



**CONESTOGA-ROVERS
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November 4, 2004

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Reference No. 19867

NYSDEC REG 9
FOIL
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Mr. Michael Hinton, P.E.
Division of Environmental Remediation
Region 9
New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 9
270 Michigan Avenue
Buffalo, New York 14203-2999

Dear Mr. Hinton:

Re: Responses to Comments
Phase I Letter Report, Operable Unit 3
Vanadium Corporation of America Site, Niagara Falls, New York

Please find attached the responses to your comments received in a letter dated September 3, 2004, regarding the Vanadium Corporation of America Site #932001 Operable Unit #3. As requested, revisions were made and revised pages are provided for inclusion in the Phase I Letter Report.

Should you have any questions regarding this information, please do not hesitate to contact us.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

Jamie Puskas
CS/ck/4

Encl.

- c.c.: Mr. Matthew Forcucci, NYSDOH (2 copies)
- Director, Division of Environmental Remediation, NYSDEC
- Maura Desmond, Esq., Division of Environmental Enforcement, NYSDEC
- Mr. Dan Johnson, Phelps Dodge Corporation
- Mr. Jim Hamula, Gallagher & Kennedy
- Edward Neuhauser, Niagara Mohawk Power Corporation
- Mr. William Holzauer, Niagara Mohawk Power Corporation
- Susan Kosikowski, New York Power Authority
- Mark Malone, New York Power Authority
- Mr. Ed Holman, New York Power Authority
- Gary A. Litwin (New York State Department of Health)



**RESPONSES TO SEPTEMBER 3, 2004
NYSDEC COMMENTS ON THE
PHASE I LETTER REPORT
VANADIUM CORPORATION OF AMERICA SITE**

USEPA Comment 1

Section 3.2 page 9 – please indicated that the data presented on this page is from the dark metallic looking material as indicated in Section 2.2 on page 2.

Response

The first sentence in the paragraph before the table on page 9 now reads, "In addition to the 30 subsurface soil samples described above, the **dark metallic looking** sample collected next to TP-20 (see **Section 2.2**) had concentrations above the RSCOs for arsenic, total chromium, copper, iron, nickel, selenium, and zinc."

USEPA Comment 2

Please provide the information and data regarding the hand auger locations along the north site of the site.

Response

Information regarding the hand auger locations along the north side of the Site has been added to pages 2 and 3. The text now reads as follows:

"On May 13, 2004, the extent of slag was delineated to the north of TP-13 using a hand auger. The three hand auger locations (HA-1, HA-2, and HA-3) are shown on Figure 2.1. These locations were staked where the extent of slag was found based on several hand augers advanced in each of the three areas. As the intent of the hand augering was solely to identify whether slag was present or not, logs were not made for the hand auger locations.

At HA-1, the field personnel began advancing hand augers at approximately 10-15 ft intervals from south to north, starting approximately 200 ft west of TP-13. Slag was observed at approximately 1.5 to 2 feet bgs at each location. The field personnel continued to move outward to the north into the swamp located in this area, until the high water level prevented further investigation in this direction. The field personnel then moved to the north side of the swamp, and began to advance hand augers in the southerly direction until the high water depth prevented further exploration in this

direction. Slag was not observed at these hand auger locations. The staked location HA-1 was marked as far into the swamp as safely possible, which is approximately 10 to 15 feet north of where the slag was confirmed.

At HA-2, the field personnel started at TP-13, and advanced hand augers at approximately 10-15 ft intervals in the northern direction. Slag was observed at approximately 1.5 to 2 feet bgs at each location. The field personnel continued augering north into the swamp, until the depth of water prevented them from continuing in this direction. The field personnel again moved to the north end of the swamp, and began hand augering south. Slag was not observed at these hand auger locations. Again, the depth of water in the swamp prevented the field personnel from reaching the last auger location where the slag had been confirmed. The staked location HA-2 was marked between the two auger locations, and is within approximately 10 feet of the confirmed slag.

At HA-3, the field personnel started approximately 50 ft east of TP-13, and advanced hand augers at approximately 10-15 ft intervals heading north until no slag was encountered. Slag was observed at approximately 1.5 to 2 feet bgs at each location. The staked location HA-3 was marked midway between the last auger location where slag was confirmed and the auger location where no slag was encountered.”

