µg/L	10 U	10 U	-	-	-
Hexachlorobutadiene	µg/L	10 U	10 U	-	-	-
Hexachlorocyclopentadiene	µg/L	10 U	10 U	-	-	-
Hexachloroethane	µg/L	10 U	10 U	-	-	-
Indeno(1,2,3-cd)pyrene	µg/L	10 U	10 U	**553[b]**	-	-
Isophorone	µg/L	10 U	10 U	-	-	-
Naphthalene	µg/L	10 U	10 U	80 U**	-	-
Nitrobenzene	µg/L	10 U	10 U	-	-	-
N-Nitrosodi-n-propylamine	µg/L	10 U	10 U	-	-	-
N-Nitrosodiphenylamine	µg/L	10 U	10 U	-	-	-
Pentachlorophenol	µg/L	25 U	25 U	-	-	-
Phenanthrene	µg/L	10 U	10 U	**511[b]**	**55[b]**	10 U
Phenol	µg/L	10 U	10 U	-	-	-
Pyrene	µg/L	10 U	10 U	**685[b]**	**57[b]**	10 U
Total SVOCs	µg/L	ND	ND	5916	347	ND
Metals						
Aluminum	mg/L	3.07	3.13	-	-	-
Antimony	mg/L	0.0033 U	0.0033 U	-	-	-
Arsenic	mg/L	0.0056 U	0.0056 U	-	-	-
Barium	mg/L	0.0739	0.0754	-	-	-
Beryllium	mg/L	0.0171 U	0.0171 U	-	-	-
Cadmium	mg/L	0.00037 U	0.00037 U	-	-	-
Calcium	mg/L	257	255	-	-	-
Chromium Total	mg/L	0.0075	0.0116	-	-	-
Chromium VI (Hexavalent)	mg/L	-	-	-	-	-
Cobalt	mg/L	0.0041	0.0047	-	-	-
Copper	mg/L	0.0032	0.0051	-	-	-
Iron	mg/L	**11.2[a]**	**11.4[a]**	-	-	-
Lead	mg/L	0.0077	0.0064	-	-	-
Magnesium	mg/L	28.7	29.2	-	-	-
Manganese	mg/L	**0.358[a]**	**0.377[a]**	-	-	-
Mercury	mg/L	0.00011	0.00010	-	-	-
Nickel	mg/L	0.0107	0.0132	-	-	-
Potassium	mg/L	11	12.5	-	-	-
Selenium	mg/L	0.0054 U	0.0054 U	-	-	-
Silver	mg/L	0.0036 U	0.0036 U	-	-	-
Sodium	mg/L	**29.1[a]**	**32.9[a]**	-	-	-
Thallium	mg/L	0.0050 U	0.0050 U	-	-	-
Vanadium	mg/L	0.0070	0.0081	-	-	-
Zinc	mg/L	0.0447	0.0525	-	-	-

TABLE 2.2

GROUNDWATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*MW-18D-05*	*MW-18D-05*	*MW-19-91*	*MW-19-91*	*MW-20-91*
Sample ID:		*WG-2428-081605-002*	*WG-2428-081605-003*	*MW19-91*	*MW19-91*	*MW20-91*
Sample Date:		*8/16/2005*	*8/16/2005*	*7/18/1991*	*7/6/1992*	*7/6/1992*
			Duplicate			
Parameter	*Units*					
General Chemistry						
Cyanide (free)	mg/L	-	-	-	-	-
Cyanide (total)	mg/L	0.0481	0.0430	0.012	0.004	0.001 U
Oil and Grease	mg/L	-	-	44	2.2	2.2
Phenolics (Total)	mg/L	-	-	-	-	-
Total Organic Halides (TOX)	mg/L	-	-	-	-	-

Notes:

C	The associated data is estimated due to outlying calibration data.
E	The associated data is estimated due to outlying surrogate recoveries or to chemical and/or physical interferences.
J	Estimated.
NA	Parameter not analyzed.
NS	No sample.
R	Unusable data due to holding time exceedance.
U	Not present at or above the associated value.
UJ	Estimated reporting limit.
W	Indicates low spike recoveries and may reflect a low bias in results.
X	The associated data is estimated due to holding time exceedences.
Y	The associated data is unusable due to spike recoveries.
*	Also present in laboratory/reagent blank, indicating possible/probable laboratory contamination.
**	High quantifiable limits due to the necessary dilution of the sample.
- -	Not applicable.

TABLE 2.3

SOIL ANALYTICAL RESULTS SUMMARY - AUGUST 2005
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*SS-1*	*SS-2*	*SS-3*	*SS-4*	*SS-4*	*SS-5*	*SS-6*
Sample ID:				*SO-2428-081705-011*	*SO-2428-081705-012*	*SO-2428-081705-013*	*SO-2428-081705-014*	*SO-2428-081705-015*	*SO-2428-081705-016*	*SO-2428-081705-017*
Sample Date:				*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/17/2005*
		Restricted Use Soil Cleanup Objectives Protection of Public Health								
Parameter	*Units*	*Industrial* a	*Res. Residential* b					*Duplicate*		
Volatiles										
1,1,1-Trichloroethane	µg/kg	1000000	100000	8 U	10 U	7 U	7 U	6 U	7 U	8 U
1,1,2,2-Tetrachloroethane	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U	8 U
1,1,2-Trichloroethane	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U	8 U
1,1-Dichloroethane	µg/kg	480000	26000	8 U	10 U	7 U	2 J	1 J	2 J	8 U
1,1-Dichloroethene	µg/kg	1000000	100000	8 U	10 U	7 U	7 U	6 U	7 U	8 U
1,2,4-Trichlorobenzene	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U	8 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U	8 U
1,2-Dibromoethane (Ethylene Dibromide)	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U	8 U
1,2-Dichlorobenzene	µg/kg	1000000	100000	8 U	10 U	7 U	7 U	6 U	7 U	8 U
1,2-Dichloroethane	µg/kg	60000	3100	8 U	10 U	7 U	7 U	6 U	7 U	8 U
1,2-Dichloropropane	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U	8 U
1,3-Dichlorobenzene	µg/kg	560000	49000	8 U	10 U	7 U	7 U	6 U	7 U	8 U
1,4-Dichlorobenzene	µg/kg	250000	13000	8 U	10 U	7 U	7 U	6 U	7 U	8 U
2-Butanone (Methyl Ethyl Ketone)	µg/kg	1000000	100000	16 U	20 U	49	29	33	19	51
2-Hexanone	µg/kg	-	-	16 U	20 U	14 U	13 U	13 U	14 U	16 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/kg	-	-	16 U	20 U	14 U	13 U	13 U	14 U	16 U
Acetone	µg/kg	1000000	100000	36	61	140	260	260	160	110
Benzene	µg/kg	89000	4800	5 J	10 U	2 J	8	8	2 J	2 J
Bromodichloromethane	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U	8 U
Bromoform	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U	8 U
Bromomethane (Methyl Bromide)	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U	8 U
Carbon disulfide	µg/kg	-	-	8 U	10 U	2 J	7	7	5 J	8 U
Carbon tetrachloride	µg/kg	44000	2400	8 U	10 U	7 U	7 U	6 U	7 U	8 U
Chlorobenzene	µg/kg	1000000	100000	8 U	10 U	7 U	7 U	6 U	7 U	8 U
Chloroethane	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U	8 U
Chloroform (Trichloromethane)	µg/kg	700000	49000	8 U	10 U	7 U	7 U	6 U	7 U	8 U
Chloromethane (Methyl Chloride)	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U	8 U
cis-1,2-Dichloroethene	µg/kg	1000000	100000	8 U	10 U	7 U	7 U	6 U	7 U	8 U
cis-1,3-Dichloropropene	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U	8 U
Cyclohexane	µg/kg	-	-	8 U	10 U	14	10	9	7 U	8 U
Dibromochloromethane	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U	8 U
Dichlorodifluoromethane (CFC-12)	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U	8 U
Ethylbenzene	µg/kg	780000	41000	8 U	10 U	7 U	7 U	6 U	7 U	8 U
Isopropylbenzene	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U	8 U
Methyl acetate	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U	8 U
Methyl cyclohexane	µg/kg	-	-	8 U	10 U	22	15	13	7 U	8 U
Methyl Tert Butyl Ether	µg/kg	1000000	100000	8 U	10 U	7 U	7 U	6 U	7 U	8 U
Methylene chloride	µg/kg	1000000	100000	14 U	16 U	13 U	12 U	12 U	13 U	13 U
Styrene	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U	8 U
Tetrachloroethene	µg/kg	300000	19000	8 U	10 U	7 U	7 U	6 U	7 U	8 U
Toluene	µg/kg	1000000	100000	8 U	10 U	7 U	2 J	2 J	2 J	2 J
trans-1,2-Dichloroethene	µg/kg	1000000	100000	8 U	10 U	7 U	7 U	6 U	7 U	8 U
trans-1,3-Dichloropropene	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U	8 U
Trichloroethene	µg/kg	400000	21000	8 U	10 U	7 U	7 U	6 U	7 U	8 U
Trichlorofluoromethane (CFC-11)	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U	8 U
Trifluorotrichloroethane (Freon 113)	µg/kg	-	-	8 U	10 U	7 U	7 U	6 U	7 U	8 U
Vinyl chloride	µg/kg	27000	900	8 U	10 U	7 U	7 U	6 U	7 U	8 U
Xylene (total)	µg/kg	1000000	100000	8 U	10 U	7 U	7 U	2 J	7 U	8 U
Total VOCs	µg/kg	-	-	41	61	229	333	335	190	165

TABLE 2.3

SOIL ANALYTICAL RESULTS SUMMARY - AUGUST 2005
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*SS-1*	*SS-2*	*SS-3*	*SS-4*	*SS-4*	*SS-5*	*SS-6*
Sample ID:				*SO-2428-081705-011*	*SO-2428-081705-012*	*SO-2428-081705-013*	*SO-2428-081705-014*	*SO-2428-081705-015*	*SO-2428-081705-016*	*SO-2428-081705-017*
Sample Date:				*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/17/2005*
		Restricted Use Soil Cleanup Objectives Protection of Public Health								
Parameter	*Units*	*Industrial*	*Res. Residential*					*Duplicate*		
		a	b							
Semi-Volatiles										
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether)	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U	410 U
2,4,5-Trichlorophenol	µg/kg	-	-	920 U	1100 U	930 U	990 U	970 U	960 U	1000 U
2,4,6-Trichlorophenol	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U	410 U
2,4-Dichlorophenol	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U	410 U
2,4-Dimethylphenol	µg/kg	-	-	220 J	170 J	370 U	390 U	380 U	380 U	410 U
2,4-Dinitrophenol	µg/kg	-	-	920 U	1100 U	930 U	990 U	970 U	960 U	1000 U
2,4-Dinitrotoluene	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U	410 U
2,6-Dinitrotoluene	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U	410 U
2-Chloronaphthalene	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U	410 U
2-Chlorophenol	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U	410 U
2-Methylnaphthalene	µg/kg	-	-	4600	8800	82 J	220 J	250 J	190 J	170 J
2-Methylphenol	µg/kg	1000000	100000	280 J	180 J	370 U	390 U	380 U	380 U	410 U
2-Nitroaniline	µg/kg	-	-	920 U	1100 U	930 U	990 U	970 U	960 U	1000 U
2-Nitrophenol	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U	410 U
3,3'-Dichlorobenzidine	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U	410 U
3-Nitroaniline	µg/kg	-	-	920 U	1100 U	930 U	990 U	970 U	960 U	1000 U
4,6-Dinitro-2-methylphenol	µg/kg	-	-	920 U	1100 U	930 U	990 U	970 U	960 U	1000 U
4-Bromophenyl phenyl ether	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U	410 U
4-Chloro-3-methylphenol	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U	410 U
4-Chloroaniline	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U	410 U
4-Chlorophenyl phenyl ether	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U	410 U
4-Methylphenol	µg/kg	1000000	100000	680	320 J	370 U	130 J	160 J	170 J	410 U
4-Nitroaniline	µg/kg	-	-	920 U	1100 U	930 U	990 U	970 U	960 U	1000 U
4-Nitrophenol	µg/kg	-	-	920 U	1100 U	930 U	990 U	970 U	960 U	1000 U
Acenaphthene	µg/kg	1000000	100000	570	450	130 J	120 J	110 J	80 J	160 J
Acenaphthylene	µg/kg	1000000	100000	12000	1700	360 J	320 J	260 J	380 U	170 J
Acetophenone	µg/kg	-	-	240 J	700	370 U	390 U	380 U	380 U	410 U
Anthracene	µg/kg	1000000	100000	16000	1800	380	500	370 J	200 J	300 J
Atrazine	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U	410 U
Benzaldehyde	µg/kg	-	-	520	1200	370 U	390 U	380 U	530	130 J
Benzo(a)anthracene	µg/kg	11000	1000	**50000[ab]**	**9400[b]**	**2200[b]**	**1500[b]**	**1100[b]**	730	**1100[b]**
Benzo(a)pyrene	µg/kg	1100	1000	**48000[ab]**	**6400 J[ab]**	**2200[ab]**	**1300[ab]**	1000	780	**1300[ab]**
Benzo(b)fluoranthene	µg/kg	11000	1000	**68000[ab]**	**13000[ab]**	**2700[b]**	**1500[b]**	**1500[b]**	**1100[b]**	**1800[b]**
Benzo(g,h,i)perylene	µg/kg	1000000	100000	20000	1700 J	1900	750	540	380	510
Benzo(k)fluoranthene	µg/kg	110000	3900	**27000[b]**	**4600 J[b]**	1100	870	500	600	590
Biphenyl	µg/kg	-	-	1000	1000	370 U	390 U	380 U	380 U	410 U
bis(2-Chloroethoxy)methane	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U	410 U
bis(2-Chloroethyl)ether	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U	410 U
bis(2-Ethylhexyl)phthalate	µg/kg	-	-	140 J	230 J	370 U	180 J	130 J	220 J	150 J
Butyl benzylphthalate	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U	410 U
Caprolactam	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U	410 U
Carbazole	µg/kg	-	-	3700	1100	200 J	160 J	160 J	120 J	170 J
Chrysene	µg/kg	110000	3900	**52000[b]**	**10000[b]**	2100	1300	1300	860	1200
Dibenz(a,h)anthracene	µg/kg	1100	330	**2900 J[ab]**	**720 J[b]**	**440[b]**	230 J	180 J	100 J	150 J
Dibenzofuran	µg/kg	1000000	59000	3500	2700	96 J	180 J	160 J	120 J	160 J
Diethyl phthalate	µg/kg	-	-	3000	210 J	370 U	390 U	87 J	100 J	410 U
Dimethyl phthalate	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U	410 U
Di-n-butylphthalate	µg/kg	-	-	370 U	290 J	370 U	180 J	380 U	380 U	160 J

TABLE 2.3

SOIL ANALYTICAL RESULTS SUMMARY - AUGUST 2005
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*SS-1*	*SS-2*	*SS-3*	*SS-4*	*SS-4*	*SS-5*	*SS-6*
Sample ID:				*SO-2428-081705-011*	*SO-2428-081705-012*	*SO-2428-081705-013*	*SO-2428-081705-014*	*SO-2428-081705-015*	*SO-2428-081705-016*	*SO-2428-081705-017*
Sample Date:				*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/17/2005*
		Restricted Use Soil Cleanup Objectives Protection of Public Health								
Parameter	*Units*	*Industrial*	*Res. Residential*					*Duplicate*		
		a	b							
Di-n-octyl phthalate	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U	410 U
Fluoranthene	µg/kg	1000000	100000	90000	15000	3600	2700	1900	1400	1800
Fluorene	µg/kg	1000000	100000	2500	850	130 J	210 J	170 J	82 J	150 J
Hexachlorobenzene	µg/kg	12000	1200	370 U	420 U	370 U	390 U	380 U	380 U	410 U
Hexachlorobutadiene	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U	410 U
Hexachlorocyclopentadiene	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U	410 U
Hexachloroethane	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U	410 U
Indeno(1,2,3-cd)pyrene	µg/kg	11000	500	**20000[ab]**	**1600[b]**	**1600[b]**	**700[b]**	**550[b]**	370 J	480
Isophorone	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U	410 U
Naphthalene	µg/kg	1000000	100000	25000	10000	170 J	460	620	260 J	400 J
Nitrobenzene	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U	410 U
N-Nitrosodi-n-propylamine	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U	410 U
N-Nitrosodiphenylamine	µg/kg	-	-	370 U	420 U	370 U	390 U	380 U	380 U	410 U
Pentachlorophenol	µg/kg	55000	6700	920 U	1100 U	930 U	990 U	970 U	960 U	1000 U
Phenanthrene	µg/kg	1000000	100000	44000	14000	1800	2100	1500	970	1200
Phenol	µg/kg	1000000	100000	480	170 J	370 U	390 U	380 U	380 U	410 U
Pyrene	µg/kg	1000000	100000	71000	12000	3100	2100	1500	1100	1400
Total SVOCs	µg/kg	-	-	567330	120290	24288	17710	14047	10462	13650

TABLE 2.3

SOIL ANALYTICAL RESULTS SUMMARY - AUGUST 2005
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*SS-1*	*SS-2*	*SS-3*	*SS-4*	*SS-4*	*SS-5*	*SS-6*
Sample ID:				*SO-2428-081705-011*	*SO-2428-081705-012*	*SO-2428-081705-013*	*SO-2428-081705-014*	*SO-2428-081705-015*	*SO-2428-081705-016*	*SO-2428-081705-017*
Sample Date:				*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/17/2005*
		Restricted Use Soil Cleanup Objectives Protection of Public Health						*Duplicate*		
Parameter	*Units*	*Industrial*	*Res. Residential*							
		a	b							
Metals										
Aluminum	mg/kg	-	-	2620	2700	13600	8460	8980	9040	8530
Antimony	mg/kg	-	-	0.37 U	0.42 U	0.37 U	0.61	1.1	0.68	0.41 U
Arsenic	mg/kg	16	16	5.1	5.3	7.0	7.7	7.4	12.1	3.8
Barium	mg/kg	10000	400	64.5	67.8	120	102	101	130	58.6
Beryllium	mg/kg	2700	72	1.9 U	2.2 U	1.9 U	2.0 U	2.0 U	2.0 U	2.1 U
Cadmium	mg/kg	60	4.3	0.28	0.43	0.10	2.6	2.8	4.3	0.17
Calcium	mg/kg	-	-	3800	5810	21600	24800	18700	14600	39700
Chromium Total	mg/kg	-	-	19.2 J	152 J	20.6 J	52.8 J	62.9 J	84.6 J	14.1 J
Cobalt	mg/kg	-	-	4.2	3.2	10.8	6.4	6.3	6.6	4.2
Copper	mg/kg	10000	270	34.8 J	16.1 J	21.2 J	65.0 J	70.6 J	96.9 J	17.6 J
Iron	mg/kg	-	-	10800	8410	30200	29300	31100	40300	12600
Lead	mg/kg	3900	400	44.2	207	22.0	145	154	226	25.4
Magnesium	mg/kg	-	-	889	998	8990	7210	4920	3550	4420
Manganese	mg/kg	10000	2000	195	290	525	835	1190	963	216
Mercury	mg/kg	5.7	0.81	0.58 J	0.31 J	0.097 J	0.21 J	0.16 J	0.13 J	R
Nickel	mg/kg	10000	310	26.5	11.1	23.2	33.0	27.7	30.7	13.3
Potassium	mg/kg	-	-	625	460	2400	1550	1790	1320	1080
Selenium	mg/kg	6800	180	1.5 J	1.2 J	0.68 J	0.64 U	0.62 U	0.62 U	0.67 U
Silver	mg/kg	6800	180	0.95	0.45 U	0.40 U	0.79	0.94	1.2	0.45 U
Sodium	mg/kg	-	-	76.5	78.3	128	169 J	1530 J	212	197
Thallium	mg/kg	-	-	1.0	0.80	2.7	2.6	3.2	4.1	0.90
Vanadium	mg/kg	-	-	94.0	9.8	29.6	85.3	44.3	16.3	17.1
Zinc	mg/kg	10000	10000	60.6	305	107	418	464	659	75.3
General Chemistry										
Cyanide (total)	mg/kg	10000	27	2.6 J	1.0 J	2.0 J	3.1 J	2.1 J	1.9 J	0.62 U
Percent Moisture	%	-	-	10.2	21.0	10.6	16.0	14.1	13.8	20.0
Total Petroleum Hydrocarbons	mg/kg	-	-	334	190	268	131	58.2	348	412

Notes:

J	Estimated
R	Rejected
U	Not present at or above the associated value
UJ	Estimated reporting limit

TABLE 2.3

SOIL ANALYTICAL RESULTS SUMMARY - AUGUST 2005
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*SS-7*	*SS-8*	*SS-9*	*SS-10*	*SS-11*	*SS-12*	*SS-13*
Sample ID:				*SO-2428-081705-018*	*SO-2428-081705-019*	*SO-2428-081705-020*	*SO-2428-081705-021*	*SO-2428-081705-022*	*SO-2428-081705-023*	*SO-2428-081805-024*
Sample Date:				*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/18/2005*
		Restricted Use Soil Cleanup Objectives Protection of Public Health								
Parameter	*Units*	*Industrial* a	*Res. Residential* b							
Volatiles										
1,1,1-Trichloroethane	µg/kg	1000000	100000	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
1,1,2,2-Tetrachloroethane	µg/kg	-	-	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
1,1,2-Trichloroethane	µg/kg	-	-	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
1,1-Dichloroethane	µg/kg	480000	26000	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
1,1-Dichloroethene	µg/kg	1000000	100000	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
1,2,4-Trichlorobenzene	µg/kg	-	-	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	-	-	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
1,2-Dibromoethane (Ethylene Dibromide)	µg/kg	-	-	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
1,2-Dichlorobenzene	µg/kg	1000000	100000	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
1,2-Dichloroethane	µg/kg	60000	3100	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
1,2-Dichloropropane	µg/kg	-	-	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
1,3-Dichlorobenzene	µg/kg	560000	49000	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
1,4-Dichlorobenzene	µg/kg	250000	13000	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
2-Butanone (Methyl Ethyl Ketone)	µg/kg	1000000	100000	17 U	83	14 UJ	37	18 U	19 U	17 U
2-Hexanone	µg/kg	-	-	17 U	21 U	14 UJ	14 U	18 U	19 U	17 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/kg	-	-	17 U	21 U	14 UJ	14 U	18 U	19 U	17 U
Acetone	µg/kg	1000000	100000	140	250	44 J	210	80	43	17 U
Benzene	µg/kg	89000	4800	2 J	10 U	7 UJ	2 J	9 U	9 U	9 U
Bromodichloromethane	µg/kg	-	-	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
Bromoform	µg/kg	-	-	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
Bromomethane (Methyl Bromide)	µg/kg	-	-	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
Carbon disulfide	µg/kg	-	-	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
Carbon tetrachloride	µg/kg	44000	2400	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
Chlorobenzene	µg/kg	1000000	100000	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
Chloroethane	µg/kg	-	-	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
Chloroform (Trichloromethane)	µg/kg	700000	49000	8 U	10 U	7 U	7 U	9 U	9 U	9 U
Chloromethane (Methyl Chloride)	µg/kg	-	-	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
cis-1,2-Dichloroethene	µg/kg	1000000	100000	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
cis-1,3-Dichloropropene	µg/kg	-	-	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
Cyclohexane	µg/kg	-	-	12	10 U	8 J	24	9 U	9 U	9 U
Dibromochloromethane	µg/kg	-	-	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
Dichlorodifluoromethane (CFC-12)	µg/kg	-	-	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
Ethylbenzene	µg/kg	780000	41000	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
Isopropylbenzene	µg/kg	-	-	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
Methyl acetate	µg/kg	-	-	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
Methyl cyclohexane	µg/kg	-	-	19	10 U	10 J	38	9 U	9 U	9 U
Methyl Tert Butyl Ether	µg/kg	1000000	100000	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
Methylene chloride	µg/kg	1000000	100000	15 U	19 U	12 U	11 U	15 U	16 U	14
Styrene	µg/kg	-	-	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
Tetrachloroethene	µg/kg	300000	19000	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
Toluene	µg/kg	1000000	100000	3 J	10 U	7 UJ	2 J	9 U	9 U	9 U
trans-1,2-Dichloroethene	µg/kg	1000000	100000	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
trans-1,3-Dichloropropene	µg/kg	-	-	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
Trichloroethene	µg/kg	400000	21000	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
Trichlorofluoromethane (CFC-11)	µg/kg	-	-	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
Trifluorotrichloroethane (Freon 113)	µg/kg	-	-	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
Vinyl chloride	µg/kg	27000	900	8 U	10 U	7 UJ	7 U	9 U	9 U	9 U
Xylene (total)	µg/kg	1000000	100000	2 J	10 U	7 UJ	3 J	9 U	9 U	9 U
Total VOCs	µg/kg	-	-	178	333	62	316	80	43	14

TABLE 2.3

SOIL ANALYTICAL RESULTS SUMMARY - AUGUST 2005
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*SS-7*	*SS-8*	*SS-9*	*SS-10*	*SS-11*	*SS-12*	*SS-13*
Sample ID:				*SO-2428-081705-018*	*SO-2428-081705-019*	*SO-2428-081705-020*	*SO-2428-081705-021*	*SO-2428-081705-022*	*SO-2428-081705-023*	*SO-2428-081805-024*
Sample Date:				*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/18/2005*
		Restricted Use Soil Cleanup Objectives Protection of Public Health								
Parameter	*Units*	*Industrial* a	*Res. Residential* b							
Semi-Volatiles										
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether)	µg/kg	-	-	340 U	360 U	340 U	380 U	440 U	340 U	350 U
2,4,5-Trichlorophenol	µg/kg	-	-	850 U	900 U	850 U	960 U	1100 U	870 U	880 U
2,4,6-Trichlorophenol	µg/kg	-	-	340 U	360 U	340 U	380 U	440 U	340 U	350 U
2,4-Dichlorophenol	µg/kg	-	-	340 U	360 U	340 U	380 U	440 U	340 U	350 U
2,4-Dimethylphenol	µg/kg	-	-	340 U	360 U	130 J	380 U	100 J	170 J	350 U
2,4-Dinitrophenol	µg/kg	-	-	850 U	900 U	850 U	960 U	1100 U	870 U	880 U
2,4-Dinitrotoluene	µg/kg	-	-	340 U	360 U	340 U	380 U	440 U	340 U	350 U
2,6-Dinitrotoluene	µg/kg	-	-	340 U	360 U	340 U	380 U	440 U	340 U	350 U
2-Chloronaphthalene	µg/kg	-	-	340 U	360 U	340 U	380 U	440 U	340 U	350 U
2-Chlorophenol	µg/kg	-	-	340 U	360 U	340 U	380 U	440 U	340 U	350 U
2-Methylnaphthalene	µg/kg	-	-	95 J	440	2900	400	1300	1600	3000
2-Methylphenol	µg/kg	1000000	100000	340 U	360 U	130 J	380 U	97 J	160 J	81 J
2-Nitroaniline	µg/kg	-	-	850 U	900 U	850 U	960 U	1100 U	870 U	880 U
2-Nitrophenol	µg/kg	-	-	340 U	360 U	340 U	380 U	440 U	340 U	350 U
3,3'-Dichlorobenzidine	µg/kg	-	-	340 U	360 U	340 U	380 U	440 U	340 U	350 U
3-Nitroaniline	µg/kg	-	-	850 U	900 U	850 U	960 U	1100 U	870 U	880 U
4,6-Dinitro-2-methylphenol	µg/kg	-	-	850 U	900 U	850 U	960 U	1100 U	870 U	880 U
4-Bromophenyl phenyl ether	µg/kg	-	-	340 U	360 U	340 U	380 U	440 U	340 U	350 U
4-Chloro-3-methylphenol	µg/kg	-	-	340 U	360 U	340 U	380 U	440 U	340 U	350 U
4-Chloroaniline	µg/kg	-	-	340 U	360 U	340 U	380 U	440 U	340 U	350 U
4-Chlorophenyl phenyl ether	µg/kg	-	-	340 U	360 U	340 U	380 U	440 U	340 U	350 U
4-Methylphenol	µg/kg	1000000	100000	340 U	95 J	330 J	100 J	280 J	350	250 J
4-Nitroaniline	µg/kg	-	-	850 U	900 U	850 U	960 U	1100 U	870 U	880 U
4-Nitrophenol	µg/kg	-	-	850 U	900 U	850 U	960 U	1100 U	870 U	880 U
Acenaphthene	µg/kg	1000000	100000	340 U	680	5200	290 J	1000	710	400
Acenaphthylene	µg/kg	1000000	100000	99 J	310 J	1300	160 J	4400	2200	2900
Acetophenone	µg/kg	-	-	97 J	360 U	160 J	110 J	91 J	78 J	350 U
Anthracene	µg/kg	1000000	100000	120 J	810	13000	460	4300	3200	4900
Atrazine	µg/kg	-	-	340 U	360 U	340 U	380 U	440 U	340 U	350 U
Benzaldehyde	µg/kg	-	-	340 U	140 J	190 J	840	240 J	220 J	350 UJ
Benzo(a)anthracene	µg/kg	11000	1000	600	**4000[b]**	**49000[ab]**	**2200[b]**	**20000[ab]**	**13000[ab]**	**10000[b]**
Benzo(a)pyrene	µg/kg	1100	1000	740	**5600 J[ab]**	**53000[ab]**	**2600[ab]**	**21000[ab]**	**13000[ab]**	**8500[ab]**
Benzo(b)fluoranthene	µg/kg	11000	1000	980	**6800[b]**	**71000[ab]**	**3400[b]**	**32000[ab]**	**17000[ab]**	**13000[ab]**
Benzo(g,h,i)perylene	µg/kg	1000000	100000	430	1600 J	25000	1700	4400 J	3800	4900
Benzo(k)fluoranthene	µg/kg	110000	3900	410	3300 J	**20000[b]**	980	**5100 J[b]**	**4400[b]**	2200
Biphenyl	µg/kg	-	-	340 U	84 J	670	380 U	330 J	360	960
bis(2-Chloroethoxy)methane	µg/kg	-	-	340 U	360 U	340 U	380 U	440 U	340 U	350 U
bis(2-Chloroethyl)ether	µg/kg	-	-	340 U	360 U	340 U	380 U	440 U	340 U	350 U
bis(2-Ethylhexyl)phthalate	µg/kg	-	-	350	390	320 J	690	110 J	74 J	160 J
Butyl benzylphthalate	µg/kg	-	-	340 U	360 U	340 U	380 U	440 U	340 U	350 U
Caprolactam	µg/kg	-	-	340 U	360 U	340 U	380 U	440 U	340 U	350 U
Carbazole	µg/kg	-	-	84 J	640	9800	370 J	1600	1300	1200
Chrysene	µg/kg	110000	3900	700	**4600[b]**	**51000[b]**	2200	**21000[b]**	**13000[b]**	**12000[b]**
Dibenz(a,h)anthracene	µg/kg	1100	330	120 J	**430 J[b]**	**2900[ab]**	**440[b]**	**1700 J[ab]**	**1300[ab]**	**1600[ab]**
Dibenzofuran	µg/kg	1000000	59000	72 J	320 J	3600	240 J	1400	1400	3900
Diethyl phthalate	µg/kg	-	-	150 J	140 J	160 J	380 U	140 J	1000	180 J
Dimethyl phthalate	µg/kg	-	-	340 U	360 U	340 U	380 U	440 U	340 U	350 U
Di-n-butylphthalate	µg/kg	-	-	150 J	180 J	340 U	180 J	440 U	340 U	350 U

TABLE 2.3

SOIL ANALYTICAL RESULTS SUMMARY - AUGUST 2005
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*SS-7*	*SS-8*	*SS-9*	*SS-10*	*SS-11*	*SS-12*	*SS-13*
Sample ID:				*SO-2428-081705-018*	*SO-2428-081705-019*	*SO-2428-081705-020*	*SO-2428-081705-021*	*SO-2428-081705-022*	*SO-2428-081705-023*	*SO-2428-081805-024*
Sample Date:				*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/18/2005*
		Restricted Use Soil Cleanup Objectives Protection of Public Health								
Parameter	*Units*	*Industrial*	*Res. Residential*							
		a	b							
Di-n-octyl phthalate	µg/kg	-	-	340 U	360 U	340 U	380 U	440 U	340 U	350 U
Fluoranthene	µg/kg	1000000	100000	1000	7000	79000	3400	36000	21000	21000
Fluorene	µg/kg	1000000	100000	340 U	340 J	4500	200 J	1800	1200	2800
Hexachlorobenzene	µg/kg	12000	1200	340 U	360 U	340 U	380 U	440 U	340 U	350 U
Hexachlorobutadiene	µg/kg	-	-	340 U	360 U	340 U	380 U	440 U	340 U	350 U
Hexachlorocyclopentadiene	µg/kg	-	-	340 U	360 U	340 U	380 U	440 U	340 U	350 U
Hexachloroethane	µg/kg	-	-	340 U	360 U	340 U	380 U	440 U	340 U	350 U
Indeno(1,2,3-cd)pyrene	µg/kg	11000	500	420	**1600 J[b]**	**23000[ab]**	**1600[b]**	**4700 J[b]**	**3800[b]**	**4500[b]**
Isophorone	µg/kg	-	-	340 U	360 U	340 U	380 U	440 U	340 U	350 U
Naphthalene	µg/kg	1000000	100000	180 J	620	7400	570	3000	4000	8700
Nitrobenzene	µg/kg	-	-	340 U	360 U	340 U	380 U	440 U	340 U	350 U
N-Nitrosodi-n-propylamine	µg/kg	-	-	340 U	360 U	340 U	380 U	440 U	340 U	350 U
N-Nitrosodiphenylamine	µg/kg	-	-	340 U	360 U	340 U	380 U	440 U	340 U	350 U
Pentachlorophenol	µg/kg	55000	6700	850 U	900 U	850 U	960 U	1100 U	870 U	880 U
Phenanthrene	µg/kg	1000000	100000	570	3800	50000	2200	19000	13000	16000
Phenol	µg/kg	1000000	100000	340 U	360 U	290 J	380 U	220 J	180 J	180 J
Pyrene	µg/kg	1000000	100000	830	5800	60000	3000	28000	16000	15000
Total SVOCs	µg/kg	-	-	8197	49719	533980	28330	213308	137502	138311

TABLE 2.3

SOIL ANALYTICAL RESULTS SUMMARY - AUGUST 2005
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*SS-7*	*SS-8*	*SS-9*	*SS-10*	*SS-11*	*SS-12*	*SS-13*
Sample ID:				*SO-2428-081705-018*	*SO-2428-081705-019*	*SO-2428-081705-020*	*SO-2428-081705-021*	*SO-2428-081705-022*	*SO-2428-081705-023*	*SO-2428-081805-024*
Sample Date:				*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/17/2005*	*8/18/2005*
		Restricted Use Soil Cleanup Objectives Protection of Public Health								
Parameter	*Units*	*Industrial* a	*Res. Residential* b							
Metals										
Aluminum	mg/kg	-	-	8510	12100	2710	8010	7160	1800	965
Antimony	mg/kg	-	-	0.34 U	0.36 U	0.34 U	0.38 U	0.64	0.34 U	0.35 UJ
Arsenic	mg/kg	16	16	4.5	10.2	4.5	4.2	9.6	6.0	2.8
Barium	mg/kg	10000	400	66.4	89.0	53.3	73.5	97.8	51.8	39.3
Beryllium	mg/kg	2700	72	1.8 U	1.9 U	1.7 U	2.0 U	2.3 U	1.8 U	1.8 U
Cadmium	mg/kg	60	4.3	0.30	0.21	0.16	0.083	0.10	0.081	0.039 U
Calcium	mg/kg	-	-	12200	5380	66900	30800	24400	3120	1360
Chromium Total	mg/kg	-	-	23.2 J	22.3 J	26.0 J	44.3 J	25.1 J	15.6 J	7.1
Cobalt	mg/kg	-	-	4.5	12.0	2.9	6.9	6.0	3.6	2.1
Copper	mg/kg	10000	270	25.0 J	23.5 J	20.4 J	16.3 J	57.2 J	44.1 J	16.4
Iron	mg/kg	-	-	14800	27600	8330	16000	23300	16200	7300
Lead	mg/kg	3900	400	58.6	49.9	43.6	21.0	42.6	40.2	10.1
Magnesium	mg/kg	-	-	4960	3260	6110	7560	7640	1090	386
Manganese	mg/kg	10000	2000	275	865	253	372	522	148	72.2
Mercury	mg/kg	5.7	0.81	0.16 J	0.033 J	0.030 J	0.12 J	0.19 J	0.32 J	0.018 U
Nickel	mg/kg	10000	310	18.2	23.5	15.1	28.0	20.9	14.7	6.4
Potassium	mg/kg	-	-	1030	1620	749	1630	963	302	158
Selenium	mg/kg	6800	180	0.55 U	0.75 J	0.77 J	0.62 U	1.3 J	0.85 J	0.96 J
Silver	mg/kg	6800	180	0.37 U	0.39 U	0.37 U	0.41 U	0.48 U	0.37 U	0.38 U
Sodium	mg/kg	-	-	100	72.3	209	131	496	86.7	94.9
Thallium	mg/kg	-	-	1.1	2.6	0.51 U	1.1	1.8	1.3	0.61 J
Vanadium	mg/kg	-	-	18.2	29.5	8.9	17.8	18.2	9.7	5.2
Zinc	mg/kg	10000	10000	104	143	70.6	67.0	100	71.1	37.3 J
General Chemistry										
Cyanide (total)	mg/kg	10000	27	0.51 U	0.60 J	0.51 U	0.58 U	5.1 J	3.9 J	1.4
Percent Moisture	%	-	-	2.7	8.0	2.1	13.2	25.2	4.1	5.9
Total Petroleum Hydrocarbons	mg/kg	-	-	103	76.1	541	115	602	177	85.0

Estimated
Rejected
Not present at or above the associated value
Estimated reporting limit

TABLE 2.3

SOIL ANALYTICAL RESULTS SUMMARY - AUGUST 2005
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*SS-14*	*SS-15*	*TEST PIT-1*	*TEST PIT-2*	*TEST PIT-3*
Sample ID:				*SO-2428-081805-025*	*SO-2428-081805-026*	*SO-2428-081605-001*	*SO-2428-081605-005*	*SO-2428-081605-006*
Sample Date:				*8/18/2005*	*8/18/2005*	*8/16/2005*	*8/16/2005*	*8/16/2005*
		Restricted Use Soil Cleanup Objectives Protection of Public Health						
Parameter	*Units*	*Industrial* a	*Res. Residential* b					
Volatiles								
1,1,1-Trichloroethane	µg/kg	1000000	100000	15 U	9 U	9 UJ	14 U	5 U
1,1,2,2-Tetrachloroethane	µg/kg	-	-	15 U	9 U	9 UJ	14 U	5 U
1,1,2-Trichloroethane	µg/kg	-	-	15 U	9 U	9 UJ	14 U	5 U
1,1-Dichloroethane	µg/kg	480000	26000	15 U	9 U	9 UJ	14 U	5 U
1,1-Dichloroethene	µg/kg	1000000	100000	15 U	9 U	9 UJ	14 U	5 U
1,2,4-Trichlorobenzene	µg/kg	-	-	15 U	9 U	9 UJ	14 U	5 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	-	-	15 U	9 U	9 UJ	14 U	5 U
1,2-Dibromoethane (Ethylene Dibromide)	µg/kg	-	-	15 U	9 U	9 UJ	14 U	5 U
1,2-Dichlorobenzene	µg/kg	1000000	100000	15 U	9 U	9 UJ	14 U	5 U
1,2-Dichloroethane	µg/kg	60000	3100	15 U	9 U	9 UJ	14 U	5 U
1,2-Dichloropropane	µg/kg	-	-	15 U	9 U	9 UJ	14 U	5 U
1,3-Dichlorobenzene	µg/kg	560000	49000	15 U	9 U	9 UJ	14 U	5 U
1,4-Dichlorobenzene	µg/kg	250000	13000	15 U	9 U	9 UJ	14 U	5 U
2-Butanone (Methyl Ethyl Ketone)	µg/kg	1000000	100000	34	18 U	18 UJ	78	9 U
2-Hexanone	µg/kg	-	-	30 U	18 U	18 UJ	28 U	9 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/kg	-	-	30 U	18 U	18 UJ	28 U	9 U
Acetone	µg/kg	1000000	100000	98	18 U	96 J	290	26
Benzene	µg/kg	89000	4800	4 J	3 J	16 J	2500	3 J
Bromodichloromethane	µg/kg	-	-	15 U	9 U	9 UJ	14 U	5 U
Bromoform	µg/kg	-	-	15 U	9 U	9 UJ	14 U	5 U
Bromomethane (Methyl Bromide)	µg/kg	-	-	15 U	9 U	9 UJ	14 U	5 U
Carbon disulfide	µg/kg	-	-	15 U	9 U	5 J	240	4 J
Carbon tetrachloride	µg/kg	44000	2400	15 U	9 U	9 UJ	14 U	5 U
Chlorobenzene	µg/kg	1000000	100000	15 U	9 U	9 UJ	14 U	5 U
Chloroethane	µg/kg	-	-	15 U	9 U	9 UJ	14 U	5 U
Chloroform (Trichloromethane)	µg/kg	700000	49000	15 U	9 U	9 UJ	14 U	5 U
Chloromethane (Methyl Chloride)	µg/kg	-	-	15 U	9 U	9 UJ	14 U	5 U
cis-1,2-Dichloroethene	µg/kg	1000000	100000	15 U	9 U	9 UJ	14	5 U
cis-1,3-Dichloropropene	µg/kg	-	-	15 U	9 U	9 UJ	14 U	5 U
Cyclohexane	µg/kg	-	-	15 U	9 U	33 J	14 U	12
Dibromochloromethane	µg/kg	-	-	15 U	9 U	9 UJ	14 U	5 U
Dichlorodifluoromethane (CFC-12)	µg/kg	-	-	15 U	9 U	9 UJ	14 U	5 U
Ethylbenzene	µg/kg	780000	41000	15 U	9 U	9 UJ	1900	5 U
Isopropylbenzene	µg/kg	-	-	15 U	9 U	9 UJ	21	5 U
Methyl acetate	µg/kg	-	-	15 U	9 U	9 UJ	14 U	5 U
Methyl cyclohexane	µg/kg	-	-	15 U	9 U	38 J	14 U	24
Methyl Tert Butyl Ether	µg/kg	1000000	100000	15 U	9 U	9 UJ	14 U	5 U
Methylene chloride	µg/kg	1000000	100000	23	14	9 U	14 U	5 U
Styrene	µg/kg	-	-	15 U	9 U	9 UJ	14 U	5 U
Tetrachloroethene	µg/kg	300000	19000	15 U	9 U	9 UJ	14 U	5 U
Toluene	µg/kg	1000000	100000	15 U	9 U	6 J	140	6
trans-1,2-Dichloroethene	µg/kg	1000000	100000	15 U	9 U	9 UJ	14 U	5 U
trans-1,3-Dichloropropene	µg/kg	-	-	15 U	9 U	9 UJ	14 U	5 U
Trichloroethene	µg/kg	400000	21000	15 U	9 U	9 UJ	28	5 U
Trichlorofluoromethane (CFC-11)	µg/kg	-	-	15 U	9 U	9 UJ	14 U	5 U
Trifluorotrichloroethane (Freon 113)	µg/kg	-	-	15 U	9 U	9 UJ	14 U	5 U
Vinyl chloride	µg/kg	27000	900	15 U	9 U	9 UJ	14 U	5 U
Xylene (total)	µg/kg	1000000	100000	15 U	9 U	4 J	770	5
Total VOCs	µg/kg	-	-	159	17	198	5981	80

TABLE 2.3

SOIL ANALYTICAL RESULTS SUMMARY - AUGUST 2005
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*SS-14*	*SS-15*	*TEST PIT-1*	*TEST PIT-2*	*TEST PIT-3*
Sample ID:				*SO-2428-081805-025*	*SO-2428-081805-026*	*SO-2428-081605-001*	*SO-2428-081605-005*	*SO-2428-081605-006*
Sample Date:				*8/18/2005*	*8/18/2005*	*8/16/2005*	*8/16/2005*	*8/16/2005*
		Restricted Use Soil Cleanup Objectives Protection of Public Health						
Parameter	*Units*	*Industrial* a	*Res. Residential* b					
Semi-Volatiles								
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether)	µg/kg	-	-	410 U	370 U	460 U	770 U	410 U
2,4,5-Trichlorophenol	µg/kg	-	-	1000 U	920 U	1200 U	1900 U	1000 U
2,4,6-Trichlorophenol	µg/kg	-	-	410 U	370 U	460 U	770 U	410 U
2,4-Dichlorophenol	µg/kg	-	-	410 U	370 U	460 U	770 U	410 U
2,4-Dimethylphenol	µg/kg	-	-	410 U	370 U	160 J	770 U	410 U
2,4-Dinitrophenol	µg/kg	-	-	1000 U	920 U	1200 U	1900 U	1000 U
2,4-Dinitrotoluene	µg/kg	-	-	410 U	370 U	460 U	770 U	410 U
2,6-Dinitrotoluene	µg/kg	-	-	410 U	370 U	460 U	770 U	410 U
2-Chloronaphthalene	µg/kg	-	-	410 U	370 U	460 U	770 U	410 U
2-Chlorophenol	µg/kg	-	-	410 U	370 U	460 U	770 U	410 U
2-Methylnaphthalene	µg/kg	-	-	950	2300	1000	260 J	120 J
2-Methylphenol	µg/kg	1000000	100000	410 U	120 J	100 J	770 U	410 U
2-Nitroaniline	µg/kg	-	-	1000 U	920 U	1200 U	1900 U	1000 U
2-Nitrophenol	µg/kg	-	-	410 U	370 U	460 U	770 U	410 U
3,3'-Dichlorobenzidine	µg/kg	-	-	410 U	370 U	460 U	770 U	410 U
3-Nitroaniline	µg/kg	-	-	1000 U	920 U	1200 U	1900 U	1000 U
4,6-Dinitro-2-methylphenol	µg/kg	-	-	1000 U	920 U	1200 U	1900 U	1000 U
4-Bromophenyl phenyl ether	µg/kg	-	-	410 U	370 U	460 U	770 U	410 U
4-Chloro-3-methylphenol	µg/kg	-	-	410 U	370 U	460 U	770 U	410 U
4-Chloroaniline	µg/kg	-	-	410 U	370 U	460 U	770 U	410 U
4-Chlorophenyl phenyl ether	µg/kg	-	-	410 U	370 U	460 U	770 U	410 U
4-Methylphenol	µg/kg	1000000	100000	120 J	320 J	260 J	770 U	410 U
4-Nitroaniline	µg/kg	-	-	1000 U	920 U	1200 U	1900 U	1000 U
4-Nitrophenol	µg/kg	-	-	1000 U	920 U	1200 U	1900 U	1000 U
Acenaphthene	µg/kg	1000000	100000	320 J	830	330 J	240 J	410 U
Acenaphthylene	µg/kg	1000000	100000	990	3000	630	600 J	410 U
Acetophenone	µg/kg	-	-	410 U	370 U	460 U	770 U	410 U
Anthracene	µg/kg	1000000	100000	1300	2800	1100	320 J	150 J
Atrazine	µg/kg	-	-	410 U	370 U	460 U	770 U	410 U
Benzaldehyde	µg/kg	-	-	440 J	280 J	460 UJ	330 J	410 UJ
Benzo(a)anthracene	µg/kg	11000	1000	**6400[b]**	**16000[ab]**	**2500[b]**	290 J	430
Benzo(a)pyrene	µg/kg	1100	1000	**6000[ab]**	**17000[ab]**	**2300[ab]**	170 J	360 J
Benzo(b)fluoranthene	µg/kg	11000	1000	**7700[b]**	**22000[ab]**	**2800[b]**	250 J	490
Benzo(g,h,i)perylene	µg/kg	1000000	100000	2600	17000	1800	770 U	240 J
Benzo(k)fluoranthene	µg/kg	110000	3900	2800	**4300[b]**	800	770 U	170 J
Biphenyl	µg/kg	-	-	250 J	550	340 J	220 J	410 U
bis(2-Chloroethoxy)methane	µg/kg	-	-	410 U	370 U	460 U	770 U	410 U
bis(2-Chloroethyl)ether	µg/kg	-	-	410 U	370 U	460 U	770 U	410 U
bis(2-Ethylhexyl)phthalate	µg/kg	-	-	230 J	1000	460 U	770 U	410 U
Butyl benzylphthalate	µg/kg	-	-	410 U	370 U	460 U	770 U	410 U
Caprolactam	µg/kg	-	-	410 U	370 U	460 U	770 U	410 U
Carbazole	µg/kg	-	-	910	1200	380 J	430 J	410 U
Chrysene	µg/kg	110000	3900	**6500[b]**	**17000[b]**	2600	290 J	390 J
Dibenz(a,h)anthracene	µg/kg	1100	330	**880[b]**	**2300[ab]**	**450 J[b]**	770 U	410 U
Dibenzofuran	µg/kg	1000000	59000	780	1600	550	580 J	100 J
Diethyl phthalate	µg/kg	-	-	200 J	200 J	220 J	410 J	230 J
Dimethyl phthalate	µg/kg	-	-	410 U	370 U	460 U	770 U	410 U
Di-n-butylphthalate	µg/kg	-	-	410 U	93 J	460 U	770 U	410 U