Revised November 4, 2004
August 6, 2004

Reference No. 19867

Mr. Michael J. Hinton, P.E.
Division of Environmental Remediation, Region 9
New York State Department of Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203-2999

Dear Mr. Hinton:

Re: Vanadium Corporation of America
Niagara Falls, New York

This letter report presents the data generated by Conestoga-Rovers & Associates (CRA) during the Phase I Investigation at the Vanadium Corporation of America Site (Site) in Niagara Falls, New York.

1.0 INTRODUCTION

The New York State Department of Environmental Conservation (NYSDEC) has designated the New York Power Authority and Niagara Mohawk Power Corporation parcel of the Site as Operable Unit 3 (OU3). The scope of work for conducting a Remedial Investigation/Feasibility Study (RI/FS) for OU3 is outlined in the Order on Consent.

As presented in the Order on Consent, the work to be performed is being done in a phased manner. The Phase I Work Plan (Work Plan) dated September 27, 2002 was prepared to meet the requirements of Phase I – Additional Data Collection. This letter report presents the data generated thus far during the Phase I investigation of OU3.

2.0 INVESTIGATION DESCRIPTION

This section provides a description of the field work performed on OU3, and is broken down into individual tasks as outlined in the Work Plan.

2.1 Shallow Monitoring Well Inventory, Survey, and Water Levels

An inventory of all existing shallow monitoring wells in the vicinity of the Site was completed during a Site visit on January 9, 2003. At that time, a total of 14 wells were located and inspected. Seven monitoring wells, including MW3R-88, WT-107-92, MW-101A, MW-101B,

BW1-86-UC, BW5-86-US, and BW6-86-UC no longer exist in the field. No repairs were required to any of the existing wells. A well inspection log was completed for each well, and the logs are presented as Attachment A. A round of hydraulic water levels was taken on January 9, 2003, and is presented in Table 2.1.

2.2 Test Pit Excavations

A total of 21 test pits were completed on July 30 and 31, and August 1, 18, and 19, 2003. The purpose of the test pits was to further delineate the extent of buried slag at the Site, particularly in the northern portion of OU3 and east of the capped area. From these test pits, the approximate limit of slag material was further delineated. The locations of the test pits were surveyed. The test pit locations and the revised extent of the slag material are presented on Figure 2.1. Test pit logs are presented as Attachment B.

The slag limits were not delineated to the north of TP-13 in 2003. Slag was identified at TP-13; however, the test trench was not continued beyond the edge of the densely vegetated marshy area. The slag limits were also not identified to the north of the ditch near TP-15 through TP-18. The property north of the ditch is currently fenced and is used as a paved parking lot for storing new automobiles. On May 13, 2004, the extent of slag was delineated to the north of TP-13 using a hand auger. The three hand auger locations (HA-1, HA-2, and HA-3) are shown on Figure 2.1. These locations were staked where the extent of slag was found based on several hand augers advanced in each of the three areas. As the intent of the hand augering was solely to identify whether slag was present or not, logs were not made for the hand auger locations.

At HA-1, the field personnel began advancing hand augers at approximately 10-15 ft intervals from south to north, starting approximately 200 ft west of TP-13. Slag was observed at approximately 1.5 to 2 feet bgs at each location. The field personnel continued to move outward to the north into the swamp located in this area, until the high water level prevented further investigation in this direction. The field personnel then moved to the north side of the swamp, and began to advance hand augers in the southerly direction until the high water depth prevented further exploration in this direction. Slag was not observed at these hand auger locations. The staked location HA-1 was marked as far into the swamp as safely possible, which is approximately 10 to 15 feet north of where the slag was confirmed.

At HA-2, the field personnel started at TP-13, and advanced hand augers at approximately 10-15 ft intervals in the northern direction. Slag was observed at approximately 1.5 to 2 feet bgs at each location. The field personnel continued augering north into the swamp, until the depth of water prevented them from continuing in this direction. The field personnel again moved to the north end of the swamp, and began hand augering south. Slag was not observed at these hand auger locations. Again, the depth of water in the swamp prevented the field personnel

from reaching the last auger location where the slag had been confirmed. The staked location HA-2 was marked between the two auger locations, and is within approximately 10 feet of the confirmed slag.

At HA-3, the field personnel started approximately 50 ft east of TP-13, and advanced hand augers at approximately 10-15 ft intervals heading north until no slag was encountered. Slag was observed at approximately 1.5 to 2 feet bgs at each location. The staked location HA-3 was marked midway between the last auger location where slag was confirmed and the auger location where no slag was encountered.

During the test pit excavation at TP-20, a dark, metallic looking material was encountered in addition to the gray white slag material. A sample of this metallic material was collected and analyzed for Target Compound List (TAL) inorganics and hexavalent chromium. The analytical data for this sample is presented in Table 2.2 and is discussed in Section 3.2.

2.3 Boreholes and Subsurface Soil Sampling and Analysis

A total of 15 boreholes (MW-1 to MW-11, MW-13 to MW-15, and BH-12) were advanced on July 22 to 25, 28, 29, and August 20, 2003. All boreholes were completed using a 4 1/4-inch hollow-stem auger (HSA). The purpose of the soil borings was to gather information to be used to:

- determine the distribution and thickness of the slag material at the Site;
- determine the thickness of the existing cap material, where present;
- determine the topography of the subsurface silt layer; and
- determine where the slag material is saturated.

All drilling techniques and decontamination procedures were conducted in accordance with the Work Plan. A total of 14 of the 15 boreholes were completed as shallow monitoring wells. The locations of the monitoring wells and boreholes are presented on Figure 2.2.

At each borehole location, subsurface soil samples were collected from two depths; the slag/fill material, where present, and the underlying native silt unit. At BH-12 and MW-18, both samples were collected from the slag/fill layer. No slag/fill material was observed at MW-15, MW-16, and MW-17. At these locations, the samples were taken from the native clay material at two different depths. All drill cuttings were collected and placed in 55-gallon drums for storage until proper waste disposal.

All subsurface soil samples were analyzed for pH, TAL inorganics, and hexavalent chromium. Table 2.2 presents the analytical data obtained from the subsurface soil sampling. An analysis of the data follows in Section 3.7.

2.4 Monitoring Well Installation

A total of 14 shallow groundwater monitoring wells were installed in the soil borings discussed above. The depths of the monitoring wells range from 10 to 24 feet below ground surface (bgs). The monitoring well stratigraphic logs are presented as Attachment C. All monitoring wells were installed and developed in accordance with the Work Plan.

Monitoring well construction details are summarized in Table 2.3.

2.5 Hydraulic Water Level Measurements

Three rounds of hydraulic water level measurements have been completed to date. The three rounds were completed on August 13, 2003, September 30, 2003, and December 19, 2003, respectively. The water level data are presented in Table 2.1. The groundwater contours for each of the three rounds are shown on Figures 2.3 to 2.5.

The contours presented of Figures 2.3 to 2.5 suggest that within OU3, the shallow groundwater appears to flow radially from the area around the large pond and the portion of the mound east of the pond. The data indicate relatively high fluctuations in water levels at several of the monitoring well locations. The greatest variability in water levels were observed at wells MW-17 (9.34 feet), MW-106A (7.45 feet), MW-103A (7.40 feet), MW-15 (7.37 feet) and MW-106B (7.25 feet). These wells are located at the southern end of the Site. The wells with the least variability are MW-20 (0.44 feet), MW-23 (0.81 feet), and MW-21 (0.95 feet). MW-21 is located on top of the mounded area, whereas MW-20 and MW-23 are located in the uncovered slag area west of the mound.

Although there is considerable variability in the water levels measured at some of the wells, the overall groundwater contour distribution over the three sampling rounds is relatively consistent with an overall shallow groundwater flow direction from the northwest towards the southeast with a groundwater mound in the vicinity of the pond.

2.6 Shallow Groundwater Sampling and Analysis

Following installation, all new wells were developed with a centrifugal pump using development protocols as outlined in the Work Plan. All wells were developed until two consecutive and consistent readings of temperature, pH, and conductivity were obtained and

the turbidity was less than 50 NTUs, where possible. At locations MW-18, MW-21, and MW-28, the well recharge was insufficient to conduct the well development as previously described. At these locations, the wells were pumped to dryness on 3 consecutive days. All development water was collected and stored in drums until proper waste disposal.