TABLE 2.3

SOIL ANALYTICAL RESULTS SUMMARY - AUGUST 2005
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*SS-14*	*SS-15*	*TEST PIT-1*	*TEST PIT-2*	*TEST PIT-3*
Sample ID:				*SO-2428-081805-025*	*SO-2428-081805-026*	*SO-2428-081605-001*	*SO-2428-081605-005*	*SO-2428-081605-006*
Sample Date:				*8/18/2005*	*8/18/2005*	*8/16/2005*	*8/16/2005*	*8/16/2005*
		Restricted Use Soil Cleanup Objectives Protection of Public Health						
Parameter	*Units*	*Industrial*	*Res. Residential*					
		a	b					
Di-n-octyl phthalate	µg/kg	-	-	410 U	370 U	460 U	770 U	410 U
Fluoranthene	µg/kg	1000000	100000	9300	23000	4200	1400	870
Fluorene	µg/kg	1000000	100000	570	1000	770	920	95 J
Hexachlorobenzene	µg/kg	12000	1200	410 U	370 U	460 U	770 U	410 U
Hexachlorobutadiene	µg/kg	-	-	410 U	370 U	460 U	770 U	410 U
Hexachlorocyclopentadiene	µg/kg	-	-	410 U	370 U	460 U	770 U	410 U
Hexachloroethane	µg/kg	-	-	410 U	370 U	460 U	770 U	410 U
Indeno(1,2,3-cd)pyrene	µg/kg	11000	500	**2800**[b]	**15000**[a,b]	**1400**[b]	770 U	210 J
Isophorone	µg/kg	-	-	410 U	370 U	460 U	770 U	410 U
Naphthalene	µg/kg	1000000	100000	2500	4500	1500	5700	360 J
Nitrobenzene	µg/kg	-	-	410 U	370 U	460 U	770 U	410 U
N-Nitrosodi-n-propylamine	µg/kg	-	-	410 U	370 U	460 U	770 U	410 U
N-Nitrosodiphenylamine	µg/kg	-	-	410 U	370 U	460 U	770 U	410 U
Pentachlorophenol	µg/kg	55000	6700	1000 U	920 U	1200 U	1900 U	1000 U
Phenanthrene	µg/kg	1000000	100000	5400	13000	4300	1900	580
Phenol	µg/kg	1000000	100000	410 U	190 J	140 J	770 U	410 U
Pyrene	µg/kg	1000000	100000	7600 J	20000	3900	1000	620
Total SVOCs	µg/kg	-	-	67540	186583	34530	15310	5415

TABLE 2.3

SOIL ANALYTICAL RESULTS SUMMARY - AUGUST 2005
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*SS-14*	*SS-15*	*TEST PIT-1*	*TEST PIT-2*	*TEST PIT-3*
Sample ID:				*SO-2428-081805-025*	*SO-2428-081805-026*	*SO-2428-081605-001*	*SO-2428-081605-005*	*SO-2428-081605-006*
Sample Date:				*8/18/2005*	*8/18/2005*	*8/16/2005*	*8/16/2005*	*8/16/2005*
		Restricted Use Soil Cleanup Objectives Protection of Public Health						
Parameter	*Units*	*Industrial* a	*Res. Residential* b					
Metals								
Aluminum	mg/kg	-	-	3040	3040	7300	18800	9870
Antimony	mg/kg	-	-	0.71 J	0.48 J	0.46 UJ	0.89 J	0.41 UJ
Arsenic	mg/kg	16	16	8.0	9.7	6.4	**20.6**[ab]	3.7
Barium	mg/kg	10000	400	57.2	74.4	83.7	72.1	90.8
Beryllium	mg/kg	2700	72	2.1 U	1.9 U	2.4 U	4.0 U	2.1 U
Cadmium	mg/kg	60	4.3	0.40	0.055	0.051 U	**12.4**[b]	0.046 U
Calcium	mg/kg	-	-	5050	7830	26100	5680	52900
Chromium Total	mg/kg	-	-	12.2	18.6	12.7	50.9	16.3
Cobalt	mg/kg	-	-	4.9	5.1	8.0	30.5	13.1
Copper	mg/kg	10000	270	24.8	46.7	22.0	**528**[b]	14.7
Iron	mg/kg	-	-	10100	19900	16000	44100	46700
Lead	mg/kg	3900	400	17.7	44.0	26.5	219	15.6
Magnesium	mg/kg	-	-	699	1460	6540	3740	12100
Manganese	mg/kg	10000	2000	174	284	320	116	908
Mercury	mg/kg	5.7	0.81	0.18	**1.0**[b]	0.18	0.30	0.035
Nickel	mg/kg	10000	310	13.1	16.7	20.0	105	31.8
Potassium	mg/kg	-	-	456	538	1390	1350	2070
Selenium	mg/kg	6800	180	2.2 J	2.1 J	1.1 J	5.4 J	0.67 UJ
Silver	mg/kg	6800	180	0.44 U	0.40 U	0.50 U	0.83 U	0.45 U
Sodium	mg/kg	-	-	163	180	192	280	177
Thallium	mg/kg	-	-	0.82 J	1.9 J	1.1 J	5.0 J	4.2 J
Vanadium	mg/kg	-	-	15.6	14.2	26.6	41.0	21.5
Zinc	mg/kg	10000	10000	111 J	122 J	58.7 J	1920 J	113 J
General Chemistry								
Cyanide (total)	mg/kg	10000	27	4.0	3.2	3.7	**45.1**[b]	7.8
Percent Moisture	%	-	-	18.6	9.7	29.0	56.9	20.3
Total Petroleum Hydrocarbons	mg/kg	-	-	86.0	144	98.6	510	62.7 U

Estimated
Rejected
Not present at or above the associated value
Estimated reporting limit

TABLE 2.4

BACKGROUND SURFACE SOIL ANALYTICAL RESULTS SUMMARY - DECEMBER 2005
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*001*	*002*	*003*	*004*
Sample ID:				*S-2428-122105-JRR-001*	*S-2428-122105-JRR-002*	*S-2428-122105-JRR-003*	*S-2428-122105-JRR-004*
Sample Date:				*12/21/2005*	*12/21/2005*	*12/21/2005*	*12/21/2005*
		Restricted Use Soil Cleanup Objectives Protection of Public Health					
Parameter	*Units*	*Industrial*	*Res. Residential*				
		a	b				
Semi-Volatiles							
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether)	µg/kg	-	-	460 U	530 U	410 U	450 U
2,4,5-Trichlorophenol	µg/kg	-	-	1200 U	1300 U	1000 U	1100 U
2,4,6-Trichlorophenol	µg/kg	-	-	460 U	530 U	410 U	450 U
2,4-Dichlorophenol	µg/kg	-	-	460 U	530 U	410 U	450 U
2,4-Dimethylphenol	µg/kg	-	-	100 J	530 U	410 U	450 U
2,4-Dinitrophenol	µg/kg	-	-	1200 U	1300 U	1000 U	1100 U
2,4-Dinitrotoluene	µg/kg	-	-	460 U	530 U	410 U	450 U
2,6-Dinitrotoluene	µg/kg	-	-	460 U	530 U	410 U	450 U
2-Chloronaphthalene	µg/kg	-	-	460 U	530 U	410 U	450 U
2-Chlorophenol	µg/kg	-	-	460 U	530 U	410 U	450 U
2-Methylnaphthalene	µg/kg	-	-	4200	530 U	260 J	160 J
2-Methylphenol	µg/kg	1000000	100000	100 J	530 U	410 U	450 U
2-Nitroaniline	µg/kg	-	-	1200 U	1300 U	1000 U	1100 U
2-Nitrophenol	µg/kg	-	-	460 U	530 U	410 U	450 U
3,3'-Dichlorobenzidine	µg/kg	-	-	460 U	530 U	410 U	450 U
3-Nitroaniline	µg/kg	-	-	1200 U	1300 U	1000 U	1100 U
4,6-Dinitro-2-methylphenol	µg/kg	-	-	1200 U	1300 U	1000 U	1100 U
4-Bromophenyl phenyl ether	µg/kg	-	-	460 U	530 U	410 U	450 U
4-Chloro-3-methylphenol	µg/kg	-	-	460 U	530 U	410 U	450 U
4-Chloroaniline	µg/kg	-	-	460 U	530 U	410 U	450 U
4-Chlorophenyl phenyl ether	µg/kg	-	-	460 U	530 U	410 U	450 U
4-Methylphenol	µg/kg	1000000	100000	460	530 U	410 U	450 U
4-Nitroaniline	µg/kg	-	-	1200 U	1300 U	1000 U	1100 U
4-Nitrophenol	µg/kg	-	-	1200 U	1300 U	1000 U	1100 U
Acenaphthene	µg/kg	1000000	100000	190 J	530 U	150 J	450 U
Acenaphthylene	µg/kg	1000000	100000	160 J	530 U	490	450 U
Acetophenone	µg/kg	-	-	380 J	530 U	410 U	450 U
Anthracene	µg/kg	1000000	100000	230 J	530 U	890	150 J
Atrazine	µg/kg	-	-	460 U	530 U	410 U	450 U
Benzaldehyde	µg/kg	-	-	830	530 U	410 U	450 U
Benzo(a)anthracene	µg/kg	11000	1000	970	470 J	**4200**[b]	570
Benzo(a)pyrene	µg/kg	1100	1000	990	550	**4100**[ab]	600
Benzo(b)fluoranthene	µg/kg	11000	1000	**1900**[b]	670	**8200 D**[b]	730
Benzo(g,h,i)perylene	µg/kg	1000000	100000	340 J	330 J	1600	290 J
Benzo(k)fluoranthene	µg/kg	110000	3900	620	290 J	2700	340 J
Biphenyl	µg/kg	-	-	480	530 U	410 U	450 U
bis(2-Chloroethoxy)methane	µg/kg	-	-	460 U	530 U	410 U	450 U
bis(2-Chloroethyl)ether	µg/kg	-	-	460 U	530 U	410 U	450 U
bis(2-Ethylhexyl)phthalate	µg/kg	-	-	310 J	230 J	510	120 J
Butyl benzylphthalate	µg/kg	-	-	460 U	530 U	410 U	450 U
Caprolactam	µg/kg	-	-	460 U	530 U	410 U	450 U
Carbazole	µg/kg	-	-	320 J	530 U	820	96 J
Chrysene	µg/kg	110000	3900	1500	580	**4400**[b]	570
Dibenz(a,h)anthracene	µg/kg	1100	330	110 J	530 U	140 J	91 J

TABLE 2.4

BACKGROUND SURFACE SOIL ANALYTICAL RESULTS SUMMARY - DECEMBER 2005
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*001*	*002*	*003*	*004*
Sample ID:				*S-2428-122105-JRR-001*	*S-2428-122105-JRR-002*	*S-2428-122105-JRR-003*	*S-2428-122105-JRR-004*
Sample Date:				*12/21/2005*	*12/21/2005*	*12/21/2005*	*12/21/2005*
		Restricted Use Soil Cleanup Objectives Protection of Public Health					
Parameter	*Units*	*Industrial* a	*Res. Residential* b				
Semi-VolatilesContinued							
Dibenzofuran	µg/kg	1000000	59000	1400	530 U	250 J	110 J
Diethyl phthalate	µg/kg	-	-	380 J	430 J	540	340 J
Dimethyl phthalate	µg/kg	-	-	460 U	530 U	410 U	450 U
Di-n-butylphthalate	µg/kg	-	-	280 J	140 J	90 J	97 J
Di-n-octyl phthalate	µg/kg	-	-	460 U	530 U	410 U	450 U
Fluoranthene	µg/kg	1000000	100000	2300	1000	9200 D	1000
Fluorene	µg/kg	1000000	100000	290 J	530 U	350 J	450 U
Hexachlorobenzene	µg/kg	12000	1200	460 U	530 U	410 U	450 U
Hexachlorobutadiene	µg/kg	-	-	460 U	530 U	410 U	450 U
Hexachlorocyclopentadiene	µg/kg	-	-	460 U	530 U	410 U	450 U
Hexachloroethane	µg/kg	-	-	460 U	530 U	410 U	450 U
Indeno(1,2,3-cd)pyrene	µg/kg	11000	500	320 J	320 J	**1700[b]**	290 J
Isophorone	µg/kg	-	-	460 U	530 U	410 U	450 U
Naphthalene	µg/kg	1000000	100000	3600	130 J	640	400 J
Nitrobenzene	µg/kg	-	-	460 U	530 U	410 U	450 U
N-Nitrosodi-n-propylamine	µg/kg	-	-	460 U	530 U	410 U	450 U
N-Nitrosodiphenylamine	µg/kg	-	-	460 U	530 U	410 U	450 U
Pentachlorophenol	µg/kg	55000	6700	1200 U	1300 U	1000 U	1100 U
Phenanthrene	µg/kg	1000000	100000	4300	640	4800	700
Phenol	µg/kg	1000000	100000	560	530 U	410 U	450 U
Pyrene	µg/kg	1000000	100000	2600	870	13000 D	880
Total SVOCs	µg/kg	-	-	30220	6650	59030	7534
Metals							
Aluminum	mg/kg	-	-	1390	12300	12600	17500
Antimony	mg/kg	-	-	0.89 BN	0.55 BN	0.39 BN	0.29 UN
Arsenic	mg/kg	16	16	8.9	10.7	5.7	6.6
Barium	mg/kg	10000	400	70.4	99.4	227	134
Beryllium	mg/kg	2700	72	0.81	0.87	2.0	0.82
Cadmium	mg/kg	60	4.3	1.1	1.2	1.3	0.90
Calcium	mg/kg	-	-	2720	6870	105000	34000
Chromium Total	mg/kg	-	-	9.2 *	21.3 *	17.5 *	25.6 *
Cobalt	mg/kg	-	-	5.0 B	8.6	4.0 B	8.8
Copper	mg/kg	10000	270	22.4	98.5	31.5	29.6
Iron	mg/kg	-	-	10600 E	21600 E	18600 E	35500 E
Lead	mg/kg	3900	400	161	107	79.3	36.1
Magnesium	mg/kg	-	-	459 B	4100	19400	10500
Manganese	mg/kg	10000	2000	152 N	387 N	1060 N	448 N
Mercury	mg/kg	5.7	0.81	0.15	0.15	0.021 U	0.13
Nickel	mg/kg	10000	310	10.6	24.0	12.9	24.2
Potassium	mg/kg	-	-	479 B	1350	1230	2460
Selenium	mg/kg	6800	180	2.1	0.63 B	0.55 B	0.27 U
Silver	mg/kg	6800	180	0.12 B	0.22 B	0.17 B	0.14 B
Sodium	mg/kg	-	-	49.4 B	163 B	607 B	149 B
Thallium	mg/kg	-	-	0.88 B	1.4 B	0.41 B	2.0
Vanadium	mg/kg	-	-	10.6	28.5	16.5	32.3
Zinc	mg/kg	10000	10000	212 NE	297 NE	240 NE	131 NE

TABLE 2.4

BACKGROUND SURFACE SOIL ANALYTICAL RESULTS SUMMARY - DECEMBER 2005
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*001*	*002*	*003*	*004*
Sample ID:				*S-2428-122105-JRR-001*	*S-2428-122105-JRR-002*	*S-2428-122105-JRR-003*	*S-2428-122105-JRR-004*
Sample Date:				*12/21/2005*	*12/21/2005*	*12/21/2005*	*12/21/2005*
		Restricted Use Soil Cleanup Objectives Protection of Public Health					
Parameter	*Units*	*Industrial*	*Res. Residential*				
		a	b				
General Chemistry							
Cyanide (total)	mg/kg	10000	27	1.2	0.81 U	0.97	0.68 U
Percent Moisture	%	-	-	28.3	38.0	19.5	26.4
Total Petroleum Hydrocarbons	mg/kg	-	-	139	129	1070	217

Notes:

B - Reported value is less than the CRDL but greater than the IDL.
D - Compounds at secondary dilution factor.
E - Estimated because of the presence of interference.
J - Estimated.
N - Matrix spike sample recovery not within control limits.
U - Not present at or above the associated value.
* - Duplicate analysis not within control limits.

TABLE 2.5

SOIL ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*BH-1(T&U)*	*BH-2(V&W)*	*Site 108-2*	*Site 108-2*	*Site 108-3*	*Site 108-3*	*Site 109-1A*	*Site 109-2A*	*Site 109-3A*	*Site 110*	*Site 110-1*	*Site 110-1*	*Site 110-2*
Sample ID:				*S-2428-DT-021*	*S-2428-DT-022*	*Site 108-2*	*Site 108-2*	*Site 108-3*	*Site 108-3*	*Site 109-1A*	*Site 109-2A*	*Site 109-3A*	*Site 110*	*Site 110-1*	*Site 110-1-SPLIT*	*Site 110-2*
Sample Date:		*Restricted Use Soil Cleanup Objectives Protection of Public Health*		*10/16/1989*	*10/16/1989*	*7/13/1982*	*5/24/1983*	*7/13/1982*	*5/24/1983*	*5/24/1983*	*5/24/1983*	*5/24/1983*	*2/4/1986*	*5/24/1983*	*5/24/1983*	*5/24/1983*
Parameter	*Units*	*Industrial* a	*Res. Residential* b													
Volatiles																
1,1,1-Trichloroethane	µg/kg	1000000	100000	-	-	-	-	-	-	U	U	U	-	U	10.8 (1)	U
1,1,2,2-Tetrachloroethane	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	µg/kg	480000	26000	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene	µg/kg	1000000	100000	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dibromoethane (Ethylene Dibromide)	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	µg/kg	1000000	100000	-	-	-	-	-	-	-	-	-	330 U	-	-	-
1,2-Dichloroethane	µg/kg	60000	3100	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	560000	49000	-	-	-	-	-	-	-	-	-	330 U	-	-	-
1,4-Dichlorobenzene	µg/kg	250000	13000	-	-	-	-	-	-	-	-	-	330 U	-	-	-
2-Butanone (Methyl Ethyl Ketone)	µg/kg	1000000	100000	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	U	U	U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	U	U	U
Acetone	µg/kg	1000000	100000	-	-	NA	U	NA	352 (1)	-	-	-	-	U	164 (1)	379 (1)
Acrolein	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	U	U	U
Benzene	µg/kg	89000	4800	-	-	NA	32.2 (1)	NA	134 (1)	5.7 (1)	8.3	U	330 U	64.0 (1)	U	3560 (1)
Bromodichloromethane	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromomethane (Methyl Bromide)	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon disulfide	µg/kg	-	-	-	-	NA	44.2 (1)	NA	247 (1)	2.9 (1)	33.4	37.9 (1)	-	180 (1)	614 (1)	620 (1)
Carbon tetrachloride	µg/kg	44000	2400	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	µg/kg	1000000	100000	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroethane	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloroform (Trichloromethane)	µg/kg	700000	49000	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloromethane (Methyl Chloride)	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	µg/kg	1000000	100000	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	U	-	U
Cyclohexane	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane (CFC-12)	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/kg	780000	41000	-	-	NA	28.5 (1)	NA	150 (1)	-	-	-	330 U	U	-	737 (1)
Isopropylbenzene	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m&p-Xylene	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl acetate	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl cyclohexane	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methyl Tert Butyl Ether	µg/kg	1000000	100000	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene chloride	µg/kg	1000000	100000	-	-	NA	45.0 (1)	NA	U	-	-	-	-	81.4 (1)	83.9 (1)	314 (1)
m-Xylene/Chlorobenzene	µg/kg	-	-	-	-	-	-	-	-	-	-	-	330 U	-	-	-
o-Xylene	µg/kg	-	-	-	-	NA	126 (1)	NA	530 (1)	U	U	5.3 (1)	330 U	4.7 (1)	25.5 (1)	238 (1)
p-Xylene	µg/kg	-	-	-	-	-	-	-	-	-	-	-	330 U	-	-	-
Styrene	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	U	U	86.1 (1)
Tetrachloroethene	µg/kg	300000	19000	-	-	NA	U	NA	33.0 (1)	-	-	-	-	-	-	-
Toluene	µg/kg	1000000	100000	-	-	NA	16.1 (1)	NA	363 (1)	3.9 (1)	U	8.2 (1)	330 U	5.97 (1)	21.0 (1)	1420 (1)

TABLE 2.5

SOIL ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*BH-1(T&U)*	*BH-2(V&W)*	*Site 108-2*	*Site 108-2*	*Site 108-3*	*Site 108-3*	*Site 109-1A*	*Site 109-2A*	*Site 109-3A*	*Site 110*	*Site 110-1*	*Site 110-1*	*Site 110-2*
Sample ID:				*S-2428-DT-021*	*S-2428-DT-022*	*Site 108-2*	*Site 108-2*	*Site 108-3*	*Site 108-3*	*Site 109-1A*	*Site 109-2A*	*Site 109-3A*	*Site 110*	*Site 110-1*	*Site 110-1-SPLIT*	*Site 110-2*
Sample Date:		*Restricted Use Soil Cleanup Objectives Protection of Public Health*		*10/16/1989*	*10/16/1989*	*7/13/1982*	*5/24/1983*	*7/13/1982*	*5/24/1983*	*5/24/1983*	*5/24/1983*	*5/24/1983*	*2/4/1986*	*5/24/1983*	*5/24/1983*	*5/24/1983*
Parameter	*Units*	*Industrial*	*Res. Residential*													
		a	b													
Total VOCS	µg/kg	-	-	U	U	-	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	µg/kg	1000000	100000	-	-	NA	U	NA	468 (1)	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	µg/kg	400000	21000	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichlorofluoromethane (CFC-11)	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trifluorotrichloroethane (Freon 113)	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl chloride	µg/kg	27000	900	-	-	NA	U	NA	2180 (1)[b]	-	-	-	-	-	-	-
Xylene (total)	µg/kg	1000000	100000	-	-	-	-	-	-	-	-	-	-	-	-	-
Total VOCs	µg/kg	-	-	ND	ND	-	292	-	4457	12.5	41.7	51.4	ND	336.07	919.2	7354.1
TIC Volatiles																
1-Methylnaphthalene A	µg/kg	-	-	-	-	-	-	-	-	U	U	(2)	-	(2)	U	U
2-Methylbutane A	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	U	U	U
Benzene, 1,3-diemthyl- A	µg/kg	-	-	-	-	-	-	-	-	U	U	(2)	-	-	-	-
Cyclohexane A	µg/kg	-	-	-	-	NA	U	NA	(2)	-	-	-	-	U	U	U
Cyclopentane, methyl- A	µg/kg	-	-	-	-	NA	U	NA	(2)	-	-	-	-	-	-	-
p-Xylene A	µg/kg	-	-	-	-	-	-	-	-	U	U	(2)	-	-	-	-
Tetrahydrofuran A	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	U	U	U
Thiophene A	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	U	U	(2)
TCLP Volatiles																
2-Butanone (Methyl Ethyl Ketone)	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene chloride	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toluene	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatiles																
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether)	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chlorophenol	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	µg/kg	-	-	-	-	NA	(2)	NA	U	(2)	(2)	(2)	-	(2)	(2)	U
2-Methylphenol	µg/kg	1000000	100000	-	-	-	-	-	-	U	U	U	-	-	-	-
2-Nitroaniline	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitrophenol	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,4-Dinitrotoluene	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	U	(2)	U
3-Nitroaniline	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloroaniline	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	(2)	U	U
Semi-Volatiles Continued																
4-Chlorophenyl phenyl ether	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methylphenol	µg/kg	1000000	100000	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitroaniline	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9-Methylphenanthrene	µg/kg	-	-	-	-	-	-	-	-	U	U	(2)	-	-	-	-

TABLE 2.5

SOIL ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*BH-1(T&U)*	*BH-2(V&W)*	*Site 108-2*	*Site 108-2*	*Site 108-3*	*Site 108-3*	*Site 109-1A*	*Site 109-2A*	*Site 109-3A*	*Site 110*	*Site 110-1*	*Site 110-1*	*Site 110-2*
Sample ID:				*S-2428-DT-021*	*S-2428-DT-022*	*Site 108-2*	*Site 108-2*	*Site 108-3*	*Site 108-3*	*Site 109-1A*	*Site 109-2A*	*Site 109-3A*	*Site 110*	*Site 110-1*	*Site 110-1-SPLIT*	*Site 110-2*
Sample Date:		*Restricted Use Soil Cleanup Objectives Protection of Public Health*		*10/16/1989*	*10/16/1989*	*7/13/1982*	*5/24/1983*	*7/13/1982*	*5/24/1983*	*5/24/1983*	*5/24/1983*	*5/24/1983*	*2/4/1986*	*5/24/1983*	*5/24/1983*	*5/24/1983*
Parameter	*Units*	*Industrial*	*Res. Residential*													
		a	b													
Acenaphthene	µg/kg	1000000	100000	-	-	NA	(2)	NA	U	(2)	(2)	U	500 U	U	(2)	U
Acenaphthylene	µg/kg	1000000	100000	-	-	NA	(2)	NA	U	(2)	(2)	(2)	630 U	U	(2)	U
Acetophenone	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	µg/kg	1000000	100000	-	-	-	-	-	-	-	-	-	3300 U	-	-	-
Atrazine	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzaldehyde	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	µg/kg	11000	1000	-	-	NA	(2)	NA	U	U	(2)	(2)	4000 U	-	-	-
Benzo(a)pyrene	µg/kg	1100	1000	-	-	-	-	-	-	(2)	(2)	(2)	6300 U	(2)	(2)	U
Benzo(b)fluoranthene	µg/kg	11000	1000	-	-	-	-	-	-	-	-	-	6000 U	-	-	-
Benzo(b)fluoranthene/ Benzo(k)fluoranthene	µg/kg	-	-	-	-	NA	(2)	NA	U	(2)	(2)	(2)	-	(2)	(2)	U
Benzo(g,h,i)perylene	µg/kg	1000000	100000	-	-	NA	(2)	NA	U	(2)	(2)	(2)	3200 U	(2)	(2)	U
Benzo(k)fluoranthene	µg/kg	110000	3900	-	-	-	-	-	-	-	-	-	23000 U	-	-	-
Benzoic acid	µg/kg	-	-	-	-	U	NA	U	NA	(2)	U	U	-	-	-	-
Biphenyl	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate	µg/kg	-	-	8.0	1.0	NA	(2)	NA	U	(2)	(2)	(2)	-	(2)	(2)	U
Butyl benzylphthalate	µg/kg	-	-	-	-	-	-	-	-	U	(2)	U	-	-	-	-
Caprolactam	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbazole	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	µg/kg	110000	3900	-	-	-	-	-	-	(2)	U	U	2500 U	(2)	U	U
Dibenz(a,h)anthracene	µg/kg	1100	330	-	-	-	-	-	-	(2)	(2)	(2)	1900 U	(2)	(2)	U
Dibenzofuran	µg/kg	1000000	59000	-	-	NA	(2)	NA	U	(2)	(2)	U	-	U	(2)	U
Diethyl phthalate	µg/kg	-	-	-	-	U	U	U	U	U	(2)	U	-	U	(2)	U
Dimethyl phthalate	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-butylphthalate	µg/kg	-	-	-	-	-	-	-	-	U	(2)	U	-	U	(2)	U
Di-n-octyl phthalate	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	(2)	U	U
Fluoranthene	µg/kg	1000000	100000	-	-	NA	(2)	NA	U	(2)	(2)	(2)	2000 U	(2)	(2)	U
Fluorene	µg/kg	1000000	100000	-	-	NA	(2)	NA	U	(2)	(2)	(2)	1200 U	(2)	(2)	U
Hexachlorobenzene	µg/kg	12000	1200	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachloroethane	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	µg/kg	11000	500	-	-	NA	(2)	NA	U	U	(2)	(2)	12000 U	(2)	U	U
Isophorone	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	µg/kg	1000000	100000	-	-	NA	(2)	NA	(2)	(2)	(2)	(2)	1400 U	(2)	(2)	U
Nitrobenzene	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	U	(2)	U
Pentachlorophenol	µg/kg	55000	6700	-	-	-	-	-	-	-	-	-	-	-	-	-
Perylene	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	U	(2)	U
Phenanthrene	µg/kg	1000000	100000	-	-	-	-	-	-	-	-	-	6700 U	(2)	(2)	U
Phenol	µg/kg	1000000	100000	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	µg/kg	1000000	100000	-	-	NA	(2)	NA	U	(2)	(2)	(2)	3600 U	(2)	(2)	U
Total SVOCs	µg/kg	-	-	8	1	ND	(2)	ND	(2)	(2)	(2)	(2)	ND	(2)	(2)	ND
TIC Semi-Volatiles																
1,1,3-Trimethylcyclohexane A	µg/kg	-	-	-	-	NA	U	NA	(2)	-	-	-	-	-	-	-
1,8-Dimethylnaphthalene A	µg/kg	-	-	-	-	-	-	-	-	U	U	(2)	-	(2)	U	U
1-Ethyl-3-methyl-trans-cyclopentane A	µg/kg	-	-	-	-	NA	U	NA	(2)	-	-	-	-	-	-	-
2,2,3,4-Tetramethylpentane A	µg/kg	-	-	-	-	NA	U	NA	(2)	-	-	-	-	-	-	-
2,3,5-Trimethylphenanthrene A	µg/kg	-	-	-	-	-	-	-	-	U	U	(2)	-	-	-	-
2,6,6-Trimethyl-bicyclo-(3.1.1)hepten-2-ene A	µg/kg	-	-	-	-	NA	U	NA	(2)	-	-	-	-	-	-	-

TABLE 2.5

SOIL ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*BH-1(T&U)*	*BH-2(V&W)*	*Site 108-2*	*Site 108-2*	*Site 108-3*	*Site 108-3*	*Site 109-1A*	*Site 109-2A*	*Site 109-3A*	*Site 110*	*Site 110-1*	*Site 110-1*	*Site 110-2*
Sample ID:				*S-2428-DT-021*	*S-2428-DT-022*	*Site 108-2*	*Site 108-2*	*Site 108-3*	*Site 108-3*	*Site 109-1A*	*Site 109-2A*	*Site 109-3A*	*Site 110*	*Site 110-1*	*Site 110-1-SPLIT*	*Site 110-2*
Sample Date:		*Restricted Use Soil Cleanup Objectives Protection of Public Health*		*10/16/1989*	*10/16/1989*	*7/13/1982*	*5/24/1983*	*7/13/1982*	*5/24/1983*	*5/24/1983*	*5/24/1983*	*5/24/1983*	*2/4/1986*	*5/24/1983*	*5/24/1983*	*5/24/1983*
Parameter	*Units*	*Industrial*	*Res. Residential*													
		a	b													
2-Octadecanol A	µg/kg	-	-	-	-	-	-	-	-	(2)	U	U	-	-	-	-
4-Methylphenanthrene A	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	U	(2)	U
7-Octadecanol A	µg/kg	-	-	-	-	-	-	-	-	U	(2)	U	-	-	-	-
Hexadecanoic Acid A	µg/kg	-	-	-	-	-	-	-	-	(2)	U	U	-	-	-	-
Hexadecanol A	µg/kg	-	-	-	-	-	-	-	-	U	(2)	U	-	-	-	-
Indane A	µg/kg	-	-	-	-	NA	(2)	NA	U	-	-	-	-	-	-	-
Indene A	µg/kg	-	-	-	-	NA	(2)	NA	U	-	-	-	-	-	-	-
Molecular sulfur A	µg/kg	-	-	-	-	NA	11000	NA	U	U	1900	U	-	-	-	-
Perylene A	µg/kg	-	-	-	-	-	-	-	-	(2)	U	U	-	-	-	-
Undecane, 2,6-dimethyl- A	µg/kg	-	-	-	-	-	-	-	-	U	U	(2)	-	-	-	-
Unknown Hydrocarbon A	µg/kg	-	-	-	-	NA	U	NA	(2)	(2)	U	(2)	-	(2)	(2)	U
Unknown PAH A	µg/kg	-	-	-	-	-	-	-	-	NA	NA	(2)	-	-	-	-
TCLP Semi-Volatiles																
3-Methylphenol	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methylphenol	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	µg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals																
Aluminum	mg/kg	-	-	10200	11800	-	-	-	-	-	-	-	-	-	-	-
Antimony	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	mg/kg	16	16	1.90	1.80	-	-	-	-	-	-	-	-	-	-	-
Barium	mg/kg	10000	400	47.0	30.0	-	-	-	-	-	-	-	-	-	-	-
Beryllium	mg/kg	2700	72	1.60	1.60	-	-	-	-	-	-	-	-	-	-	-
Cadmium	mg/kg	60	4.3	0.15	0.15	-	-	-	-	-	-	-	-	-	-	-
Calcium	mg/kg	-	-	36780	22400	-	-	-	-	-	-	-	-	-	-	-
Chromium Total	mg/kg	-	-	15.0	13.0	-	-	-	-	-	-	-	-	-	-	-
Chromium VI (Hexavalent)	mg/kg	800	110	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	mg/kg	-	-	10.0	13.0	-	-	-	-	-	-	-	-	-	-	-
Copper	mg/kg	10000	270	17.0	18.0	-	-	-	-	-	-	-	-	-	-	-
Iron	mg/kg	-	-	180	179	9500	NA	5900	NA	-	-	-	-	-	-	-
Lead	mg/kg	3900	400	4.40	4.10	-	-	-	-	-	-	-	-	-	-	-
Magnesium	mg/kg	-	-	16500	16500	-	-	-	-	-	-	-	-	-	-	-
Manganese	mg/kg	10000	2000	530	480	-	-	-	-	-	-	-	-	-	-	-
Mercury	mg/kg	5.7	0.81	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	mg/kg	10000	310	25.5	24.0	-	-	-	-	-	-	-	-	-	-	-
Potassium	mg/kg	-	-	3260	3080	-	-	-	-	-	-	-	-	-	-	-
Selenium	mg/kg	6800	180	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver	mg/kg	6800	180	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	mg/kg	-	-	630	690	-	-	-	-	-	-	-	-	-	-	-
Thallium	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	mg/kg	-	-	17.7	14.0	-	-	-	-	-	-	-	-	-	-	-
Zinc	mg/kg	10000	10000	64.0	70.0	-	-	-	-	-	-	-	-	-	-	-
TCLP Metals																
Arsenic	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium Total	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pesticides																
alpha-BHC	µg/kg	6800	480	-	-	-	-	-	-	U	U	U	-	-	-	-

TABLE 2.5

SOIL ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*BH-1(T&U)*	*BH-2(V&W)*	*Site 108-2*	*Site 108-2*	*Site 108-3*	*Site 108-3*	*Site 109-1A*	*Site 109-2A*	*Site 109-3A*	*Site 110*	*Site 110-1*	*Site 110-1*	*Site 110-2*
Sample ID:				*S-2428-DT-021*	*S-2428-DT-022*	*Site 108-2*	*Site 108-2*	*Site 108-3*	*Site 108-3*	*Site 109-1A*	*Site 109-2A*	*Site 109-3A*	*Site 110*	*Site 110-1*	*Site 110-1-SPLIT*	*Site 110-2*
Sample Date:		*Restricted Use Soil Cleanup Objectives Protection of Public Health*		*10/16/1989*	*10/16/1989*	*7/13/1982*	*5/24/1983*	*7/13/1982*	*5/24/1983*	*5/24/1983*	*5/24/1983*	*5/24/1983*	*2/4/1986*	*5/24/1983*	*5/24/1983*	*5/24/1983*
Parameter	*Units*	*Industrial*	*Res. Residential*													
		a	b													
Dieldrin	µg/kg	2800	200	-	-	-	-	-	-	-	-	-	-	U	31	U
Heptachlor epoxide	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-	22 (1)	U	U
General Chemistry																
Cyanide (free)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	0.76	-	-	-
Cyanide (total)	mg/kg	10000	27	-	-	U	NA	U	NA	-	-	-	4.96	-	-	-
Oil and Grease	mg/kg	-	-	419	1050	-	-	-	-	-	-	-	-	-	-	-
Percent Moisture	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenolics (Total)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	0.30	-	-	-
Total Organic Halides (TOX)	mg/kg	-	-	-	-	-	-	-	-	-	-	-	0.6 U	-	-	-
Total Petroleum Hydrocarbons	mg/kg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

(1) Surrogate recoveries were above or below the acceptance limits.

(2) Compounds detected but not quantified. Holding times exceeded before GC/MS acid and base-neutral extractable compounds were extracted.

ALLPHDA All phenolic data.

C Denotes a compound whose concentration is estimated due to unsatisfactory percent differences (% D's) in response factors determined from the calibration.

J Estimated

M Indicated matrix spike recoveries were outside control limits and may reflect a high bias in sample data

NA Parameter not analyzed

R Rejected

U Not present at or above the associated value.

UJ Estimated reporting limit.

UR* Unusable data due to holding time exceedence. Also present in laboratory blanks, indicating possible/probable laboratory contamination.

UR** Unusable data due to holding time exceedence. The concentration of Cr+6 may have been equal to, however not greater than, the amount of total chrome detected in the associated sample.

W Indicated spike recoveries were outside control limits and may reflect a low bias in sample data.

X Unusable data due to low surrogate spike recoveries. All sample data for the affected compounds were non-detected.

* Also present in laboratory blanks, indicating possible/probable laboratory contamination.

-- Not applicable.

TABLE 2.5

SOIL ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*Site 110-3*	*TP-1(Q&S)*	*TP-1(Q&S)*	*TP-2(T&U)*	*TP-3(V&W)*	*TP-4(M&N)*	*TP-X,Y,Z*	*TP-Z*
Sample ID:				*Site 110-3*	*S-2428-DT-001*	*S-2428-DT-005*	*S-2428-DT-002/002re*	*S-2428-DT-003/003re*	*S-2428-DT-004/004re*	*TP-X,Y,Z*	*TP-Z*
Sample Date:		*Restricted Use Soil Cleanup Objectives Protection of Public Health*		*5/24/1983*	*6/19/1989*	*6/19/1989 Duplicate*	*6/19/1989*	*6/19/1989*	*6/19/1989*	*6/14/1991*	*6/14/1991*
Parameter	*Units*	*Industrial* a	*Res. Residential* b								
Volatiles											
1,1,1-Trichloroethane	µg/kg	1000000	100000	3.0 (1)	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	µg/kg	480000	26000	-	-	-	-	-	-	-	-
1,1-Dichloroethene	µg/kg	1000000	100000	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	-	-	-	-	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	-	-	-	-	-	-	-	-	-	-
1,2-Dibromoethane (Ethylene Dibromide)	µg/kg	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	µg/kg	1000000	100000	-	-	-	-	-	-	-	-
1,2-Dichloroethane	µg/kg	60000	3100	-	-	-	-	-	-	-	-
1,2-Dichloropropane	µg/kg	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	560000	49000	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	250000	13000	-	-	-	-	-	-	-	-
2-Butanone (Methyl Ethyl Ketone)	µg/kg	1000000	100000	-	-	-	-	-	-	-	-
2-Hexanone	µg/kg	-	-	17.1 (1)	-	-	-	-	-	-	-
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	µg/kg	-	-	6.3 (1)	-	-	-	-	-	-	-
Acetone	µg/kg	1000000	100000	U	42 *	24 *	260 C	37 * / 21 *	49 * / 94 *	-	-
Acrolein	µg/kg	-	-	U	-	-	-	-	-	-	-
Benzene	µg/kg	89000	4800	77.1 (1)	-	-	-	-	-	2800	66000 b
Bromodichloromethane	µg/kg	-	-	-	-	-	-	-	-	-	-
Bromoform	µg/kg	-	-	-	-	-	-	-	-	-	-
Bromomethane (Methyl Bromide)	µg/kg	-	-	-	-	-	-	-	-	-	-
Carbon disulfide	µg/kg	-	-	161 (1)	-	-	-	-	-	-	-
Carbon tetrachloride	µg/kg	44000	2400	-	-	-	-	-	-	-	-
Chlorobenzene	µg/kg	1000000	100000	-	-	-	-	-	-	-	-
Chloroethane	µg/kg	-	-	-	-	-	-	-	-	-	-
Chloroform (Trichloromethane)	µg/kg	700000	49000	-	-	-	-	-	-	-	-
Chloromethane (Methyl Chloride)	µg/kg	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	µg/kg	1000000	100000	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	µg/kg	-	-	5.9 (1)	-	-	-	-	-	-	-
Cyclohexane	µg/kg	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	µg/kg	-	-	-	-	-	-	-	-	-	-
Dichlorodifluoromethane (CFC-12)	µg/kg	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/kg	780000	41000	U	-	-	-	-	-	22000	60000 b
Isopropylbenzene	µg/kg	-	-	-	-	-	-	-	-	-	-
m&p-Xylene	µg/kg	-	-	-	-	-	-	-	-	6400	100000
Methyl acetate	µg/kg	-	-	-	-	-	-	-	-	-	-
Methyl cyclohexane	µg/kg	-	-	-	-	-	-	-	-	-	-
Methyl Tert Butyl Ether	µg/kg	1000000	100000	-	-	-	-	-	-	-	-
Methylene chloride	µg/kg	1000000	100000	160 (1)	44 *	29 *	110 / 27 *	46 * / 46 *	73 * / 30 *	-	-
m-Xylene/Chlorobenzene	µg/kg	-	-	-	-	-	-	-	-	-	-
o-Xylene	µg/kg	-	-	17.1 (1)	-	-	-	-	-	8000	98000
p-Xylene	µg/kg	-	-	-	-	-	-	-	-	-	-
Styrene	µg/kg	-	-	U	-	-	-	-	-	-	-
Tetrachloroethene	µg/kg	300000	19000	-	-	-	-	-	-	-	-
Toluene	µg/kg	1000000	100000	16.8 (1)	9	8	7 U	6 U	7 U	6400	140000 b

TABLE 2.5

SOIL ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*Site 110-3*	*TP-1(Q&S)*	*TP-1(Q&S)*	*TP-2(T&U)*	*TP-3(V&W)*	*TP-4(M&N)*	*TP-X,Y,Z*	*TP-Z*
Sample ID:				*Site 110-3*	*S-2428-DT-001*	*S-2428-DT-005*	*S-2428-DT-002/002re*	*S-2428-DT-003/003re*	*S-2428-DT-004/004re*	*TP-X,Y,Z*	*TP-Z*
Sample Date:		*Restricted Use Soil Cleanup Objectives Protection of Public Health*		*5/24/1983*	*6/19/1989*	*6/19/1989 Duplicate*	*6/19/1989*	*6/19/1989*	*6/19/1989*	*6/14/1991*	*6/14/1991*
Parameter	*Units*	*Industrial* a	*Res. Residential* b								
Total VOCS	µg/kg	-	-	-	-	-	-	-	-	-	-
trans-1,2-Dichloroethene	µg/kg	1000000	100000	-	-	-	-	-	-	-	-
trans-1,3-Dichloropropene	µg/kg	-	-	-	-	-	-	-	-	-	-
Trichloroethene	µg/kg	400000	21000	-	-	-	-	-	-	-	-
Trichlorofluoromethane (CFC-11)	µg/kg	-	-	-	-	-	-	-	-	-	-
Trifluorotrichloroethane (Freon 113)	µg/kg	-	-	-	-	-	-	-	-	-	-
Vinyl chloride	µg/kg	27000	900	-	-	-	-	-	-	-	-
Xylene (total)	µg/kg	1000000	100000	-	11	11	7 U	6 U	7 U	-	-
Total VOCs	µg/kg	-	-	464.3	106	72	370 /287	83 /67	122 /124	45600	464000
TIC Volatiles											
1-Methylnaphthalene A	µg/kg	-	-	U	-	-	-	-	-	-	-
2-Methylbutane A	µg/kg	-	-	(2)	-	-	-	-	-	-	-
Benzene, 1,3-diemthyl- A	µg/kg	-	-	-	-	-	-	-	-	-	-
Cyclohexane A	µg/kg	-	-	(2)	-	-	-	-	-	-	-
Cyclopentane, methyl- A	µg/kg	-	-	-	-	-	-	-	-	-	-
p-Xylene A	µg/kg	-	-	-	-	-	-	-	-	-	-
Tetrahydrofuran A	µg/kg	-	-	(2)	-	-	-	-	-	-	-
Thiophene A	µg/kg	-	-	U	-	-	-	-	-	-	-
TCLP Volatiles											
2-Butanone (Methyl Ethyl Ketone)	µg/L	-	-	-	38	10 U	10 U	10 U	10 U	-	-
Benzene	µg/L	-	-	-	4 J	2 J	5 U	5 U	5 U	-	-
Methylene chloride	µg/L	-	-	-	31 *	14 *	15 *	11 *	15 *	-	-
Toluene	µg/L	-	-	-	75	5	5 U	5 U	5 U	-	-
Semi-Volatiles											
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether)	µg/kg	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	µg/kg	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	µg/kg	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	µg/kg	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	µg/kg	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	µg/kg	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	µg/kg	-	-	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	µg/kg	-	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	µg/kg	-	-	-	-	-	-	-	-	-	-
2-Chlorophenol	µg/kg	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	µg/kg	-	-	(2)	7400	14000	900 U	1900 U	2300 U	33000 U	86000
2-Methylphenol	µg/kg	1000000	100000	-	-	-	-	-	-	-	-
2-Nitroaniline	µg/kg	-	-	-	-	-	-	-	-	-	-
2-Nitrophenol	µg/kg	-	-	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	µg/kg	-	-	-	-	-	-	-	-	-	-
3,4-Dinitrotoluene	µg/kg	-	-	U	-	-	-	-	-	-	-
3-Nitroaniline	µg/kg	-	-	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	µg/kg	-	-	-	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	µg/kg	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	µg/kg	-	-	-	-	-	-	-	-	-	-
4-Chloroaniline	µg/kg	-	-	U	-	-	-	-	-	-	-
Semi-Volatiles Continued											
4-Chlorophenyl phenyl ether	µg/kg	-	-	-	-	-	-	-	-	-	-
4-Methylphenol	µg/kg	1000000	100000	-	-	-	-	-	-	-	-
4-Nitroaniline	µg/kg	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	µg/kg	-	-	-	-	-	-	-	-	-	-
9-Methylphenanthrene	µg/kg	-	-	-	-	-	-	-	-	-	-

SOIL ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*Site 110-3*	*TP-1(Q&S)*	*TP-1(Q&S)*	*TP-2(T&U)*	*TP-3(V&W)*	*TP-4(M&N)*	*TP-X,Y,Z*	*TP-Z*
Sample ID:				*Site 110-3*	*S-2428-DT-001*	*S-2428-DT-005*	*S-2428-DT-002/002re*	*S-2428-DT-003/003re*	*S-2428-DT-004/004re*	*TP-X,Y,Z*	*TP-Z*
Sample Date:		*Restricted Use Soil Cleanup Objectives Protection of Public Health*		*5/24/1983*	*6/19/1989*	*6/19/1989 Duplicate*	*6/19/1989*	*6/19/1989*	*6/19/1989*	*6/14/1991*	*6/14/1991*
Parameter	*Units*	*Industrial* a	*Res. Residential* b								
Acenaphthene	µg/kg	1000000	100000	U	970	2100 U	900 U	1900 U	2300 U	-	-
Acenaphthylene	µg/kg	1000000	100000	(2)	2900	5000	900 U	1900 U	2300 U	-	-
Acetophenone	µg/kg	-	-	-	-	-	-	-	-	-	-
Anthracene	µg/kg	1000000	100000	-	4200 U	5000	900 U	1900 U	2300 U	33000 U	74000
Atrazine	µg/kg	-	-	-	-	-	-	-	-	-	-
Benzaldehyde	µg/kg	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	µg/kg	11000	1000	-	4400[b]	9800[b]	1700[b]	8700[b]	4700[b]	33000 U	57000[ab]
Benzo(a)pyrene	µg/kg	1100	1000	(2)	4800[ab]	8700[ab]	2400[ab]	11000[ab]	4400[ab]	33000 U	47000[ab]
Benzo(b)fluoranthene	µg/kg	11000	1000	-	5200[b]	11000[b]	3800[b]	17000[ab]	7400[b]	33000 U	40000[ab]
Benzo(b)fluoranthene/ Benzo(k)fluoranthene	µg/kg	-	-	(2)	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	µg/kg	1000000	100000	(2)	2100	3600	940	6200	2500	-	-
Benzo(k)fluoranthene	µg/kg	110000	3900	-	5200[b]	11000[b]	3800	17000[b]	7400[b]	33000 U	45000[b]
Benzoic acid	µg/kg	-	-	-	-	-	-	-	-	-	-
Biphenyl	µg/kg	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	µg/kg	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	µg/kg	-	-	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate	µg/kg	-	-	U	-	-	-	-	-	-	-
Butyl benzylphthalate	µg/kg	-	-	-	-	-	-	-	-	-	-
Caprolactam	µg/kg	-	-	-	-	-	-	-	-	-	-
Carbazole	µg/kg	-	-	-	-	-	-	-	-	-	-
Chrysene	µg/kg	110000	3900	(2)	5700[b]	11000[b]	2200	11000[b]	5600[b]	33000 U	47000[b]
Dibenz(a,h)anthracene	µg/kg	1100	330	(2)	510[b]	2100 U	900 U	3200[ab]	2300 U	-	-
Dibenzofuran	µg/kg	1000000	59000	(2)	640	2100 U	900 U	1900 U	2300 U	33000 U	69000[b]
Diethyl phthalate	µg/kg	-	-	U	-	-	-	-	-	-	-
Dimethyl phthalate	µg/kg	-	-	-	-	-	-	-	-	-	-
Di-n-butylphthalate	µg/kg	-	-	U	-	-	-	-	-	-	-
Di-n-octyl phthalate	µg/kg	-	-	U	-	-	-	-	-	-	-
Fluoranthene	µg/kg	1000000	100000	(2)	8800	20000	3600	14000	9900	67000	150000[b]
Fluorene	µg/kg	1000000	100000	(2)	4600	6000	900 U	1900 U	2300 U	33000 U	85000
Hexachlorobenzene	µg/kg	12000	1200	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/kg	-	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	µg/kg	-	-	-	-	-	-	-	-	-	-
Hexachloroethane	µg/kg	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	µg/kg	11000	500	(2)	2100[b]	3400[b]	900 U	4500[b]	2300 U	-	-
Isophorone	µg/kg	-	-	-	-	-	-	-	-	-	-
Naphthalene	µg/kg	1000000	100000	(2)	14000	21000	900 U	1900 U	2300 U	92000	270000[b]
Nitrobenzene	µg/kg	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	µg/kg	-	-	-	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	µg/kg	-	-	U	-	-	-	-	-	-	-
Pentachlorophenol	µg/kg	55000	6700	-	-	-	-	-	-	-	-
Perylene	µg/kg	-	-	U	-	-	-	-	-	-	-
Phenanthrene	µg/kg	1000000	100000	(2)	17000	29000	1800	4400	5200	62000	180000[b]
Phenol	µg/kg	1000000	100000	-	-	-	-	-	-	-	-
Pyrene	µg/kg	1000000	100000	(2)	12000	18000	2600	12000	7400	44000	99000
Total SVOCs	µg/kg	-	-	(2)	98320	176500	22840	109000	54500	265000	1249000
TIC Semi-Volatiles											
1,1,3-Trimethylcyclohexane A	µg/kg	-	-	-	-	-	-	-	-	-	-
1,8-Dimethylnaphthalene A	µg/kg	-	-	U	-	-	-	-	-	-	-
1-Ethyl-3-methyl-trans-cyclopentane A	µg/kg	-	-	-	-	-	-	-	-	-	-
2,2,3,4-Tetramethylpentane A	µg/kg	-	-	-	-	-	-	-	-	-	-
2,3,5-Trimethylphenanthrene A	µg/kg	-	-	-	-	-	-	-	-	-	-
2,6,6-Trimethyl-bicyclo-(3.1.1)hepten-2-ene A	µg/kg	-	-	-	-	-	-	-	-	-	-

TABLE 2.5

SOIL ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*Site 110-3*	*TP-1(Q&S)*	*TP-1(Q&S)*	*TP-2(T&U)*	*TP-3(V&W)*	*TP-4(M&N)*	*TP-X,Y,Z*	*TP-Z*
Sample ID:				*Site 110-3*	*S-2428-DT-001*	*S-2428-DT-005*	*S-2428-DT-002/002re*	*S-2428-DT-003/003re*	*S-2428-DT-004/004re*	*TP-X,Y,Z*	*TP-Z*
Sample Date:		*Restricted Use Soil Cleanup Objectives Protection of Public Health*		*5/24/1983*	*6/19/1989*	*6/19/1989 Duplicate*	*6/19/1989*	*6/19/1989*	*6/19/1989*	*6/14/1991*	*6/14/1991*
Parameter	*Units*	*Industrial* a	*Res. Residential* b								
2-Octadecanol A	µg/kg	-	-	-	-	-	-	-	-	-	-
4-Methylphenanthrene A	µg/kg	-	-	U	-	-	-	-	-	-	-
7-Octadecanol A	µg/kg	-	-	-	-	-	-	-	-	-	-
Hexadecanoic Acid A	µg/kg	-	-	-	-	-	-	-	-	-	-
Hexadecanol A	µg/kg	-	-	-	-	-	-	-	-	-	-
Indane A	µg/kg	-	-	-	-	-	-	-	-	-	-
Indene A	µg/kg	-	-	-	-	-	-	-	-	-	-
Molecular sulfur A	µg/kg	-	-	-	-	-	-	-	-	-	-
Perylene A	µg/kg	-	-	-	-	-	-	-	-	-	-
Undecane, 2,6-dimethyl- A	µg/kg	-	-	-	-	-	-	-	-	-	-
Unknown Hydrocarbon A	µg/kg	-	-	U	-	-	-	-	-	-	-
Unknown PAH A	µg/kg	-	-	-	-	-	-	-	-	-	-
TCLP Semi-Volatiles											
3-Methylphenol	µg/L	-	-	-	ALLPHDA	10 U	ALLPHDA	10 U	10 U	-	-
4-Methylphenol	µg/L	-	-	-	X	10 U	X	10 U	10 U	-	-
Pentachlorophenol	µg/L	-	-	-	-	20 U	-	20 U	20 U	-	-
Metals											
Aluminum	mg/kg	-	-	-	9570	13400	848	87.6	1320	15000	22500
Antimony	mg/kg	-	-	-	-	-	-	-	-	-	-
Arsenic	mg/kg	16	16	-	10.6	4.1	3.1	2.2	0.59	10.1	**240[ab]**
Barium	mg/kg	10000	400	-	118	105	28.6	9.0	40	16.2	46.7
Beryllium	mg/kg	2700	72	-	0.69	0.7	0.13 U	0.11 U	0.14 U	-	-
Cadmium	mg/kg	60	4.3	-	-	-	-	-	-	1.05	0.05 U
Calcium	mg/kg	-	-	-	27100	41600	750	405	792	9490	496
Chromium Total	mg/kg	-	-	-	116.1	17.6	6.7	4.8	5.2	24.1	16.7
Chromium VI (Hexavalent)	mg/kg	800	110	-	0.5 UR**	0.5 UR**	0.5 UR**	0.5 UR*	0.5 UR**	-	-
Cobalt	mg/kg	-	-	-	10	12.1	3.8	0.74 U	3.3	-	-
Copper	mg/kg	10000	270	-	43.2	68.7	11.2	10.0	16.4	50.7	64
Iron	mg/kg	-	-	-	35700	21800	3210	329	6730	32000	77100
Lead	mg/kg	3900	400	-	81.8	36.3	3.2	5.8	10.1	108	172
Magnesium	mg/kg	-	-	-	8190	12500	72.3	15.4 U	162	4250	3480
Manganese	mg/kg	10000	2000	-	579	488	41.7 M	39.0	109	245	190
Mercury	mg/kg	5.7	0.81	-	**1.0[b]**	0.4	0.11 U	0.11 U	0.14 U	**4[b]**	**3.5[b]**
Nickel	mg/kg	10000	310	-	16.4	22.2	7.1	8.9	5.1 U	**362[b]**	83
Potassium	mg/kg	-	-	-	1290 *	2090 *	3430	390 U	522 *	875	1590
Selenium	mg/kg	6800	180	-	0.74 U	1.3 U	0.54 W	0.31	0.26 U	1.43	0.5 U
Silver	mg/kg	6800	180	-	-	-	-	-	-	1.74	23.3
Sodium	mg/kg	-	-	-	361 U	399 U	1350	349 U	429 U	365	488
Thallium	mg/kg	-	-	-	-	-	-	-	-	-	-
Vanadium	mg/kg	-	-	-	46.7	33.5	9.9	28.8	9.4	1.6	13.8
Zinc	mg/kg	10000	10000	-	136	95.5	34.0	17.4	42.0	145	204
TCLP Metals											
Arsenic	mg/L	-	-	-	0.0084	0.0493	0.0068	0.0021	0.006	-	-
Barium	mg/L	-	-	-	0.769	0.679	0.329	0.101	0.288	-	-
Chromium Total	mg/L	-	-	-	0.0048	0.132	0.0038 U	0.0169	0.0098	-	-
Lead	mg/L	-	-	-	0.0145	0.389	0.0130	0.0418	0.0169	-	-
Mercury	mg/L	-	-	-	0.00020 U	0.0372	0.00020 U	0.00020 U	0.00020 U	-	-
Selenium	mg/L	-	-	-	0.010 U	0.0050 U	0.010 U	0.0015	0.010 U	-	-
Pesticides											
alpha-BHC	µg/kg	6800	480	-	-	-	-	-	-	-	-

TABLE 2.5

SOIL ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*Site 110-3*	*TP-1(Q&S)*	*TP-1(Q&S)*	*TP-2(T&U)*	*TP-3(V&W)*	*TP-4(M&N)*	*TP-X,Y,Z*	*TP-Z*
Sample ID:				*Site 110-3*	*S-2428-DT-001*	*S-2428-DT-005*	*S-2428-DT-002/002re*	*S-2428-DT-003/003re*	*S-2428-DT-004/004re*	*TP-X,Y,Z*	*TP-Z*
Sample Date:		*Restricted Use Soil Cleanup Objectives Protection of Public Health*		*5/24/1983*	*6/19/1989*	*6/19/1989 Duplicate*	*6/19/1989*	*6/19/1989*	*6/19/1989*	*6/14/1991*	*6/14/1991*
Parameter	*Units*	*Industrial* a	*Res. Residential* b								
Dieldrin	µg/kg	2800	200	U	-	-	-	-	-	-	-
Heptachlor epoxide	µg/kg	-	-	U	-	-	-	-	-	-	-
General Chemistry											
Cyanide (free)	mg/kg	-	-	-	-	-	-	-	-	-	-
Cyanide (total)	mg/kg	10000	27	-	186[R]	271[R]	0.68 W	0.56 U	1.5	-	-
Oil and Grease	mg/kg	-	-	-	3300	38000	180	240 M	250	-	-
Percent Moisture	%	-	-	-	-	-	-	-	-	-	-
Phenolics (Total)	mg/kg	-	-	-	-	-	-	-	-	-	-
Total Organic Halides (TOX)	mg/kg	-	-	-	-	-	-	-	-	-	-
Total Petroleum Hydrocarbons	mg/kg	-	-	-	-	-	-	-	-	-	-

Notes:

(1)	Surrogate recoveries were above or below the acceptance limits.
(2)	Compounds detected but not quantified. Holding times exceeded before GC/MS acid and base-neutral extractable compounds were extracted.
ALLPHDA	All phenolic data.
C	Denotes a compound whose concentration is estimated due to unsatisfactory percent differences (%D's) in response factors determined from the calibration.
J	Estimated
M	Indicated matrix spike recoveries were outside control limits and may reflect a high bias in sample data
NA	Parameter not analyzed
R	Rejected
U	Not present at or above the associated value.
UJ	Estimated reporting limit.
UR*	Unusable data due to holding time exceedence. Also present in laboratory blanks, indicating possible/probable laboratory contamination.
UR**	Unusable data due to holding time exceedence. The concentration of Cr+6 may have been equal to, however not greater than, the amount of total chrome detected in the associated sample.
W	Indicated spike recoveries were outside control limits and may reflect a low bias in sample data.
X	Unusable data due to low surrogate spike recoveries. All sample data for the affected compounds were non-detected.
*	Also present in laboratory blanks, indicating possible/probable laboratory contamination.
--	Not applicable.

TABLE 2.6

SURFACE WATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*Site 108*	*Site 109*	*SW-1*	*SW-1*	*SW-2*	*SW-2*	*SW-3*	*SW-3*	*SW-4*	*SW-4*
Sample ID:				*Site 108*	*Site 109*	*SW-1*	*SW-1*	*SW-2*	*SW-2*	*SW-3*	*SW-3*	*SW-4*	*SW-4*
Sample Date:				*7/13/1982*	*7/14/1982*	*11/1/1985*	*8/1/1986*	*11/1/1985*	*8/1/1986*	*11/1/1985*	*8/1/1986*	*11/1/1985*	*8/1/1986*
Parameter	*Units*	*Ambient Water Quality Standards (GA)* *a*	*Ambient Water Quality Guidance Values (GA)* *b*										
Volatiles													
1,4-Dichlorobenzene	µg/L	3	-	-	-	NA	5.0 U	NA	5.0 U	NA	9.5[a]	NA	22[a]
Acetone	µg/L	-	50	-	-	-	-	-	-	-	-	-	-
Benzene	µg/L	1	-	-	-	48[a]	33[a]	5.0 U	5.0 U	7.7[a]	7.8[a]	7.0[a]	34[a]
Chlorobenzene	µg/L	5	-	-	-	NA	5.0 U	NA	5.0 U	NA	14[a]	NA	30[a]
Ethylbenzene	µg/L	5	-	-	-	NA	5.0 U	NA	5.0 U	NA	5.0 U	NA	9.3[a]
Methylene chloride	µg/L	5	-	-	-	-	-	-	-	-	-	-	-
m-Xylene/Chlorobenzene	µg/L	-	-	-	-	9.0	NA	5.0 U	NA	10	NA	6.0	NA
o-Xylene	µg/L	5	-	NA	26[a]	7.0[a]	NA	5.0 U	NA	12[a]	NA	7.0[a]	NA
Toluene	µg/L	5	-	-	-	24[a]	12[a]	5.0 U	5.0 U	20[a]	17[a]	14[a]	87[a]
Total VOCs	µg/L	-	-	-	26	88	45	ND	ND	49.7	48.3	34	182.3
Semi-Volatiles													
2-Methylphenol	µg/L	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	µg/L	-	20	-	-	11	NA	7.0 U	NA	16 U	NA	15 U	NA
Acenaphthylene	µg/L	-	-	-	-	50	NA	12 U	NA	26 U	NA	26 U	NA
Anthracene	µg/L	-	50	-	-	NA	208 *[b]	NA	48 U	NA	48 U	NA	44 U
Benzo(a)pyrene	µg/L	ND	-	-	-	6.0[a]	NA	260 U	NA	118 U	NA	116 U	NA
Benzoic acid	µg/L	5	-	U	NA	-	-	-	-	-	-	-	-
Diethyl phthalate	µg/L	-	50	U	NA	-	-	-	-	-	-	-	-
Di-n-butylphthalate	µg/L	50	-	NA	U	-	-	-	-	-	-	-	-
Fluoranthene	µg/L	-	50	-	-	-	-	-	-	-	-	-	-
Naphthalene	µg/L	-	10	-	-	210[b]	1050[b]	11 U	82 U	10 U	82 U	10 U	76 U
Phenol	µg/L	1	-	-	-	-	-	-	-	-	-	-	-
Pyrene	µg/L	-	50	-	-	-	-	-	-	-	-	-	-
Total SVOCS	µg/L	-	-	ND	ND	277	1258	ND	ND	ND	ND	ND	ND
Metals													
Aluminum	mg/L	-	-	NA	1.3	-	-	-	-	-	-	-	-
Antimony	mg/L	0.003	-	NA	U	-	-	-	-	-	-	-	-
Arsenic	mg/L	0.025	-	NA	U	-	-	-	-	-	-	-	-
Barium	mg/L	1	-	NA	0.284	-	-	-	-	-	-	-	-
Beryllium	mg/L	-	0.003	NA	U	-	-	-	-	-	-	-	-
Cadmium	mg/L	0.005	-	NA	0.003	-	-	-	-	-	-	-	-
Calcium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Chromium Total	mg/L	0.05	-	NA	1.1[a]	-	-	-	-	-	-	-	-
Chromium VI (Hexavalent)	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-
Cobalt	mg/L	-	-	NA	0.065	-	-	-	-	-	-	-	-
Copper	mg/L	0.2	-	NA	0.724[a]	-	-	-	-	-	-	-	-
Iron	mg/L	0.3	-	2.4[a]	280[a]	-	-	-	-	-	-	-	-
Lead	mg/L	0.025	-	NA	0.12[a]	-	-	-	-	-	-	-	-
Magnesium	mg/L	-	35	-	-	-	-	-	-	-	-	-	-

TABLE 2.6

SURFACE WATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*Site 108*	*Site 109*	*SW-1*	*SW-1*	*SW-2*	*SW-2*	*SW-3*	*SW-3*	*SW-4*	*SW-4*
Sample ID:				*Site 108*	*Site 109*	*SW-1*	*SW-1*	*SW-2*	*SW-2*	*SW-3*	*SW-3*	*SW-4*	*SW-4*
Sample Date:				*7/13/1982*	*7/14/1982*	*11/1/1985*	*8/1/1986*	*11/1/1985*	*8/1/1986*	*11/1/1985*	*8/1/1986*	*11/1/1985*	*8/1/1986*
Parameter	*Units*	*Ambient Water Quality Standards (GA)*	*Ambient Water Quality Guidance Values (GA)*										
		a	*b*										
Manganese	mg/L	0.3	-	NA	5.04[a]	-	-	-	-	-	-	-	-
Mercury	mg/L	0.0007	-	NA	0.0003	-	-	-	-	-	-	-	-
Nickel	mg/L	0.1	-	NA	0.244[a]	-	-	-	-	-	-	-	-
Potassium	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	mg/L	0.01	-	NA	U	-	-	-	-	-	-	-	-
Silver	mg/L	0.05	-	NA	U	-	-	-	-	-	-	-	-
Sodium	mg/L	20	-	-	-	-	-	-	-	-	-	-	-
Tellurium	mg/L	-	-	NA	U	-	-	-	-	-	-	-	-
Vanadium	mg/L	-	-	NA	U	-	-	-	-	-	-	-	-
Zinc	mg/L	-	2	NA	0.192	-	-	-	-	-	-	-	-
General Chemistry													
Conductivity	µmhos/cm	-	-	1020	3000	-	-	-	-	-	-	-	-
Cyanide (free)	mg/L	-	-	-	-	0.053	NA	0.0060	NA	0.014	NA	0.013	NA
Cyanide (total)	mg/L	0.2	-	0.03	NA	0.057	0.013	0.06	0.01	0.049	0.0040 U	0.033	0.008
Oil and Grease	mg/L	-	-	-	-	-	-	-	-	-	-	-	-
pH	s.u.	-	-	7.2	3.2	-	-	-	-	-	-	-	-
Phenolics (Total)	mg/L	0.001	-	-	-	0.039[a]	0.61[a]	0.01 U	0.01 U	0.065[a]	0.046[a]	0.104[a]	0.059[a]
Temperature	deg C	-	-	26.2	21.0	-	-	-	-	-	-	-	-
Total Organic Halides (TOX)	mg/L	-	-	-	-	0.024	0.0387	0.00002	0.00189	0.00045	0.00307	0.0017	0.00356

Notes:

NA Parameter not analyzed

U Not present at or above the associated value

\+ The associated value is estimated due to potential field contamination or Anthracene and phenanthracene coelute as one peak on the gas chromatogram. The reported value could be a reflection of the concentration of one or both compounds.

-- Not applicable

TABLE 2.6

SURFACE WATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*SW-5*	*SW-5*	*SW-5*	*SW-6*	*SW-6*	*SW-6*	*SW-8*	*SW-8*	*SW-9*	*SW-9*
Sample ID:		*SW-2428-DT-036*	*SW-2428-DT-075*	*SW-2428-DT-076*	*SW-2428-DT-037*	*SW-2428-DT-038*	*SW-2428-DT-079*	*SW-2428-DT-039*	*SW-2428-DT-074*	*SW-2428-DT-024*	*SW-2428-DT-090*
Sample Date:		*10/19/1989*	*12/20/1989*	*12/20/1989 Duplicate*	*10/19/1989*	*10/19/1989 Duplicate*	*12/20/1989*	*10/19/1989*	*12/20/1989*	*10/16/1989*	*3/15/1990*
Parameter	*Units*										
Volatiles											
1,4-Dichlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-
Acetone	µg/L	170 *[b]	-	-	160 *[b]	180 *[b]	-	200[b]	-	NA	-
Benzene	µg/L	5 U	-	-	6.9[a]	7.0[a]	-	5 U	-	10 U	-
Chlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/L	-	-	-	-	-	-	-	-	-	-
Methylene chloride	µg/L	10 U	-	-	10 U	10 U	-	10 U	-	NA	-
m-Xylene/Chlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-
o-Xylene	µg/L	-	-	-	-	-	-	-	-	-	-
Toluene	µg/L	5 U	-	-	13[a]	14[a]	-	5 U	-	10 U	-
Total VOCs	µg/L	170	-	-	179.9	201	-	200	-	ND	-
Semi-Volatiles											
2-Methylphenol	µg/L	10 U	-	-	10 U	10 U	-	10	-	NA	-
Acenaphthene	µg/L	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	µg/L	-	-	-	-	-	-	-	-	-	-
Anthracene	µg/L	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	µg/L	-	-	-	-	-	-	-	-	-	-
Benzoic acid	µg/L	-	-	-	-	-	-	-	-	-	-
Diethyl phthalate	µg/L	-	-	-	-	-	-	-	-	-	-
Di-n-butylphthalate	µg/L	-	-	-	-	-	-	-	-	-	-
Fluoranthene	µg/L	10 U	-	-	10 U	10 U	-	10 U	-	42.5	-
Naphthalene	µg/L	-	-	-	-	-	-	-	-	-	-
Phenol	µg/L	10 U	-	-	10 U	10 U	-	10[a]	-	NA	-
Pyrene	µg/L	10 U	-	-	10 U	10 U	-	10 U	-	23.9	-
Total SVOCS	µg/L	ND	-	-	ND	ND	-	20	-	66.4	-
Metals											
Aluminum	mg/L	-	0.157	0.149	-	-	0.198	-	0.203	-	0.602
Antimony	mg/L	-	0.02 U	0.02 U	-	-	0.02 U	-	0.02 U	-	0.02 U
Arsenic	mg/L	-	0.005 U	0.005 U	-	-	0.005 U	-	0.005 U	-	0.007
Barium	mg/L	-	0.026	0.024	-	-	0.045	-	0.01 U	-	0.026
Beryllium	mg/L	-	1 U	0.001	-	-	1 U	-	1 U	-	0.001 U
Cadmium	mg/L	-	0.0005 U	0.0005 U	-	-	1 U	-	0.0005 U	-	0.0005 U
Calcium	mg/L	-	87	100	-	-	146	-	212	-	180
Chromium Total	mg/L	-	0.005 U	0.005 U	-	-	0.108[a]	-	0.042	-	0.005 U
Chromium VI (Hexavalent)	mg/L	0.01 U	-	-	0.01 U	0.01 U	-	0.01 U	-	0.01 U	-
Cobalt	mg/L	-	0.005 U	0.005 U	-	-	0.005 U	-	0.005 U	-	0.084
Copper	mg/L	-	0.009	0.005 U	-	-	0.03	-	0.013	-	0.005 U
Iron	mg/L	-	0.82[a]	0.83[a]	-	-	1.64[a]	-	0.81[a]	-	1.18[a]
Lead	mg/L	-	0.005 U	0.005 U	-	-	0.023	-	0.014	-	0.005 U
Magnesium	mg/L	-	20.5	22.3	-	-	27.3	-	22.1	-	27.3

TABLE 2.6

SURFACE WATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*SW-5*	*SW-5*	*SW-5*	*SW-6*	*SW-6*	*SW-6*	*SW-8*	*SW-8*	*SW-9*	*SW-9*
Sample ID:		*SW-2428-DT-036*	*SW-2428-DT-075*	*SW-2428-DT-076*	*SW-2428-DT-037*	*SW-2428-DT-038*	*SW-2428-DT-079*	*SW-2428-DT-039*	*SW-2428-DT-074*	*SW-2428-DT-024*	*SW-2428-DT-090*
Sample Date:		*10/19/1989*	*12/20/1989*	*12/20/1989 Duplicate*	*10/19/1989*	*10/19/1989 Duplicate*	*12/20/1989*	*10/19/1989*	*12/20/1989*	*10/16/1989*	*3/15/1990*
Parameter	*Units*										
Manganese	mg/L	-	0.96[a]	0.8[a]	-	-	5[a]	-	1.2[a]	-	0.2
Mercury	mg/L	-	-	-	-	-	-	-	-	-	0.001 U
Nickel	mg/L	-	0.16[a]	0.047	-	-	0.52[a]	-	0.28[a]	-	0.005 U
Potassium	mg/L	-	7.7	8.55	-	-	10.7	-	12.9	-	20.2
Selenium	mg/L	-	-	-	-	-	-	-	-	-	-
Silver	mg/L	-	-	-	-	-	-	-	-	-	-
Sodium	mg/L	-	212[a]	240[a]	-	-	614[a]	-	1210[a]	-	93.3[a]
Tellurium	mg/L	-	-	-	-	-	-	-	-	-	-
Vanadium	mg/L	-	-	-	-	-	-	-	-	-	0.01 U
Zinc	mg/L	-	0.021	0.041	-	-	0.007	-	0.048	-	0.11
General Chemistry											
Conductivity	µmhos/cm	-	-	-	-	-	-	-	-	-	-
Cyanide (free)	mg/L	-	-	-	-	-	-	-	-	-	-
Cyanide (total)	mg/L	0.02	0.051	0.042	0.01	0.02	1.68[a]	0.01	0.033	0.09	-
Oil and Grease	mg/L	1.3	-	-	1 U	1 U	-	1	-	15.4	-
pH	s.u.	-	-	-	-	-	-	-	-	-	-
Phenolics (Total)	mg/L	-	-	-	-	-	-	-	-	-	-
Temperature	deg C	-	-	-	-	-	-	-	-	-	-
Total Organic Halides (TOX)	mg/L	-	-	-	-	-	-	-	-	-	-

Notes:

NA Parameter not analyzed

U Not present at or above the associated value

* The associated value is estimated due to potential field contamination or Anthracene and phenanthracene coelute as one peak on the gas chromatogram. The reported value could be a reflection of the concentration of one or both compounds.

- - Not applicable

TABLE 2.6

SURFACE WATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*SW-10*	*SW-10*	*SW-11*	*SW-11*	*SW-11*	*SW-12*	*SW-12*	*SW-12*	*SW-13*	*SW-14*	*SW-14*
Sample ID:		*SW-2428-DT-023*	*SW-2428-DT-069*	*SW-2428-DT-042*	*SW-2428-DT-086*	*SW-11*	*SW-2428-DT-043*	*SW-2428-DT-089*	*SW-12*	*SW-13*	*SW-2428-DT-040*	*SW-2428-DT-082*
Sample Date:		*10/16/1989*	*12/20/1989*	*10/19/1989*	*3/15/1990*	*7/9/1992*	*10/19/1989*	*12/19/1989*	*7/8/1992*	*7/8/1992*	*10/19/1989*	*3/15/1990*
Parameter	*Units*											
Volatiles												
1,4-Dichlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Acetone	µg/L	80 *[b]	-	NA	-	50 U	NA	-	50 U	50 U	55 *[b]	-
Benzene	µg/L	5 U	-	1000 U	-	-	1000 U	-	-	-	5 U	-
Chlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Methylene chloride	µg/L	10 U	-	NA	-	-	NA	-	-	-	10 U	-
m-Xylene/Chlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-	-
o-Xylene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Toluene	µg/L	5 U	-	1000 U	-	-	1000 U	-	-	-	5 U	-
Total VOCs	µg/L	80	-	ND	-	ND	ND	-	ND	ND	55	-
Semi-Volatiles												
2-Methylphenol	µg/L	10 U	-	NA	-	-	NA	-	-	-	10 U	-
Acenaphthene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Anthracene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Benzoic acid	µg/L	-	-	-	-	-	-	-	-	-	-	-
Diethyl phthalate	µg/L	-	-	-	-	-	-	-	-	-	-	-
Di-n-butylphthalate	µg/L	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	µg/L	10 U	-	3 U	-	-	3 U	-	-	-	10 U	-
Naphthalene	µg/L	-	-	-	-	-	-	-	-	-	-	-
Phenol	µg/L	10 U	-	NA	-	-	NA	-	-	-	10 U	-
Pyrene	µg/L	10 U	-	4.83	-	-	6.58	-	-	-	10 U	-
Total SVOCS	µg/L	ND	-	4.83	-	ND	6.58	-	ND	ND	ND	-
Metals												
Aluminum	mg/L	-	0.106	-	11.1	0.33	-	1.06	0.01	0.005 U	-	23.6
Antimony	mg/L	-	0.02 U	-	0.02 U	-	-	0.02 U	-	-	-	0.02 U
Arsenic	mg/L	-	0.005	-	0.005 U	0.002 U	-	0.005 U	0.002 U	0.002 U	-	0.005 U
Barium	mg/L	-	0.018	-	0.01 U	0.01	-	0.017	0.04	0.04	-	0.01 U
Beryllium	mg/L	-	1 U	-	0.003	-	-	0.001 U	-	-	-	0.004[b]
Cadmium	mg/L	-	0.0005 U	-	0.0019	-	-	0.0005 U	-	-	-	0.0012
Calcium	mg/L	-	224	-	140	113	-	43.2	101	105	-	245
Chromium Total	mg/L	-	0.005 U	-	0.005 U	0.01 U	-	0.005 U	0.01 U	0.01 U	-	0.086[a]
Chromium VI (Hexavalent)	mg/L	0.01 U	-	0.01 U	-	0.01 U	0.01 U	-	0.01 U	0.01 U	0.01 U	-
Cobalt	mg/L	-	0.005 U	-	0.179	0.005 U	-	0.089	0.005 U	0.005 U	-	0.329
Copper	mg/L	-	0.092	-	0.025	0.02	-	0.005 U	0.01 U	0.01 U	-	0.029
Iron	mg/L	-	0.22	-	82.6[a]	1.37[a]	-	1.12[a]	3.36[a]	1.09[a]	-	472[a]
Lead	mg/L	-	0.023	-	0.005 U	0.004	-	0.005 U	0.005	0.002 U	-	0.005 U
Magnesium	mg/L	-	17.1	-	26.6	21.3	-	8.49	17.3	17.3	-	37.9[b]

TABLE 2.6

SURFACE WATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*SW-10*	*SW-10*	*SW-11*	*SW-11*	*SW-11*	*SW-12*	*SW-12*	*SW-12*	*SW-13*	*SW-14*	*SW-14*
Sample ID:		*SW-2428-DT-023*	*SW-2428-DT-069*	*SW-2428-DT-042*	*SW-2428-DT-086*	*SW-11*	*SW-2428-DT-043*	*SW-2428-DT-089*	*SW-12*	*SW-13*	*SW-2428-DT-040*	*SW-2428-DT-082*
Sample Date:		*10/16/1989*	*12/20/1989*	*10/19/1989*	*3/15/1990*	*7/9/1992*	*10/19/1989*	*12/19/1989*	*7/8/1992*	*7/8/1992*	*10/19/1989*	*3/15/1990*
Parameter	*Units*											
Manganese	mg/L	-	0.46[a]	-	1.08[a]	0.14	-	0.068	0.48[a]	0.47[a]	-	2.48[a]
Mercury	mg/L	-	-	-	0.001 U	-	-	0.001 U	-	-	-	0.001 U
Nickel	mg/L	-	0.32[a]	-	0.14[a]	0.02 U	-	0.005 U	0.02 U	0.02 U	-	0.216[a]
Potassium	mg/L	-	12.5	-	2.01	0.9	-	3.53	0.34	0.89	-	1.75
Selenium	mg/L	-	-	-	-	0.004	-	-	0.002 U	0.002 U	-	-
Silver	mg/L	-	-	-	-	0.005 U	-	-	0.005 U	0.005 U	-	-
Sodium	mg/L	-	1390[a]	-	10.4	7.87	-	8.5	8.63	7.94	-	10
Tellurium	mg/L	-	-	-	-	-	-	-	-	-	-	-
Vanadium	mg/L	-	-	-	0.01 U	0.01	-	0.01 U	0.01	0.01	-	0.191
Zinc	mg/L	-	0.016	-	0.6	0.04	-	0.09	0.02	0.01	-	0.76
General Chemistry												
Conductivity	µmhos/cm	-	-	-	-	-	-	-	-	-	-	-
Cyanide (free)	mg/L	-	-	-	-	-	-	-	-	-	-	-
Cyanide (total)	mg/L	0.01	0.04	0.01 U	-	0.138	0.01 U	-	0.004 U	0.004 U	0.01	-
Oil and Grease	mg/L	1 U	-	1.9	-	2	1 U	-	1.9	1 U	1 U	-
pH	s.u.	-	-	-	-	-	-	-	-	-	-	-
Phenolics (Total)	mg/L	-	-	-	-	-	-	-	-	-	-	-
Temperature	deg C	-	-	-	-	-	-	-	-	-	-	-
Total Organic Halides (TOX)	mg/L	-	-	-	-	-	-	-	-	-	-	-

Notes:

NA Parameter not analyzed

U Not present at or above the associated value

* The associated value is estimated due to potential field contamination or Anthracene and phenanthracene coelute as one peak on the gas chromatogram. The reported value could be a reflection of the concentration of one or both compounds.

- - Not applicable

TABLE 2.6

SURFACE WATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*SW-14*	*SW-15*	*SW-15*	*SW-15*	*SW-15*	*SW-15*	*SW-16*	*SW-17*	*SW-17*	*SW-18*
Sample ID:		*SW-14*	*SW-2428-DT-041*	*SW-2428-DT-084*	*SW-2428-DT-085*	*SW-15*	*SW-15 dup.*	*SW-2428-DT-064*	*SW-2428-DT-066*	*SW-2428-DT-067*	*SW-2428-DT-068*
Sample Date:		*7/8/1992*	*10/19/1989*	*3/15/1990*	*3/15/1990*	*7/8/1992*	*7/8/1992*	*12/19/1989*	*12/19/1989*	*12/19/1989*	*12/19/1989*
					Duplicate		*Duplicate*			*Duplicate*	
Parameter	*Units*										
Volatiles											
1,4-Dichlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-
Acetone	µg/L	364[b]	NA	-	-	50 U	50 U	50 U	50 U	50 U	50 U
Benzene	µg/L	-	1000 U	-	-	-	-	6.4[a]	5 U	5 U	5 U
Chlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/L	-	-	-	-	-	-	-	-	-	-
Methylene chloride	µg/L	-	NA	-	-	-	-	10 U	10 U	10 U	52[a]
m-Xylene/Chlorobenzene	µg/L	-	-	-	-	-	-	-	-	-	-
o-Xylene	µg/L	-	-	-	-	-	-	-	-	-	-
Toluene	µg/L	-	1000 U	-	-	-	-	5 U	5 U	5 U	5 U
Total VOCs	µg/L	364	ND	-	-	ND	ND	6.4	ND	ND	52
Semi-Volatiles											
2-Methylphenol	µg/L	-	NA	-	-	-	-	10 U	10 U	10 U	10 U
Acenaphthene	µg/L	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	µg/L	-	-	-	-	-	-	-	-	-	-
Anthracene	µg/L	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	µg/L	-	-	-	-	-	-	-	-	-	-
Benzoic acid	µg/L	-	-	-	-	-	-	-	-	-	-
Diethyl phthalate	µg/L	-	-	-	-	-	-	-	-	-	-
Di-n-butylphthalate	µg/L	-	-	-	-	-	-	-	-	-	-
Fluoranthene	µg/L	-	3 U	-	-	-	-	10 U	10 U	10 U	10 U
Naphthalene	µg/L	-	-	-	-	-	-	-	-	-	-
Phenol	µg/L	-	NA	-	-	-	-	10 U	10 U	10 U	10 U
Pyrene	µg/L	-	9.13	-	-	-	-	10 U	10 U	10 U	10 U
Total SVOCS	µg/L	ND	9.13	-	-	ND	ND	ND	ND	ND	ND
Metals											
Aluminum	mg/L	8.1	-	0.662	0.412	0.54	0.4	0.159	0.197	0.196	0.203
Antimony	mg/L	-	-	0.02 U	0.02 U	-	-	0.02 U	0.022[a]	0.02 U	0.02 U
Arsenic	mg/L	0.002 U	-	0.005 U	0.005 U	0.003	0.003	0.005 U	0.005 U	0.005 U	0.005
Barium	mg/L	0.01	-	0.066	0.01 U	0.003	0.003	0.045	0.027	0.028	0.035
Beryllium	mg/L	-	-	0.001 U	0.001 U	-	-	0.001	0.001 U	0.001	0.001 U
Cadmium	mg/L	-	-	0.0011	0.0007	-	-	0.0007	0.0005 U	0.0005	0.0007
Calcium	mg/L	489	-	83.2	70.8	106	106	86.8	88	93.5	111
Chromium Total	mg/L	0.01	-	0.005 U	0.027	0.01 U	0.01 U	0.009	0.008	0.011	0.006
Chromium VI (Hexavalent)	mg/L	0.03	0.01 U	-	-	0.01 U	0.01 U	0.01 U	0.01	0.01 U	0.01 U
Cobalt	mg/L	0.03	-	0.174	0.154	0.005 U	0.005	0.005 U	0.005 U	0.005 U	0.016
Copper	mg/L	0.02	-	0.005 U	0.005 U	0.01 U	0.01 U	0.009	0.005	0.007	0.049
Iron	mg/L	161[a]	-	3.76[a]	2.75[a]	4.58[a]	4.33[a]	0.92[a]	0.98[a]	0.92[a]	0.1
Lead	mg/L	0.007	-	0.005 U	0.005 U	0.008	0.004	0.018	0.019	0.02	0.044[a]
Magnesium	mg/L	64.8[b]	-	13.9	12.7	18.1	18.3	29.7	31	29.9	13

TABLE 2.6

SURFACE WATER ANALYTICAL RESULTS SUMMARY - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:		*SW-14*	*SW-15*	*SW-15*	*SW-15*	*SW-15*	*SW-15*	*SW-16*	*SW-17*	*SW-17*	*SW-18*
Sample ID:		*SW-14*	*SW-2428-DT-041*	*SW-2428-DT-084*	*SW-2428-DT-085*	*SW-15*	*SW-15 dup.*	*SW-2428-DT-064*	*SW-2428-DT-066*	*SW-2428-DT-067*	*SW-2428-DT-068*
Sample Date:		*7/8/1992*	*10/19/1989*	*3/15/1990*	*3/15/1990*	*7/8/1992*	*7/8/1992*	*12/19/1989*	*12/19/1989*	*12/19/1989*	*12/19/1989*
					Duplicate		*Duplicate*			*Duplicate*	
Parameter	*Units*										
Manganese	mg/L	3.91[a]	-	0.15	0.26	0.6[a]	0.6[a]	3.52[a]	0.22	0.72[a]	0.88[a]
Mercury	mg/L	-	-	0.001 U	0.001[a]	-	-	-	-	-	-
Nickel	mg/L	0.1	-	0.011	0.005 U	0.02 U	0.02 U	0.038	0.041	0.046	0.045
Potassium	mg/L	10.1	-	3.6	3.13	3.27	3.55	5.9	6.19	6.61	2.06
Selenium	mg/L	0.002 U	-	-	-	0.002 U	0.002 U	-	-	-	-
Silver	mg/L	0.005 U	-	-	-	0.01	0.009	-	-	-	-
Sodium	mg/L	11.6	-	13.3	10.5	12.2	12.3	141[a]	142[a]	206[a]	32.8[a]
Tellurium	mg/L	-	-	-	-	-	-	-	-	-	-
Vanadium	mg/L	0.08	-	0.01 U	0.01 U	0.02	0.02	-	-	-	-
Zinc	mg/L	0.45	-	0.19	0.1	0.01 U	0.01 U	0.0028	0.022	0.029	0.0093
General Chemistry											
Conductivity	µmhos/cm	-	-	-	-	-	-	-	-	-	-
Cyanide (free)	mg/L	-	-	-	-	-	-	-	-	-	-
Cyanide (total)	mg/L	0.012	0.06	-	-	0.03	0.028	0.155	0.23[a]	0.212[a]	0.01 U
Oil and Grease	mg/L	1 U	1.2	-	-	1 U	1 U	1 U	1 U	1 U	1 U
pH	s.u.	-	-	-	-	-	-	-	-	-	-
Phenolics (Total)	mg/L	-	-	-	-	-	-	-	-	-	-
Temperature	deg C	-	-	-	-	-	-	-	-	-	-
Total Organic Halides (TOX)	mg/L	-	-	-	-	-	-	-	-	-	-

Notes:

NA Parameter not analyzed

U Not present at or above the associated value

* The associated value is estimated due to potential field contamination or Anthracene and phenanthracene coelute as one peak on the gas chromatogram. The reported value could be a reflection of the concentration of one or both compounds.