Two rounds of groundwater samples were collected using low flow purging and sampling protocols as outlined in the Work Plan. The first round was completed on August 15, 18, 20, 25, and 28, 2003. The second round was completed on October 1, 3, 6, 7, and 22, 2003.

All groundwater samples were analyzed for pH, TAL inorganics, and hexavalent chromium. Additionally, a total of seven groundwater samples were field filtered using in-line filters and analyzed for dissolved TAL inorganics and hexavalent chromium. The groundwater analytical data are presented in Table 2.4 and discussed in Section 3.5.

2.7 Surface Soil Sampling and Analysis

A total of 31 surface soil samples, SS-10 to SS-40, were collected on July 18, 21, and 22, 2003. The samples were collected from 0 to 2 inches bgs using a stainless steel spoon and bowl. All surface soil sampling and decontamination was conducted in accordance with the Work Plan. The sample locations are shown on Figure 2.6.

All surface soil samples were analyzed for pH, TAL inorganics, and hexavalent chromium. The analytical data generated from this sampling event are presented in Table 2.5. An analysis of the data is presented in the Section 3.1.

2.8 Surface Water and Sediment Sampling and Analysis

A total of four rounds of surface water sampling and one round of sediment sampling were completed. All surface water and sediment sampling and decontamination was conducted in accordance with the Work Plan.

The first round of surface water sampling and the one sediment sampling round were completed on August 14 and 21, 2003. During this sampling round, a total of 10 surface water samples and 16 sediment samples were collected. Six surface water locations from the Work Plan were not sampled as they were dry (SW-8, SW-9, SW-10, SW-16, SW-17, and SW-18). Additionally, no surface water or sediment sample was collected from location SW-12 as this area was inaccessible by field personnel during the summer. The area surrounding location SW-12 was densely vegetated with tall reeds during the summer, and was too swampy to reach on foot.

During the second round of surface water sampling conducted on October 7, 2003, a total of 9 surface water samples were collected. Seven locations were not sampled as they were dry (SW-8, SW-9, SW-10, SW-16, SW-17, SW-18, and SW-22). The location for SW-12 was still inaccessible by field personnel during this sampling round.

During the third round of surface water sampling conducted on December 17, 2003, a total of 15 surface water samples were collected. Two locations, SW-8 and SW-10, were not sampled as they were dry. A surface water sample was collected from SW-12 during this sampling round.

During the fourth round of surface water sampling conducted on May 12, 2004, a total of 15 surface water samples were collected. Two locations, SW-8 and SW-10, were not sampled as they were dry. Additionally, a sediment sample was collected at SW-12. Sediment samples were also collected at SW-8, SW-9, SW-16, and SW-17, as the pH was not collected during the initial sediment sampling round.

Surface water samples and sediment samples were analyzed for pH, TAL inorganics, and hexavalent chromium. Due to a field oversight, pH was not measured for surface water samples collected in August and December 2003 and sediment samples from SW-8, SW-9, SW-16, and SW-17. All sediment samples were analyzed for TAL inorganics and hexavalent chromium. A complete round of surface water pH measurements was completed on April 7, 2004. Readings were not obtained at three locations, SW-8, SW-10, and SW-22, as they were dry.

The surface water and sediment sampling locations are shown on Figure 2.7, and the analytical data are presented in Tables 2.6 and 2.7. An analysis of the data follows in Sections 3.3 and 3.4.

2.9 Soil Cover Material Sampling and Analysis

A soil cover currently overlays the slag material on the eastern side of the Site. One of the tasks as outlined in the Work Plan was to collect samples from the soil cover material and analyze the samples for physical soil parameters to determine if the existing cover could be used either by itself or as a part of a final cap design.