-- Not applicable

TABLE 2.7

SEDIMENT ANALYTICAL RESULTS SUMMARY - AUGUST 2005
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*RIVER-1*	*RIVER-2*	*RIVER-2*	*RIVER-3*
Sample ID:				*STS-2428-081705-009*	*STS-2428-081705-008*	*STS-2428-081705-010*	*STS-2428-081705-007*
Sample Date:		*Restricted Use Soil Cleanup Objectives Protection of Public Health*		*8/17/2005*	*8/17/2005*	*8/17/2005 Duplicate*	*8/17/2005*
Parameter	*Units*	*Industrial* a	*Res. Residential* b				
Semi-Volatiles							
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether)	µg/kg	-	-	440 U	420 U	430 U	540 U
2,4,5-Trichlorophenol	µg/kg	-	-	1100 U	1100 U	1100 U	1400 U
2,4,6-Trichlorophenol	µg/kg	-	-	440 U	420 U	430 U	540 U
2,4-Dichlorophenol	µg/kg	-	-	440 U	420 U	430 U	540 U
2,4-Dimethylphenol	µg/kg	-	-	440 U	420 U	430 U	540 U
2,4-Dinitrophenol	µg/kg	-	-	1100 U	1100 U	1100 U	1400 U
2,4-Dinitrotoluene	µg/kg	-	-	440 U	420 U	430 U	540 U
2,6-Dinitrotoluene	µg/kg	-	-	440 U	420 U	430 U	540 U
2-Chloronaphthalene	µg/kg	-	-	440 U	420 U	430 U	540 U
2-Chlorophenol	µg/kg	-	-	440 U	420 U	430 U	540 U
2-Methylnaphthalene	µg/kg	-	-	1500	420 U	430 U	540 U
2-Methylphenol	µg/kg	1000000	100000	440 U	420 U	430 U	540 U
2-Nitroaniline	µg/kg	-	-	1100 U	1100 U	1100 U	1400 U
2-Nitrophenol	µg/kg	-	-	440 U	420 U	430 U	540 U
3,3'-Dichlorobenzidine	µg/kg	-	-	440 U	420 U	430 U	540 U
3-Nitroaniline	µg/kg	-	-	1100 U	1100 U	1100 U	1400 U
4,6-Dinitro-2-methylphenol	µg/kg	-	-	1100 U	1100 U	1100 U	1400 U
4-Bromophenyl phenyl ether	µg/kg	-	-	440 U	420 U	430 U	540 U
4-Chloro-3-methylphenol	µg/kg	-	-	440 U	420 U	430 U	540 U
4-Chloroaniline	µg/kg	-	-	440 U	420 U	430 U	540 U
4-Chlorophenyl phenyl ether	µg/kg	-	-	440 U	420 U	430 U	540 U
4-Methylphenol	µg/kg	1000000	100000	440 U	420 U	430 U	130 J
4-Nitroaniline	µg/kg	-	-	1100 U	1100 U	1100 U	1400 U
4-Nitrophenol	µg/kg	-	-	1100 U	1100 U	1100 U	1400 U
Acenaphthene	µg/kg	1000000	100000	3100 J	420 U	430 U	540 U
Acenaphthylene	µg/kg	1000000	100000	4900	420 U	430 U	540 U
Acetophenone	µg/kg	-	-	110 J	420 U	430 U	540 U
Anthracene	µg/kg	1000000	100000	8700	420 U	430 U	540 U
Atrazine	µg/kg	-	-	440 U	420 U	430 U	540 U
Benzaldehyde	µg/kg	-	-	440 U	420 U	430 U	540 U
Benzo(a)anthracene	µg/kg	11000	1000	24000[a,b]	160 J	160 J	220 J
Benzo(a)pyrene	µg/kg	1100	1000	23000[a,b]	210 J	210 J	260 J
Benzo(b)fluoranthene	µg/kg	11000	1000	26000[a,b]	300 J	310 J	300 J
Benzo(g,h,i)perylene	µg/kg	1000000	100000	4700 J	140 J	140 J	190 J
Benzo(k)fluoranthene	µg/kg	110000	3900	9300[b]	130 J	430 U	200 J
Biphenyl	µg/kg	-	-	780	420 U	430 U	540 U
bis(2-Chloroethoxy)methane	µg/kg	-	-	440 U	420 U	430 U	540 U
bis(2-Chloroethyl)ether	µg/kg	-	-	440 U	420 U	430 U	540 U
bis(2-Ethylhexyl)phthalate	µg/kg	-	-	330 J	110 J	430 U	290 J
Butyl benzylphthalate	µg/kg	-	-	440 U	420 U	430 U	540 U
Caprolactam	µg/kg	-	-	440 U	420 U	430 U	540 U
Carbazole	µg/kg	-	-	1800	420 U	430 U	540 U

TABLE 2.7

SEDIMENT ANALYTICAL RESULTS SUMMARY - AUGUST 2005
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*RIVER-1*	*RIVER-2*	*RIVER-2*	*RIVER-3*
Sample ID:				*STS-2428-081705-009*	*STS-2428-081705-008*	*STS-2428-081705-010*	*STS-2428-081705-007*
Sample Date:		*Restricted Use Soil Cleanup Objectives Protection of Public Health*		*8/17/2005*	*8/17/2005*	*8/17/2005 Duplicate*	*8/17/2005*
Parameter	*Units*	*Industrial*	*Res. Residential*				
		a	b				
Chrysene	µg/kg	110000	3900	**22000**[b]	160 J	180 J	310 J
Dibenz(a,h)anthracene	µg/kg	1100	330	**1400 J**[ab]	420 U	430 U	540 U
Dibenzofuran	µg/kg	1000000	59000	3900	420 U	430 U	540 U
Diethyl phthalate	µg/kg	-	-	4000	3900 J	170 J	5000
Dimethyl phthalate	µg/kg	-	-	440 U	420 U	430 U	540 U
Di-n-butylphthalate	µg/kg	-	-	230 J	120 J	430 U	180 J
Di-n-octyl phthalate	µg/kg	-	-	440 U	420 U	430 U	540 U
Fluoranthene	µg/kg	1000000	100000	54000	190 J	300 J	650
Fluorene	µg/kg	1000000	100000	5900	420 U	430 U	540 U
Hexachlorobenzene	µg/kg	12000	1200	440 U	420 U	430 U	540 U
Hexachlorobutadiene	µg/kg	-	-	440 U	420 U	430 U	540 U
Hexachlorocyclopentadiene	µg/kg	-	-	440 U	420 U	430 U	540 U
Hexachloroethane	µg/kg	-	-	440 U	420 U	430 U	540 U
Indeno(1,2,3-cd)pyrene	µg/kg	11000	500	**4800 J**[b]	120 J	120 J	160 J
Isophorone	µg/kg	-	-	440 U	420 U	430 U	540 U
Naphthalene	µg/kg	1000000	100000	10000	420 U	430 U	540 U
Nitrobenzene	µg/kg	-	-	440 U	420 U	430 U	540 U
N-Nitrosodi-n-propylamine	µg/kg	-	-	440 U	420 U	430 U	540 U
N-Nitrosodiphenylamine	µg/kg	-	-	440 U	420 U	430 U	540 U
Pentachlorophenol	µg/kg	55000	6700	1100 U	1100 U	1100 U	1400 U
Phenanthrene	µg/kg	1000000	100000	37000	420 U	95 J	330 J
Phenol	µg/kg	1000000	100000	140 J	420 U	430 U	540 U
Pyrene	µg/kg	1000000	100000	41000	160 J	260 J	490 J
Total SVOCs	µg/kg	-	-	292590	5700	1945	8710
General Chemistry							
Percent Moisture	%	-	-	25.4	22.2	22.6	38.7

Notes:

J Estimated

U Not present at or above the associated value

TABLE 2.8

ANALYTICAL RESULTS SUMMARY
SEDIMENT SAMPLING - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*01*	*02*	*03*	*04*	*05*	*SW-5*	*SW-6*	*SW-9*	*SW-9*	*SW-11*
Sample ID:				*01*	*02*	*03*	*04*	*05*	*S-2428-DT-077*	*S-2428-DT-080*	*S-2428-DT-072*	*S-2428-DT-073*	*S-2428-DT-087*
Sample Date:				*7/1/1993*	*7/1/1993*	*7/1/1993*	*7/1/1993*	*7/1/1993*	*12/20/1989*	*12/20/1989*	*12/20/1989*	*12/20/1989*	*3/15/1990*
		Restricted Use Soil Cleanup Objectives Protection of Public Health										*Duplicate*	
Parameter	*Units*	*Industrial* a	*Res. Residential* b										
Volatiles													
1,1,1-Trichloroethane	µg/kg	1000000	100000	-	-	-	-	-	20 U	20 U	20 U	20 U	200
1,2-Dichloroethene (total)	µg/kg	-	-	3 J	3 J	3 J	2 J	1 J	2690	90	20 U	20 U	20 U
2-Butanone (Methyl Ethyl Ketone)	µg/kg	1000000	100000	13 U	18	10 J	56	23	-	-	-	-	-
Benzene	µg/kg	89000	4800	3 J	5 J	7 J	19 U	3 J	40	190	160	60	20 U
Carbon disulfide	µg/kg	-	-	3 J	14 U	14 U	19 U	10 U	-	-	-	-	-
Chloroform (Trichloromethane)	µg/kg	700000	49000	1 J	0.8 J	0.4 J	19 U	10 U	-	-	-	-	-
Ethylbenzene	µg/kg	780000	41000	2 J	0.8 J	3 J	1 J	0.9 J	20 U	110	20 U	20 U	100
Methylene chloride	µg/kg	1000000	100000	-	-	-	-	-	2500	2090	2010	1300	950
Styrene	µg/kg	-	-	0.9 J	0.4 J	0.9 J	0.3 J	0.4 J	-	-	-	-	-
Tetrachloroethene	µg/kg	300000	19000	0.5 J	14 U	14 U	19 U	10 U	-	-	-	-	-
Toluene	µg/kg	1000000	100000	3 J	3 J	4 J	2 J	2 J	200	420	120	100	390
Trichloroethene	µg/kg	400000	21000	2 J	1 J	1 J	1 J	0.9 J	-	-	-	-	-
Xylene (total)	µg/kg	1000000	100000	4 J	3 J	11 J	2 J	3 J	20 U	280	20 U	20 U	20 U
Total VOCs	µg/kg	-	-	22.4	35	40.3	64.3	34.2	5430	3180	2290	1460	1640
Semi-Volatiles													
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether)	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
2-Chlorophenol	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	µg/kg	-	-	110 J	5200	3200 J	7200	NA	-	-	-	-	-
2-Methylphenol	µg/kg	1000000	100000	-	-	-	-	-	-	-	-	-	-
2-Nitroaniline	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitrophenol	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
3-Nitroaniline	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloroaniline	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
4-Chlorophenyl phenyl ether	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
4-Methylphenol	µg/kg	1000000	100000	-	-	-	-	-	-	-	-	-	-
4-Nitroaniline	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	µg/kg	1000000	100000	560	11000	9200	21000	NA	-	-	-	-	-
Acenaphthylene	µg/kg	1000000	100000	530	18000	14000	34000	NA	7500 U*	6000 U*	2120	1960	300 U
Acetophenone	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	µg/kg	1000000	100000	270	31000	27000	100000	NA	7500 U*	36600	600 U	600 U	300 U
Atrazine	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
Benzaldehyde	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	µg/kg	11000	1000	**3600[b]**	**90000[ab]**	**70000[ab]**	**180000[ab]**	NA	7500 U*	**20800[ab]**	600 U	600 U	**5300[b]**

TABLE 2.8

ANALYTICAL RESULTS SUMMARY
SEDIMENT SAMPLING - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*01*	*02*	*03*	*04*	*05*	*SW-5*	*SW-6*	*SW-9*	*SW-9*	*SW-11*
Sample ID:				*01*	*02*	*03*	*04*	*05*	*S-2428-DT-077*	*S-2428-DT-080*	*S-2428-DT-072*	*S-2428-DT-073*	*S-2428-DT-087*
Sample Date:				*7/1/1993*	*7/1/1993*	*7/1/1993*	*7/1/1993*	*7/1/1993*	*12/20/1989*	*12/20/1989*	*12/20/1989*	*12/20/1989*	*3/15/1990*
		Restricted Use Soil Cleanup Objectives Protection of Public Health										*Duplicate*	
Parameter	*Units*	*Industrial*	*Res. Residential*										
		a	b										
Benzo(a)pyrene	µg/kg	1100	1000	**2000[ab]**	**74000[ab]**	**62000[ab]**	**160000[ab]**	NA	-	-	-	-	570
Benzo(b)fluoranthene	µg/kg	11000	1000	**7400[b]**	**95000[ab]**	**88000[ab]**	**230000[ab]**	NA	7500 U*	**39900[a,b]**	600 U	600 U	**1490[b]**
Benzo(g,h,i)perylene	µg/kg	1000000	100000	500 U	17000	13000	30000	NA	-	-	-	-	-
Benzo(k)fluoranthene	µg/kg	110000	3900	2300	**21000[b]**	**19000[b]**	**75000[b]**	NA	7500 U*	**39900[b]**	600 U	600 U	1490
Biphenyl	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate	µg/kg	-	-	570	1200 J	1400 J	1100 J	NA	-	-	-	-	-
Butyl benzylphthalate	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
Caprolactam	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
Carbazole	µg/kg	-	-	1200	8700	6800	13000	NA	-	-	-	-	-
Chrysene	µg/kg	110000	3900	3400	**67000[b]**	**38000[b]**	**160000[a,b]**	NA	7500 U*	**32000[b]**	600 U	600 U	720
Dibenz(a,h)anthracene	µg/kg	1100	330	220 J	**5500[a,b]**	**3500 J[a,b]**	**9900[a,b]**	NA	-	-	-	-	300 U
Dibenzofuran	µg/kg	1000000	59000	390 J	18000	12000	32000	NA	-	-	-	-	-
Diethyl phthalate	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
Dimethyl phthalate	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-butylphthalate	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-octyl phthalate	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	µg/kg	1000000	100000	12000	**170000[b]**	**130000[b]**	**390000[b]**	NA	7500 U*	**106000[b]**	600 U	600 U	4570
Fluorene	µg/kg	1000000	100000	760	35000	22000	93000	NA	7500 U*	**194000[b]**	600 U	600 U	300 U
Hexachlorobenzene	µg/kg	12000	1200	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
Hexachloroethane	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	µg/kg	11000	500	**1100[b]**	**22000[a,b]**	**16000[a,b]**	**61000[a,b]**	NA	-	-	-	-	300 U
Isophorone	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	µg/kg	1000000	100000	300 J	23000	18000	40000	NA	-	-	-	-	300 U
Nitrobenzene	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	µg/kg	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	µg/kg	55000	6700	-	-	-	-	-	-	-	-	-	-
Phenanthrene	µg/kg	1000000	100000	8600	**180000[b]**	**110000[b]**	**400000[b]**	NA	8350	**125000[b]**	600 U	600 U	3300
Phenol	µg/kg	1000000	100000	500 U	4900 U	4900 U	430 J	NA	-	-	-	-	-
Pyrene	µg/kg	1000000	100000	7900	**160000[b]**	**120000[b]**	**350000[b]**	NA	9620	6000 U*	600 U	600 U	4080
Total SVOCs		-	-	53210	1052600	783100	2387630	-	17970	594200	2120	1960	21520
General Chemistry													
Cyanide (total)	mg/kg	10000	27	0.0019 U	NA	NA	NA	NA	-	-	-	-	-
Oil and Grease	mg/kg	-	-	-	-	-	-	-	4060	31.7	17.6	606	1 U
Percent Moisture	%	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

J	Estimated
NA	Not analyzed
U	Not present at or above the associated value
*	High quantifiable limits due to dilution
- -	Not applicable

TABLE 2.8

ANALYTICAL RESULTS SUMMARY
SEDIMENT SAMPLING - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*SW-11*	*SW-11*	*SW-14*	*SW-14*	*SW-14*
Sample ID:				*S-2428-DT-088*	*SW-11*	*S-2428-DT-083*	*SW-14*	*SW-14 dup.*
Sample Date:				*3/15/1990*	*7/8/1992*	*3/15/1990*	*7/8/1992*	*7/8/1992*
		Restricted Use Soil Cleanup Objectives Protection of Public Health		*Duplicate*				*Duplicate*
Parameter	*Units*	*Industrial* a	*Res. Residential* b					
Volatiles								
1,1,1-Trichloroethane	µg/kg	1000000	100000	210	-	20 U	-	-
1,2-Dichloroethene (total)	µg/kg	-	-	20 U	-	20 U	-	-
2-Butanone (Methyl Ethyl Ketone)	µg/kg	1000000	100000	-	-	-	-	-
Benzene	µg/kg	89000	4800	20 U	-	680	-	-
Carbon disulfide	µg/kg	-	-	-	-	-	-	-
Chloroform (Trichloromethane)	µg/kg	700000	49000	-	-	-	-	-
Ethylbenzene	µg/kg	780000	41000	20 U	-	20 U	-	-
Methylene chloride	µg/kg	1000000	100000	890	40.1	580	2620	2090
Styrene	µg/kg	-	-	-	-	-	-	-
Tetrachloroethene	µg/kg	300000	19000	-	-	-	-	-
Toluene	µg/kg	1000000	100000	290	11.8	870	500 U	500 U
Trichloroethene	µg/kg	400000	21000	-	-	-	-	-
Xylene (total)	µg/kg	1000000	100000	20 U	-	160	-	-
Total VOCs	µg/kg	-	-	1390	51.9	2290	2620	2090
Semi-Volatiles								
2,2'-oxybis(1-Chloropropane) (bis(2-chloroisopropyl) ether	µg/kg	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	µg/kg	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	µg/kg	-	-	-	-	-	-	-
2,4-Dichlorophenol	µg/kg	-	-	-	-	-	-	-
2,4-Dimethylphenol	µg/kg	-	-	-	-	-	-	-
2,4-Dinitrophenol	µg/kg	-	-	-	-	-	-	-
2,4-Dinitrotoluene	µg/kg	-	-	-	-	-	-	-
2,6-Dinitrotoluene	µg/kg	-	-	-	-	-	-	-
2-Chloronaphthalene	µg/kg	-	-	-	-	-	-	-
2-Chlorophenol	µg/kg	-	-	-	-	-	-	-
2-Methylnaphthalene	µg/kg	-	-	-	-	-	-	-
2-Methylphenol	µg/kg	1000000	100000	-	-	-	-	-
2-Nitroaniline	µg/kg	-	-	-	-	-	-	-
2-Nitrophenol	µg/kg	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	µg/kg	-	-	-	-	-	-	-
3-Nitroaniline	µg/kg	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	µg/kg	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	µg/kg	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	µg/kg	-	-	-	-	-	-	-
4-Chloroaniline	µg/kg	-	-	-	-	-	-	-
4-Chlorophenyl phenyl ether	µg/kg	-	-	-	-	-	-	-
4-Methylphenol	µg/kg	1000000	100000	-	-	-	-	-
4-Nitroaniline	µg/kg	-	-	-	-	-	-	-
4-Nitrophenol	µg/kg	-	-	-	-	-	-	-
Acenaphthene	µg/kg	1000000	100000	-	-	-	-	-
Acenaphthylene	µg/kg	1000000	100000	300 U	330 U	173000[b]	680	790
Acetophenone	µg/kg	-	-	-	-	-	-	-
Anthracene	µg/kg	1000000	100000	300 U	330 U	2280	1000	940
Atrazine	µg/kg	-	-	-	-	-	-	-
Benzaldehyde	µg/kg	-	-	-	-	-	-	-
Benzo(a)anthracene	µg/kg	11000	1000	300 U	330 U	10300[b]	4700[b]	4700[b]

TABLE 2.8

ANALYTICAL RESULTS SUMMARY
SEDIMENT SAMPLING - HISTORICAL
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Sample Location:				*SW-11*	*SW-11*	*SW-14*	*SW-14*	*SW-14*
Sample ID:				*S-2428-DT-088*	*SW-11*	*S-2428-DT-083*	*SW-14*	*SW-14 dup.*
Sample Date:				*3/15/1990*	*7/8/1992*	*3/15/1990*	*7/8/1992*	*7/8/1992*
		Restricted Use Soil Cleanup Objectives Protection of Public Health		*Duplicate*				*Duplicate*
Parameter	*Units*	*Industrial*	*Res. Residential*					
		a	b					
Benzo(a)pyrene	µg/kg	1100	1000	-	-	**4530**[a,b]	-	-
Benzo(b)fluoranthene	µg/kg	11000	1000	300 U	480	300 U	**5900**[b]	**6200**[b]
Benzo(g,h,i)perylene	µg/kg	1000000	100000	-	-	-	-	-
Benzo(k)fluoranthene	µg/kg	110000	3900	300 U	440	300 U	**7300**[b]	**5900**[b]
Biphenyl	µg/kg	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	µg/kg	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	µg/kg	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate	µg/kg	-	-	-	-	-	-	-
Butyl benzylphthalate	µg/kg	-	-	-	-	-	-	-
Caprolactam	µg/kg	-	-	-	-	-	-	-
Carbazole	µg/kg	-	-	-	-	-	-	-
Chrysene	µg/kg	110000	3900	300 U	340	**5770**[b]	**5400**[b]	**5300**[b]
Dibenz(a,h)anthracene	µg/kg	1100	330	-	-	**3430**[a,b]	-	-
Dibenzofuran	µg/kg	1000000	59000	-	-	-	-	-
Diethyl phthalate	µg/kg	-	-	-	-	-	-	-
Dimethyl phthalate	µg/kg	-	-	-	-	-	-	-
Di-n-butylphthalate	µg/kg	-	-	-	-	-	-	-
Di-n-octyl phthalate	µg/kg	-	-	-	-	-	-	-
Fluoranthene	µg/kg	1000000	100000	570	400	30300	7200	6700
Fluorene	µg/kg	1000000	100000	300 U	330 U	900	510	580
Hexachlorobenzene	µg/kg	12000	1200	-	-	-	-	-
Hexachlorobutadiene	µg/kg	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	µg/kg	-	-	-	-	-	-	-
Hexachloroethane	µg/kg	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	µg/kg	11000	500	300 U	-	**1970**[b]	-	-
Isophorone	µg/kg	-	-	-	-	-	-	-
Naphthalene	µg/kg	1000000	100000	300 U	-	810	-	-
Nitrobenzene	µg/kg	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	µg/kg	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	µg/kg	-	-	-	-	-	-	-
Pentachlorophenol	µg/kg	55000	6700	-	-	-	-	-
Phenanthrene	µg/kg	1000000	100000	300 U	330 U	22400	4400	4100
Phenol	µg/kg	1000000	100000	-	-	-	-	-
Pyrene	µg/kg	1000000	100000	300 U	460	25500	9200	8000
Total SVOCs		-	-	570	2120	281190	46290	43210
General Chemistry								
Cyanide (total)	mg/kg	10000	27	-	2.4	-	**30.3**[b]	21.9
Oil and Grease	mg/kg	-	-	1 U	-	1 U	-	-
Percent Moisture	%	-	-	-	-	-	-	-

Notes:

J	Estimated
NA	Not analyzed
U	Not present at or above the associated value
*	High quantifiable limits due to dilution
--	Not applicable

TABLE 7.1

NEW YORK STATE RECOMMENDED SOIL CLEANUP OBJECTIVES FOR
SVOCs DETECTED IN SURFACE SOIL
FEASIBILITY STUDY
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

	Restricted Use Soil Cleanup Objectives	
	Restricted Residential (ppm)	*Industrial (ppm)*
Compound		
Acenaphthylene	100	1,000
Benzo(a)anthracene	1	11
Benzo(a)pyrene	1	1.1
Benzo(b)fluoranthene	1	11
Benzo(k)fluoranthene	3.9	110
Chrysene	3.9	110
Dibenzo(a,h)anthracene	0.33	1.1
Fluoranthene	100	1,000
Fluorene	100	1,000
Indeno(1,2,3-cd)pyrene	0.5	11
Naphthalene	100	1,000
Phenanthrene	100	1,000
Pyrene	100	1,000

Notes:
ppm Parts Per Milliion.
Source: 6 NYCRR Part 375 Environmental Remediation Programs
Restricted Use Soil Cleanup Objectives Table 375-6.8(b)
Effective December 14, 2006

TABLE 7.2

POTENTIAL ACTION-SPECIFIC STANDARDS, CRITERIA AND GUIDELINES
FEASIBILITY STUDY
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

	Federal SCGs			*New York State SCGs*		
Activity	*Title*	*Subtitle*	*Citation*	*Title*	*Subtitle*	*Citation*
Capping	Standards for owners and operators of hazardous waste treatment, storage and disposal facilities	Closure and post-closure care Post-closure care and use of property	40 CFR 264.310 40 CFR 264.117(c)	Hazardous waste treatment, storage and disposal facility permitting requirements	--	6 NYCRR Subpart 373-1
				Final status standards for owners and operators of hazardous waste treatment, storage and disposal facilities	--	6 NYCRR Subpart 373-2
Container Storage	Standards for owners and operators of hazardous waste treatment, storage and disposal facilities	Condition of containers Compatibility of waste with containers Management of containers Inspections Containment	40 CFR 264.171 40 CFR 264.172 40 CFR 264.173 40 CFR 264.174 40 CFR 264.175	Hazardous waste treatment, storage and disposal facility permitting requirements	--	6 NYCRR Subpart 373-1
Construction of New Landfill on Site	Standards for owners and operators of hazardous waste treatment, storage and disposal facilities	Design and operating requirements Operation and maintenance Closure and post-closure care Groundwater protection	40 CFR 264.301 40 CFR 264.303-304 40 CFR 264.310 40 CFR 264.91-100	Hazardous waste treatment, storage and disposal facility permitting requirements	--	6 NYCRR Subpart 373-1
Discharge of Treatment System Effluent	Administered permit programs: The national pollutant discharge elimination system	Establishing limitations, standards and other permit conditions	40 CFR 122.44 and State regulations approved under 40 CFR 131	Implementation of NPDES program in New York State Technical and Operations Guidance Series Blending policy for use of sources of drinking water	-- -- --	6 NYCRR Part 750-757 -- NYSDOH PWS 68
	Criteria and standards for the national pollutant discharge elimination program	Best management practices Discharge to waters of the U.S.	40 CFR 125.100 40 CFR 125.104	Drinking water supplies Use and protection of waters	-- --	Part 5 of State Sanitary Code 6 NYCRR Part 608
	Guidelines establishing test procedures for the analysis of pollutants	Identification of test procedures and alternate test procedures	40 CFR 136.1-4			
	Effluent guidelines and standards	Organic chemicals plastics and synthetic fibers	40 CFR Part 414			
Excavation	Land disposal restrictions (also see Closure)	Treatment standards	40 CFR 268 (Subpart D)	Hazardous waste treatment, storage and disposal facility permitting requirements	--	6 NYCRR Subpart 376
Incineration Off Site	Standards for owners and operators of hazardous waste treatment, storage and disposal facilities	Waste analysis	40 CFR 264.341			
Land Treatment	Standards for owners and operators of hazardous waste treatment, storage and disposal facilities	Treatment program Design and operating requirements Unsaturated zone monitoring Special requirements for ignitable or reactive waste	40 CFR 264.271 40 CFR 264.273 40 CFR 264.278 40 CFR 264.281	Hazardous waste treatment, storage and disposal facility permitting requirements New York air pollution control regulations	-- General provisions Permits and certificates General prohibitions General process emission sources Incinerators	6 NYCRR Subpart 373-1 6 NYCRR Part 200 6 NYCRR Part 201 6 NYCRR Part 211 6 NYCRR Part 212 6 NYCRR Part 219
Placement of Waste in Land Disposal Unit	Land disposal restrictions	Treatment standards	40 CFR 268 (Subpart D)	Hazardous waste treatment, storage and disposal facility permitting requirements	-- Basis for Listing Hazardous Waste	6 NYCRR Subpart 373-1 6 NYCRR Appendix 22

TABLE 7.2

POTENTIAL ACTION-SPECIFIC STANDARDS, CRITERIA AND GUIDELINES
FEASIBILITY STUDY
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

	Federal SCGs			*New York State SCGs*		
Activity	*Title*	*Subtitle*	*Citation*	*Title*	*Subtitle*	*Citation*
Surface Water Control	Standards for owners and operators of hazardous waste treatment, storage and disposal facilities	Design and operating requirements for waste piles	40 CFR 264.251(c),(d)	Hazardous waste treatment, storage and disposal facility permitting requirements	--	6 NYCRR Subpart 373-1 6 NYCRR Part 701 and Part 703
		Design and operating requirements for land treatment	40 CFR 264.273(c),(d)			
		Design and operating requirements for landfills	40 CFR 264.301(c),(d)			
Treatment (in a unit)	Standards for owners and operators of hazardous waste treatment, storage and disposal facilities	Design and operating requirements for waste piles	40 CFR 264.251	Hazardous waste treatment, storage and disposal facility permitting requirements	--	6 NYCRR Subpart 373-1
		Design and operating requirements for thermal treatment units	40 CFR 265.373	Interim status standards for owners and operators of hazardous waste facilities	--	6 NYCRR Subpart 373-3
		Design and operating requirements for miscellaneous treatment units	40 CFR 264.601	New York air pollution control regulations	General provisions Permits and certificates General prohibitions General process emission sources	6 NYCRR Part 200 6 NYCRR Part 201 6 NYCRR Part 211 6 NYCRR Part 212
Treatment (when waste will be land disposed)	Land disposal restrictions	Identification of waste Treatment Standards Waste Specific prohibitions - Solvent wastes	40 CFR 268.10-12 40 CFR 268 (Subpart D) 40 CFR 268.30 RCRA Sections 3004 (d) (3), (e) (3) 42 USC 6924 (d) (3), (e) (3)	Hazardous waste treatment, storage and disposal facility permitting requirements	--	6 NYCRR Subpart 373-1
				Interim status standards for owners and operators of hazardous waste facilities	--	6 NYCRR Subpart 373-3
Waste Pile	Standards for owners and operators of hazardous waste treatment, storage and disposal facilities	Design and operating requirements	40 CFR 264.251	New York air pollution control regulations	General provisions Permits and certificates General prohibitions General process emission sources	6 NYCRR Part 200 6 NYCRR Part 201 6 NYCRR Part 211 6 NYCRR Part 212
				Hazardous waste treatment, storage and disposal facility permitting requirements	--	6 NYCRR Subpart 373-1
				Interim status standards for owners and operators of hazardous waste facilities	--	6 NYCRR Subpart 373-3
Closure with Waste in Place	Standards for owners and operators of hazardous waste treatment, storage and disposal facilities	Closure and post-closure care	40 CFR 264.258			
		Post-closure care and groundwater monitoring	40 CFR 264.310			
Closure of Land Treatment Units	Standards for owners and operators of hazardous waste treatment, storage and disposal facilities	Closure of land treatment units	40 CFR 264.280	Final status standards for owners and operators of hazardous waste facilities	--	6 NYCRR Subpart 373-2
Transporting Hazardous Waste Off Site	Standards applicable to transporters of hazardous waste	--	40 CFR 263	Waste transport permits	--	5 NYCRR Part 364
				Hazardous waste manifest system and related standards for generators, transporters and facilities	--	6 NYCRR Part 372
Vapor Emissions	Air emissions standards for process vents	--	40 CFR 264 (Subpart AA)	NY air pollution control regulations	General provisions Permits and certificates	6NYCRR Part 200 6NYCRR Part 201

TABLE 7.3

POTENTIAL RESPONSE ACTIONS AND REMEDIAL TECHNOLOGIES
FEASIBILITY STUDY
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Medium	*General Response Action*	*Remedial Technology*	*Process Options*	*Description*
Surface Soil	No Action	None	Not Applicable	No action. Natural processes are allowed to reduce chemical concentrations to acceptable levels.
	Institutional Control	None	Physical and Deed Restrictions, Environmental Easments	Restrict land use and exposure to impacted surface soil and/or develop and enforce special procedures for worker protection.
	Containment	Physical Treatment	Capping	A permanent surface barrier is placed over the area containing contaminated soil thus preventing or minimizing physical contact.
	Collection	Excavation	Excavation	Excavate contaminated soil for on-site treatment or off-site disposal. Backfill excavation with treated soil or clean, imported granular fill.
	Ex Situ Treatment	Physical Treatment	Thermal Desorption	Excavated soil is heated to volatilize chemicals. Treated soils may be used as excavation backfill or transported off-site for disposal.
			Incineration	Excavated soil is processed at high temperature to volatilize and combust organic contaminants. Treated soils may be used as excavation backfill or transported off-site for disposal.
	Disposal	On-site Disposal	Backfilling	Treated excavated soil is returned to the original excavation as backfill.
			Construct Permitted Landfill Cell	Untreated excavated soil is placed in a permitted landfill cell on-Site.
		Off-site Disposal	Off-site Disposal	Treated or untreated excavated soil is transported to a permitted treatment, storage, and disposal facility.

TABLE 7.4

SCREENING OF IDENTIFIED REMEDIAL ALTERNATIVES FOR SURFACE SOIL
FEASIBILITY STUDY
TONAWNADA COKE CORPORATION
TONAWANDA, NEW YORK

General Response Action	*Description*	*Effectiveness*	*Implementability*
NO FURTHER ACTION	No additional measures are taken to improve Site environmental conditions with respect to surface soil. All contaminants remain on Site. Environmental risks and potential exposure pathways are not directly addressed by any activities.	- Not effective in meeting all RAOs. - No reduction of volume, toxicity, or mobility of Site contaminants. - No additional risk during implementation.	- Readily implemented.
INSTITUTIONAL CONTROLS Physical and Deed Restrictions, Environmental Easments	Implementation of institutional controls, such as deed restrictions, environmenatal easmenta, safe work practices, or physical barriers such as fencing to reduce potential exposure to Site related chemicalsin surface soil.	- Effectiveness is dependant on future enforcement of restrictions. - No reduction of volume, toxicity, or mobility of COCs. - Effective in reducing potential for human exposure to COCs.	- Readily implemented.
PHYSICAL CONTAINMENT Capping	Areas of Site containing surface soil exhibiting chemical concentrations exceeding potential soil cleanup goals are regraded if necessary to promote drainage and covered with compacted, clean, granular fill.	- Effective in reducing the potential for human exposure to Site chemicals in the soil. - Does not reduce the volume, toxicity, or mobility of COCs.	- Readily implemented. - Technically feasible. - Requires routine inspection and maintenance.
COLLECTION Excavation	Removal of impacted surface soil.	- Effectively reduces the volume, toxicity, and mobility of contaminants.	- Implementable. - Scope of work highly dependent upon results of confirmatory sample analyses.
EX SITU TREATMENT AND DISPOSAL Thermal Desorption	Excavated soil is treated on-site utilizing high temperature thermal desorption. Treated soil is used as backfill or transported off-Site for disposal.	- Does not reduce the volume, toxicity, or mobility of COCs without vapor treatment.	- Not technically feasible for on-site use.
Incineration	Chemical presence in excavated soil is treated through volatilization and combustion. Treated soil is used as backfill or transported off-Site for disposal.	- Effectively reduces the volume, toxicity, and mobility of contaminants.	- Not technically feasible for on-site use.
DISPOSAL Off-Site Treatment & Disposal	Transport soil to a permitted waste treatment, storage, and disposal facility.	- Eliminates potential for exposure to chemicals in the surface soil. - Reduces volume, toxicity, or mobility of Site contaminants.	- Readily implemented. - Technically feasible. - Disposal as a hazardous waste may be required.
On-Site Disposal	Construct a permitted landfill cell on-Site and dispose of untreated excavated soils.	- Eliminates potential for exposure to chemicals in the surface soil. - Concentrates contaminants in one area reducing area of contamination. - Reduces mobility of Site contaminants.	- Not Readily implemented. - Technically feasible. - Waste remains on site. - Does not reduce volume or toxicity of Site contaminates.

Notes:
COCs Compounds of Concern.
RAOs Remedial Action Objectives.

TABLE 7.5

SUMMARY OF DEVELOPMENT AND SCREENING OF REMEDIAL ALTERNATIVES FOR SURFACE SOIL
FEASIBILITY STUDY
TONAWANDA COKE COPORATION
TONAWANDA, NEW YORK

	No Further Action	*Institutional Controls*	*Physical Containment* / *Granular Cover*	*Collection* / *Excavation*
Effectiveness				
• Further reduces toxicity, mobility, and volume of COCs	No	No	No	Yes
• Further minimizes residual risk and affords additional long-term protection	No	Yes	Yes	Yes
Implementability	Readily implemented	Readily implemented	Implementable	Implementable
Relative Cost				
• Capital	None	Low	Moderate	High
• O&M (30 years)	None	Low	Moderate	Low
Recommendation	Required for detailed analysis	Retained for detailed analysis	Retained for detailed analysis	Retained for detailed analysis

	Ex Situ Treatment and Disposal			*On-Site Disposal*
	Thermal Destruction	*Incineration*	*Off-Site Disposal*	*Disposal in On-Site Landfil*
Effectiveness				
• Further reduces toxicity, mobility, and volume of COCs	No	Yes	Yes	No
• Further minimizes residual risk and affords additional long-term protection	Yes	Yes	Yes	Yes
Implementability	Not Implementable	Not Implementable	Implementable	Not Readily Implemented
Relative Cost				
• Capital	High	High	High	High
• O&M (30 years)	None	None	None	High
Recommendation	Eliminated from further consideration	Eliminated from further consideration	Eliminated from further consideration	Eliminated from further consideration

TABLE 7.6

COST ANALYSIS SUMMARY
SURFACE SOIL ALTERNATIVE 1 - NO ACTION
FEASIBILITY STUDY
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

	Item	*Estimated Cost*
A.	No Action	$0
	TOTAL ESTIMATED COST - SS ALTERNATIVE 1:	$0

TABLE 7.7

COST ANALYSIS SUMMARY
SURFACE SOIL ALTERNATIVE 2 -
INSTITUTIONAL CONTROL AND FENCING
FEASIBILITY STUDY
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Item No.		*Quantity*	*Unit*	*Unit Price*	*Total Price*	*Present Value Cost*
A.	**CAPITAL COSTS**					
1	Administrative	1	LUMP	$ 10,000	$ 10,000	$ 10,000
4	Insurance, Mobilization/Demobilization	0	LUMP	$ 1,500	$ -	$ -
5	Supply and Install Fencing	0	L.F.	$ 32	$ -	$ -
	Subtotal					$ 10,000
	Contingency 20%					$ 2,000
	Subtotal Capital Cost					$ 12,000
B.	**INDIRECT CAPITAL COSTS**					
	Engineering 25%					$ 2,500
	Total Capital Costs					**$ 14,500**
C.	**O&M COSTS** [1]	*Quantity*	*Unit*	*Unit Price*	*Annual Cost*	*Present Value Cost*
1	Monthly Inspections [2]	12	EVENTS	$ 300	$ 3,600	$44,700
2	Existing Fence Replacement (@ 15years) [3]	1	EVENTS	$ 320,000	$ 10,667	$132,400
	Subtotal					$177,100
	Contingency 20%					$ 35,500
	Total O&M Costs					**$212,600**
					TOTAL ESTIMATED COST	**$ 227,100**

Note:

[1] Assumes a 7% discount rate.

[2] Assumes monthly inspections over a period of 30 years.

[3] Assumes replacement of existing fence once over 30 years. Cost based on $32/L.F. to fence the three Sites.

TABLE 7.8

COST ANALYSIS SUMMARY
SURFACE SOIL ALTERNATIVE 3 -
CAPPING WITH INSTITUTIONAL CONTROL
FEASIBILITY STUDY
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Item No.		*Quantity*	*Unit*	*Unit Price*	*Total Price*	*Present Value Cost*
A.	**CAPITAL COSTS**					
1	Administrative	1	LUMP	$ 10,000	$ 10,000	$ 10,000
2	Insurance, Mobilization/Demobilization	1	LUMP	$ 5,000	$ 5,000	$ 5,000
3	Capping					
	Area prep	1	LUMP	$ 120,000	$ 120,000	$ 120,000
	Supply and place imported backfill (1 foot)	40550	C.Y.	$ 30	$ 1,216,500	$ 1,216,500
	Supply and place topsoil (4 inches)	13381	C.Y.	$ 35	$ 468,335	$ 468,400
	Seed and vegetate	1	LUMP	$ 1,500	$ 1,500	$ 1,500
	Survey	1	LUMP	$ 5,000	$ 5,000	$ 5,000
	Waste Disposal	1	LUMP	$ 15,000	$ 15,000	$ 15,000
	Subtotal					$ 1,841,400
	Contingency 20%					$ 368,300
	Subtotal Capital Cost					$ 2,209,700
B.	**INDIRECT CAPITAL COSTS**					
	Design, Engineering, and Reporting					$ 460,400
	Total Capital Costs					**$ 2,670,100**

	O&M COSTS [1]	*Quantity*	*Unit*	*Unit Price*	*Annual Cost*	*Present Value Cost*
1	Monthly Inspections [2]	12	EVENTS	$ 300	$ 3,600	$44,700
2	Maintenance and Repair	1	L.S.	$ 1,500	$ 1,500	$18,700
	Subtotal					$63,400
	Contingency 20%					$ 12,700
	Total O&M Costs					**$76,100**
					TOTAL ESTIMATED COST	**$ 2,746,200**

Note:

[1] Assumes a 7% discount rate.

[2] Assumes monthly inspections over a period of 30 years.

TABLE 7.9

COST ANALYSIS SUMMARY
SURFACE SOIL ALTERNATIVE 4 -
SURFACE SOIL EXCAVATION AND DISPOSAL
FEASIBILITY STUDY
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

Item No.		*Quantity*	*Unit*	*Unit Price*	*Total Price*	*Present Value Cost*
A.	**CAPITAL COSTS**					
1	Administrative	1	LUMP	$ 10,000	$ 10,000	$ 10,000
2	Insurance, Mobilization/Demobilization	1	LUMP	$ 5,000	$ 5,000	$ 5,000
3	Excavate & Restore					
	Excavate and load soil	40550	C.Y.	$ 30	$ 1,216,500	$ 1,216,500
	Supply and place filter fabric	121637	YD^2	$ 1.20	$ 145,964	$ 146,000
	Supply and place backfill	40550	C.Y.	$ 30	$ 1,216,500	$ 1,216,500
	Supply and place topsoil (4 inches)	13381	C.Y.	$ 35	$ 468,335	$ 468,400
	Seed and vegetate	1	LUMP	$ 1,500	$ 1,500	$ 1,500
	Survey	1	LUMP	$ 5,000	$ 5,000	$ 5,000
	Waste Disposal	49268	ton	$ 175	$ 8,621,900	$ 8,621,900
	Subtotal					$ 11,690,800
	Contingency 20%					$ 2,338,200
	Subtotal Capital Cost					$ 14,029,000
B.	**INDIRECT CAPITAL COSTS**					
	Design, Engineering, and Reporting					$ 2,922,700
	Total Capital Costs					**$ 16,951,700**

	C. O&M COSTS [1]	*Quantity*	*Unit*	*Unit Price*	*Annual Cost*	*Present Value Cost*
1	Monthly Inspections [2]	12	EVENTS	$ 300	$ 3,600	$44,700
2	Maintenance and Repair	1	L.S.	$ 1,500	$ 1,500	$10,600
	Subtotal					$55,300
	Contingency 20%					$ 11,100
	Total O&M Costs					**$66,400**
					TOTAL ESTIMATED COST	**$ 17,018,100**

Note:

[1] Assumes a 7% discount rate.

[2] Assumes monthly inspections over a period of 30 years.

TABLE 7.10

COMPARATIVE RANKING OF SURFACE SOIL REMEDIAL ALTERNATIVES
FEASIBILITY STUDY
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

	Surface Soil Alternative			
	1 *No Action*	*2* *Institutional Control and Fencing*	*3* *Capping with Institutional Control*	*4* *Excavation and Disposal*
Overall Protection of Human Health	4	3	2	1
Compliance with SCGs	3*	3*	2	1
Reduction of Toxicity, Mobility, and Volume	3*	3*	2	1
Short-Term Effectiveness	1*	1*	3	4
Long-Term Effectiveness and Permanence	4	2	2	1
Implementability	1*	2	3	4
Net Present Worth Cost**	$0	$385,900	$2,746,200	$17,018,100

Notes:

* Alternatives of same ranking are equally effective.

** Present worth calculated using a 7 percent interest rate.

APPENDIX A

EXCERPTS FROM MAY 1997 REMEDIAL INVESTIGATION SUMMARY REPORT

INTRODUCTION

PURPOSE OF REPORT

This report has been prepared by Conestoga-Rovers & Associates (CRA) on behalf of Tonawanda Coke Corporation (TCC). In a letter dated March 28, 1996, the New York State Department of Environmental Conservation (NYSDEC) formally requested that TCC prepare a Remedial Investigation (RI) Report for Site No. 915055 (Tonawanda facility). This RI Report has been prepared in accordance with TCC's response letter (prepared by Mr. Rick Kennedy of Hodgson Russ Andrews Woods and Goodyear) to the NYSDEC, dated May 2, 1996. A proposed Table of Contents was submitted to the NYSDEC on October 30, 1996. NYSDEC issued a letter dated November 27, 1996 approving the Table of Contents, with some recommendations. Copies of all letters are provided in Appendix A for reference.

SITE BACKGROUND

SITE DESCRIPTION

The TCC Site is located along and to the east of the eastern bank of the Niagara River within the Town of Tonawanda, Erie County, New York. The Site location is presented on Figure 1.1.

A number of areas were used to dispose of industrial and C&D wastes on the Site between 1917 and 1978. The NYSDEC's areas of concern have historically been referred to as Site 108, Site 109, and Site 110. Figure 1.2 presents the approximate locations of these former disposal areas. All of these disposal areas are inactive and have been since 1978 disposal.

SITE HISTORY

The Buffalo Coke Plant which is located at 3875 River Road in Tonawanda, New York was owned and operated from 1917 through 1947 by Semet-Solvay Company, a subsidiary of Allied Chemical and Dye Corporation. In 1947, Semet-Solvay Company was merged into Allied Chemical Corporation, which owned and operated the plant until January 27, 1978, when it was sold to TCC.

Manufacturing processes which were used at the plant from 1917 through 1975 included by-products coking; light oil distillation; ammonia recovery; and benzene, toluene, and xylene extraction. A few areas of the plant Site were used for the disposal of wastes. Materials such as tar sludge, fly ash and cinders may have been deposited at the rear of the plant (southeast corner of the area east of River Road, now referred to as Site 110) throughout most of the plant's history until 1978. In 1973, the Semet-Solvay Division was granted permission by the Erie County Health Department to establish a new refuse disposal area on the west side of River Road (now referred to as Site 108). This Site was eventually filled with refuse, wood, scrap polyethylene, and ceramic saddle packing from refining equipment. An unknown quantity of brick rubble and related demolition wastes were also disposed in an area adjacent to River Road in 1977.

A Phase I Summary Report prepared by Recra Research, Inc. in November 1983 stated that "Two areas of landfilling received either general plant refuse or demolition wastes. The primary disposal area of concern lies to the southwest of the site, and has been used for the dumping of flyash, chemicals, demolition wastes and tar sludges." The two disposal areas referred to are Sites 109 and 110. The area southwest of the Site is Site 108. A Phase II Site Investigation Report prepared by Malcolm Pirnie, Inc. in December 1986 stated "Wastes reported to have been disposed of at Site 108 include ash, cinders and coal tar. Site 109 received non-hazardous wastes including bricks, rubble and demolition debris. At Site 110, spent iron oxide and wood shavings were disposed of."

PREVIOUS INVESTIGATIONS

Four major investigations and several other sampling events have been conducted at the Site, focusing primarily on the former on-Site disposal areas.

In July 1982 and May 1983, the United States Geological Survey (USGS) undertook the sampling of a number of inactive hazardous waste disposal sites roughly within a 3-mile wide band along the Niagara River. This sampling program was part of an overall investigation of toxic contaminant entry into the Niagara River. The USGS program involved the collection of two groundwater samples, 10 soil samples and two surface water samples from the TCC Site.

Subsequent to the USGS sampling, four major investigations have been performed over the past 10 years. The results of the four subsequent major studies are presented in the following previously submitted reports:

1. "Tonawanda Coke Corporation
New York State Superfund Phase I Summary Report
November 1983"
prepared by Recra Research Inc.;

This study did not involve the collection of any samples for chemical analyses. The purpose of the study was to calculate a Hazard Ranking System Score for the Site based upon the USGS sample results.

2. "Phase II Site Investigation
Tonawanda Coke Site"
December 1986"
prepared by Malcolm Pirnie Inc.;

The Phase II Site Investigation consisted of the following activities:

i) installation of seven overburden groundwater monitoring wells;
ii) collection of 13 groundwater samples;
iii) installation of 12 test pits;
iv) collection of one composite soil sample from four of the 12 test pits; and
v) collection of eight surface water samples.

3. "Supplemental Site Investigation
Tonawanda Coke Corporation
Tonawanda, New York
July 1990"
prepared by Conestoga-Rovers & Associates; and

The Supplemental Site Investigation consisted of the following activities:

i) installation of 10 overburden groundwater monitoring wells;
ii) collection of 32 groundwater samples;
iii) installation of eight test pits;
iv) collection of four composite soil samples from the test pits;
v) advancement of four boreholes;

vi) collection of two composite samples from the boreholes;

vii) collection of 21 surface water samples; and

viii) collection of 10 sediment samples.

4. "Additional Site Investigation
Tonawanda Coke Corporation
Tonawanda, New York
November 1992"
prepared by Conestoga-Rovers & Associates.

The Additional Site Investigation consisted of the following activities:

i) installation of three overburden groundwater monitoring wells;
ii) collection of 10 groundwater samples;
iii) installation of nine test pits;
iv) collection of two samples from the test pits;
v) advancement of one borehole;
vi) collection of five surface water samples; and
vii) collection of two sediment samples.

REPORT ORGANIZATION

This RI Report summarizes the field activities undertaken and the associated analytical data which resulted primarily from the latter two Site Investigations performed by CRA. Information and data from previous studies are included. In addition, pertinent information from studies on an adjacent Site (Allied Chemical Corporation) has also been included.

Section 2.0 presents the Site characterization field activities.

Section 3.0 presents the physical characteristics of the study area; specifically, surface features, surface water hydrology, geology, soils and hydrogeology.

Section 4.0 presents the nature and extent of contamination; specifically, chemical sources, soils, groundwater, surface water, sediments and air.

Section 5.0 discusses contaminant fate and transport; specifically, potential routes of migration and actual contaminant migration.

Section 6.0 presents the summary and conclusions.

CONCLUSIONS AND RECOMMENDATIONS

The following conclusions can be made regarding the TCC Site.

- The underlying clay is acting as an aquitard, preventing both vertical and horizontal groundwater movement. In support of this conclusion, the clay does not contain TCC chemicals.

- PAH presence is isolated to two specific on Site locations. Other adjacent off-Site sources of PAHs also exist.

- Groundwater chemical presence is isolated to two specific on-Site locations; wells MW3R-89 and MW8-89. There is no evidence of the observed chemical presence exiting the Site.

- The groundwater samples from wells MW-2 and MW18-91 along the Niagara River have not exhibited any VOC or PAH presence exceeding the most stringent MCL. This indicates that no significant migration of the localized chemical presence in the middle of Site 108 has reached the Niagara River. There are no loadings of Site-specific parameters to the Niagara River.

- Cyanide is present in the groundwater beneath the Site but does not appear above MCLs at the Site boundaries except in the northeast corner. However, there is no observed cyanide presence in off-Site wells adjacent to the northeast corner. The estimated chemical mass flux of cyanide to the River via the groundwater is estimated to be 7.2×10^{-9} lbs/day. Other sources of cyanide are present in the industrial neighborhood in which the TCC facility is located and likely contribute to this loading.

- No chemicals are currently leaving the TCC Site via the surface water pathways, either to the Niagara River or to adjacent properties to the Site.

- Chemical presence in TCC surface waters to the west of River Road appears to be due to off-Site surface water drainage from the southern oil-field properties.

- Manufacturing Area: There were no SSI parameter exceedances reported for the collected groundwater samples. Thus, there is no off-Site migration of groundwater with chemical presence and the manufacturing area is not an area of concern.

- Coal Fields Storage Area: Small insignificant metals MCL exceedances were reported for the soil samples collected. Marginal groundwater MCL exceedances were reported for three parameters and one of these was cyanide, which is present upgradient on Allied property. Surface water flow is discharged under an outfall permit. No monitored parameter exceedances have ever been reported at this outfall. Therefore, the coal fields storage area is not an area of concern.

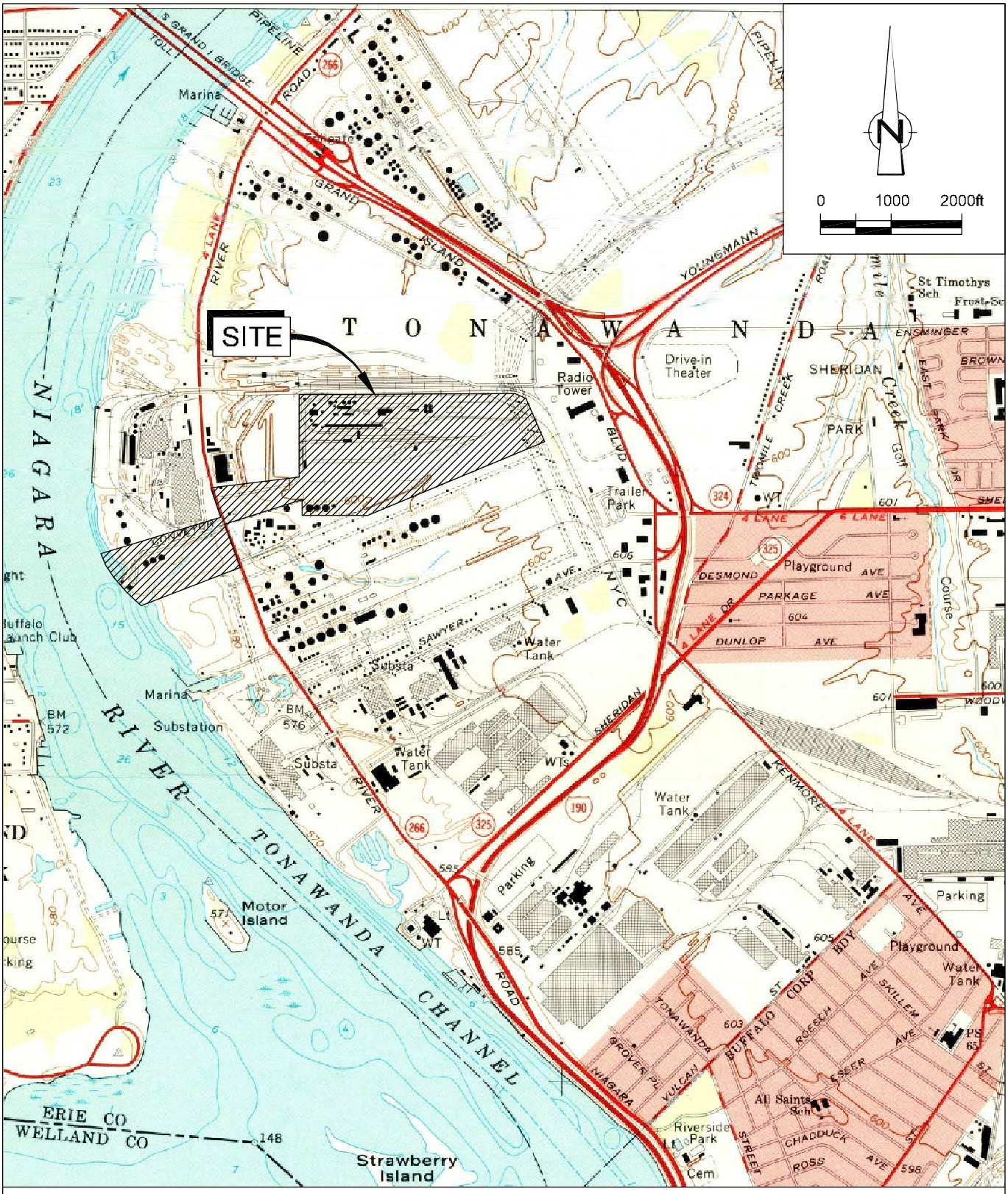
- Site 108: Chemistry present in the collected soil samples is limited to PAHs and low metals exceedances. Soil exceedances are primarily attributable to the collected "mud" sample. Elevated chemical presence in the groundwater is limited to the vicinity around MW8-89. The chemistry is known to be isolated as water availability at MW8-89 is poor and there is no elevated chemical presence in the groundwater downgradient at MW-7. Elevated chemical presence in the surface water is attributable to southerly off-Site sources. There is no discharge of TCC chemicals to the Niagara River from surface water. Marginal VOC MCL exceedances were reported for collected sediment samples. PAHs were present in the sediment samples, however, due to particle adsorption this chemistry has not migrated to either the groundwater or surface water. Therefore, Site 108 is not an area of concern.

- Site 109: Elevated levels of cyanide were detected in the groundwater, however, greater concentrations of cyanide have been reported on adjacent Allied property. Surface water chemical presence was limited to minor insignificant metals exceedances. Therefore, Site 109 is not an area of concern.

- Site 110: Chemical presence in the collected soil samples was limited to PAHs, as would be expected, however, the total PAH concentration is below the maximum allowable level. Elevated chemical presence in the groundwater is localized to the vicinity around MW-3/MW3R-89. There is no off-Site migration of groundwater with elevated chemical presence. Therefore, Site 110 is not an area of concern.

- Low Marshy Area: Only one compound, zinc, marginally exceeded its MCL during the final sample round for surface water at the most downgradient sample location. Marginal, very low VOC exceedances were reported at the downgradient location in the sediment samples. PAHs were not detected during the most recent sample collected at the downgradient location. Therefore, the low marshy area is not an area of concern.

- The TCC Site does not pose a significant risk to public health or the environment.



SOURCE: USGS QUADRANGLE MAP;
BUFFALO NW, NEW YORK

figure 1.1

SITE LOCATION
REMEDIAL INVESTIGATION SUMMARY REPORT
Tonawanda Coke Corporation

CRA

405000 406000 407000 408000 409000 410000 411000

1088000 1087000 1086000 1085000

N

0 200 500ft

110

COKE OVENS

GUARD HOUSE

109

STACK

RIVER ROAD

36" RC SEWER

OUTFALL

108

NIAGARA RIVER

30" Cp WATER

WATER TREATMENT PLANT

LEGEND

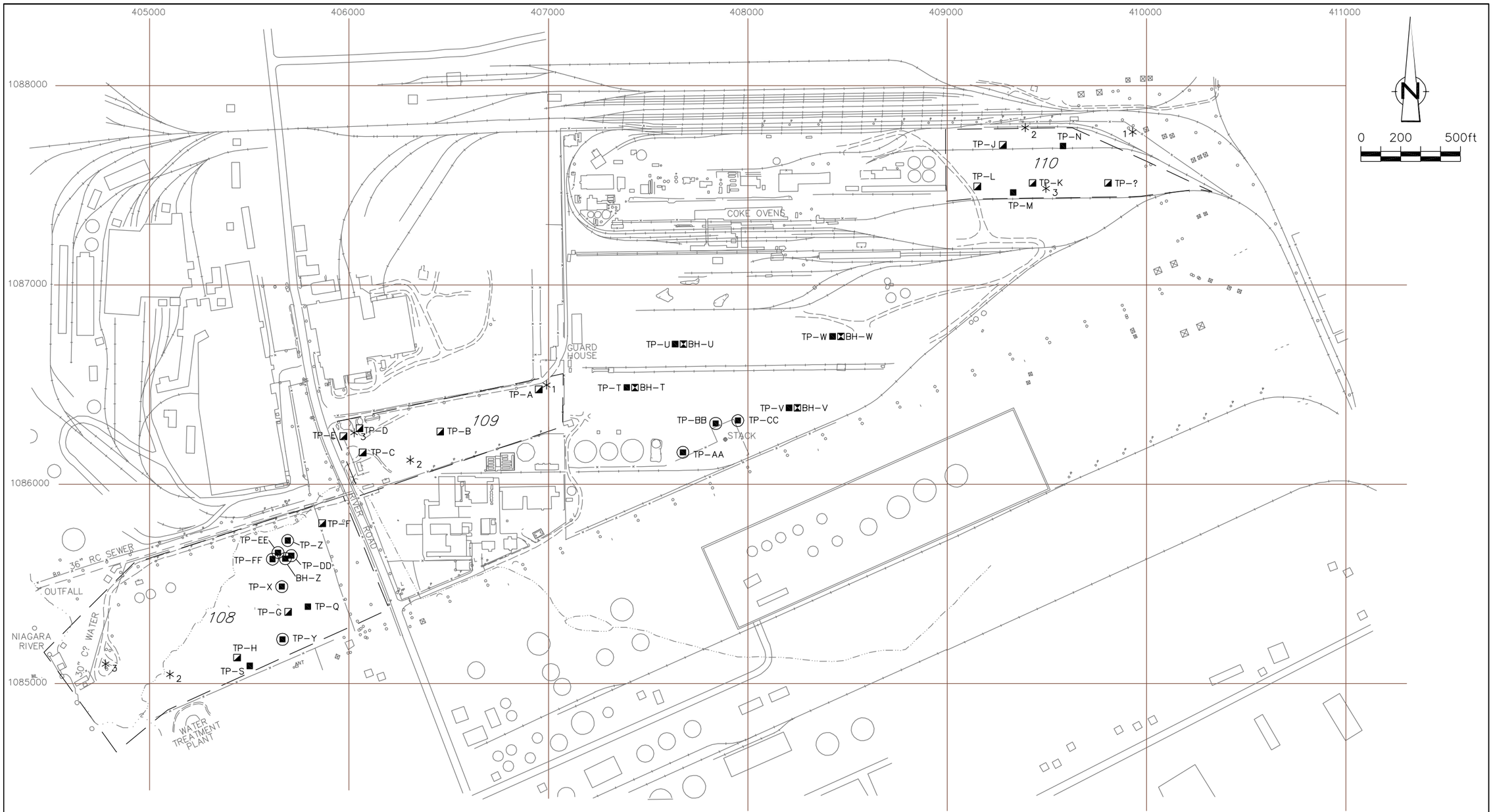
108 SITE LOCATION

figure 1.2

FORMER DISPOSAL AREA LOCATIONS
REMEDIAL INVESTIGATION SUMMARY REPORT
Tonawanda Coke Corporation

CRA

2428 (6) APR 11/97(W) REV.0 (P-21)



LEGEND

108	SITE LOCATION
*2	BOREHOLE – USGS STUDY (APPROXIMATE)
TP-H	TEST PIT – MALCOLM PIRNIE PHASE ? INVESTIGATION
TP-U	TEST PIT – CRA SUPPLEMENTAL SITE INVESTIGATION
TP-AA	TEST PIT – CRA ADDITIONAL SITE INVESTIGATION
BH-W	TEST PIT / BOREHOLE – CRA SUPPLEMENTAL SITE INVESTIGATION

CRA

figure 2.1

TEST PIT/BOREHOLE SOIL SAMPLING LOCATIONS
REMEDIAL INVESTIGATION SUMMARY REPORT
Tonawanda Coke Corporation

405000 406000 407000 408000 409000 410000 411000

1088000 1087000 1086000 1085000

N

0 200 500ft

MW19-91
MW20-91
MW-2
MW13-89
MW12-89
MW11-89
MW10-89
110
COKE OVENS
MW3R-89
MW-3
MW14-89
MW9-89
GUARD HOUSE
MW-5
MW-4
109
MW15-89
MW17-89
MW16-89
STACK
MW-6
MW-3
MW-4
MW-2
MW-8
MW-6
MW-7
MW-5
MW-1
36" RC SEWER
OUTFALL
MW18-91
108
NIAGARA RIVER
30" C.I. WATER
MW8-89
MW-7
WATER TREATMENT PLANT
RIVER ROAD

LEGEND

108	SITE LOCATION
MW-5	MONITORING WELL – MALCOLM PIRNIE PHASE ? INVESTIGATION
MW15-89	MONITORING WELL – CRA SUPPLEMENTAL SITE INVESTIGATION
MW20-91	MONITORING WELL – CRA ADDITIONAL SITE INVESTIGATION
MW-3	MONITORING WELL – APPROXIMATE ALLIED CHEMICAL SITE LOCATION

CRA

figure 2.2

GROUNDWATER SAMPLING LOCATIONS
REMEDIAL INVESTIGATION SUMMARY REPORT
Tonawanda Coke Corporation

2428 (6) APR 11/97(W) REV.0 (P-20)

405000 406000 407000 408000 409000 410000 411000

1088000 1087000 1086000 1085000

N

0 200 500ft

110

COKE OVENS

GUARD HOUSE

109

STACK

SW-1 SW-14 SW-15 SW-13 SW-12 SW-11

SW-9 SW-10 SW-18 SW-8 SW-2 SW-16 SW-17 SW-6 SW-3 SW-7

36" RC SEWER

OUTFALL

108

NIAGARA RIVER

30" C.I. WATER

ANT

SW-5 SW-4

WATER TREATMENT PLANT

LEGEND

- WETLAND
- 108 SITE LOCATION
- * SURFACE WATER SAMPLE – USGS STUDY (APPROXIMATE)
- SW-4 SURFACE WATER SAMPLE – MALCOLM PIRNIE PHASE ? INVESTIGATION
- SW-7 SURFACE WATER SAMPLE – CRA SUPPLEMENTAL SITE INVESTIGATION
- SW-12 SURFACE WATER SAMPLE – CRA ADDITIONAL SITE INVESTIGATION
- SW-11 SURFACE WATER/SEDIMENT SAMPLE – CRA SUPPLEMENTAL SITE INVESTIGATION
- SW-11 SURFACE WATER/SEDIMENT SAMPLE – CRA ADDITIONAL SITE INVESTIGATION

CRA

figure 2.3

SURFACE WATER/SEDIMENT SAMPLING LOCATIONS
REMEDIAL INVESTIGATION SUMMARY REPORT
Tonawanda Coke Corporation

2428 (6) APR 11/97(W) REV.0 (P-16)

405000 406000 407000 408000 409000 410000 411000

1088000 1087000 1086000 1085000

N

0 200 500ft

MW19-91 A' MW20-91

MW11-89 MW12-89 MW-2 TP-N TP-J MW13-89

110

TP-L TP-K TP-? TP-M

MW10-89 COKE OVENS

MW3R-89 MW-3 MW14-89

MW9-89

TP-W

GUARD HOUSE

TP-U

MW-5 TP-T

MW-4 TP-A TP-V MW15-89

TP-CC TP-BB

109

TP-B TP-D TP-E MW17-89 TP-C MW16-89 STACK TP-AA

TP-F MW-6

TP-EE TP-Z

TP-FF TP-DD BH-Z

36" RC SEWER

TP-X TP-Q

OUTFALL MW18-91

TP-G

108

NIAGARA RIVER

30" C.I. WATER MAIN

TP-Y

TP-H MW8-89 TP-S

MW-7

WATER TREATMENT PLANT

A

LEGEND

A GEOLOGIC CROSS-SECTION LOCATION

108 SITE LOCATION

MW-5 MONITORING WELL – MALCOLM PIRNIE PHASE ? INVESTIGATION

MW15-89 MONITORING WELL – CRA SUPPLEMENTAL SITE INVESTIGATION

MW20-91 MONITORING WELL – CRA ADDITIONAL SITE INVESTIGATION

TP-H TEST PIT – MALCOLM PIRNIE PHASE ? INVESTIGATION

TP-U TEST PIT – CRA SUPPLEMENTAL SITE INVESTIGATION

TP-AA TEST PIT – CRA ADDITIONAL SITE INVESTIGATION

CRA

figure 3.1

GEOLOGIC CROSS-SECTION LOCATION
REMEDIAL INVESTIGATION SUMMARY REPORT
Tonawanda Coke Corporation

2428 (6) APR 11/97(W) REV.0 (P-17)

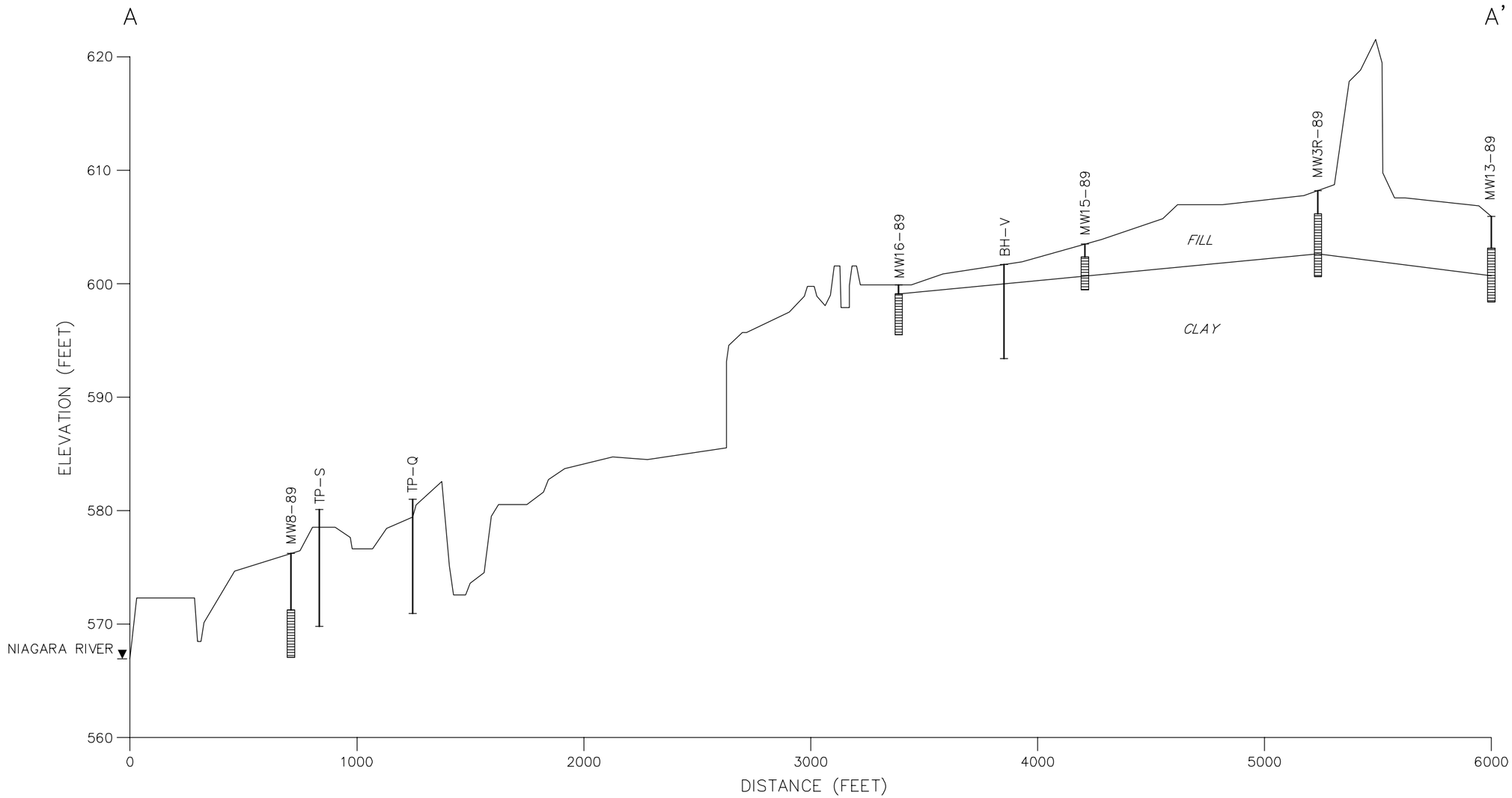
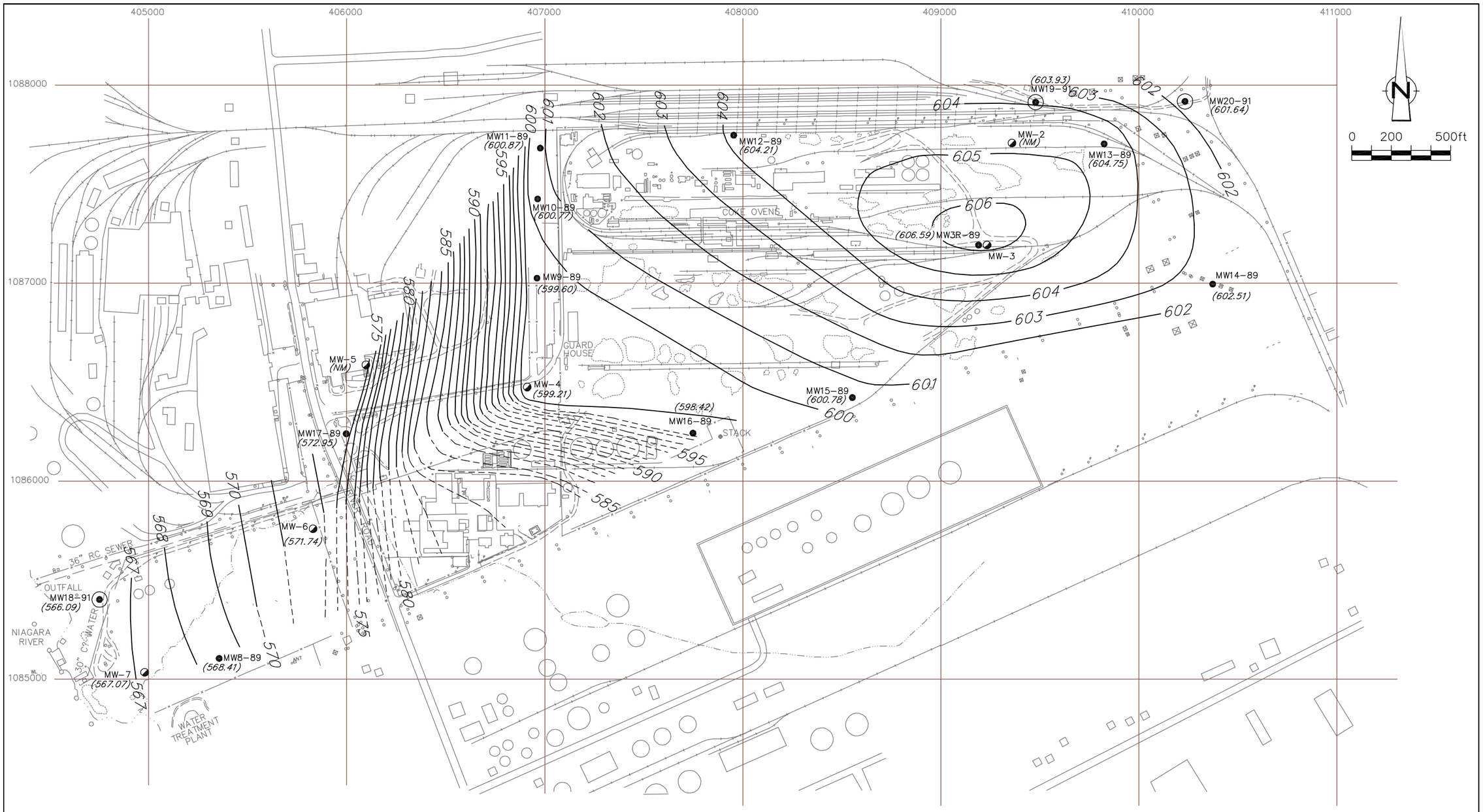


figure 3.2

GEOLOGIC CROSS-SECTION A-A'
REMEDIAL INVESTIGATION SUMMARY REPORT
Tonawanda Coke Corporation

CRA

2428 (6) APR 11/97(W) REV.0 (X-02)



LEGEND

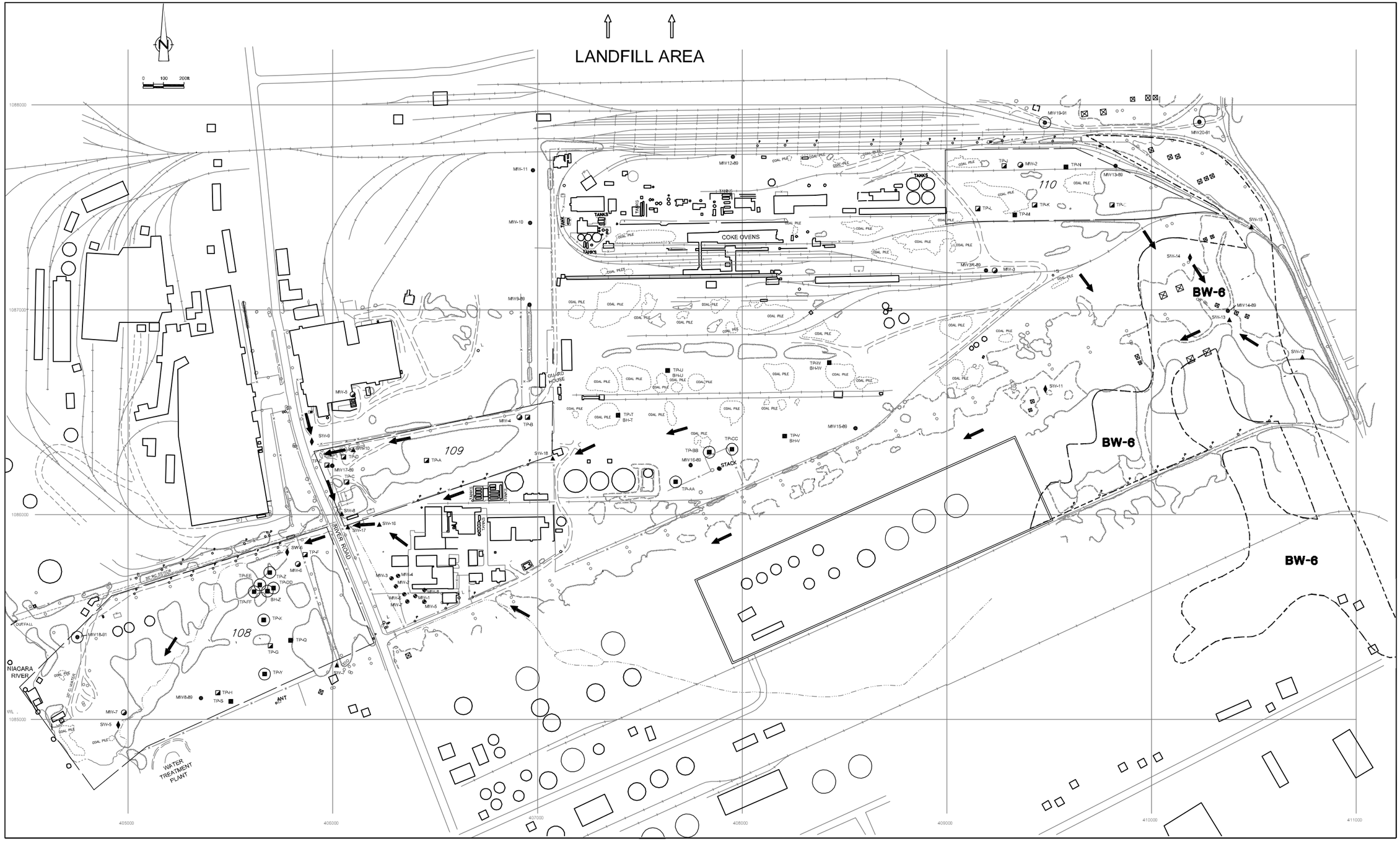
	COAL PILE
MW-5	MONITORING WELL – MALCOLM PIRNIE PHASE ? INVESTIGATION
MW15-89	MONITORING WELL – CRA SUPPLEMENTAL SITE INVESTIGATION
MW20-91	MONITORING WELL – CRA ADDITIONAL SITE INVESTIGATION
570	GROUNDWATER CONTOUR (FEET)
(598.42)	GROUNDWATER ELEVATION (FEET)(7/6/92)

CRA

figure 3.3

OVERBURDEN GROUNDWATER CONTOURS
REMEDIAL INVESTIGATION SUMMARY REPORT
Tonawanda Coke Corporation

2428 (6) APR 11/97(W) REV.0 (P-19)



LEGEND

TP-F	HISTORICAL TEST PIT LOCATION	MW13-89	SUPPLEMENTAL MONITORING WELL LOCATION		DISPOSAL AREA BOUNDARY
TP-S	SUPPLEMENTAL TEST PIT LOCATION	MW19-91	ADDITIONAL MONITORING WELL LOCATION	109	LANDFILL IDENTIFICATION
TP-W	ADDITIONAL TEST PIT LOCATION	SW-13	SUPPLEMENTAL SURFACE WATER SAMPLING LOCATION		WETLANDS AREA
MW-2	HISTORICAL MONITORING WELL LOCATION	SW-5	SUPPLEMENTAL SURFACE WATER AND SEDIMENT SAMPLING LOCATION		SURFACE WATER FLOW DIRECTION
		MW-3	MONITORING WELL - APPROXIMATE ALLIED CHEMICAL SITE LOCATION		

N°	Revision	Date	Initial

NOTES:

CONCENTRATIONS AND STANDARDS REPORTED ARE IN ug/L

EXCEEDANCES : NUMBER OF STANDARDS EXCEEDANCES PER NUMBER OF DETECTIONS.

NA: NOT ANALYZED

ND: NOT DETECTED AT OR ABOVE DETECTION LIMIT.

-: NO STANDARD AVAILABLE

TONAWANDA COKE CORPORATION

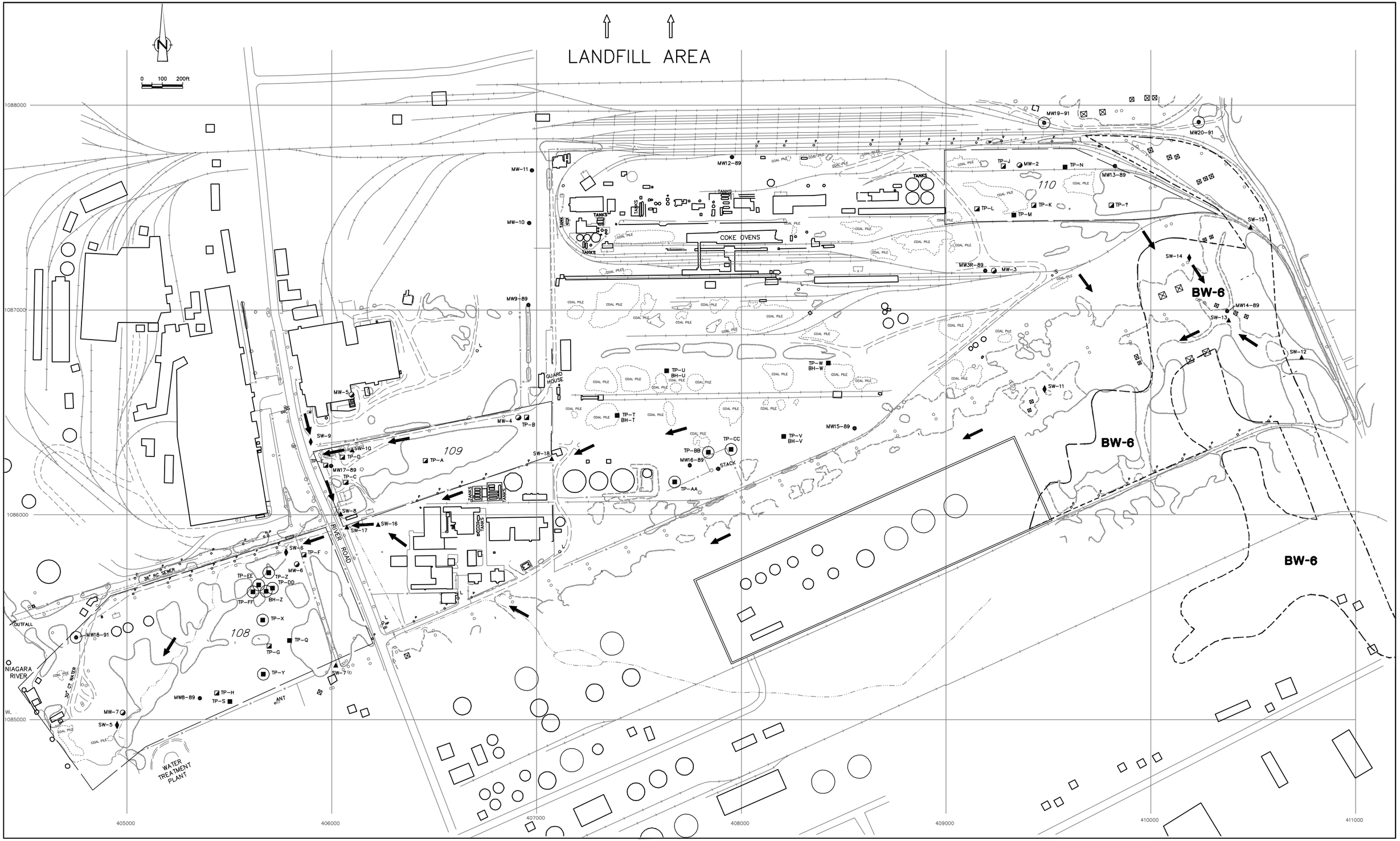
CHEMICAL PRESENCE (ug/L)

GROUNDWATER

CRA
CONESTOGA-ROVERS & ASSOCIATES

Drawn by: GRS	Scale: 1" = 200'	Date: NOVEMBER 1995	File N °: P-12	Rev. N°: 0	
Designed by: CRH					
Checked by: JKK	Field book:	Project N °: 2428	Drawing N °: PLAN 1		

NOV 30/95(H)



LEGEND

TP-F	HISTORICAL TEST PIT LOCATION	MW13-89	SUPPLEMENTAL MONITORING WELL LOCATION		DISPOSAL AREA BOUNDARY
TP-S	SUPPLEMENTAL TEST PIT LOCATION	MW19-91	ADDITIONAL MONITORING WELL LOCATION	109	LANDFILL IDENTIFICATION
TP-W	ADDITIONAL TEST PIT LOCATION	SW-13	SUPPLEMENTAL SURFACE WATER SAMPLING LOCATION		WETLANDS AREA
MW-2	HISTORICAL MONITORING WELL LOCATION	SW-5	SUPPLEMENTAL SURFACE WATER AND SEDIMENT SAMPLING LOCATION		SURFACE WATER FLOW DIRECTION

Nº	Revision	Date	Initial

NOTES:

CONCENTRATIONS AND STANDARDS REPORTED ARE IN µg/L.

EXCEEDANCES : NUMBER OF STANDARDS EXCEEDANCES PER NUMBER OF DETECTIONS.

NA: NOT ANALYZED

ND: NOT DETECTED AT OR ABOVE DETECTION LIMIT.

–: NO STANDARD AVAILABLE

TONAWANDA COKE CORPORATION

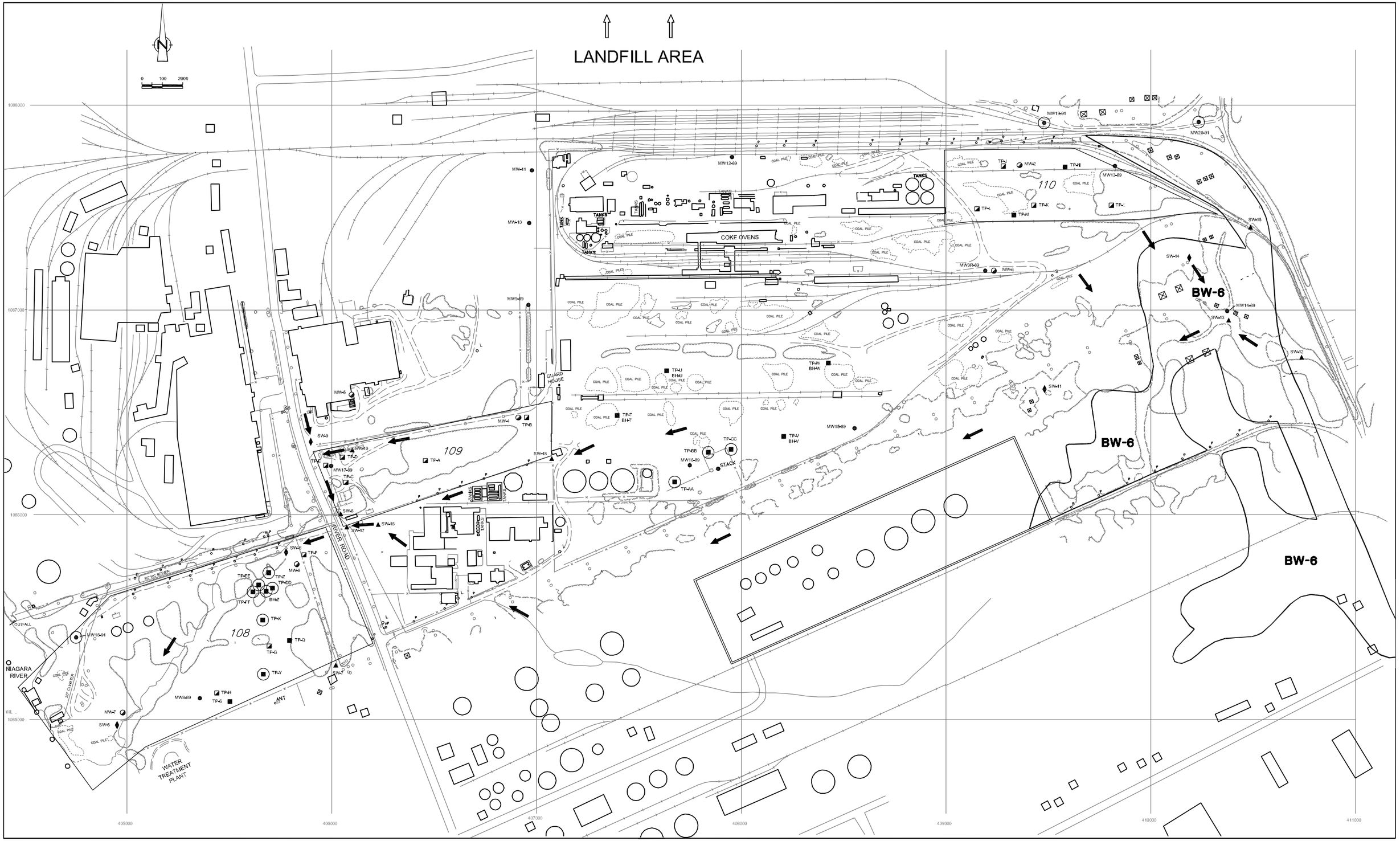
CHEMICAL PRESENCE (µg/L)

SURFACE WATER

CRA
CONESTOGA-ROVERS & ASSOCIATES

Drawn by: GRB	Scale: 1" = 200'	Date: NOVEMBER 1995	File Nº: P-13	Rev.Nº: 0
Designed by: CRH				
Checked by: JKK	Field book:	Project Nº: 2428	Drawing Nº: PLAN 2	

NOV 30/95(W)



LEGEND

TP-F	HISTORICAL TEST PIT LOCATION	MW13-89	SUPPLEMENTAL MONITORING WELL LOCATION		DISPOSAL AREA BOUNDARY
TP-S	SUPPLEMENTAL TEST PIT LOCATION	MW19-91	ADDITIONAL MONITORING WELL LOCATION	109	LANDFILL IDENTIFICATION
TP-W	ADDITIONAL TEST PIT LOCATION	SW-13	SUPPLEMENTAL SURFACE WATER SAMPLING LOCATION		WETLANDS AREA
MW-2	HISTORICAL MONITORING WELL LOCATION	SW-5	SUPPLEMENTAL SURFACE WATER AND SEDIMENT SAMPLING LOCATION		SURFACE WATER FLOW DIRECTION

№	Revision	Date	Initial

NOTES:

CONCENTRATIONS AND CRITERIA REPORTED ARE IN ug/g.

EXCEEDANCES : NUMBER OF STANDARDS EXCEEDANCES PER NUMBER OF DETECTIONS.

NA: NOT ANALYZED

ND: NOT DETECTED AT OR ABOVE DETECTION LIMIT.