A total of three samples were collected from the cap material on Site. The samples were collected from approximately 2 to 10 inches bgs at locations MW-21, MW-23, and MW-24. It was decided in the field that the Shelby tube method of collection would not be effective due to the shallow nature of the cap material. The three samples were collected in 5-gallon plastic containers. An excavator was used to scrape away the top vegetated layer, and then fill the 5-gallon containers with cap material. All samples were analyzed for particle size distribution, liquid limit, plastic limit, plasticity index, and hydraulic conductivity. The results are

summarized in Table 2.9. The laboratory report containing all analyses performed is included as Attachment D.

2.10 Community Air Monitoring

A community air monitoring plan in accordance with the Work Plan and New York State Department of Health protocols was implemented at the Site during ground intrusive activities.

The ground intrusive activities included advancement of boreholes, installation of monitoring wells, and the test pit program. There were no exceedances of the maximum allowable 1-hour average PM-10 concentration of 150 $\mu\text{g}/\text{m}^3$ during any of the drilling activities.

During the test pit program, the 1-hour average PM-10 concentration (Time Weighted Average) was not recorded due to frequent relocation of the excavator. The real-time PM-10 concentration was recorded approximately every hour during test pit. Tables 2.10 and 2.11 provide a summary of the data collected during the community air monitoring program. As shown in these tables, the TWA and PM-10 concentrations did not exceed 150 $\mu\text{g}/\text{m}^3$.

2.11 Topographic/Property Survey

A topographic/property survey was completed between May 6 and June 30, 2004, and is presented on Figure 2.8. This survey will provide the topographic contouring required to generate geologic cross-sections across the Site and define surface water drainage patterns for the Remedial Investigation Report. The cross-sections will be used to further evaluate the slag and cap material depths across the Site, as well as the shallow groundwater flow patterns.

3.0 DATA ANALYSIS

The following sections provide an evaluation of the results obtained from the surface soil, subsurface soil, surface water, sediment, and groundwater sampling programs. The Analytical Data Assessment and Validation Report is included as Attachment E.

3.1 Surface Soil Data

The surface soil data were compared to the Recommended Soil Cleanup Objectives (RSCOs) as presented in NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046 dated January 1994. In general, beryllium, chromium (total), copper, iron, mercury, nickel, selenium, vanadium, and zinc were detected at concentrations above the RSCOs in surface soils. Elevated hexavalent chromium and pH values were also detected in surface soils. A summary

of concentrations of these parameters in the surface soil samples is presented in the table below and the analytical results for chromium (total), chromium (hexavalent), copper, nickel, selenium, zinc, and pH are presented on Figure 2.9.

<i>Parameter</i>	<i>TAGM (mg/kg)</i>	<i>Number of Samples</i>	<i>Number of Exceedances</i>	<i>Range of Detects (mg/kg)</i>	<i>Location of Highest Concentration</i>
Beryllium	0.16	31	27	0.186 - 0.868	SS-21
Chromium (total)	50	31	21	15.4 - 10,300	SS-23
Chromium (hex.)	NS ¹	31	NA ²	1.4 - 16	SS-23
Cobalt	30	31	4	3.79 - 34.1	SS-23
Copper	25	31	20	17.8 - 462	SS-40
Iron	2,000	31	31	7,630 - 29,300	SS-21
Mercury	0.1	31	8	0.0115 - 0.784	SS-38
Nickel	13	31	31	13.8 - 1,570	SS-31
Selenium	2	31	14	0.950 - 26.3	SS-15
Vanadium	150	31	4	17.1 - 263	SS-20
Zinc	20	31	31	80.2 - 515	SS-13
pH	NS	31	NA	6.5 - 8.8	SS-27

In general, the highest concentrations of total and hexavalent chromium, copper, nickel, and selenium in the surface soils were detected in the areas of exposed slag (SS-15, SS-16, SS-20, SS-22, SS-23, SS-27, SS-30, SS-31, and SS-40). Lower concentrations were generally detected in areas where the slag is covered by common fill or topsoil.

3.2 Subsurface Soil Data

The subsurface soil data were compared to the RSCOs as presented in NYSDEC TAGM 4046 dated January 1994. For evaluation purposes, the data for the slag/fill samples has been separated from the data for samples collected from the native soils. The analytical results for chromium (total), chromium (hexavalent), copper, nickel, selenium, zinc, and pH are presented on Figure 2.10.

A summary of the slag/fill material parameter concentrations is presented in the table below.