-: NO STANDARD AVAILABLE

TONAWANDA COKE CORPORATION

CHEMICAL PRESENCE (µg/g)

SEDIMENT

CRA
CONESTOGA-ROVERS & ASSOCIATES

Drawn by: GRB	Scale: 1" = 200'	Date: NOVEMBER 1995	File №: P-14	Rev.№: 0
Designed by: CRH				
Checked by: JKK	Field book:	Project №: 2428	Drawing №: PLAN 3	

NOV 30/95(WV)

TABLE 2.1

CRA SUPPLEMENTAL SITE INVESTIGATION
TEST PIT SOIL SAMPLING SUMMARY
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Sample Location	*Sample Number*	*Sample Date*	*Sample Time*	*Shipping Date*	*Chain-of-Custody Number*	*Comments*
TP-1	2428-DT-001	6-19-89	1345	6-19-89	4375	Composite of TP-Q and TP-S
TP-2	2428-DT-002	6-19-89	1050	6-19-89	4375	Composite of TP-T and TP-U
TP-3	2428-DT-003	6-19-89	1005	6-19-89	4375	Composite of TP-V and TP-W
TP-4	2428-DT-004	6-19-89	0920	6-19-89	4375	Composite of TP-M and TP-N
TP-5	2428-DT-005	6-19-89	1450	6-19-89	4375	Duplicate of TP-1

TABLE 2.2

CRA SUPPLEMENTAL SITE INVESTIGATION
BOREHOLE SOIL SAMPLING SUMMARY
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Sample Location	*Sample Number*	*Sample Date*	*Sample Time*	*Shipping Date*	*Chain-of-Custody Number*	*Comments*
BH-T	S-2428-DT-021	10-16-89	1010	10-16-89	7632	4.6 ft - 6.0 ft BGS Composited with BH-U in lab
BH-U	S-2428-DT-021	10-16-89	1050	10-16-89	7632	6.0 ft - 8.0 ft BGS Composited with BH-T in lab
BH-V	S-2428-DT-022	10-16-89	1400	10-16-89	7632	6.0 ft - 8.0 ft BGS Composited with BH-W in lab
BH-W	S-2428-DT-022	10-16-89	1200	10-16-89	7632	10.0 ft - 12.0 ft BGS Composited with BH-V in lab

TABLE 2.3

TEST PIT/BOREHOLE STRATIGRAPHIC SUMMARIES
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

CRA Supplemental Site Investigation

Test Pit/Borehole	*Ground Elevation (ft AMSL)*	*Depth of Fill (feet)*	*Top of Clay Elevation (ft AMSL)*	*Depth of Hole (feet)*
TP-M	609.6	3.5	606.1	3.5
TP-N	606.9	5.0	601.9	5.0
TP-Q	580.6	>10.0	<570.6	10.0
TP-S	580.0	>10.5	<569.5	10.5
BH-T	602.1	4.6	597.5	6.0
BH-U	603.9	4.0	599.9	8.0
BH-V	601.9	2.0	599.9	8.0
BH-W	604.6	6.3	598.3	12.0

CRA Additional Site Investigation

TP-X

0 to 1.0 ft BGS	- Brown, black and tan SILT, some fine to medium sand and cinders, FILL
1.0 to 8.0 ft BGS	- PLASTIC, BRICKS and WOOD, some black silt and tar paper, little glass, moist
8.0 to 13.0 ft BGS	- Black SILT with vegetation, NATIVE
13.0 to 15.0 ft BGS	- Black SILT and fine SAND, little clay, wet
15.0 ft BGS	- Bottom of test pit

TP-Y

0 to 3.5 ft BGS	- Brown SILT and fine SAND, little roots and vegetation, FILL
3.5 to 7.0 ft BGS	- Black CINDERS, some brick, wood and plastic, trace foundry core
7.0 to 9.0 ft BGS	- Reddish brown CLAY, little silt, NATIVE
9.0 ft BGS	- Bottom of test pit

TP-Z

0 to 11.5 ft BGS	- Brown and black SILT, some fine sand, bricks and concrete, little medium and coarse sand, trace wood, plastic, wire, metal, roots and vegetation, dry to moist, FILL
11.5 to 12.5 ft BGS	- Black vegetative MUD, some vegetation, wet, NATIVE**
12.5 ft BGS	- Bottom of test pit

TP-AA

0 to 1.6 ft BGS	- COAL, grain size range from coarse sand to coarse gravel
1.6 to 1.8 ft BGS	- Reddish-Brown CLAY with trace silt, NATIVE
1.8 ft BGS	- Bottom of test pit

TABLE 2.3

TEST PIT/BOREHOLE STRATIGRAPHIC SUMMARIES
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

TP-BB	
0 to 1.2 ft BGS	- COAL, grain size range from coarse sand to coarse gravel
1.2 to 1.4 ft BGS	- Reddish-brown CLAY with trace silt, NATIVE
1.4 ft BGS	- Bottom of test pit
TP-CC	
0 to 0.8 ft BGS	- COAL, grain size range from coarse sand to coarse gravel
0.8 to 1.0 ft BGS	- Reddish-brown CLAY with trace silt, NATIVE
1.0 ft BGS	- Bottom of test pit
TP-DD	
0 to 13.0 ft BGS	- Black SILT and fine SAND, some bricks and concrete, little wood and clay, trace roots and vegetation, moist, FILL
13.0 to 13.5 ft BGS	- Black VEGETATION, wet, NATIVE
13.5 to 15.5 ft BGS	- Dark brown SILT, little fine to medium sand, trace clay, moist
15.5 to 16.5 ft BGS	- Gray fine SAND, some silt, little medium sand, moist
16.5 ft BGS	- Bottom of test pit
TP-EE	
0 to 11.0 ft BGS	- Black SILT with red and white bricks, little wood, clay and sand, trace plastic and metal, moist, FILL
11.0 to 12.5 ft BGS	- Black VEGETATION, wet, NATIVE
12.5 ft BGS	- Bottom of test pit
TP-FF	
0 to 14.5 ft BGS	- Black SILT and fine to medium SAND, some bricks and wood, little plastic and paper, moist, FILL
14.5 to 15.0 ft BGS	- Black VEGETATION, wet, NATIVE
15.0 to 15.5 ft BGS	- Dark gray SILT, little clay, trace wood, moist
15.5 ft BGS	- Bottom of test pit

Note:

** - HNU readings of 140 ppm above background, abandoned test pit and backfilled due to high readings

TABLE 2.4

CRA SUPPLEMENTAL SITE INVESTIGATION
AIR MONITORING (HNU) SUMMARY
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Test Pit/Well Location	*Date*	*Background Reading*	*Highest Reading Over Open Hole*
TP-X	6-14-91	0.9	*
TP-Y	6-14-91	1	3.5
TP-Z	6-14-91	1.2	140
TP-DD	6-14-91	*	4
TP-EE	6-14-91	*	25
BH-TP-Z	6-17-91	3	0.5
MW18-91	6-17-91	1.1	0
MW18-91	6-18-91	1.6	0
MW18-91	6-19-91	1.8	0
MW19-91	6-18-91	1.6	0.6
MW20-91	6-18-91	1.8	0.7

Notes:

* - HNu readings not recorded
No HNu readings were reported for TP-AA, TP-BB, TP-CC and TP-FF

TABLE 3.1

STRATIGRAPHIC WELL SUMMARY
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Well ID	*Ground Elevation (ft AMSL)*	*Depth of Fill (feet)*	*Top of Clay Elevation (ft AMSL)*	*Depth of Hole (feet)*
MW3R-89	609.0	6.3	602.7	8.0
MW8-89	576.7	>10.0	566.7	10.0
MW9-89	602.8	4.1	598.7	6.0
MW10-89	603.9	4.5	599.4	6.0
MW11-89	602.0	2.1	599.9	6.0
MW12-89	606.3	5.0	601.3	6.0
MW13-89	606.2	5.5	600.7	8.0
MW14-89	603.6	2.1	601.5	6.0
MW15-89	603.8	3.3	600.5	4.0
MW16-89	599.9	0.9	599.0	4.0
MW17-89	576.9	4.9	572.0	6.0
MW18-91	570.2	0.5	<548.2	22.0
MW19-91	605.4	2.0	602.1	4.0
MW20-91	603.5	3.0	600.5	4.0

TABLE 3.2
GROUNDWATER ELEVATIONS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

	MW-1	MW-2	MW-3	MW3R-89	MW-4	MW-5	MW-6	MW-7	MW8-89	MW9-89
TOC Elevation	*606.67*	*609.57*	*610.49*	*611.16*	*602.84*	*580.56*	*579.78*	*575.15*	*578.99*	*604.92*
(1) Nov. 25/26 1985	603.67	607.17	606.69	NI	599.24	573.96	573.18	567.15	NI	NI
Jan. 31 1986	603.47	606.57	606.49	NI	599.14	574.96	573.18	567.65	NI	NI
Feb. 27 1986	Frozen	Frozen	606.69	NI	599.54	575.16	573.68	567.65	NI	NI
Mar. 6 1986	Frozen	Frozen	606.49	NI	599.84	574.86	573.48	567.15	NI	NI
Mar. 18 1986	Frozen	606.97	607.19	NI	599.74	575.26	573.88	567.65	NI	NI
Apr. 2 1986	604.27	606.47	606.29	NI	599.04	574.96	573.38	567.35	NI	NI
Apr. 17 1986	604.97	607.07	607.19	NI	599.84	575.46	573.68	567.75	NI	NI
Apr. 28 1986	604.47	606.67	606.49	NI	599.14	575.16	573.68	567.55	NI	NI
May 12 1986	604.37	605.57	605.89	NI	598.34	574.86	572.98	567.25	NI	NI
May 26 1986	601.47	606.67	606.69	NI	599.24	575.16	573.28	567.65	NI	NI
Jun. 9 1986	604.57	606.67	606.59	NI	599.24	575.06	573.08	568.75	NI	NI
Jun 30 1986	603.77	605.87	606.09	NI	598.84	574.46	572.18	567.55	NI	NI
Jul 9 1986	603.47	605.57	605.39	NI	598.44	573.96	572.08	567.25	NI	NI
Aug 6 1986	Destroyed	606.57	605.79	NI	599.24	574.26	572.48	567.15	NI	NI
(2) Jun. 26/28 1989	Destroyed	606.42	606.39	NM	NM	NM	NM	NM	NM	600.47
Oct. 9/18 1989	Destroyed	604.94	603.49	NM	598.52	571.56	569.21	568.70	567.39	599.12
Dec. 12/15 1989	Destroyed	NM	NM	605.93	598.87	574.26	572.01	564.95	567.37	600.36
(3) Apr. 15, 1992	Destroyed	NM	NM	606.99	NM	574.56	573.36	NM	569.74	599.92
Jul. 6, 1992	Destroyed	NM	605.23	606.59	599.21	NM	571.74	567.07	568.41	599.60

Notes:

(1) Measurements collected during Malcolm Pirnie Phase II Investigation
(2) Measurements collected during CRA's Supplemental Site Investigation
(3) Measurements collected during CRA's Additional Site Investigation
NI - Well not installed at time of water level measurements.
NM - Well not measured.

TABLE 3.2
GROUNDWATER ELEVATIONS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

	MW10-89	MW11-89	MW12-89	MW13-89	MW14-89	MW15-89	MW16-89	MW17-89	MW18-91	MW19-91	MW20-91
TOC Elevation	*605.54*	*603.77*	*609.19*	*608.39*	*605.57*	*605.99*	*603.46*	*579.15*	572.2	*607.17*	*605.33*
(1) Nov. 25/26 1985	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Jan. 31 1986	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Feb. 27 1986	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Mar. 6 1986	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Mar. 18 1986	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Apr. 2 1986	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Apr. 17 1986	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Apr. 28 1986	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
May 12 1986	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
May 26 1986	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Jun. 9 1986	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Jun 30 1986	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Jul 9 1986	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
Aug 6 1986	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
(2) Jun. 26/28 1989	NM	601.09	NM	NM	NM	NM	NM	NM	NI	NI	NI
Oct. 9/18 1989	600.19	600.84	603.85	603.14	601.50	603.05	599.64	572.67	NI	NI	NI
Dec. 12/15 1989	600.99	600.81	604.00	605.01	602.49	602.69	598.55	574.27	NI	NI	NI
(3) Apr. 15, 1992	601.12	600.60	604.02	605.47	NM	601.99	599.71	574.48	566.03	604.84	602.50
Jul. 6, 1992	600.77	600.87	604.21	604.75	602.51	600.78	598.42	572.95	566.09	603.93	601.64

Notes:

(1) Measurements collected during Malcolm Pirnie Phase II Investigation
(2) Measurements collected during CRA's Supplemental Site Investigation
(3) Measurements collected during CRA's Additional Site Investigation
NI - Well not installed at time of water level measurements.
NM - Well not measured.

TABLE 3.3

SUMMARY OF SUPPLEMENTAL SITE INVESTIGATION MONITORING WELL HYDRAULIC CONDUCTIVITY VALUES
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

MW-2	1.3×10^{-3} cm/sec
MW-3	no drawdown during purging
MW3R-89	no drawdown during purging
MW-4	3.6×10^{-5} cm/sec
MW-5	5.8×10^{-5} cm/sec
MW-6	1.4×10^{-3} cm/sec
MW-7	3.9×10^{-4} cm/sec
MW8-89	2.0×10^{-3} cm/sec
MW9-89	4.4×10^{-5} cm/sec
MW10-89	3.2×10^{-5} cm/sec
MW11-89	4.3×10^{-4} cm/sec
MW12-89	1.1×10^{-2} cm/sec
MW13-89	2.3×10^{-3} cm/sec
MW14-89	8.6×10^{-5} cm/sec
MW15-89	7.4×10^{-4} cm/sec
MW16-89	3.8×10^{-4} cm/sec
MW17-89	2.3×10^{-4} cm/sec
geometric mean	3.6×10^{-4} cm/sec

TABLE 4.1

USGS STUDY
SOIL ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

	Site 108				*Recommended Soil clean up Objective (4)*
	2		3		
Location					
Date	*7/13/1982*	*5/24/1983*	*7/13/1982*	*5/24/1983*	
	(µg/kg)	*(µg/kg)*	*(µg/kg)*	*(µg/kg)*	*(µg/kg)*
Inorganic Constitutents					
Cyanide	ND	NA	ND	NA	--
Iron	9,500,000	NA	5,900,000	NA	2,000,000
Molecular Sulfur (1)	NA	11,000	NA	ND	--
Priority Pollutants					
Diethylphthalate	ND	ND	ND	ND	7,100
Benzene	NA	32.2(1)	NA	134(1)	60
1,2-Trans-dichloroethene	NA	ND	NA	468(1)	300
Ethylbenzene	NA	28.5 (1)	NA	150(1)	5,500
Methylene Chloride	NA	45.0(1)	NA	ND	100
Tetrachloroethene	NA	ND	NA	33.0(1)	1,400
Toluene	NA	16.1(1)	NA	363(1)	1,500
Vinyl Chloride	NA	ND	NA	2,180(1)	200
Acenaphthene	NA	(2)	NA	ND	50,000*
Fluoranthene	NA	(2)	NA	ND	50,000*
Naphthalene	NA	(2)	NA	(2)	13,000
Bis (2-ethylhexyl)phthalate	NA	(2)	NA	ND	50,000*
Benzo(a)anthracene	NA	(2)	NA	ND	224
Benzo(b)fluoranthene and benzo(k)fluoranthene	NA	(2)	NA	ND	1100
Acenaphthylene	NA	(2)	NA	ND	41,000
Benzo(g,h,i)perylene	NA	(2)	NA	ND	50,000*
Fluorene	NA	(2)	NA	ND	50,000*
Indeno(1,2,3-cd)pyrene	NA	(2)	NA	ND	3,200
Pyrene	NA	(2)	NA	ND	50,000*

Notes:

(1) Surrogate recoveries were above or below the acceptance limits.
(2) Compounds detected but not quantified. Holding times exceeded before GC/MS acid and base-neutral extractable compounds were extracted.
(3) Tentative identification based on comparison with the National Bureau of Standards (NBS) library. No external standard was available. Concentration reported is semi-quantitative and is based only on an internal standard. GC/MS spectra were examined and interpreted by GC/MS analyses.
* As per TAGM #4046, Total Pesticides <10ppm.
-- No value provided.
(4) Source: TAGM #4046 - Determination of Soil Cleanup Objectives and Cleanup Levels.

TABLE 4.1

USGS STUDY
SOIL ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

					Recommended Soil clean up Objective (4)
	Site 108 (cont'd)				
Location	2		3		
Date	*7/13/1982*	*5/24/1983*	*7/13/1982*	*5/24/1983*	
	(µg/L)	*(µg/L)*	*(µg/L)*	*(µg/L)*	*(µg/L)*
Non-Priority Pollutants					
Acetone	NA	ND	NA	352(1)	200
Benzoic Acid	ND	NA	ND	NA	2,700
Carbondisulfide	NA	44.2(1)	NA	247(1)	2,700
o-Xylene	NA	126(1)	NA	530(1)	1,200**
Dibenzofuran	NA	(2)	NA	ND	6,200
2-Methylnaphthalene	NA	(2)	NA	ND	36,400
2,3-Dihydro-1H-indene (3)	NA	(2)	NA	ND	--
1H-Indene (3)	NA	(2)	NA	ND	--
Cyclohexane (3)	NA	ND	NA	(2)	--
Methylcyclopentane (3)	NA	ND	NA	(2)	--
1,1,3-Trimethyl-cyclohexane (3)	NA	ND	NA	(2)	--
2,2,3,4-Tetramethylpentane (3)	NA	ND	NA	(2)	--
1-Ethyl-3-methyl-trans-cyclopentane	NA	ND	NA	(2)	--
2,6,6-Trimethyl-bicyclo-(3.1.1)hepten-2-ene (3)	NA	ND	NA	(2)	--
Unknown hydrocarbons (3)	NA	ND	NA	(2)	--

Notes:

(1) Surrogate recoveries were above or below the acceptance limits.
(2) Compounds detected but not quantified. Holding times exceeded before GC/MS acid and base-neutral extractable compounds were extracted.
(3) Tentative identification based on comparison with the National Bureau of Standards (NBS) library. No external standard was available. Concentration reported is semi-quantitative and is based only on an internal standard. GC/MS spectra were examined and interpreted by GC/MS analyses.
* As per TAGM #4046, Total Pesticides <10ppm.
-- No value provided.
(4) Source: TAGM #4046 - Determination of Soil Cleanup Objectives and Cleanup Levels.

TABLE 4.1

USGS STUDY
SOIL ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

	Site 109			*Recommended Soil clean up Objective (4)*
	1A	*2A*	*3A*	
Second Sampling (5-24-83)				
(µg/kg)				
Inorganic Constituent				
Molecular sulfur (3)	ND	1,900	ND	--
Organic Compounds				
Priority pollutants				
Benzene	5.7(1)	8.3	ND	60
1,1,1-Trichloroethane	ND	ND	LT	800
Toluene	3.9(1)	LT	8.2(1)	1,500
BMC-alpha	ND	LT	LT	--
Acenaphthene	(2)	(2)	ND	50,000*
Fluoranthene	(2)	(2)	(2)	50,000*
Naphthalene	(2)	(2)	(2)	13,000
Bis(2-ethylhexyl)phthalate	(2)	(2)	(2)	50,000*
Butylbenzylphthalate	ND	(2)	ND	50,000*
Di-n-butylphthalate	ND	(2)	ND	8,100
Diethylphthalate	ND	(2)	ND	7,100
Benzo(a)anthracene	ND	(2)	(2)	224
Benzo(a)pyrene	(2)	(2)	(2)	--
Benzo(b)fluoranthene and benzo(k)fluoranthene	(2)	(2)	(2)	1,100
Chrysene	(2)	ND	ND	400
Acenaphthylene	(2)	(2)	(2)	41,000
Benzo(ghi)perylene	(2)	(2)	(2)	50,000*
Fluorene	(2)	(2)	(2)	50,000*
Dibenzo(a,h)anthracene	(2)	(2)	(2)	14
Indeno(1,2,3-cd)pyrene	ND	(2)	(2)	3,200
Pyrene	(2)	(2)	(2)	50,000*

Notes:

(1) Surrogate recoveries were above or below the acceptance limits.
(2) Compounds detected but not quantified. Holding times exceeded before GC/MS acid and base-neutral extractable compounds were extracted.
(3) Tentative identification based on comparison with the National Bureau of Standards (NBS) library. No external standard was available. Concentration reported is semi-quantitative and is based only on an internal standard. GC/MS spectra were examined and interpreted by GC/MS analyses.
* As per TAGM #4046, Total Pesticides <10ppm.
-- No value provided.
(4) Source: TAGM #4046 - Determination of Soil Cleanup Objectives and Cleanup Levels.

TABLE 4.1

USGS STUDY
SOIL ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

	Site 109 (cont'd)			*Recommended Soil clean up Objective (4)*
	1A	*2A*	*3A*	
Second Sampling (5-24-83)				
(µg/kg)				
Organic Compound (continued)				
Non-priority pollutants				
Carbondisulfide	2.9(1)	33.4	37.9 (1)	2,700
O-xylene	ND	ND	5.3 (1)	1,200**
Benzoic acid	(2)	ND	ND	2,700
2-Methylphenol	ND	LT	ND	100
Dibenzofuran	(2)	(2)	ND	6,200
2-Methylnaphthalene	(2)	(2)	(2)	36,400
1,3-Dimethylbenzene (3)	ND	ND	(2)	--
1,4-Dimethylbenzene (3)	ND	ND	(2)	--
1-Methylnaphthalene (3)	ND	ND	(2)	--
1,8-Dimethylnaphthalene (3)	ND	ND	(2)	--
1,6,7-Trimethylnaphthalene (3)	ND	ND	(2)	--
7-Octadecanol (3)	ND	(2)	ND	--
Hexadeconaol (3)	ND	(2)	ND	--
Hexadecanoic acid (3)	(2)	ND	ND	--
2-Octadecanol (3)	(2)	ND	ND	--
Perylene (3)	(2)	ND	ND	--
9-Methylphenanthrene	ND	ND	(2)	--
Unknown hydrocarbons (3)	(2)	ND	(2)	--
Unknown PAH (3)	NA	NA	(2)	--
Compound Potentially of Natural Origin				
2,6-Dimethylundecane (3)	ND	ND	(2)	--

Notes:

(1) Surrogate recoveries were above or below the acceptance limits.
(2) Compounds detected but not quantified. Holding times exceeded before GC/MS acid and base-neutral extractable compounds were extracted.
(3) Tentative identification based on comparison with the National Bureau of Standards (NBS) library. No external standard was available. Concentration reported is semi-quantitative and is based only on an internal standard. GC/MS spectra were examined and interpreted by GC/MS analyses.
* As per TAGM #4046, Total Pesticides <10ppm.
-- No value provided.
(4) Source: TAGM #4046 - Determination of Soil Cleanup Objectives and Cleanup Levels.

TABLE 4.1

USGS STUDY
SOIL ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

	Site 110				*Recommended Soil clean up Objective (4)*
	1		*2*	*3*	
		(split)			
Second Sampling (5-24-83)					
(µg/kg)					
Organic Compounds					
Priority pollutants					
Acrolein	LT	ND	ND	ND	--
Benzene	64.0(1)	ND	3,560(1)	77.1(1)	60
1,1,1-Trichloroethane	LT	10.8(1)	ND	3.0(1)	800
Cis,1,3-Dichloropropene	ND		ND	5.9(1)	300
Ethylbenzene	LT		737(1)	ND	5,500
Methylene chloride	81.4(1)	83.9(1)	314(1)	160(1)	100
Toluene	5.97(1)	21.0(1)	1,420(1)	16.8(1)	1,500
Dieldrin	ND	31	ND	ND	44
Heptachlor epoxide	22(1)	ND	ND	ND	20
Acenaphthene	ND	(2)	ND	ND	50,000*
3,4-Dinitrotoluene	ND	(2)	ND	ND	--
Fluoranthene	(2)	(2)	ND	(2)	50,000*
Naphthalene	(2)	(2)	ND	(2)	13,000
N-nitrosodidiphenylamine	ND	(2)	ND	ND	--
Bis(2-ethylhexyl)phthalate	(2)	(2)	ND	ND	50,000*
Di-n-butylphthalate	ND	(2)	ND	ND	8,100
Di-n-octylphthalate	(2)	ND	ND	ND	50,000*
Diethylphthalate	ND	(2)	ND	ND	7,100
Benzo(a)pyrene	(2)	(2)	ND	(2)	--
Benzo(b)fluoranthene and benzo(k)fluoranthene	(2)	(2)	ND	(2)	1,100
Chrysene	(2)	ND	ND	(2)	400
Acenaphthylene	ND	(2)	ND	(2)	41,000
Benzo(ghi)perylene	(2)	(2)	ND	(2)	50,000*
Fluorene	(2)	(2)	ND	(2)	50,000*
Phenanthrene	(2)	(2)	ND	(2)	50,000*
Dibenzo(a,h)anthracene	(2)	(2)	ND	(2)	14
Indeno(1,2,3-cd)pyrene	(2)	ND	ND	(2)	3,200
Pyrene	(2)	(2)	ND	(2)	50,000*

Notes:

(1) Surrogate recoveries were above or below the acceptance limits.
(2) Compounds detected but not quantified. Holding times exceeded before GC/MS acid and base-neutral extractable compounds were extracted.
(3) Tentative identification based on comparison with the National Bureau of Standards (NBS) library. No external standard was available. Concentration reported is semi-quantitative and is based only on an internal standard. GC/MS spectra were examined and interpreted by GC/MS analyses.
* As per TAGM #4046, Total Pesticides <10ppm.
-- No value provided.
(4) Source: TAGM #4046 - Determination of Soil Cleanup Objectives and Cleanup Levels.

TABLE 4.1

USGS STUDY
SOIL ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

	Site 110 (cont'd)				*Recommended Soil clean up Objective (4)*
	1	*(split)*	*2*	*3*	
Organic Compounds Cont'd (µg/kg)					
Non-priority pollutants					
Acetone	ND	164(1)	379(1)	ND	200
Carbondisulfide	180(1)	614(1)	620(1)	161(1)	2,700
2-Hexanone	ND	ND	ND	17.1(1)	--
4-Methyl-2-pentanone	ND	ND	ND	6.3(1)	1,000
Styrene	ND	ND	86.1(1)	ND	--
O-xylene	4.7(1)	25.5(1)	238(1)	17.1(1)	1,200**
4-Chloroaniline	(2)	ND	ND	ND	220
Dibenzofuran	ND	(2)	ND	(2)	6,200
2-Methylnaphthalene	(2)	(2)	ND	(2)	36,400
4-Methylphenanthrene (3)	ND	(2)	ND	ND	--
Tetrahydrofuran (3)	ND	ND	ND	(2)	--
Perylene	ND	(2)	ND	ND	--
1-Methylnaphthalene (3)	(2)	ND	ND	ND	--
1,8-Dimethylnaphthalene (3)	(2)	ND	ND	ND	--
Thiophene (3)	ND	ND	(2)	ND	--
2-Methylbutane (3)	ND	ND	ND	(2)	--
Cyclohexane (3)	ND	ND	ND	(2)	--
Unknown hydrocarbons (3)	(2)	(2)	ND	ND	--

Notes:

(1) Surrogate recoveries were above or below the acceptance limits.
(2) Compounds detected but not quantified. Holding times exceeded before GC/MS acid and base-neutral extractable compounds were extracted.
(3) Tentative identification based on comparison with the National Bureau of Standards (NBS) library. No external standard was available. Concentration reported is semi-quantitative and is based only on an internal standard. GC/MS spectra were examined and interpreted by GC/MS analyses.
* As per TAGM #4046, Total Pesticides <10ppm.
-- No value provided.
(4) Source: TAGM #4046 - Determination of Soil Cleanup Objectives and Cleanup Levels.

TABLE 4.2

MALCOLM PIRNIE PHASE II INVESTIGATION
SOIL ANALYTICAL RESULS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Parameter	*Site 110*	
	Result (mg/kg Wet Weight)	*Recommended Soil Cleanup Objective (1) (mg/kg)*
Free Cyanide	0.76	--
Total Cyanide	4.96	--
Phenols	0.30	0.03
Benzene	LT 0.33	0.06
Toluene	LT 0.33	65
Ethylbenzene	LT 0.33	5.5
Para-Xylene	LT 0.33	1.2**
Meta-Xylene/Chlorobenzene*	LT 0.33	1.2**
Ortho-Xylene	LT 0.33	1.2**
Para-dichlorobenzene	LT 0.33	8.5
Meta-dichlorobenzene	LT 0.33	1.6
Ortho-dichlorobenzene	LT 0.33	7.9
Acenaphthene	LT 0.50	50***
Acenaphthylene	LT 0.63	41
Anthracene	LT 3.3	50***
Benzo(a)anthracene	LT 4.0	0.224
Benzo(a)pyrene	LT 6.3	--
Benzo(b)fluoranthene	LT 6.0	1.1
Benzo(g,h,i)perylene	LT 3.2	50***
Benzo(k)fluoranthene	LT 23	1.1
Chrysene	LT 2.5	0.4
Dibenzo(a,h)anthracene	LT 1.9	0.014
Fluoranthene	LT 2.0	50***
Fluorene	LT 1.2	50***
Indeno(1,2,3-c,d)pyrene	LT 12	3.2
Naphthalene	LT 1.4	13
Phenanthrene	LT 6.7	50***
Pyrene	LT 3.6	50***
TOX	LT 0.6	--

Note:

(1) Source: TAGM #4046 - Determination of Soil Cleanup Objectives and Cleanup Levels.

* Chlorobenzene and Meta-Xylene coelute as one peak on the Gas Chromatogram.

** Value shown is for Total xylenes.

*** As per TAGM #4046, Total Pesticides <10ppm.

TABLE 4.3

CRA SUPPLEMENTAL SITE INVESTIGATION
TEST PIT SOIL SAMPLE ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Source *Sample ID* *Date*	*TP-1(Q&S)* *S-2428-DT-001* *6-19-89*	*TP-1(Q&S) dup* *S-2428-DT-005* *6-19-89*	*TP-2(T&U)* *S-2428-DT-002/002re* *6-19-89*	*TP-3(V&W)* *S-2428-DT-003/003re* *6-19-89*	*TP-4(M&N)* *S-2428-DT-004/004re* *6-19-89*	*Recommended* *Soil Cleanup* *Objective (2)*
TCL VOCs (µg/Kg)						
Methylene Chloride	44*	29*	27*/110	46*/46*	30*/73*	100
Acetone	42*	24*	--/260C	37*/21*	49*/94*	200
Toluene	9	8	ND(7)	ND(6)	ND(7)	1,500
Total Xylenes	11	11	ND(7)	ND(6)	ND(7)	1,200
TCL BNAs (µg/Kg)						
Napthalene	14,000	21,000	ND(900)	ND(1,900)	ND(2,300)	13,000
2-Methynapthalene	7,400	14,000	ND(900)	ND(1,900)	ND(2,300)	36,400
Acenaphthylene	2,900	5,000	ND(900)	ND(1,900)	ND(2,300)	41,000
Acenaphthene	970	ND(2,100)	ND(900)	ND(1,900)	ND(2,300)	50,000***
Dibenzofuran	640	ND(2,100)	ND(900)	ND(1,900)	ND(2,300)	6,200
Fluorene	4,600	6,000	ND(900)	ND(1,900)	ND(2,300)	50,000***
Phenanthrene	17,000	29,000	1,800	4,400	5,200	50,000***
Anthracene	ND (4,200)	5,000	ND(900)	ND(1,900)	ND(2,300)	50,000***
Fluoranthene	8,800	20,000	3,600	14,000	9,900	50,000***
Pyrene	12,000	18,000	2,600	12,000	7,400	50,000***
Benzo(a)Anthracene	4,400	9,800	1,700	8,700	4,700	224
Chrysene	5,700	11,000	2,200	11,000	5,600	400
Benzo(b)Fluoranthene (1)	5,200	11,000	3,800	17,000	7,400	1,100
Benzo(k)Fluoranthene (1)	5,200	11,000	3,800	17,000	7,400	1,100
Benzo(a)Pyrene	4,800	8,700	2,400	11,000	4,400	--
Indeno(1,2,3-cd)Pyrene	2,100	3,400	ND(900)	4,500	ND(2,300)	3,200
Dibenzo(a,h)Anthracene	510	ND(2,100)	ND(900)	3,200	ND(2,300)	14
Benzo(g,h,i)Perylene	2,100	3,600	940	6,200	2,500	50,000***

TABLE 4.3

CRA SUPPLEMENTAL SITE INVESTIGATION
TEST PIT SOIL SAMPLE ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Source *Sample ID* *Date*	*TP-1(Q&S)* *S-2428-DT-001* *6-19-89*	*TP-1(Q&S) dup* *S-2428-DT-005* *6-19-89*	*TP-2(T&U)* *S-2428-DT-002/002re* *6-19-89*	*TP-3(V&W)* *S-2428-DT-003/003re* *6-19-89*	*TP-4(M&N)* *S-2428-DT-004/004re* *6-19-89*	*Eastern USA Background Soil Concentrations (2)*	*Recommended Soil Cleanup Objective*
TAL Metals (mg/Kg)							
Aluminum	9,570	13,400	848	87.6	1,320	33,000	SB
Arsenic	10.6	4.1	3.1	2.2	0.59	3 - 12	75 or SB
Barium	118	105	28.6	9.0	40	15-600	300 or SB
Beryllium	0.69	0.7	ND(0.13)	ND(0.11)	ND(0.14)	0-1.75	0.16 or SB
Calcium	27,100	41,600	750	405	792	130-35,000	
Chromium	116.1	17.6	6.7	4.8	5.2	1.5-40	10 or SB
Cobalt	10	12.1	3.8	ND(0.74)	3.3	2.5-60	30 or SB
Copper	43.2	68.7	11.2	10.0	16.4	1-50	25 or SB
Iron	35,700	21,800	3,210	329	6,730	2,000-550,000	2,000 or SB
Lead	81.8	36.3	3.2	5.8	10.1	200-500***	SB****
Magnesium	8,190	12,500	72.3	ND(15.4)	162	100-5,000	SB
Manganese	579	488	41.7M	39.0	109	50-5,000	SB
Mercury	1.0	0.4	ND(0.11)	ND(0.11)	ND(0.14)	0.001-0.2	0.1
Nickel	16.4	22.2	7.1	8.9	ND(5.1)	0.5-25	13 or SB
TAL Metals (mg/Kg)							
Potassium	1290*	2,090*	3,430	ND(390)	522*	8,500-43,000	SB
Selenium	ND(0.74)	ND(1.3)	0.54W	0.31	ND(0.26)	0.1-3.9	2 or SB
Sodium	ND(361)	ND(399)	1,350	ND(349)	ND(429)	6,000-8,000	SB
Vanadium	46.7	33.5	9.9	28.8	9.4	1-300	150 or SB
Zinc	136	95.5	34.0	17.4	42.0	9-50	20 or SB

TABLE 4.3

CRA SUPPLEMENTAL SITE INVESTIGATION
TEST PIT SOIL SAMPLE ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Source *Sample ID* *Date*	*TP-1(Q&S)* *S-2428-DT-001* *6-19-89*	*TP-1(Q&S) dup* *S-2428-DT-005* *6-19-89*	*TP-2(T&U)* *S-2428-DT-002/002re* *6-19-89*	*TP-3(V&W)* *S-2428-DT-003/003re* *6-19-89*	*TP-4(M&N)* *S-2428-DT-004/004re* *6-19-89*	*Background Surface Soil Concentrations (2)*
Other Compounds (mg/Kg)						
Cyanide	186	271	0.68W	ND(0.56)	1.5	--
Oil & Grease	3,300	38,000	180	240M	250	--
Hexavalent Chromium	<0.5R**	<0.5R**	<0.5R**	<0.5R*	<0.5R**	--
TCLP VOCs (µg/L)						TCLP Regulatory Level µg/L
Benzene	4J	2J	ND(5)	ND(5)	ND(5)	500
Methylene Chloride	31*	14*	15*	11*	15*	--
2-Butanone	38	ND(10)	ND(10)	ND(10)	ND(10)	200,000
Toluene	75	5	ND(5)	ND(5)	ND(5)	--
TCLP BNAs (µg/L)						
3-MethylPhenol (1)	all phenolic data	ND(10)	all phenolic data	ND(10)	ND(10)	200,000
4-MethylPhenol (1)	qualified X	ND(10)	qualified X	ND(10)	ND(10)	200,000
Pentachlorophenol		ND (20)		ND(20)	ND(20)	100,000
TCLP Metals (µg/L)						
Arsenic	8.4	49.3	6.8	2.1	6	5,000
Barium	769	679	329	101	288	100,000
Chromium	4.8	132	ND(3.8)	16.9	9.8	5,000
Lead	14.5	389	13.0	41.8	16.9	5,000
Mercury	ND(0.20)	37.2	ND(0.20)	ND(0.20)	ND(0.20)	200
Selenium	ND(10.0)	ND(5.0)	ND(10.0)	1.5	ND(10.0)	1,000

TABLE 4.3

CRA SUPPLEMENTAL SITE INVESTIGATION
TEST PIT SOIL SAMPLE ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Notes:

All other TCL/TAL/TCLP parameters were not detected in any samples.

re Samples S-2428-DT-002,003 and 004 were reanalyzed for VOCs (sample IDs noted with the suffix - re) due to outlying surrogate spike recoveries. The reanalyzed samples showed similar surrogate spike recoveries.

C Denotes a compound whose concentration is estimated due to unsatisfactory percent differences (%D's) in response factors determined from the calibration.

* Also present in laboratory blanks, indicating possible/probable laboratory contamination.

ND Not detected above quantifiable limits stated in parentheses.

R Unusable data due to holding time exceedence.

** The concentration of Cr+6 may have been equal to, however not greater than, the amount of total chrome detected in the associated sample.

M Indicated matrix spike recoveries were outside control limits and may reflect a high bias in sample data.

W Indicated spike recoveries were outside control limits and may reflect a low bias in sample data.

(1) Indistinguishable isomers, reported value is total concentration.

X Unusable data due to low surrogate spike recoveries. All sample data for the affected compounds were non-detected.

*** As per TAGM #4046, Total Pesticides <10ppm.

**** Background levels for lead vary widely. Average levels in undeveloped, rural areas may range from 4-61ppm. Average background levels in metropolitan or surburban areas or near highways are much higher and typically range from 200-500 ppm.

SB Site Background.

(2) Source: TAGM #4046 - Determination of Soil Cleanup Objectives and Cleanup Levels.

TABLE 4.4

CRA SUPPLEMENTAL SITE INVESTIGATION
BOREHOLE SOIL SAMPLE ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Sample ID *Source* *Date*	*S-2428-DT-021* *BH-1(T&U)* *10-16-89*	*S-2428-DT-022* *BH-2(V&W)* *10-16-89*	*Eastern USA Background Surface Soil Concentrations (1)*	*Recommended Soil Cleanup Objective (1)*
TCL VOCs (µg/kg)	none detected			
TCL BNAs (µg/kg)				
Bis(2-ethylhexyl)phthalate	8.0	1.0		50,000*
TAL Metals (mg/kg)				
Aluminum	10,200	11,800	33,000	SB
Arsenic	1.90	1.80	3-12	7.5 or SB
Barium	47.0	30.0	15-600	300 or SB
Beryllium	1.60	1.60	0-1.75	0.16 or SB
Cadmium	0.15	0.15	0.1-1	1 or SB
Calcium	36,780	22,400	130-35,000	SB
Chromium	15.0	13.0	1.5-40	10 or SB
Copper	17.0	18.0	1-50	25 or SB
Cobalt	10.0	13.0	2.5-60	30 or SB
Iron	180	179	2,000-550,000	2,000 or SB
Lead	4.40	4.10	200-500**	SB**
Magnesium	16,500	16,500	100-5,000	SB
Manganese	530	480	50-5,000	SB
Nickel	25.5	24.0	0.5-25	13 or SB
Potassium	3,260	3,080	8,500-43,000	SB
Sodium	630	690	6,000-8,000	SB
Vanadium	17.7	14.0	1-300	150 or SB
Zinc	64.0	70.0	9-50	20 or SB
Other Compounds (mg/kg)				
Oil and Grease	419	1050		

Note:

(1) Source: TAGM #4046 - Determination of Soil Cleanup Objectives and Cleanup Levels.
All other TCL/TAL parameters, cyanide and Cr+6 were not detected in any sample.

SB Site Background

* As per TAGM #4046, Total Pesticides <10 ppm.

** Background levels for lead vary widely. Average levels in underdeveloped, rural areas may range from 4-61 ppm. Average background levels in metropolitan or suburban areas or near highways, are much higher and typically range from 200-500 ppm.

TABLE 4.5

CRA ADDITIONAL SITE INVESTIGATON
TEST PIT SOIL SAMPLE ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Test Pit # *Sample Type* *Date*	*TP-X,Y,Z* *COMPOSITE* *6-14-91*	*TP-Z* *GRAB* *6-14-91*	*Recommended* *Soil Cleanup* *Objective (1)*
TCL VOCs (mg/kg)			
Benzene	2.8	66	0.06
Toluene	6.4	140	1.5
Ethylbenzene	22	60	5.5
m/p-Xylene	6.4	100	1.2
o-Xylene	8	98	1.2
TCL BNAs (mg/kg)			
Naphthalene	92	270	13
Phenanthrene	62	180	50*
Anthracene	ND(33)	74	50*
Fluoranthene	67	150	50*
Pyrene	44	99	50*
Benzo(a)Anthracene	ND(33)	57	0.224
Chrysene	ND(33)	47	0.4
Benzo(b)Fluoranthene	ND(33)	40	1.1
Benzo(k)Fluoranthene	ND(33)	45	1.1
Benzo(a)Pyrene	ND(33)	47	0.061
2-Methylnaphthalene	ND(33)	86	36.4
Dibenzofuran	ND(33)	69	6.2
Fluorene	ND(33)	85	50*

TABLE 4.5

CRA ADDITIONAL SITE INVESTIGATON
TEST PIT SOIL SAMPLE ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

TAL METALS (mg/kg)			*Eastern USA Background Soil Concentrations (1)*	*Recommended Soil Cleanup Objective (1)*
Aluminum	15,000	22,500	33,000	SB
Arsenic	10.1	240	3-12	7.5 or SB
Barium	16.2	46.7	15-600	300 or SB
Cadmium	1.05	ND(0.05)	0.1-1	1 or SB
Calcium	9,490	496	130-35,000	SB
Chromium	24.1	16.7	1.5-40	10 or SB
Copper	50.7	64	1-50	25 or SB
Iron	32,000	77,100	2,000-550,000	2,000 or SB
Lead	108	172	200-500**	SB**
Magnesium	4,250	3,480	100-5,000	SB
Manganese	245	190	50-5,000	SB
Mercury	4	3.5	0.001-0.2	0.1
Nickel	362	83	0.5-25	13 or SB
Potassium	875	1,590	8,500-43,000	SB
Selenium	1.43	ND(0.5)	0.1-3.9	2 or SB
Silver	1.74	23.3	NA	SB
Sodium	365	488	6,000-8,000	SB
Vanadium	1.6	13.8	1-300	150 or SB
Zinc	145	204	9-50	20 or SB

Note:

(1) Source: TAGM #4046 - Determination of Soil Cleanup Objectives and Cleanup Levels.
ND(#) Not detected above quantifiable limits stated in parentheses
* As per TAGM #4046, Total Pesticides <10 ppm.
** Background levels for lead vary widely. Average levels in undeveloped, rural areas may range from 4-61 ppm. Average background levles in metropolitan or suburban areas or near highways are much higher and typically range from 200-500 ppm.

TABLE 4.6

SUMMARY OF SOIL PARAMETER EXCEEDANCES
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Parameter	*Sample Exceedance/ Total Number of Samples*	*Exceedance Location*
VOC's		
Acetone	3/11	Site 108-#3*, Site 110-#2*, TP-2 (T&U)
Methylene chloride	3/11	Site 110-# 2*, Site 110-#3*, TP-2 (T&U)
Toluene	2/13	TP-X,Y,Z, and TP-Z
Xylene	2/14	TP-X,Y,Z, and TP-Z
Benzene	6/12	Site 108-#3*, Site 110-#1*, Site 110-#2**, Site 110-#3**, TP-X,Y,Z, and TP-Z
1,2-Trans-dichloroethane	1/2	Site 108-#3*
Ethylbenzene	2/7	TP-X,Y,Z, and TP-Z
Tetrachloroethene	0/2	
Vinyl Chloride	1/2	Site 108-#3*
Acrolein	0/3	
1,1,1-Trichloroethane	0/3	
Cis,1,3-Dichloropropene	0/3	
Styrene	0/4	
	20/86 23%	
BNA's		
Polynucleur Aromatic Hydrocarbons		
Acenaphthene	0/10	
Fluoranthene	0/7	
Naphthalene	3/8	TP-1 (Q&S), TP-X,Y,Z, and TP-Z
Benzo(a)anthracene	5/9	TP-1 (Q&S), TP-2 (T&U), TP-3 (V&W), TP-4 (M&N), TP-Z
Benzo(b)fluoranthene and Benzo(k)fluoranthene	5/9	TP-1 (Q&S), TP-2 (T&U), TP-3 (V&W), TP-4 (M&N), TP-Z
Acenaphthylene	0/8	
Benzo(g,h,i)perylene	0/7	
Fluorene	1/9	TP-Z
Indeno(1,2,3-cd)pyrene	2/9	TP-1 (Q&S), TP-3 (V&W)
Pyrene	1/9	TP-Z
Chrysene	5/11	TP-1 (Q&S), TP-2 (T&U), TP-3 (V&W), TP-4 (M&N), TP-Z

TABLE 4.6

SUMMARY OF SOIL PARAMETER EXCEEDANCES
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Parameter	*Sample Exceedance/ Total Number of Samples*	*Exceedance Location*
Dibenzo (a,h) anthracene	2/6	TP-1 (Q&S), TP-3 (V&W)
Perylene	0/5	
Anthracene	1/7	TP-Z
Phenanthcene	2/8	TP-X,Y,Z, and TP-Z
2-Methynaphthalene	1/7	TP-Z
Base Neutrals		
Diethylphthalate	0/9	
Bis (2-ethylhexyl) phthalate	0/5	
Butylbenzylphthalate	0/2	
Di-n-butylphthalate	0/5	
Di-n-octylphthalate	0/3	
N-nitrosodiphenylamine	0/3	
Metals		
Aluminum	0/8	
Arsenic	1/8	TP-Z
Barium	0/8	
Beryllium	0/6	
Calcium	2/8	TP-1 (Q&S), BH-1 (T&U)
Chromium	1/8	TP-1 (Q&S)
Cobalt	0/6	
Copper	2/8	TP-1 (Q&S), TP-Z
Iron	0/8	
Lead	0/8	
Magnesium	3/8	TP-1 (Q&S), BH-1 (T&U), BH-2 (V&W)
Manganese	0/8	
Mercury	2/6	TP-X,Y,Z, and TP-Z
Nickel	3/8	BH-1 (T&U), TP-X,Y,Z, and TP-Z
Potassium	0/8	
Selenium	0/6	
Sodium	0/8	
Vanadium	0/8	
Zinc	5/8	TP-1 (Q&S), BH-1 (T&U), BH-2 (V&W), TP-X,Y,Z, and TP-Z

TABLE 4.7

USGS STUDY
SUMMARY OF COMPOUNDS DETECTED* IN GROUNDWATER SAMPLES
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Site / *Date*	*Site 108* 7/13/1982	*Site 109* 7/14/1982	*Most Stringent* MCL (µg/L)
Cyanide	280	--	100
Iron	170,000	--	300
Undecone	--	5	--

Note:

-- Indicates no sample information.

TABLE 4.8

MALCOLM PIRNIE, INC. - PHASE II INVESTIGATION
ROUND 1 (NOV. 1985) GROUNDWATER SAMPLES* ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Parameter	*Most Stringent MCL (µg/L)*	*MW-1*	*MW-2*	*MW-3*	*MW-4*	*MW-5*	*MW-6*	*MW-7*
CyanideFree	--	0.038	0.042	0.018	0.011	0.013	***	***
Cyanide-Total	100	0.730	0.740	0.196	0.021	0.030	0.189	0.089
Phenols	1	LT 0.010	0.060	0.520	LT 0.010	LT 0.010	LT 0.025	LT 0.025
Benzene	ND	LT 5.0	LT 5.0	84.0	LT 5.0	LT 5.0	LT 10	LT 10
Toluene	5	LT 5.0	LT 5.0	59.0	LT 5.0	LT 5.0	LT 10	LT 10
p-Xylene	5	LT 5.0	LT 5.0	19.0	LT 5.0	LT 5.0	***	***
m-Xylene/Chlorobenzene	5	LT 5.0	LT 5.0	62.0	LT 5.0	LT 5.0	LT 10	LT 10
O-Xylene	5	LT 5.0	LT 5.0	36.0	LT 5.0	LT 5.0	***	***
Acenaphthene	20	LT 7.0	LT 6.2	59.0	LT 6.0	LT 3.0	LT 10	LT 10
Acenaphthylene	--	LT 12.0	LT 11.0	450.0	LT 11.0	LT 5.0	LT 10	LT 10
Anthracene	50	LT 14.0	LT 15.0	173.0	LT 27.0	LT 12.0	LT 10	LT 10
Benzo(a)pyrene	ND	LT 26.0	LT 24.0	95.0	LT 58.0	LT 24.0	LT 10	LT 10
Benzo(ghi)perylene	--	LT 65.0	LT 59.0	78.0	LT 59.0	LT 24.0	LT 25	LT 25
Chrysene	0.002	LT 21.0	LT 19.0	9.0	88.0	LT 19.0	LT 10	LT 10
Fluoranthene	50	LT 14.0	LT 12.0	400.0	LT 16.0	LT 12.0	LT 10	LT 10
Fluorene	50	LT14.0	LT 12.0	99.0	LT 26.0	LT 12.0	LT 10	LT 10
Indeno (1,2,3-c,d) pyrene	0.002	LT 250.0	LT 229.0	95.0	LT 229.0	LT 229.0	LT 25	LT 25
Naphthalene	10	LT 13.0	LT 10.0	4,540.0	LT 36.0	LT 6.0	LT 10	LT 10
Phenanthrene	50	LT 12.0	LT 15.0	1,100.0	LT 11.0	LT 11.0	LT 10	LT 10
Pyrene	50	LT 24.0	LT 22.0	302.0	LT 22.0	LT 22.0	LT 10	LT 10
TOX	--	0.62	10.0	61.0	1.90	0.19	***	***
Arsenic	25						0.013	0.022
Copper	200						0.02	LT 0.01
Nickel	--						LT 0.01	0.05
Zinc	300						0.18	0.14

* All results in µg/L, except Cyanides, Phenols and metals (mg/L)
** Applies to sum of isomers
*** Parameter not analyzed
LT(x) Parameter not detected at associated x value

TABLE 4.9

MALCOLM PIRNIE, INC. - PHASE II INVESTIGATION
ROUND 2 (AUG. 1986) GROUNDWATER SAMPLES* ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

	Most Stringent MCL (µg/L)	*MW-1*	*MW-2*	*MW-3*	*MW-4*	*MW-5*	*MW-6*	*MW-7*
Cyanide-T	100	NA**	0.500	0.120	0.030	0.043	0.198	0.064
Phenols	1	NA	LT 0.010	0.050	LT 0.010	LT 0.010	LT 0.010	LT 0.010
Benzene	ND	NA	LT 5.0	6.7	LT 5.0	LT 5.0	LT 5.0	LT 5.0
Toluene	5	NA	LT 5.0	11.0	LT 5.0	LT 5.0	LT 5.0	LT 5.0
Chlorobenzene	5	NA	LT 5.0	22.0	LT 5.0	LT 5.0	LT 5.0	LT 5.0
1,4-Dichlorobenzene	5	NA	LT 5.0	29.0	LT 5.0	LT 5.0	LT 5.0	LT 5.0
Total Xylenes	5	NA	LT 15.0	45.0	LT 15.0	LT 15.0	LT 15.0	LT 15.0
Acenaphthylene	--	NA	LT 44.0	146.0	LT 41.0	LT 45.0	LT 42.0	LT 43.0
Fluroranthene	50	NA	LT 27.0	37.0	LT 24.0	LT 27.0	LT 25.0	LT 26.0
Fluorene	50	NA	LT 50.0	110.0	LT 46.0	LT 51.0	LT 48.0	LT 49.0
TOX	N/A --	NA	2.73	11.3	6.01	2.07	0.59	0.93

* All results in µg/L, except Cyanide-T and Phenols (mg/L)
** Well damaged, no sample
*** Applies to sum of para (1,4-) and ortho (1,2-) isomers
LT(x) Parameter not detected at associated x value
NA - Parameter not analyzed

TABLE 4.10

CRA SUPPLEMENTAL SITE INVESTIGATION
GROUNDWATER SAMPLE ANALYTICAL RESULTS - VOCs
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Source	*MW-2*	*MW-2 dup*	*MW-2 dup*	*MW-2*	*MW-3*	*MW-3 dup*	*MW-3*
Sample ID	*W-2428-DT-004*	*W-2428-DT-005*	*W-2428-DT-006*	*W-2428-DT-017*	*W-2428-DT-007*	*W-2428-DT-008*	*W-2428-DT-032*
Date	*6/28/1989*	*6/28/1989*	*6/28/1989*	*10/11/1989*	*6/28/1989*	*6/28/1989*	*10/18/1989*
Units	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
Methylene Chloride	ND(5)	ND(5)	ND(5)	NA	ND(5)	ND(5)	NA
Acetone	ND(10)	ND(10)	ND(10)	NA	ND(10)	ND(10)	NA
1,2-Dichloroethene (total)	ND(5)	ND(5)	ND(5)	ND(1.0)	ND(5)	ND(5)	ND(1.0)
1,1,1-Trichloroethane	ND(5)	ND(5)	ND(5)	ND(1.0)	7D	8D	12.2D
Benzene	ND(5)	ND(5)	ND(5)	ND(1.0)	ND(5)	ND(5)	2.71AE
Toluene	ND(5)	ND(5)	ND(5)	ND(1.0)	ND(5)	ND(5)	ND(1.0)
Ethylbenzene	ND(5)	ND(5)	ND(5)	ND(1.0)	ND(5)	ND(5)	1.66E
Total Xylenes	ND(5)	ND(5)	ND(5)	ND(1.0)	ND(5)	ND(5)	ND(1.0)

Source	*MW3R-89*	*MW3R-89 dup*	*MW3R-89*	*MW-4*	*MW-4*	*MW-5*	*MW-5*
Sample ID	*W-2428-DT-033*	*W-2428-DT-034*	*W-2428-DT-049*	*W-2428-DT-015*	*W-2428-DT-058*	*W-2428-DT-019*	*W-2428-DT-053*
Date	*10/18/1989*	*10/18/1989*	*12/13/1989*	*10/11/1989*	*12/15/1989*	*10/12/1989*	*12/13/1989*
Units	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
Methylene Chloride	NA	NA	6.96*	NA	ND(5)	NA	8.04*
Acetone	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,1,1-Trichloroethane	11.4DE	10.6DE	12.2D	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Benzene	2.41AE	2.46AE	2.08A	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Toluene	1.10E	1.44E	1.24	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Ethylbenzene	ND(1.0)	1.80E	1.13	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Total Xylenes	2.34E	6.35DE	6.89D	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)

TABLE 4.10

CRA SUPPLEMENTAL SITE INVESTIGATION
GROUNDWATER SAMPLE ANALYTICAL RESULTS - VOCs
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Source	*MW-6*	*MW-6*	*MW-7*	*MW-7 dup*	*MW-7*	*MW-7 dup*	*MW8-89*
Sample ID	*W-2428-DT-014*	*W-2428-DT-055*	*W-2428-DT-012*	*W-2428-DT-013*	*W-2428-DT-051*	*W-2428-DT-052*	*W-2428-DT-009*
Date	*10/10/1989*	*12/13/1989*	*10/9/1989*	*10/9/1989*	*12/13/1989*	*12/13/1989*	*6/30/1989*
Units	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
Methylene Chloride	NA	ND(5)	NA	NA	ND(5)	5.61*	ND(5)
Acetone	NA	NA	NA	NA	NA	NA	34*
1,2-Dichloroethene (total)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	6D
1,1,1-Trichloroethane	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(5)
Benzene	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	41AD
Toluene	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	16D
Ethylbenzene	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	8D
Total Xylenes	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	27D

Source	*MW9-89*	*MW9-89*	*MW10-89*	*MW11-89*	*MW11-89*	*MW12-89*	*MW12-89*
Sample ID	*W-2428-DT-001*	*W-2428-DT-061*	*W-2428-DT-060*	*W-2428-DT-026*	*W-2428-DT-059*	*W-2428-DT-030*	*W-2428-DT-048*
Date	*6/26/1989*	*12/19/1989*	*12/19/1989*	*12/19/1990*	*12/19/1989*	*10/18/1989*	*12/12/1989*
Units	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
Methylene Chloride	ND(5)	ND(5)	ND(5)	NA	ND(5)	NA	ND(5)
Acetone	ND(10)	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	ND(5)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
1,1,1-Trichloroethane	ND(5)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Benzene	ND(5)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Toluene	ND(5)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Ethylbenzene	ND(5)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Total Xylenes	ND(5)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)

TABLE 4.10

CRA SUPPLEMENTAL SITE INVESTIGATION
GROUNDWATER SAMPLE ANALYTICAL RESULTS - VOCs
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Source	*MW13-89*	*MW13-89*	*MW13-89*	*MW14-89*	*MW14-89*	*MW15-89*	*MW15-89*
Sample ID	*W-2428-DT-016*	*W-2428-DT-046*	*W-2428-DT-047*	*W-2428-DT-010*	*W-2428-DT-063*	*W-2428-DT-025*	*W-2428-DT-054*
Date	*10/17/1989*	*12/12/1989*	*12/12/1989*	*7/5/1989*	*12/20/1989*	*10/17/1989*	*12/14/1989*
Units	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
Methylene Chloride	NA	ND(5)	ND(5)	ND(10)	5.15*	NA	ND(5)
Acetone	NA	NA	NA	240D	NA	NA	NA
1,2-Dichloroethene (total)	ND(1.0)	ND(1.0)	ND(1.0)	ND(10)	ND(1.0)	ND(10)	ND(1.0)
1,1,1-Trichloroethane	ND(1.0)	ND(1.0)	ND(1.0)	ND(10)	ND(1.0)	ND(10)	ND(1.0)
Benzene	ND(1.0)	ND(1.0)	ND(1.0)	ND(10)	ND(1.0)	ND(10)	ND(1.0)
Toluene	ND(1.0)	ND(1.0)	ND(1.0)	ND(10)	ND(1.0)	ND(10)	ND(1.0)
Ethylbenzene	ND(1.0)	ND(1.0)	ND(1.0)	ND(10)	ND(1.0)	ND(10)	ND(1.0)
Total Xylenes	ND(1.0)	ND(1.0)	ND(1.0)	ND(10)	ND(1.0)	ND(10)	ND(1.0)

Source	*MW16-89*	*MW16-89*	*MW17-89*	*MW17-89*	*Most*
Sample ID	*W-2428-DT-020*	*W-2428-DT-062*	*W-2428-DT-002*	*W-2428-DT-057*	*Stringent*
Date	*10/17/1989*	*12/19/1989*	*6/27/1989*	*12/15/1989*	*MCL*
Units	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
Methylene Chloride	NA	5.74*	ND(5)	ND(5)	5
Acetone	NA	NA	36*	NA	50
1,2-Dichloroethene (total)	ND(10)	ND(1.0)	ND(5)	ND(1.0)	5
1,1,1-Trichloroethane	ND(10)	ND(1.0)	ND(5)	ND(1.0)	5
Benzene	ND(10)	3.76A	ND(5)	ND(1.0)	ND
Toluene	ND(10)	ND(1.0)	ND(5)	ND(1.0)	5
Ethylbenzene	ND(10)	ND(1.0)	ND(5)	ND(1.0)	5
Total Xylenes	ND(10)	ND(1.0)	ND(5)	ND(1.0)	5

Notes:

All other TCL VOCs were not detected during Round 1 (June 1989) sampling.
* Also present in laboratory/reagent blank, indicating possible/probable laboratory contamination.
A The associated value exceeded NYSDEC Class GA Groundwater Standards (6NYCRR Part 703.5).
D The associated value exceeded NYSDOH Drinking Water Standards (Sanitary Code Part 5).
ND Not detected above quantifiable limits stated in parentheses.
E The associated data is estimated due to outlying surrogate recoveries.
NA Not analyzed for the particular parameter as it was not included in the SSIs.

TABLE 4.11

CRA SUPPLEMENTAL SITE INVESTIGATION
GROUNDWATER SAMPLE ANALYTICAL RESULTS - BNAs
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Source	*MW-2*	*MW-2 dup*	*MW-2 dup*	*MW-2*	*MW-3*	*MW-3 dup*	*MW-3*
Sample ID	*W-2428-DT-004*	*W-2428-DT-005*	*W-2428-DT-006*	*W-2428-DT-017*	*W-2428-DT-007*	*W-2428-DT-008*	*W-2428-DT-032*
Date	*6/28/1989*	*6/28/1989*	*6/28/1989*	*10/11/1989*	*6/28/1989*	*6/28/1989*	*10/18/1989*
Units	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
Naphthalene	ND(10)	ND(10)	ND(10)	ND(3)	73D	100D	ND(3)
2-Methylnaphthalene	ND(10)	ND(10)	ND(10)	ND(3)	25	ND(10)	3.71
Acenapthylene	ND(10)	ND(10)	ND(10)	ND(3)	30	31	62.1D
Acenaphthene	ND(10)	ND(10)	ND(10)	ND(3)	ND(10)	ND(10)	19.2
Fluorene	ND(10)	ND(10)	ND(10)	ND(3)	45	49	112D
Phenanthrene	ND(10)	ND(10)	ND(10)	ND(3)	29	38	148D
Anthracene	ND(10)	ND(10)	ND(10)	ND(3)	ND(10)	ND(10)	17.1
Fluoranthene	ND(10)	ND(10)	ND(10)	ND(3)	34	16	21.3
Pyrene	ND(10)	ND(10)	ND(10)	ND(3)	21	15	11.2
Benzo(a)anthracene	ND(10)	ND(10)	ND(10)	ND(3)	ND(10)	ND(10)	ND(3)
Chrysene	ND(10)	ND(10)	ND(10)	ND(3)	ND(10)	ND(10)	ND(3)
Benzo(b)fluoranthene (1)	ND(10)	ND(10)	ND(10)	ND(3)	15	ND(10)	ND(3)
Benzo(k)fluoranthene (1)	ND(10)	ND(10)	ND(10)	ND(3)	15	ND(10)	ND(3)
Benzo(a)pyrene	ND(10)	ND(10)	ND(10)	ND(3)	ND(10)	ND(10)	ND(3)
Dibenzofuran	ND(10)	ND(10)	ND(10)	NA	34	37	NA
Benzo(g,h,i)perylene	NA	NA	NA	ND(3)	NA	NA	ND(3)
Indeno(1,2,3-c,d)pyrene	NA	NA	NA	ND(3)	NA	NA	ND(3)
2-Chloronaphthalene	NA	NA	NA	ND(3)	NA	NA	ND(3)

TABLE 4.11

CRA SUPPLEMENTAL SITE INVESTIGATION
GROUNDWATER SAMPLE ANALYTICAL RESULTS - BNAs
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Source	*MW3R-89*	*MW3R-89 dup*	*MW3R-89*	*MW-4*	*MW-4*	*MW-5*	*MW-5*
Sample ID	*W-2428-DT-033*	*W-2428-DT-034*	*W-2428-DT-049*	*W-2428-DT-015*	*W-2428-DT-058*	*W-2428-DT-019*	*W-2428-DT-053*
Date	*10/18/1989*	*10/18/1989*	*12/13/1989*	*10/11/1989*	*12/15/1989*	*10/12/1989*	*12/13/1989*
Units	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
Naphthalene	459ED	486ED	404D	ND(3)	ND(3)	ND(3)	ND(3)
2-Methylnaphthalene	57.1ED	80.6ED	33.5	ND(3)	ND(3)	ND(3)	ND(3)
Acenapthylene	64.0ED	83.1ED	40.1	ND(3)	ND(3)	ND(3)	ND(3)
Acenaphthene	55.5ED	72.3ED	34.2	ND(3)	ND(3)	ND(3)	ND(3)
Fluorene	124ED	154ED	61.2D	ND(3)	ND(3)	ND(3)	ND(3)
Phenanthrene	264ED	287ED	76.8D	ND(3)	ND(3)	ND(3)	ND(3)
Anthracene	55.0ED	36.8E	12.9	ND(3)	ND(3)	ND(3)	ND(3)
Fluoranthene	90.9ED	77.0ED	12.9	ND(3)	ND(3)	ND(3)	ND(3)
Pyrene	69.3ED	70.2ED	8.21	ND(3)	ND(3)	ND(3)	ND(3)
Benzo(a)anthracene	52.7ED	35.0E	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)
Chrysene	32.6E	18.8E	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)
Benzo(b)fluoranthene (1)	49.2E	27.0E	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)
Benzo(k)fluoranthene (1)	49.2E	27.0E	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)
Benzo(a)pyrene	28.8EA	13.2EA	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)
Dibenzofuran	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)
Indeno(1,2,3-c,d)pyrene	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)
2-Chloronaphthalene	16.7E	21.8E	9.34	ND(3)	ND(3)	ND(3)	ND(3)

TABLE 4.11

CRA SUPPLEMENTAL SITE INVESTIGATION
GROUNDWATER SAMPLE ANALYTICAL RESULTS - BNAs
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Source	*MW-6*	*MW-6*	*MW-7*	*MW-7 dup*	*MW-7*	*MW-7 dup*	*MW8-89*
Sample ID	*W-2428-DT-014*	*W-2428-DT-055*	*W-2428-DT-012*	*W-2428-DT-013*	*W-2428-DT-051*	*W-2428-DT-052*	*W-2428-DT-009*
Date	*10/10/1989*	*12/13/1989*	*10/9/1989*	*10/9/1989*	*12/13/1989*	*12/13/1989*	*6/30/1989*
Units	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
Naphthalene	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	1,900D
2-Methylnaphthalene	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	19
Acenapthylene	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(10)
Acenaphthene	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(10)
Fluorene	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(10)
Phenanthrene	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(10)
Anthracene	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(10)
Fluoranthene	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(10)
Pyrene	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(10)
Benzo(a)anthracene	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(10)
Chrysene	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(10)
Benzo(b)fluoranthene (1)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(10)
Benzo(k)fluoranthene (1)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(10)
Benzo(a)pyrene	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(10)
Dibenzofuran	NA	NA	NA	NA	NA	NA	ND(10)
Benzo(g,h,i)perylene	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	NA
Indeno(1,2,3-c,d)pyrene	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	NA
2-Chloronaphthalene	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	NA

TABLE 4.11

CRA SUPPLEMENTAL SITE INVESTIGATION
GROUNDWATER SAMPLE ANALYTICAL RESULTS - BNAs
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Source	*MW9-89*	*MW9-89*	*MW10-89*	*MW11-89*	*MW11-89*	*MW12-89*	*MW12-89*
Sample ID	*W-2428-DT-001*	*W-2428-DT-061*	*W-2428-DT-060*	*W-2428-DT-026*	*W-2428-DT-059*	*W-2428-DT-030*	*W-2428-DT-048*
Date	*6/26/1989*	*12/19/1989*	*12/19/1989*	*10/17/1989*	*12/19/1989*	*10/18/1989*	*12/12/1989*
Units	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
Naphthalene	ND(10)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)
2-Methylnaphthalene	ND(10)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)
Acenapthylene	ND(10)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)
Acenaphthene	ND(10)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)
Fluorene	ND(10)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)
Phenanthrene	ND(10)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)
Anthracene	ND(10)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)
Fluoranthene	ND(10)	ND(3)	ND(3)	8.76	ND(3)	ND(3)	ND(3)
Pyrene	ND(10)	ND(3)	ND(3)	ND(3)	ND(3)	10.4R	ND(3)
Benzo(a)anthracene	ND(10)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)
Chrysene	ND(10)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)
Benzo(b)fluoranthene (1)	ND(10)	ND(3)	ND(3)	4.26	ND(3)	ND(3)	ND(3)
Benzo(k)fluoranthene (1)	ND(10)	ND(3)	ND(3)	4.26	ND(3)	ND(3)	ND(3)
Benzo(a)pyrene	ND(10)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)
Dibenzofuran	ND(10)	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)
Indeno(1,2,3-c,d)pyrene	NA	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)
2-Chloronaphthalene	NA	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)

TABLE 4.11

CRA SUPPLEMENTAL SITE INVESTIGATION
GROUNDWATER SAMPLE ANALYTICAL RESULTS - BNAs
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Source	*MW13-89*	*MW13-89*	*MW13-89 dup*	*MW14-89*	*MW14-89*	*MW15-89*	*MW15-89*
Sample ID	*W-2428-DT-016*	*W-2428-DT-046*	*W-2428-DT-047*	*W-2428-DT-010*	*W-2428-DT-063*	*W-2428-DT-025*	*W-2428-DT-054*
Date	*10/17/1989*	*12/12/1989*	*12/12/1989*	*7/5/1989*	*12/20/1989*	*10/17/1989*	*12/14/1989*
Units	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
Naphthalene	ND(3)	ND(3)	ND(3)	ND(10)	ND(3)	7.46	ND(3)
2-Methylnaphthalene	ND(3)	ND(3)	ND(3)	ND(10)	ND(3)	4.69	ND(3)
Acenapthylene	ND(3)	ND(3)	ND(3)	ND(10)	ND(3)	ND(3)	ND(3)
Acenaphthene	ND(3)	ND(3)	ND(3)	ND(10)	ND(3)	ND(3)	ND(3)
Fluorene	ND(3)	ND(3)	ND(3)	ND(10)	ND(3)	6.49	ND(3)
Phenanthrene	ND(3)	ND(3)	ND(3)	ND(10)	ND(3)	15.6	ND(3)
Anthracene	ND(3)	ND(3)	ND(3)	ND(10)	ND(3)	ND(3)	ND(3)
Fluoranthene	ND(3)	ND(3)	ND(3)	ND(10)	ND(3)	30.9	ND(3)
Pyrene	ND(3)	ND(3)	ND(3)	ND(10)	ND(3)	18.8	ND(3)
Benzo(a)anthracene	ND(3)	ND(3)	ND(3)	ND(10)	ND(3)	17.2	ND(3)
Chrysene	ND(3)	ND(3)	ND(3)	ND(10)	ND(3)	10.5	ND(3)
Benzo(b)fluoranthene (1)	ND(3)	ND(3)	ND(3)	ND(10)	ND(3)	19.0	ND(3)
Benzo(k)fluoranthene(1)	ND(3)	ND(3)	ND(3)	ND(10)	ND(3)	19.0	ND(3)
Benzo(a)pyrene	ND(3)	ND(3)	ND(3)	ND(10)	ND(3)	12.4A	ND(3)
Dibenzofuran	NA	NA	NA	ND(10)	NA	NA	NA
Benzo(g,h,i)perylene	ND(3)	ND(3)	ND(3)	NA	ND(3)	9.17	ND(3)
Indeno(1,2,3-c,d)pyrene	ND(3)	ND(3)	ND(3)	NA	ND(3)	14.3	ND(3)
2-Chloronaphthalene	ND(3)	ND(3)	ND(3)	NA	ND(3)	3.47	ND(3)

TABLE 4.11

CRA SUPPLEMENTAL SITE INVESTIGATION
GROUNDWATER SAMPLE ANALYTICAL RESULTS - BNAs
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Source	*MW16-89*	*MW16-89*	*MW17-89*	*MW17-89*	*Most*
Sample ID	*W-2428-DT-020*	*W-2428-DT-062*	*W-2428-DT-002*	*W-2428-DT-057*	*Stringent*
Date	*10/17/1989*	*12/19/1989*	*6/27/1989*	*12/15/1989*	*MCL*
Units	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
Naphthalene	ND(3)	ND(3)	ND(10)	ND(3)	50
2-Methylnaphthalene	ND(3)	ND(3)	ND(10)	ND(3)	50
Acenapthylene	ND(3)	ND(3)	ND(10)	ND(3)	50
Acenaphthene	ND(3)	ND(3)	ND(10)	ND(3)	50
Fluorene	ND(3)	ND(3)	ND(10)	ND(3)	50
Phenanthrene	ND(3)	ND(3)	ND(10)	ND(3)	50
Anthracene	ND(3)	ND(3)	ND(10)	ND(3)	50
Fluoranthene	ND(3)	ND(3)	ND(10)	ND(3)	50
Pyrene	ND(3)	ND(3)	ND(10)	ND(3)	50
Benzo(a)anthracene	ND(3)	ND(3)	ND(10)	ND(3)	50
Chrysene	ND(3)	ND(3)	ND(10)	ND(3)	50
Benzo(b)fluoranthene (1)	ND(3)	ND(3)	ND(10)	ND(3)	50
Benzo(k)fluoranthene(1)	ND(3)	ND(3)	ND(10)	ND(3)	50
Benzo(a)pyrene	ND(3)	ND(3)	ND(10)	ND(3)	ND
Dibenzofuran	NA	NA	ND(10)	NA	50
Benzo(g,h,i)perylene	ND(3)	ND(3)	NA	ND(3)	50
Indeno(1,2,3-c,d)pyrene	ND(3)	ND(3)	NA	ND(3)	50
2-Chloronaphthalene	ND(3)	ND(3)	NA	ND(3)	50

Notes:

All other TCL BNAs were not detected during Round 1 (June 1989) sampling.

A The associated value exceeded NYSDEC Class GA Groundwater Standards (6NYCRR Part 703.5).

D The associated value exceeded NYSDOH Drinking Water Standards (Sanitary Code Part 5).

ND Not detected above quantifiable limits stated in parentheses.

E The associated data is estimated due to outlying surrogate recoveries.

NA Not analyzed for the particular parameter as it was not included in the SSIs.

(1) Indistinguishable isomers, reported value is total concentration.

TABLE 4.12

CRA SUPPLEMENTAL SITE INVESTIGATION
GROUNDWATER SAMPLE ANALYTICAL RESULTS - METALS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Source	*MW-2*	*MW-2 dup*	*MW-2 dup*	*MW-2 (filt.)*	*MW-2 (filt.) dup*	*MW-2 (filt.) dup*
Sample ID	*W-2428-DT-004*	*W-2428-DT-005*	*W-2428-DT-006*	*W-2428-DT-004*	*W-2428-DT-005*	*W-2428-DT-006*
Date	*6/28/1989*	*6/28/1989*	*6/28/1989*	*6/28/1989*	*6/28/1989*	*6/28/1989*
Units	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
Aluminum	163	226	98.5	ND(23.0)	35.1	ND(23.0)
Arsenic	1.9	2.1	1.4	3.6	3.8	3.3
Barium	48.9	51.3	49.4	47.0	47.0	42.8
Beryllium	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.70)	ND(0.70)	ND(0.70)
Calcium	120,000	120,000	123,000	149,000	140,000	140,000
Chromium	4.6	3.8	ND(3.8)	ND(6.2)	ND(6.2)	ND(6.2)
Cobalt	3.7	ND(3.3)	ND(3.3)	9.2	9.0	9.2
Copper	ND(7.3)	ND(7.3)	ND(7.3)	ND(7.2)	ND(7.2)	ND(7.2)
Iron	6,130A	6,290A	5,390A	15,800A	14,100A	14,800A
Lead	2.0	ND(0.90)	ND(0.90)W	ND(1.1)	ND(1.1)	ND(1.1)
Magnesium	12,700E	12,700E	12,800E	15,400E	14,600E	14,400E
Manganese	801A	894A	846A	1,510A	1,330A	1,420A
Mercury	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)X	ND(0.20)X	ND(0.20)X
Nickel	ND(18.6)	ND(18.6)	ND(18.6)	ND(35.8)	ND(35.8)	ND(35.8)
Potassium	2,810	2,460	1,950	6,190	6,200	5,970
Selenium	ND(10.0)E	ND(10.0)E	ND(10.0)Y	ND(16.0)	ND(16.0)	ND(16.0)
Silver	ND(4.9)	ND(4.9)	ND(4.9)	ND(5.7)	ND(5.7)	ND(5.7)
Sodium	10,700	10,500	10,000	12,500	11,800	12,100
Vanadium	ND(2.6)	ND(2.6)	ND(2.6)	8.1	7.8	8.2
Zinc	64.0	31.6	57.1	28.0	26.5	37.2

TABLE 4.12

CRA SUPPLEMENTAL SITE INVESTIGATION
GROUNDWATER SAMPLE ANALYTICAL RESULTS - METALS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Source	*MW-3*	*MW-3 dup*	*MW-3 (filt.)*	*MW-3 (filt.) dup*	*MW8-89*	*MW8-89 (filt.)*
Sample ID	*W-2428-DT-007*	*W-2428-DT-008*	*W-2428-DT-007*	*W-2427-DT-008*	*W-2428-DT-009*	*W-2428-DT-009*
Date	*6/28/1989*	*6/28/1989*	*6/28/1989*	*6/28/1989*	*6/28/1989*	*6/28/1989*
Units	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
Aluminum	172	104	ND(23.0)	ND(23.0)	139	166
Arsenic	3.2	1.4	3.1	3.2	ND(1.2)	ND(1.2)
Barium	43.1	40.7	40.4	41.8	37.8E	39.4
Beryllium	ND(0.50)	ND(0.50)	ND(0.70)	ND(0.70)	3.6	ND(0.70)
Calcium	131,000	130,000	125,000	124,000	599,000E	626,000
Chromium	3.8	ND(3.8)	ND(6.2)	ND(6.2)	9.0	ND(6.2)
Cobalt	ND(3.3)	ND(3.3)	5.3	ND(3.9)	23.1	17.6
Copper	9.4	ND(7.3)	ND(7.2)	ND(7.2)	ND(7.3)	ND(7.2)
Iron	3,300A	2,900A	2,700A	2,590A	31,200EA	33,100A
Lead	11.8	ND(0.90)	ND(1.1)	ND(1.1)	ND(0.90)	1.4
Magnesium	19,500E	19,400E	18,000E	18,000E	53,300E	55,600
Manganese	1,070A	1,040A	1,050A	1,040A	2,340EA	2,430A
Mercury	ND(0.20)	ND(0.20)	ND(0.20)X	ND(0.20)X	ND(0.20)	ND(0.20)R
Nickel	ND(18.6)	ND(18.6)	ND(35.8)	ND(35.8)	ND(18.6)	ND(35.8)
Potassium	6,000	6,850	10,200	10,700	22,300	17,800
Selenium	ND(5.0)	ND(10.0)	ND(16.0)	ND(16.0)	ND(10.0)	ND(16.0)
Silver	ND(4.9)	ND(4.9)	ND(5.7)	ND(5.7)	5.4	ND(5.7)
Sodium	29,500B	29,800B	28,900B	28,100B	80,300EB	82,600B
Vanadium	ND(2.6)	ND(2.6)	4.6	5.0	77.8	64.0
Zinc	143	167	24	16.7	83.4E	87.9

TABLE 4.12

CRA SUPPLEMENTAL SITE INVESTIGATION
GROUNDWATER SAMPLE ANALYTICAL RESULTS - METALS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Source	*MW9-89*	*MW9-89 (filt.)*	*MW14-89*	*MW14-89 (filt.)*	*MW17-89*	*MW17-89 (filt.)*	*Most*
Sample ID	*W-2428-DT-001*	*W-2428-DT-008*	*W-2428-DT-010*	*W-2428-DT-010*	*W-2428-DT-002*	*W-2428-DT-002*	*Stringent*
Date	*6/26/1989*	*6/26/1989*	*6/26/1989*	*6/26/1989*	*6/26/1989*	*6/26/1989*	*MCL*
Units	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
Aluminum	5,190	49.1	8770	40.2	127	26.5	
Arsenic	6.1	4.6	3.6	1.7	4.9	9.3	25
Barium	177	80.7	145E	62.5E	92.9	93.9	1,000
Beryllium	ND(0.50)	ND(0.70)	3.7	ND(0.50)	ND(0.50)	ND(0.70)	
Calcium	162,000	161,000	196,000E	132,000	199,000	207,000	
Chromium	4.2	ND(6.2)	23.3	ND(3.8)	ND(3.8)	ND(6.2)	50
Cobalt	ND(3.3)	ND(3.9)	12.2	4.2	ND(3.3)	5.5	
Copper	ND(7.3)	ND(7.2)	10.2	24.5	ND(7.3)	ND(7.2)	200
Iron	7,630A	52.3	11,500EA	28	5,330A	3,300A	300
Lead	2.7	ND(1.1)W	5.8E	ND(4.5)	ND(0.9)	ND(1.1)	25
Magnesium	28,600E	28,500E	57,200E	34,500	56,100E	58,600E	
Manganese	1,850A	1,540A	3,550EA	1,080A	847A	1,050A	300
Mercury	ND(0.20)	0.32X	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)X	2
Nickel	30.2	ND(35.8)	153	32.6	52.0	64.1	
Potassium	2,680	5,910	5,630	ND(1,740)	9,680	13,400	
Selenium	11.6CDB	ND(16.0)W	ND(10.0)	ND(10.0)C	ND(10.0)C	ND(16.0)	10
Silver	ND(4.9)	ND(5.7)	ND(4.9)	ND(4.9)	ND(4.9)	ND(5.7)	50
Sodium	7,360C	10,100	188,000EB	151,000B	137,000CB	142,000B	20,000*
Vanadium	10.4	9.2	38.5	7.2	3.0	7.6	
Zinc	60.2	19.2	72.1E	21.2	46.3	11.8	300

Notes:

All other TAL metals were not detected.

E The associated data is estimated due to chemical and/or physical interferences.

X The associated data is estimated due to holding time exceedences.

A The associated value exceeded NYSDEC Class GA Groundwater Standards (6NYCRR Part 703.5).

D The associated value exceeded NYSDOH Drinking Water Standards (Sanitary Code Part 5).

B The associated value exceeded NYSDOH Raw Water Supply Standards (10NYCRR Part 170).

* Water containing more than 20,000 µg/L of sodium should not be used for drinking by people on severely restricted sodium diets (270,000 µg/L for moderately restricted).

ND Not detected above quantifiable limits stated in parentheses.

C The associated data is estimated due to outlying calibration data.

R Unusable data due to holding time exceedance.

W Indicates low spike recoveries and may reflect a low bias in results.

Y The associated data is unusable due to spike recoveries.

TABLE 4.13

CRA SUPPLEMENTAL SITE INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - OTHER COMPOUNDS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Source	*MW-2*	*MW-2 dup*	*MW-2 dup*	*MW-2*	*MW-3*	*MW-3 dup*	*MW-3*
Sample ID	*W-2428-DT-004*	*W-2428-DT-005*	*W-2428-DT-006*	*W-2428-DT-017*	*W-2428-DT-007*	*W-2428-DT-008*	*W-2428-DT-032*
Date	*6/28/1989*	*6/28/1989*	*6/28/1989*	*10/11/1989*	*6/28/1989*	*6/28/1989*	*10/18/1989*
Units	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
Cyanide	230AB	259AB	254AB	620AB	79.6	79.0	220AB
Hexavalent Chromium	ND(10)	NA	NA	ND(10)	ND(10)	ND(10)	ND(10)
Oil and Grease	1,500	ND(1,000)	ND(1,000)	3,500	ND(1,000)	ND(1,000)	ND(1,000)

Source	*MW3R-89*	*MW3R-89 dup*	*MW3R-89*	*MW-4*	*MW-4*	*MW-5*	*MW-5*
Sample ID	*W-2428-DT-033*	*W-2428-DT-034*	*W-2428-DT-049*	*W-2428-DT-015*	*W-2428-DT-058*	*W-2428-DT-019*	*W-2428-DT-053*
Date	*10/18/1989*	*10/18/1989*	*12/13/1989*	*10/11/1989*	*12/15/1989*	*10/12/1989*	*12/13/1989*
Units	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
Cyanide	120B	160B	ND(10)	60	30	40	44
Hexavalent Chromium	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)
Oil and Grease	4,800	3,900	ND(1,000)	ND(1,000)	ND(1,000)	ND(1,000)	ND(1,000)

Source	*MW-6*	*MW-6*	*MW-7*	*MW-7 dup*	*MW-7*	*MW-7 dup*	*MW8-89*
Sample ID	*W-2428-DT-014*	*W-2428-DT-055*	*W-2428-DT-012*	*W-2428-DT-013*	*W-2428-DT-051*	*W-2428-DT-052*	*W-2428-DT-009*
Date	*10/10/1989*	*12/13/1989*	*10/9/1989*	*10/9/1989*	*12/13/1989*	*12/13/1989*	*6/30/1989*
Units	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
Cyanide	320AB	300AB	90	70	167B	170B	3,730AB
Hexavalent Chromium	NA	ND(10)	ND(10)	ND(10)	ND(10)	50	ND(10)
Oil and Grease	7,100	ND(1,000)	3,700	ND(1,000)	ND(1,000)	ND(1,000)	7,400

TABLE 4.13

CRA SUPPLEMENTAL SITE INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS - OTHER COMPOUNDS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Source	*MW9-89*	*MW9-89*	*MW10-89*	*MW11-89*	*MW11-89*	*MW12-89*	*MW12-89*
Sample ID	*W-2428-DT-001*	*W-2428-DT-061*	*W-2428-DT-060*	*W-2428-DT-026*	*W-2428-DT-059*	*W-2428-DT-030*	*W-2428-DT-048*
Date	*6/26/1989*	*12/19/1989*	*12/19/1989*	*10/17/1989*	*12/19/1989*	*10/18/1989*	*12/12/1989*
Units	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
Cyanide	ND(10.0)	30	19	10	12	30	24
Hexavalent Chromium	20X	ND(10)	10	ND(10)	ND(10)	ND(10)	ND(10)
Oil and Grease	ND(1,000)	ND(1,000)	6,300	ND(1,000)	ND(1,000)	ND(1,000)	ND(1,000)

Source	*MW13-89*	*MW13-89*	*MW13-89 dup*	*MW14-89*	*MW14-89*	*MW15-89*	*MW15-89*
Sample ID	*W-2428-DT-016*	*W-2428-DT-046*	*W-2428-DT-047*	*W-2428-DT-010*	*W-2428-DT-063*	*W-2428-DT-025*	*W-2428-DT-054*
Date	*10/17/1989*	*12/12/1989*	*12/12/1989*	*7/5/1989*	*12/20/1989*	*10/17/1989*	*12/14/1989*
Units	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
Cyanide	2,750AB	1,690AB	1,720AB	48.4	21	250AB	147B
Hexavalent Chromium	ND(10)	ND(10)	ND(10)	20X	ND(10)	ND(10)	ND(10)
Oil and Grease	ND(1,000)	ND(1,000)	ND(1,000)	ND(1,000)	NS	2,200	ND(1,000)

Source	*MW16-89*	*MW16-89*	*MW17-89*	*MW17-89*	*Most*
Sample ID	*W-2428-DT-020*	*W-2428-DT-062*	*W-2428-DT-002*	*W-2428-DT-057*	*Stringent*
Date	*10/17/1989*	*12/19/1989*	*6/27/1989*	*12/15/1989*	*MCL*
Units	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
Cyanide	10	15	13.8	270AB	100
Hexavalent Chromium	ND(10)	10	20X	ND(10)	50
Oil and Grease	5,500	ND(1,000)	ND	ND(1,000)	

Notes:

ND - Not detected above quantifiable limit stated in parentheses
NS - No sample due to laboratory accident
NA - Not analyzed
X - The associated data is estimated due to holding time exceedance.
B - The associated value exceeded NYSDOH Raw Water Supply Standards (10NYCRR Part 170).
A - The associated value exceeded NYSDEC Class GA groundwater Standards (6NYCRR Part 703.5).

TABLE 4.14

CRA ADDITIONAL SITE INVESTIGATION
GROUNDWATER SAMPLE ANALYTICAL RESULTS (ROUND 4) - SSIs
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Well #	*MW18-91*	*MW19-91*	*Most Stringent*
Date	*7-16-91*	*7-18-91*	*MCL*
Units	*µg/L*	*µg/L*	*µg/L*
SSI VOCs			
cis-1,2-Dichloroethene	7.68	ND(1)	5
SSI BNAs			
Acenaphthene	ND(5)	<80**D	50
Acenphthylene	ND(5)	<80**D	50
Anthracene	ND(5)	174D	50
Benzo(a)anthracene	ND(5)	493D	50
Benzo(a)pyrene	ND(5)	563D	ND
Benzo(b)&(k)fluoranthene	ND(5)	418D	50
Benmzo(g,h,i)perylene	ND(5)	714D	50
Chrysene	ND(5)	478D	50
Dibenzo(a,h)anthracene	ND(5)	405D	50
Fluoranthene	ND(5)	805D	50
Fluorene	ND(5)	117D	50
Indeno(1,2,3-cd)pyrene	ND(5)	553D	50
Napthalene	ND(5)	<80**D	50
Phenanthrene	ND(5)	511D	50
Pyrene	ND(5)	685D	50
Other Compounds			
Cyanide	36	12	100
Oil and Grease	3,800	44,000	

Notes:

ND(#) - Not detected above quantifiable limits stated in parentheses.
** - High quantifiable limits due to the necessary dilution of the sample.
D - The associated value exceeded the NYSDOH Drinking Water Standards (Sanitary Code Part 5)

TABLE 4.15

CRA ADDITIONAL SITE INVESTIGATION
GROUNDWATER SAMPLE ANALYTICAL RESULTS (ROUND 4) - METALS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Well #	*MW16-89*	*Most Stringent*
Date	*7-16-91*	*MCL*
Units	*µg/L*	*µg/L*
TAL Metals		
Arsenic	10	25
Cadmium	19A	10
Calcium	361,000	
Chromium	25	50
Copper	157	200
Iron	160,000A	300
lead	6	25
Magnesium	183,000	
Manganese	11,200A	300
Mercury	0.7	2
Nickel	73	
Potassium	5,880	
Silver	16	50
Sodium	183,000B	20,000*
Vanadium	4	
Zinc	30	300

Notes:

All other TAL metals were not detected.

ND(#) - Not detected above quantifiable limits stated in parentheses.

A - The associated value exceeded NYSDEC Class GA Groundwater Standards (6NYCRR Part 703.5).

B - The associated value exceeded NYSDOH Drinking Water Standards (Sanitary Code Part 5).

* - Water containing more than 20,000 µg/L of sodium should not be used for drinking by people on severely restricted sodium diets (270,000 µg/L for moderately restricted sodium diets).

TABLE 4.16

CRA ADDITIONAL SITE INVESTIGATION
GROUNDWATER SAMPLE ANALYTICAL RESULTS (ROUND 5)
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Well #	*MW-7*	*MW-7 dup.*	*MW11-89*	*MW14-89*	*MW16-89*	*MW18-91*	*MW19-91*	*MW20-91*	*Most*
Date	*7-7-92*	*7-7-92*	*7-9-92*	*7-10-92*	*7-9-92*	*7-7-92*	*7-6-92*	*7-6-92*	*Stringent MCL*
Units	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
SSI VOCs									
Acetone	ND(50)	ND(50)	685D	ND(50)	ND(50)	ND(50)	76D	ND(50)	50
SSI BNAs									
Acenaphthylene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	16	ND(10)	50
Anthracene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	17	ND(10)	50
Benzo(a)anthracene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	31	ND(10)	50
Benzo(a)pyrene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	29A	ND(10)	50
Benzo(b)&(k)fluoranthene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	26	ND(10)	50
Chrysene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	31	ND(10)	50
Dibenzofuran	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	11	ND(10)	50
Fluoranthene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	57D	ND(10)	50
Fluorene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	17	ND(10)	50
Phenanthrene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	55D	ND(10)	50
Pyrene	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	57D	ND(10)	50
Other Compounds									
Cyanide	37	26	4	8	6	40	4	ND(1)	100
Oil and Grease	ND(1,000)	ND(1,000)	8,300	ND(1,000)	9,100	ND(1,000)	2,200	2,200	--

Notes:

ND(#) - Not detected above quantifiable limits stated in parentheses.

A - The associated value exceeded NYSDEC Class GA Groundwater Standards (6NYCRR Part 703.5).

D - The associated value exceeded the NYSDOH Drinking Water Standards (Sanitary Code Part 5)

TABLE 4.17
SUMMARY OF SSI PARAMETER EXCEEDANCES
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Parameter	*MCL Sample Exceedance/ Total Samples*	*MCL Exceedance Location*
VOC's		
1,2-dichloroethane	2/42	MW8-89, MW18-91
1,1,1-trichloroethane	4/42	MW-3(2), MW3R-89(2)
Benzene	4/55	MW8-89, MW-3(2), MW16-89
Toluene	3/55	MW8-89, MW-3(2)
Ethylbenzene	1/42	MW8-89
Total Xylenes	3/55	MW8-89, MW3(2)
BNA's		
Naphthalene	6/41	MW-3(3), MW3R-89(2), MW19-91
2-Methylnaphthalene	1/32	MW3R-89
Acenaphthlene	5/54	MW-3(3), MW3R-89, MW19-91
Acenaphthene	3/41	MW-3, MW-3R-89, MW19-91
Fluorene	6/54	MW-3(3), MW3R-89(2), MW19-91
Phenanthrene	6/48	MW-3(2), MW3R-89(2), MW19-91(2)
Anthracene	3/48	MW-3, MW3R-89, MW19-91
Fluoranthene	4/54	MW-3, MW3R-89, MW19-91(2)
Pyrene	4/48	MW-3, MW3R-89, MW19-91(2)
Benzo(a)anthracene	2/40	MW3R-89, MW19-91
Chrysene	3/48	MW-3, MW-4, MW19-91
Benzo(b)fluoranthene(1) & Benzo(k)fluoranthene(1)	1/41	MW19-91
Benzo(a)pyrene	2/48	MW-3, MW19-91
Benzo(g,h,i)perylene	2/35	MW-3, MW19-91
Indeno(1,2,3-c,d) pyrene	2/35	MW-3, MW19-91
2-Chloronaphthalene	0/26	
Cyanide	21/56	Site 108, MW-1, MW-2(4), MW-3(3), MW3R-89, MW-6(4), MW-7, MW-8, MW12-89(2), MW15-89(2), MW17-91
Hexavalent Chromium	0/32	

Notes:

* Indicates the number of MCL parameter exceedances at the identified well location.

TABLE 4.18

USGS STUDY
SURFACE WATER ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

	Site 108 7/13/1982 (µg/L)	*Site 109 7/14/1982 (µg/L)*	*Most Stringent MCL (µg/L)*
pH	7.2	3.2	--
Specific Conductance	1,020	3,000	--
Temperature	26.2	21.0	--
Aluminum	NA	1,300	--
Antimony	NA	ND	--
Arsenic	NA	ND	25
Barium	NA	284	1,000
Beryllium	NA	ND	--
Cadmium	NA	3	10
Chromium	NA	1,100	50
Cobalt	NA	65	--
Copper	NA	724	200
Cyanide	30	NA	100
Iron	2,400	280,000	300
Lead	NA	120	25
Manganese	NA	5,040	300
Mercury	NA	0.3	2
Nickel	NA	244	--
Selenium	NA	ND	--
Silver	NA	ND	--
Tullerium	NA	ND	--
Vanadium	NA	ND	--
Zinc	NA	192	300
Di-n-butylphthalate	NA	ND	50
1,2-Dimethylbenzene	NA	26	50
Diethylphthalate	ND	NA	50
Benzoic Acid	ND	NA	--

TABLE 4.19

MALCOLM PIRNIE PHASE II INVESTIGATION
SURFACE WATER ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Location:	*SW-1 (µg/L)*		*SW-2 (µg/L)*		*SW-3 (µg/L)*		*SW-4 (µg/L)*		*Most Stringent MCL (µg/L)*
Date:	*11/85*	*8/86*	*11/85*	*8/86*	*11/85*	*8/86*	*11/85*	*8/86*	
Cyanide-free	53	NA	6.0	NA	14	NA	13	NA	--
Cyanide-Total	57	13	60	10	49	LT 4.0	33	8	100
Phenols	39	610	LT 10	LT 10	65	46	104	59	1
Benzene	48	33	LT 5.0	LT 5.0	7.7	7.8	7.0	34	ND
Toluene	24	12	LT 5.0	LT 5.0	20	17	14	87	5
m-Xylene/Chlorobenzene	9.0	NA	LT 5.0	NA	10	NA	6.0	NA	5
Ethylbenzene	NA	LT 5.0	NA	LT 5.0	NA	LT 5.0	NA	9.3	5
Chlorobenzene	NA	LT 5.0	NA	LT 5.0	NA	14	NA	30	5
o-Xylene	7.0	NA	LT 5.0	NA	12	NA	7.0	NA	5
1,4-Dichlorobenzene	NA	LT 5.0	NA	LT 5.0	NA	9.5	NA	22	4.7
Acenaphthene	11	NA	LT 7.0	NA	LT 16	NA	LT 15	NA	20
Acenaphthylene	50	NA	LT 12	NA	LT 26	NA	LT 26	NA	--
Anthracene	NA	208*	NA	LT 48	NA	LT 48	NA	LT 44	50
Benzo(a)pyrene	6.0	NA	LT 260	NA	LT 118	NA	LT 116	NA	50
Naphthalene	210	1050	LT 11	LT 82	LT 10	LT 82	LT 10	LT 76	10
TOX	24	38.7	0.02	1.89	0.45	3.07	1.7	3.56	--

Notes

* Anthracene and phenanthracene coelute as one peak on the gas chromatogram. The reported value could be a reflection of the concentration of one or both compounds.

NA Parameter not analyzed for.

LTx Parameter not detected at associated value of X.

TABLE 4.20

CRA SUPPLEMENTAL INVESTIGATION
SURFACE WATER ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Source	*SW-5*	*SW-5*	*SW-5 dup*	*SW-6*	*SW-6 dup*	*SW-6*	*SW-8*	*SW-8*	*SW-9*
Sample ID	*SW-2428-DT-036*	*SW-2428-DT-075*	*SW-2428-DT-076*	*SW-2428-DT-037*	*SW-2428-DT-038*	*SW-2428-DT-079*	*SW-2428-DT-039*	*SW-2428-DT-074*	*SW-2428-DT-024*
Date	*10/19/1989*	*12/20/1989*	*12/20/1989*	*10/19/1989*	*10/19/1989*	*12/20/1989*	*10/19/1989*	*12/20/1989*	*10/16/1989*
Units	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
VOCs									
Methylene Chloride	ND(10)			ND(10)	ND(10)		ND(10)		NA
Acetone	170*			160*	180*		200		NA
Benzene	ND(5)			6.9AD	7.0AD		ND(5)		ND(10)
Toluene	ND(5)			13D	14D		ND(5)		ND(10)
BNAs									
Fluoranthene	ND(10)			ND(10)	ND(10)		ND(10)		42.5
Pyrene	ND(10)			ND(10)	ND(10)		ND(10)		23.9
Phenol	ND(10)			ND(10)	ND(10)		10AB		NA
2-Methylphenol	ND(10)			ND(10)	ND(10)		10		NA
Metals									
Aluminum		157	149			198		203	
Antimony		ND(20)	ND(20)			ND(20)		ND(20)	
Arsenic		ND(5)	ND(5)			ND(5)		ND(5)	
Barium		26	24			45		ND(10)	
Beryllium		ND(1,000)	1			ND(1,000)		ND(1,000)	
Cadmium		ND(0.5)	ND(0.5)			ND(1,000)		ND(0.5)	
Calcium		87,000	100,000			146,000		212,000	
Chromium		ND(5)	ND(5)			108D		42	
Cobalt		ND(5)	ND(5)			ND(5)		ND(5)	
Copper		9	ND(5)			30		13	
Iron		820AD	830AD			1,640AD		810AD	
Lead		ND(5)	ND(5)			23		14	
Magnesium		20,500	22,300			27,300		22,100	
Mercury									
Manganese		960AD	800AD			5,000AD		1,200AD	
Nickel		160	47			520		280	
Potassium		7,700	8,550			10,700		12,900	
Sodium		212,000	240,000			614,000		1,210,000	
Vanadium									
Zinc		21	41			7		48	
Other Compounds									
Cyanide	20	51	42	10	20	1,680	10	33	90
Oil and Grease	1,300			ND(1,000)	ND(1,000)		1,000		15,400
Hexavalent Chromium	ND(10)			ND(10)	ND(10)		ND(10)		ND(10)

TABLE 4.20

CRA SUPPLEMENTAL INVESTIGATION
SURFACE WATER ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Source	*SW-9*	*SW-10*	*SW-10*	*SW-11*	*SW-11*	*SW-12*	*SW-12*	*SW-14*
Sample ID	*SW-2428-DT-090*	*SW-2428-DT-023*	*SW-2428-DT-069*	*SW-2428-DT-042*	*SW-2428-DT-086*	*SW-2428-DT-043*	*SW-2428-DT-089*	*SW-2428-DT-040*
Date	*3/15/1990*	*10/16/1989*	*12/20/1989*	*10/19/1989*	*3/15/1990*	*10/19/1989*	*10/19/1989*	*10/19/1989*
Units	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
VOCs								
Methylene Chloride		ND(10)		NA		NA		ND(10)
Acetone		80*		NA		NA		55*
Benzene		ND(5)		ND(1,000)		ND(1,000)		ND(5)
Toluene		ND(5)		ND(1,000)		ND(1,000)		ND(5)
BNAs								
Fluoranthene		ND(10)		ND(3)		ND(3)		ND(10)
Pyrene		ND(10)		4.83		6.58		ND(10)
Phenol		ND(10)		NA		NA		ND(10)
2-Methylphenol		ND(10)		NA		NA		ND(10)
Metals								
Aluminum	602		106		11,100		1,060	
Antimony	ND (20)		ND(20)		ND (20)		ND (20)	
Arsenic	7		5		ND (5)		ND (5)	
Barium	26		18		ND (10)		17	
Beryllium	ND (1)		ND(1,000)		3		ND (1)	
Cadmium	ND (0.5)		ND(0.5)		1.9		ND (0.5)	
Calcium	180,000		224,000		140,000		43,200	
Chromium	ND (5)		ND(5)		ND (5)		ND (5)	
Cobalt	84		ND(5)		179		89	
Copper	ND (5)		92		25		ND (5)	
Iron	1,180 AD		220		82,600 AD		1,120 AD	
Lead	ND (5)		23		ND (5)		ND (5)	
Magnesium	27,300		17,100		26,600		8,490	
Manganese	200 AD		460AD		1,080 AD		68	
Mercury	ND (1)				ND (1)		ND (1)	
Nickel	ND (5)		320		140		ND (5)	
Potassium	20,200		12,500		2,010		3,530	
Sodium	93,300 B		1,390,000		10,400		8,500	
Vanadium	ND (10)				ND (10)		ND (10)	
Zinc	110		16		600		90	
Other Compounds								
Cyanide		10	40	ND(10)		ND(10)		10
Oil and Grease		ND(1,000)		1,900		ND(1,000)		ND(1,000)
Hexavalent Chromium		ND(10)		ND(10)		ND(10)		ND(10)

TABLE 4.20

CRA SUPPLEMENTAL INVESTIGATION
SURFACE WATER ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Source	*SW-14*	*SW-15*	*SW-15*	*SW-15 dup*	*SW-16*	*SW-17*	*SW-17 dup*	*SW-18*	*Most*
Sample ID	*SW-2428-DT-082*	*SW-2428-DT-041*	*SW-2428-DT-084*	*SW-2428-DT-085*	*SW-2428-DT-064*	*SW-2428-DT-066*	*SW-2428-DT-067*	*SW-2428-DT-068*	*Stringent*
Date	*3/15/1990*	*10/19/1989*	*3/15/1990*	*3/15/1990*	*12/19/1989*	*12/19/1989*	*12/19/1989*	*12/19/1989*	*MCL*
Units	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
VOCs									
Methylene Chloride		NA			ND(10)	ND(10)	ND(10)	52	5
Acetone		NA			ND(50)	ND(50)	ND(50)	ND(50)	50
Benzene		ND(1,000)			6.4AD	ND(5)	ND(5)	ND(5)	ND
Toluene		ND(1,000)			ND(5)	ND(5)	ND(5)	ND(5)	5
BNAs									
Fluoranthene		ND(3)			ND(10)	ND(10)	ND(10)	ND(10)	50
Pyrene		9.13			ND(10)	ND(10)	ND(10)	ND(10)	50
Phenol		NA			ND(10)	ND(10)	ND(10)	ND(10)	1
2-Methylphenol		NA			ND(10)	ND(10)	ND(10)	ND(10)	50
Metals									
Aluminum	23,600		662	412	159	197	196	203	
Antimony	ND (20)		ND (20)	ND(20)	ND(20)	22	ND(20)	ND(20)	
Arsenic	ND (5)		ND (5)	ND(5)	ND(5)	ND(5)	ND(5)	5	25
Barium	ND (10)		66	ND (10)	45	27	28	35	1,000
Beryllium	4		ND (1)	ND (1)	1	ND(1)	1	ND(1)	
Cadmium	1.2		1.1	0.7	0.7	ND(0.5)	0.5	0.7	
Calcium	245,000		83,200	70,800	86,800	88,000	93,500	111,000	
Chromium	86D		ND (5)	27	9	8	11	6	50
Cobalt	329		174	154	ND(5)	ND(5)	ND(5)	16	
Copper	29		ND (5)	ND (5)	9	5	7	49	200
Iron	472,000AD		3,760AD	2,750AD	920AD	980AD	920AD	100	300
Lead	ND (5)		ND (5)	ND (5)	18	19	20	44	25
Magnesium	37,900		13,900	12,700	29,700	31,000	29,900	13,000	
Manganese	2,480 AD		150	260	3,520AD	220	720AD	880AD	300
Mercury	ND (1)		ND (1)	1					
Nickel	216		11	ND (5)	38	41	46	45	
Potassium	1,750		3,600	3,130	5,900	6,190	6,610	2,060	
Sodium	10,000		13,300	10,500	141,000	142,000	206,000	32,800	20,000
Vanadium	191		ND (10)	ND (10)					
Zinc	760		190	100	2.8	22	29	9.3	300
Other Compounds									
Cyanide		60			155	230	212	ND(10)	100
Oil and Grease		1,200			ND(1,000)	ND(1,000)	ND(1,000)	ND(1,000)	
Hexavalent Chromium		ND(10)			ND(10)	10	ND(10)	ND(10)	50

Notes:

All other TCL/TAL parameters were not detected.

* The associated value is estimated due to potential field contamination.

ND Not detected above quantifiable limits stated in parentheses.

NA Not analyzed for this particular parameter as it was not included in the SSIs.

A The associated value exceeded NYSDEC Class GA Groundwater Standards (6NYCRR Part 703.5).

D The associated value exceeded NYSDOH Drinking Water Standards (Sanitary Code Part 5).

B The associated value exceeded NYSDOH Raw Water Supply Standards (10NYCRR Part 170).

TABLE 4.21

CRA ADDITIONAL SITE INVESTIGATION
(ROUND 3) SURFACE WATER ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Surface Water #	*SW-11*	*SW-12*	*SW-13*	*SW-14*	*SW-15*	*SW-15 dup.*	*Most*
Date	*7-9-92*	*7-8-92*	*7-8-92*	*7-8-92*	*7-8-92*	*7-8-92*	*Stringent MCL*
Units	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
VOCs							
Acetone	ND(50)	ND(50)	ND(50)	364 D	ND(50)	ND(50)	50
BNAs							
All compounds	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	50
Metals							
Aluminum	330	10	ND(5)	8,100	540	400	--
Arsenic	ND(2)	ND(2)	ND(2)	ND(2)	3	3	25
Barium	10	40	40	10	3	3	1,000
Calcium	113,000	101,000	105,000	489,000	106,000	106,000	--
Chromium	ND(10)	ND(10)	ND(10)	10	ND(10)	ND(10)	50
Cobalt	ND(5)	ND(5)	ND(5)	30	ND(5)	5	--
Copper	20	ND(10)	ND(10)	20	ND(10)	ND(10)	200
Iron	1,370 AD	3,360 AD	1,090 AD	161,000 AD	4,580 AD	4,330 AD	300
Lead	4	5	ND(2)	7	8	4	25
Magnesium	21,300	17,300	17,300	64,800	18,100	18,300	--
Manganese	140	480 AD	470 AD	3,910 AD	600 AD	600 AD	300
Nickel	ND(20)	ND(20)	ND(20)	100	ND(20)	ND(20)	--
Potassium	900	340	890	10,100	3,270	3,550	--
Selenium	4	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	--
Vanadium	10	10	10	80	20	20	--
Other Compounds							
Zinc	40	20	10	450	ND(10)	ND(10)	300
Silver	ND(5)	ND(5)	ND(5)	ND(5)	10	9	--
Sodium	7,870	8,630	7,940	11,600	12,200	12,300	20,000
Cyanide	138	ND(4)	ND(4)	12	30	28	100
Oil and Grease	2,000	1,900	ND(1,000)	ND(1,000)	ND(1,000)	ND(1,000)	--
Hexavalent Chromium	ND(10)	ND(10)	ND(10)	30	ND(10)	ND(10)	50

Notes:

ND(#) - Not detected above quantifiable limits stated in parentheses.
A - The associated value exceeded NYSDEC Class GA Groundwater Standards (6NYCRR Part 703.5).
D - The associated value exceeded the NYSDOH Drinking Water Standards (Sanitary Code Part 5)

TABLE 4.22

SUMMARY OF SURFACE WATER SSI PARAMETERS AND METAL EXCEEDANCES
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Parameter	*MCL Sample Exceedance/ Total Samples*	*MCL Exceedance Location*
VOC's		
1,2-dichloroethane	0/12	
1,1,1-Trichloroethane	0/12	
Benzene	8/25	SW-6, SW-16, SW-1(2), SW-3(2), SW-4(2)
Toluene	8/25	SW-1(2), SW-3(2), SW-4(2), SW-6(2)
Ethylbenzene	1/16	SW-4
Total Xylenes	3/16	SW-1, SW-3, SW-4
BNA's		
Naphthalene	2/20	SW-1 (2)
2-Methynaphthalene	0/12	
Acenaphthlene	0/12	
Acenaphthene	0/12	
Fluorene	0/12	
Phenanthrene	0/12	
Anthracene	1/16	SW-1
Fluoranthene	0/17	
Pyrene	0/17	
Benzo(a)anthracene	0/12	
Chrysene	0/12	
Benzo(b)fluoroanthene and Benzo(k)fluoroanthene	0/12	
Benzo(a)pyrene	0/12	
Phenol	7/25	SW-1(2), SW-3(2), SW-4(2), SW-8
Methylphenol	0/17	
Benzo(g,h,i)perylene	0/12	
Indeno (1,2,3-cd) pyrene	0/12	
2-Chloronaphthalene	0/12	

TABLE 4.22

SUMMARY OF SURFACE WATER SSI PARAMETERS AND METAL EXCEEDANCES
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Parameter	*MCL Sample Exceedance/ Total Samples*	*MCL Exceedance Location*
Metals		
Arsenic	0/18	
Barium	0/18	
Cadium	0/13	
Chromium	2/18	Site 109, SW-6
Copper	1/18	Site 109
Iron	17/19	Site 108, Site 109, SW-5, SW-6, SW-8, SW-9, SW-11(2), SW-12(2), SW-13, SW-14(2), SW-15(2), SW-16, SW-17
Lead	2/18	Site 109, SW-18
Manganese	15/17	Site 109, SW-5, SW-6, SW-8, SW-9, SW-10, SW-11, SW-12, SW-13, SW-14(2), SW-15, SW-16, SW-17, SW-18
Zinc	1/17	SW-14
Other		
Cyanide	3/29	SW-16, SW-17, SW-11
Hexavalent Chromium	0/17	

TABLE 4.23

CRA SUPPLEMENTAL SITE INVESTIGATION
SEDIMENT ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

	Source:	*SW-5*	*SW-6*	*SW-9*	*SW-9 (dup)*	*SW-11*	*SW-11 (dup)*	*SW-14*	*Field Blank*	*Sediment*
	Sample ID:	*S-2428-DT-077*	*S-2428-DT-080*	*S-2428-DT-072*	*S-2428-DT-073*	*S-2428-DT-087*	*S-2428-DT-088*	*S-2428-DT-083*	*S-2428-DT-081*	*Screening*
	Date:	*12/20/1989*	*12/20/1989*	*12/20/1989*	*12/20/1989*	*3/15/1990*	*3/15/1990*	*3/15/1990*	*12/20/1989*	*Value*
VOCs (µg/kg)										
1,1,1-Trichloroethane		ND (20)	ND (20)	ND (20)	ND (20)	200	210	ND (20)	ND (20)	170 (2)
Methylene Chloride		2,500	2,090	2,010	1,300	950	890	580	4,840	265 (3)
1,2-Dichloroethene (total)		2,690	90	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	ND (20)	23 (3)
Benzene		40	190	160	60	ND (20)	ND (20)	680	240	570 (2)
Toluene		200	420	120	100	390	290	870	240	670 (2)
Total Xylenes		ND (20)	280	ND (20)	ND (20)	ND (20)	ND (20)	160	ND (20)	1,500 (3)
Ethylbenzene		ND (20)	110	ND (20)	ND (20)	100	ND (20)	ND (20)	ND (20)	3,600 (2)
BNAs (µg/kg)										
Acenaphthylene		ND (7,500)*	ND (6,000)*	2,120	1,960	ND (300)	ND (300)	173,000	ND (600)	4,000** (2)
Phenanthrene		8,350	125,000	ND (600)	ND (600)	3,300	ND (300)	22,400	ND (600)	1,200 (4)
Pyrene		9,620	ND (6,000)*	ND (600)	ND (600)	4,080	ND (300)	25,500	ND (600)	660 (2)
Anthracene		ND (7,500)*	36,600	ND (600)	ND (600)	ND (300)	ND (300)	2,280	ND (600)	4,000** (2)
Benzo(a) Anthracene		ND (7,500)*	20,800	ND (600)	ND (600)	5,300	ND (300)	10,300	ND (600)	4,000** (2)
Benzo (a) Pyrene						570		4,530		430 (2)
Benzo(b) Fluoranthene (1)		ND (7,500)*	39,900	ND (600)	ND (600)	1,490	ND (300)	ND (300)	ND (600)	4,000** (2)
Benzo(k) Fluoranthene (1)		ND (7,500)*	39,900	ND (600)	ND (600)	1,490	ND (300)	ND (300)	ND (600)	4,000** (2)
Chrysene		ND (7,500)*	32,000	ND (600)	ND (600)	720	ND (300)	5,770	ND (600)	4,000** (2)
DiBenz (a,h) Anthracene						ND (300)		3,430		4,000** (2)
Fluoranthene		ND (7,500)*	106,000	ND (600)	ND (600)	4,570	570	30,300	ND (600)	10,200 (4)
Fluorene		ND (7,500)*	194,000	ND (600)	ND (600)	ND (300)	ND (300)	900	ND (600)	540 (2)
Indeno (1,2,3-od) Pyrene						ND (300)	ND (300)	1,970		4,000** (2)
Naphthalene						ND (300)	ND (300)	810		480 (2)
Other Compounds (mg/kg)										
Oil and Grease		4,060	31.7	17.6	606	ND (1)	ND (1)	ND (1)	618	1,500 (3)

Notes:

All other SSI parameters, cyanide and Cr+6 were not detected.

* - High quantifiable limits due to dilution.
** - Value listed is that for total polycyclic aromatic hydrocarbons (PAHs).
(1) - Indistinguishable isomers, reported value is total concentration.
ND - Not detected above quantifiable limits stated in parentheses.
(2) - USEPA Ecotox Thresholds (Sediment Quality Benchmark, Effects Range Low).
(3) - Draft Minnesota Sediment Ecological Screening Criteria.
(4) - New York Benthic Aquatic Life Chronic Toxicity.

TABLE 4.24

CRA ADDITIONAL SITE INVESTIGATION
(ROUND 2) SEDIMENT ANALYTICAL RESULTS
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Sediment #:	*SW-11*	*SW-14*	*SW-14 dup.*	*Sediment Screening Value*
Date:	*7-8-92*	*7-8-92*	*7-8-92*	
Units:	*µg/kg*	*µg/kg*	*µg/kg*	
SSI VOCs				
Methylene Chloride	40.1	2,620	2,090	265 (1)
Toluene	11.8	ND (500)	ND (500)	670 (2)
SSI BNAs				
Acenaphthylene	ND (330)	680	790	4,000* (2)
Anthracene	ND (330)	1,000	940	4,000* (2)
Benzo(a)anthracene	ND (330)	4,700	4,700	4,000* (2)
Benzo(b)fluoranthene	480	5,900	6,200	4,000* (2)
Benzo(k)fluoranthene	440	7,300	5,900	4,000* (2)
Chrysene	340	5,400	5,300	4,000* (2)
Fluoranthene	400	7,200	6,700	10,200 (3)
Fluorene	ND (330)	510	580	540 (2)
Phenanthrene	ND (330)	4,400	4,100	1,200 (3)
Pyrene	460	9,200	8,000	660 (2)
Other Compounds				
Cyanide	2,400	30,300	21,900	0.1 (1)

Note:

ND (#) - Not detected above quantifiable limits stated in parentheses.
* - Value listed is that for total polycyclic aromatic hydrocarbons (PAHs).
(1) Draft Minnesota Sediment Ecological Screening Criteria.
(2) USEPA Ecotox Thresholds (Sediment Quality Benchmark, Effects Range Low).
(3) New York Benthic Aquatic Life Chronic Toxicity.

TABLE 4.25

SUMMARY OF SEDIMENT SCREENING VALUES
REMEDIAL DESIGN INVESTIGATION REPORT
TONAWANDA COKE CORPORATION

	New York Benthic Aquatic Life Chronic Toxicity (1) (ug/kg)	*USEPA Ecotox Thresholds (2) a = SQB; b = ERL (ug/kg)*	*Minnesota Sediment Ecological Screening Criteria (3) (ug/kg)*
VOCS			
Benzene	na	570 a	- -
1,2-Dichloroethene (total)	na	na	23
Ethylbenzene	na	3600 a	- -
Methylene Chloride	na	na	265
Toluene	na	670 a	- -
1,1,1-Trichloroethane	na	170 a	- -
Xylenes (total)	na	na	1500
BNAs			
Acenaphthylene	na	4000 b*	- -
Anthracene	na	4000 b*	- -
Benzo(a)anthracene	na	4000 b*	- -
Benzo(b)fluoranthene	na	4000 b*	- -
Benzo(k)fluoranthene	na	4000 b*	- -
Benzo(a)pyrene	na	430 b	- -
dibenz(a,h)anthracene	na	4000 b*	- -
Chrysene	na	4000 b*	- -
Fluoranthene	10200	- -	- -
Fluorene	na	540 a	- -
Indeno(1,2,3-cd)pyrene	na	4000 b*	- -
Naphthalene	na	480 a	- -
Phenanthrene	1200	- -	- -
Pyrene	na	660 a	- -
Other Compounds			
Oil&Grease	na	na	1500
Cyanide	na	na	0.1

Notes:

All values shown are based on an assumed Total Organic Carbon content of 1percent.

* - Value listed is that for total polycyclic aromatic hydrocarbons (PAHs).

- - - Value exists from more appropriate jurisdiction.

(1) - New York Department of Environmental Conservation, "Technical Guidance for Screening Contaminated Sediments", July 1994.

(2) - USEPA ECO Update, "Ecotox Thresholds", Intermittent Bulletin, Volume 3, Number 2, January 1996.
a = SQB - Sediment Quality Benchmark
b = ERL - Effects Range - Low

(3) - Minnesota Pollution Control Agency, "Site Screening Evaluation: Sediment Ecological Screening Criteria", Working Draft, April 26, 1996.

TABLE 4.26

SUMMARY OF SEDIMENT PARAMETER EXCEEDANCES
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION

Parameter	*# Sediment Screening Exceedances/ Total Sediment Samples*	*Exceedance Location*
VOCs		
Benzene	1/7	SW-14
1,2-Dichloroethene (total)	2/7	SW-5, SW-6
Ethylbenzene	0/7	
Methylene Chloride	6/7	SW-5, SW-6, SW-9 SW-11, SW-14 (2)
Toluene	1/7	SW-14
1,1,1-Trichloroethane	1/5	SW-11
Xylenes	0/7	
BNAs		
Acenaphthylene	1/7	SW-14
Phenanthene	5/7	SW-5, SW-6, SW-11, SW-14 (2)
Pyrene	4/7	SW-5, SW-11, SW-14 (2)
Anthracene	1/7	SW-6
Benzo(a)anthracene	4/7	SW-6, SW-11, SW-14 (2)
Benzo(a)pyrene	2/2	SW-11, SW-14
Benzo(b)fluoranthene and Benzo(k)fluoranthene	1/5	SW-6
Chrysene	3/7	SW-6, SW14 (2)
Acenaphthene	0/5	
Benzo(g,h,i)perylene	0/5	
2-Chloronaphthalene	0/5	
2-Methylnaphthalene	0/5	
Dibenzo(a,h)anthracene	0/2	
Fluoranthene	2/7	SW-6, SW-14
Fluorene	3/7	SW-6, SW-14 (2)
Ideno(1,2,3-cd)pyrene	0/2	
Naphthalene	1/2	SW-14
Other Compounds		
Cyanide	2/7	SW-11, SW-14
Oil & Grease	1/7	SW-5
Hexavalent Chromium	0/7	

TABLE 5.1

**WATER QUALITY STANDARDS,
CRITERIA AND HEALTH ADVISORIES (µg/L)
REMEDIAL INVESTIGATION SUMMARY REPORT
TONAWANDA COKE CORPORATION**

	New York (2)						*USEPA Health Advisories (5)*					
Chemical(1)	*Surface*		*Groundwater*		*MCL(3)*	*WQC(4)*	*1 Day*	*10 Day*	*Longer 10 kg*	*Longer 70 kg*	*Life*	*Risk (6) 1 x 10^{-6}*
Benzene *	1.0	(G)	ND		5	0.66	235	235	--	--	--	1.0
1,2-Dichloroethylene (Total)	50	(7)	50	(7)	70 (8)	--	2720	1000	1000	3500	350	NC
Ethylbenzene	50	(G)	50	(G)								
Toluene	50	(G)	50	(G)								
1,1,1-Trichloroethane	50	(G)	50	(G)								
Xylenes (Total)	50	(G)	50	(G)								
PAHs												
Fluoranthene (non-carc)	50	(G)	50	(G)								
Benzo (a) pyrene (Carc)	.002	(G)	--	--	--	0.028	--	--	--	--	--	--
Cyanide	100	(STD)	200	(STD)	--	200	220	220	220	750	750	
Chromium (+6)	50	(STD)	50	(STD)	--	50	1400	1400	240	840	170	
Oil & Grease												
All units are ug/liter												

Notes:

(1) * Indicates chemicals with an IRIS file.

(2) New York Surface Water and Groundwater (GW) Standards (STD) and Guidance (G).

(3) EPA Maximum Contaminant Level.

(4) EPA Water Quality Criteria (Federal Register 1980) - Fish and Water Consumption.
Carcinogens - 1 x 10^{-6} incremental risk of cancer.

(5) Health Advisors
1-day - Limit for a 10 kg child, single 1 liter exposure.
10-day - Limit for 10 kg child drinking 1 liter/day for 10 days.
Longer 10-kg - Limit for 10 kg child drinking 1 liter/day for months to years.
Longer 70-kg - Limit for 70 kg adult drinking 2 liters/day for months to years.
Lifetime: Limit for lifetime of consumption at levels noted for age groups.

(6) Risk - 1 x 10^{-6}: Concentration producing 1 x 10^{-6} incremental risk of cancer in a lifetime (IRIS)
NC - Non-Carcinogen
NA - Not available for these carcinogens. Use WQC value.

(7) Limit for trans-ISOMER.

(8) Proposed MCLG.

APPENDIX B

STRATIGRAPHIC AND WELL INSTALLATION LOGS

TEST PIT STRATIGRAPHY LOG

PROJECT NAME: Additional Investigation
PROJECT NUMBER: 2428
CLIENT: Tonawanda Coke
LOCATION: Town of Tonawanda, NY

CONTRACTOR: Tonawanda Coke
SURFACE ELEVATION:
WEATHER (A.M.):
(P.M.):

TEST PIT DESIGNATION: TP-1
DATE/TIME STARTED: 8/16/05 0855
DATE/TIME COMPLETED: 8/16/05 0955
TEST PIT METHOD: Track Hoe
CRA SUPERVISOR: D. Tyran

STRATIGRAPHIC INTERVALS (DEPTHS IN ft/m BGS) FROM	AT	TO	SAMPLE DESCRIPTION	SAMPLE DETAILS: SAMPLE #	SAMPLE INTERVAL	PID / FID (ppm)	GEOLOGIC PROFILE
			ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) – MAIN COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS. NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).				
0		0.5	Topsoil				
0.5			Clay Fill, Brick, wood, Dry				
	2.7		Silty loam, black, moist				
	5.0		Clay, Red/Brown, stiff, moist				
	13.5		Black organic material, reeds, some clay old marsh area, wet				
	15.0		Bottom of Test Pit				
			Sample SO-2428-081605-001 taken of silt loam layer 2.7-5.0 ft BGS				

NOTES AND COMMENTS

CRA

TEST PIT STRATIGRAPHY LOG

PAGE 1 OF 1

PROJECT NAME Additional Investigation
PROJECT NUMBER 2428
CLIENT Tonawanda Coke
LOCATION Town of Tonawanda, NY

CONTRACTOR Tonawanda Coke
SURFACE ELEVATION
WEATHER (A.M.)
(P.M.)

TEST PIT DESIGNATION TP-2
DATE/TIME STARTED 8-16-05 1020
DATE/TIME COMPLETED 8-16-05 1150
TEST PIT METHOD Track Hoe
CRA SUPERVISOR D. Tyran

STRATIGRAPHIC INTERVALS (DEPTHS IN ft/m BGS) FROM	AT	TO	SAMPLE DESCRIPTION	SAMPLE DETAILS: SAMPLE #	SAMPLE INTERVAL	PID / FID (ppm)	GEOLOGIC PROFILE
			ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) – MAIN COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS. NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).				
0		0.5	Topsoil				
0.5			Brick and Construction debris				
	4.5		Fine Sand, Some construction debris trace loam Black, moist				
	12.5		Black organic material, reeds, some clay, wet Old marsh area. Petroleum like odor				
	13.0		Bottom of Test Pit				
			Sample SO-2428-081605-005 taken of organic material @ 14.5ft BGS				

NOTES AND COMMENTS

CRA

TEST PIT STRATIGRAPHY LOG

PAGE 1 OF 1

PROJECT NAME Additional Investigation
PROJECT NUMBER 2428
CLIENT Tonawanda Coke
LOCATION Town of Tonawanda, NY

CONTRACTOR Tonawanda Coke
SURFACE ELEVATION
WEATHER (A.M.)
(P.M.)

TEST PIT DESIGNATION TP-3
DATE/TIME STARTED 8/16/05 1215
DATE/TIME COMPLETED 8/16/05 1330
TEST PIT METHOD Track Hoe
CRA SUPERVISOR D. Tyran

STRATIGRAPHIC INTERVALS (DEPTHS IN ft/m BGS) FROM	AT	TO	SAMPLE DESCRIPTION ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) – MAIN COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).	SAMPLE DETAILS: SAMPLE #	SAMPLE INTERVAL	PID / FID (ppm)	GEOLOGIC PROFILE
0		0.5	Topsoil				
0.5			Clay fill Red/Brown, some brick, wood, concrete				
			Dry				
	4.0		Sandy loam, black, moist. Pieces of plastic pipe, wood, concrete				
	12.5		Fine - medium gravel subround old River bottom very slight Petroleum-like odor				
	15.0		Bottom of Test Pit				
			Sample SO-2428-081605-006 taken of Sandy loam material just above the gravel layer				

NOTES AND COMMENTS
See photos 3 & 6

CRA

STRATIGRAPHY LOG (OVERBURDEN)

PROJECT NAME Tonawanda Coke
PROJECT NUMBER 2428
CLIENT Tonawanda Coke
LOCATION Town of Tonawanda, NY

DRILLING CONTRACTOR Buffalo Drilling
DRILLER
SURFACE ELEVATION
WEATHER (A.M.)
(P.M.)

HOLE DESIGNATION MW-18D-05
DATE/TIME STARTED @ 7/28/05 0800
DATE/TIME COMPLETED 7/29/05 1400
DRILLING METHOD HSA
CRA SUPERVISOR D. Tyran

STRATIGRAPHIC INTERVALS (DEPTHS IN ft/m BGS) FROM	AT	TO	SAMPLE DESCRIPTION (ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) – MAIN COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS. NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).)	SAMPLE DETAILS: SAMPLE #	SAMPLING METHOD	PENETRATION RECORD SPLIT SPOON BLOWS (RECORD N-VALUES & RECOVERIES) 6"	6"	6"	6"	SAMPLE INTERVAL	PID / FID (ppm)	CHEMICAL ANALYSIS	GRAIN SIZE
0		0.5	Coal, coke Dust w/Trace Silt, Black, Moist	1	2"SS	3	5%			0-2	0		
						N	50	R	0.3				
				2		22	50/2			2-4	0		
2.0		5.4	Slag, Gray/Blue, moist			N	50	R	0.4				
				3		30	10	2	2	4-6	0		
	5.4		Silt, very soft, dark gray, wet			N	12	R	0.8				
				4		2	2	1	1	6-8	0		
	8.75		SP Fine Sand, loose, dark gray, poorly graded			N	3	R	0				
			wet	5		3	2	3	5	8-10	0		
						N	5	R	1.25				
	11.2		S.A.A. but black	6		1	1	2	4	10-12	0		
						N	3	R	0.8				
	16.0		S.A.A. but dark gray	7		6	9	2	3	12-14	0		
						N	6	R	0.9				
	21.7		S.A.A. trace Silt	8		3	2	3	5	14-16	0		
						N	5	R	1.0				
	25.5		SP Coarse Sand, trace fine to medium gravel	9		4	4	4	6	16-18	0		
			well graded, sub round			N	8	R	1.4				
			trace fine sand, gray, wet										

NOTES AND COMMENTS

CRA

DEPTH OF BOREHOLE CAVING _____ DEPTH OF FIRST GROUNDWATER ENCOUNTER _____ TOPSOIL THICKNESS _____

WATER LEVEL IN OPEN BOREHOLE ON COMPLETION _____, AFTER ____ HOURS ____

COMPLETION DETAILS: _____

NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY LENGTH, AND SAMPLE INTERVAL.

STRATIGRAPHY LOG (OVERBURDEN)

PROJECT NAME Tonawanda Coke
PROJECT NUMBER 2928
CLIENT Tonawanda Coke
LOCATION Town of Tonawanda, NY

DRILLING CONTRACTOR Buffalo Drilling
DRILLER
SURFACE ELEVATION
WEATHER (A.M.)
(P.M.)

HOLE DESIGNATION MW-18D-05
DATE/TIME STARTED 7/28/05 0800
DATE/TIME COMPLETED 7/29/05 1400
DRILLING METHOD HSA
CRA SUPERVISOR D. Tyran

STRATIGRAPHIC INTERVALS (DEPTHS IN ft/m BGS) FROM	AT	TO	SAMPLE DESCRIPTION (ORDER OF DESCRIPTORS: SOIL TYPE SYMBOL(S) – MAIN COMPONENT(S), (NATURE OF DEPOSIT), SECONDARY COMPONENTS, RELATIVE DENSITY/CONSISTENCY, GRAIN SIZE/PLASTICITY, GRADATION/STRUCTURE, COLOUR, MOISTURE CONTENT, SUPPLEMENTARY DESCRIPTORS. NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).)	SAMPLE DETAILS: SAMPLE #	SAMPLING METHOD	PENETRATION RECORD SPLIT SPOON BLOWS (RECORD N-VALUES & RECOVERIES) 6"	6"	6"	6"	SAMPLE INTERVAL	PID / FID (ppm)	CHEMICAL ANALYSIS	GRAIN SIZE
	26		S.A.A. but dark gray	10	2"SS	6	8	12	10	18-20	0		
						N	20	R	2.0				
	29.8		ML Silt, trace fine sand, light gray, wet	11		5	6	8	8	20-22	0		
						N	14	R	2.0				
			Flowing Sands and gravel blowing up into	12		2	3	3	3	22-24	0		
			augers unable to log 30-40.4 BGS			N	6	R	1.0				
				13		1	3	4	4	24-26	0		
	40.4		SP Coarse Sand, Some Fine gravel poorly			N	7	R	1.0				
			graded, Sub angular to Sub round	14		2	3	3	3	26-28	0		
			dark gray, moist			N	6	R	0.3				
				15		2	3	4	3	28-30	0		
	40.6		GP Fine to medium gravel, well graded, Trace			N	7	R	0.5				
			fine Sand, trace Silt, dark gray, moist	16		4	5	4	6	30-32	0		
						N	9	R	0				
	42.5		Auger Refusal	17		9	8	11	11	34-36	0		
						N	19	R	0				
				18		38	19	10	16	39-41	0		
						N	29	R	0.6				

NOTES AND COMMENTS

CRA

DEPTH OF BOREHOLE CAVING _____ DEPTH OF FIRST GROUNDWATER ENCOUNTER _____ TOPSOIL THICKNESS _____

WATER LEVEL IN OPEN BOREHOLE ON COMPLETION _____ AFTER ____ HOURS ____

COMPLETION DETAILS: 2"Ø PVC 15ft #10 slot screen well set @ 40.0' BGS

NOTE: FOR EACH SPLIT-SPOON SAMPLE, RECORD BLOW COUNTS, N-VALUE, SAMPLE RECOVERY LENGTH, AND SAMPLE INTERVAL

MS MSD River-1

(16) River Sediments

Date 8.17.05 Crew DJT

Project # 2428

Location - 40 feet downstream of the outfall pipe
15ft off the edge of the bank

Depth of water < 1ft

Sediments were 1 to 2 inches deep

Fine Red/Br Sand Trace organic material

Sample Time 0815

Sample ID STS - 2428-081705-009

Vol/Analysis 3x 4oz TCL SVOCs

Small patches of oily sheen in cove area by outfall. Pass-by from the Marina to the South

DUP

River-2

Location ± 400 ± feet upstream of the outfall. Approx. half way to the Marina
15ft off Bank

Sediments were 2 to 4 inches deep

Depth of water 2 ft

Fine Dark Brown Sand Trace organic material

Sample Time 0845 (0900)

Sample ID STS - 2428-081705-008

Blind Dup STS - 2428-081705-010

Vol/Analysis 2x 4oz TCL SVOC

COC# 16727

Dave DJ

River-3

(17) River Sediments

Date 8.17.05 Crew DJT

Project # 2428

Location - Directly in front of outfall for water treatment Plant. 12" Ø Pipe discharge 15-30 gpm. Approx 300ft from Marina

Depth of water 2ft

Sediments were 4-5 inches deep Silt little fine sand Trace organic material Dark Brown

Sample Time 0905

Sample ID SIS-2428-081705-007

Lab/Analysis 1x4oz TCL SVOCs

CofC # 10727

AREA 108

Surface Sediments

Date 8.17.05 Crew DJT

Project # 2428

Sample Time 1000 [SS-1]

Sample ID SO-2428-081705-011

Location 75ft NE of outfall

Silty loam some fine sand some coke Black Dry

Sample Time 1020 [SS-2]

Sample ID SO-2428-081705-012

Location 20ft Due East of MW 18-91

Silty loam, fine sand, coke, Dry Black

Sample Time 1050 [SS-3]

Sample ID SO-2428-081705-013

Location 35ft Due East of TP-1

Silt Some clay Dry Red/Br.

CofC # 10727

Dave J Typer

AREA 108

(18) Surface Sediments

Date 8.17.05 Crew DJT

Project# 2428

[SS-4]

Sample Time 1110 (1130)

Sample ID SO-2428-081705-014

Blind Dup SO-2428-081705-015

Location 130ft Due East of TP-2

Silt some clay Red/Br Dry

[SS-5]

Sample Time 1145

Sample ID SO-2428-081705-016

Light Brown Silty loam

Location 200± ft North of TP-3 Top of Bank

All AREA 108 Sample locations were for 3x encore 30g 1x 4oz TCL SVOC 1x 4oz TCL Metals, CN, TPH

Surface Sediments AREA 109

Date 8.17.05 Crew DJT

[SS-6]

Sample Time 1205

Sample ID SO-2428-081705-017

Location 25ft upest of Tel. Pole next to left side on roadway

Light Brown Sandy loam

[SS-7]

Sample Time 1230

Sample ID SO-2428-081705-018

Location Base of Berm along River Road

Sandy loam light Brown

CofC# 10787

Dave Tyler

(19) Surface Sediments Area 109

Date 8.17.05 Crew DOT

Project # 2428

[SS-8]

Sample Time 1250

Sample ID SO-2428-081705-019

Location between Tel. Poles 4 & 5 coming E. up the driveway from the gate. 25ft off road Top of Bank

Light Brown Sandy loam

[SS-9]

Sample Time 1310

Sample ID SO-2428-081705-020

Location 15ft west from Concrete Block @ edge of Driveway

Sandy loam, coke dust Block

Surface Sediments Area 109

[SS-10]

Sample Time 1330

Sample ID SO-2428-081705-021

Location 32ft South of the SW corner of the concrete Settling lagoon.

Sandy clay Red/Brown Dry

C of C # 107217

Dave Taylor

(20) Surface Sediments AREA 110

Date 8.17.05 Crew DJF

Project # 2428

[SS-11]

Sample Time 1505

Sample ID SO-2428-081705-022

Location 50ft west of east end of Area 110
12ft North of RR Tracks
(near Tar patch)

Black, Sandy, loam, moist

[SS-12]

Sample Time 1525

Sample ID SO-2428-081705-023

Location Top of Coa Pile

Black, Dry Coal & Coke dust

CofC # 10727

Surface Sediments AREA 110

Date 8.18.05 Crew DJF

Sample Time 0800 [SS-13]

Sample ID SO-2428-081805-024

Location SW corner of AREA 110.

Coke Breeze

[SS-14] MS/MSD

Sample Time 0835

Sample ID SO-2428-081805-025

Location 10ft South of RR Tracks
North Side of mound

Dry Dark Brown Sandy loam

CofC # 10728

Dave DJF

(21) Surface Sediments Area 110

Date 8/18/05 Crew DJT

Project # 2428

[SS-15]

Sample Time 0910

Sample ID SO-2428-081805-026

Location NE Corner of Area 110 South of the RR Tracks

Sandy loam, coke dust, Dry/Black

CofC# 10728

David Coyer

APPENDIX C

ESTIMATED COSTS – SURFACE SOIL ALTERNATIVES

TABLE C.1

ESTIMATED COSTS - SURFACE SOIL ALTERNATIVE 2
INSTITUTIONAL CONTROL AND FENCING
FEASIBILITY STUDY
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

		Estimated Quantity	*Unit*	*Unit Cost*	*Total*	
Administrative Cost						
1	Administrative Cost to Implement Deed Restrictions	1	L.S.	$ 10,000	$ 10,000	
			Sub-Total, Administrative Cost:		$ 10,000	
Direct Capital Costs						
1	Insurance, Mobilization/ Demobilization	0	L.S.	$ 1,500	$ -	
2	Supply & install fencing	0	L.F.	$ 32	$ -	*
			Sub-Total, Direct Capital Cost:		$ -	
Indirect Capital Costs						
1	Design & Engineering	0	L.S.	$ 5,000	$ -	
2	Contingency Allowance (assume 20% of capital cost)				$ -	
			Sub-Total, Indirect Capital Costs:		$ -	
		Total Capital Cost - Institutional Control			$ 10,000	
Annual Operation & Maintenance						
1	Monthly inspections	12	Each	$ 300	$ 3,600	
2	Existing fence replacement (@15 years)	1	L.S	$ 21,333	$ 22,000	**
		Total Annual Operation & Maintenance			$ 26,000	

Notes:
Costs are in total present value.
* Property is already fully fenced.
**Assumes fencing is replaced once, averaged over 30 years. Linear feet assumes that the three individual areas would be fenced separately.

TABLE C.2

ESTIMATED COSTS - SURFACE SOIL ALTERNATIVE 3
CAPPING WITH INSTITUTIONAL CONTROL
FEASIBILITY STUDY
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

		Estimated Quantity	*Unit*	*Unit Cost*	*Total*
Administrative Cost					
1	Administrative Cost to Implement Deed Restrictions	1	L.S.	$ 10,000	$ 10,000
			Sub-Total, Administrative Cost:		$ 10,000
Direct Capital Costs					
1	Insurance, Mobilization/Demobilization	1	L.S.	$ 5,000	$ 5,000
2	Area preparation (incl. filter fabric)	1	L.S.	$ 120,000	$ 120,000
3	Supply & place imported backfill (1 foot)	40550	c.y.	$ 30	$ 1,220,000
4	Supply & place topsoil (4 inches)	13381	c.y.	$ 35	$ 470,000
5	Seed & vegetate	1	L.S.	$ 1,500	$ 1,500
6	Survey	1	L.S.	$ 5,000	$ 15,000
7	Waste Disposal	1	L.S.	$ 15,000	$ 15,000
			Sub-Total, Direct Capital Cost:		$ 1,846,500
Indirect Capital Costs					
1	Design, Engineering, & Reporting	1	L.S.	$ 10,000	$ 10,000
2	Contingency Allowance (assume 20% of capital cost)				$ 370,000
			Sub-Total, Indirect Capital Costs:		$ 380,000
			Total Capital Cost - Capping & Institutional Control		$ 2,240,000
Annual Operation & Maintenance					
1	Monthly inspections	12	Each	$ 300	$ 3,600
2	Maintenance & Repair	1	L.S.	$ 1,500	$ 1,500
			Total Annual Operation & Maintenance		$ 5,100

Notes:
Costs are in total present value.
Total of all three areas is approximately 51 Acres.

TABLE C.3

ESTIMATED COSTS - SURFACE SOIL ALTERNATIVE 4
SURFACE SEDIMENT EXCAVATION & DISPOSAL
FEASIBILITY STUDY
TONAWANDA COKE CORPORATION
TONAWANDA, NEW YORK

		Estimated Quantity	*Unit*	*Unit Cost*	*Total*	
Administrative Cost						
1	Administrative Cost to Implement Deed Restrictions	1	L.S.	$ 10,000	$ 10,000	
			Sub-Total, Administrative Cost:		$ 10,000	
Direct Capital Costs						
1	Insurance, Mobilization/Demobilization	1	L.S.	$ 5,000	$ 5,000	
2	Excavate & load soil	40550	c.y.	$ 30	$ 1,220,000	
3	Supply & place filter fabric	121637	yd^2	$ 1.20	$ 150,000	
4	Supply & place imported backfill	40550	c.y.	$ 30	$ 1,216,500	
5	Supply & place topsoil	13381	c.y.	$ 35	$ 470,000	
6	Seed & vegetate	1	L.S.	$ 1,500	$ 1,500	
7	Survey	1	L.S.	$ 5,000	$ 15,000	
					$ 3,078,000	
Transportation & Disposal (40550 c.y./175 ton)						
1	Transportation and disposal	49,268	ton	$ 175	$ 8,630,000	*
			Sub-Total, Direct Capital Cost:		$ 11,710,000	
Indirect Capital Costs						
1	Design & Engineering (assume 25% of capital cost)				$ 2,930,000	
2	Contingency Allowance (assume 20% of capital cost)				$ 2,342,000	
			Sub-Total, Indirect Capital Costs:		$ 5,272,000	
			Total Capital Cost - Excavation & Disposal		$ 16,992,000	
Annual Operation & Maintenance						
1	Monthly inspections	12	Each	$ 300	$ 3,600	
2	Maintenance & Repair	1	L.S.	$ 1,500	$ 1,500	
			Total Annual Operation & Maintenance		$ 5,100	

Notes:
Costs are in total present value.
Total of all three areas is approximately 51 Acres.
* Assumes $175 / ton for hazardous waste T&D