¹ NS - No Standard
² NA - Not Applicable

<i>Parameter</i>	<i>TAGM (mg/kg)</i>	<i>Number of Samples</i>	<i>Number of Exceedances</i>	<i>Range of Detects (mg/kg)</i>	<i>Average Concentration (mg/kg)</i>	<i>Location of Highest Concentration (ft bgs)</i>
Arsenic	7.5	16	3	3.00 - 70	10.7	MW-20 (4.5-6)
Beryllium	0.16	16	15	0.162 - 3.04	1.17	BH-12 (4-6.5)
Cadmium	1	16	2	0.164 - 3.75	1.61	MW-26 (2-4)
Chromium (total)	50	16	10	4.90 - 5790	1,544	MW-22 (6-8)
Chromium (hex.)	NS	16	NA	4.9 - 430	108	MW-21 (8-10)
Copper	25	16	7	2.31 - 354	42	MW-20 (4.5-6)
Iron	2,000	16	15	533 - 65,500	16,808	MW-25 (2-3)
Nickel	13	16	12	6.21 - 261	50	MW-25 (2-3)
Selenium	2	16	1	4.01	4.01	MW-17 (0-4)
Zinc	20	16	13	15.0 - 1160	144	MW-26 (2-4)
pH	NS	16	NA	8.1 - 12	10.9	See text below

A pH value of 12 was detected at MW-18 (2 to 4 feet bgs and 12 to 14 feet bgs), MW-19 (0.5 to 2 feet bgs), MW-20 (4.5 to 6 feet bgs), MW-21 (8 to 10 feet bgs), MW-22 (6 to 8 feet bgs), MW-23 (4 to 6 feet bgs), MW-24 (2 to 4 feet bgs), MW-27 (1.5 to 4 feet bgs), and MW-28 (1 to 2 feet bgs).

A summary of the native soil parameter concentrations is presented in the table below.

<i>Parameter</i>	<i>TAGM (mg/kg)</i>	<i>Number of Samples</i>	<i>Number of Exceedances</i>	<i>Range of Detects (mg/kg)</i>	<i>Average Concentration (mg/kg)</i>	<i>Location of Highest Concentration (ft bgs)</i>
Arsenic	7.5	14	2	2.95 - 9.44	5.93	MW-25 (8-10)
Beryllium	0.16	14	14	0.405 - 1.18	0.79	MW-27 (7-8)
Chromium (total)	50	14	0	9.66 - 30.4	22.7	MW-28 (7-8)
Chromium (hex.)	NS	14	0	ND ³	ND	NA
Copper	25	14	4	8.96 - 30.1	21.3	MW-27 (7-8); MW-20 (8-10)
Iron	2,000	14	14	10,600 - 33,100	25,221	MW-27 (7-8)
Nickel	13	14	13	9.97 - 32.8	24.9	MW-27 (7-8)
Selenium	2	14	3	1.67 - 6.21	2.62	MW-17 (11-13)
Zinc	20	14	14	46.9 - 387	111	MW-26 (10-12)
pH	NS	14	NA	7.4 - 11	9.0	MW-26 (10-12)

³ ND - Not Detected

The samples collected from the slag/fill material have elevated concentrations of primarily total chromium, hexavalent chromium, and pH relative to the underlying native soil. Some of the slag samples also had elevated concentrations of copper, nickel, and zinc relative to the native soils.

In addition to the 30 subsurface soil samples described above, the dark metallic looking sample collected next to TP-20 (see Section 2.2) had concentrations above the RSCOs for arsenic, total chromium, copper, iron, nickel, selenium, and zinc. This material was also observed at BH-12, but only in trace amounts from 2 to 4 feet bgs. The table below shows the parameter concentrations for this sample:

<i>Parameter</i>	<i>TAGM (mg/kg)</i>	<i>Concentration (mg/kg)</i>
Arsenic	7.5	35.8
Beryllium	0.16	0.965
Chromium (total)	50	317
Copper	25	379
Iron	2,000	52,200
Nickel	13	87.8
Selenium	2.0	7.27
Zinc	20	258

In summary, parameter concentrations in this sample are generally within the range of concentrations for the other slag/fill material on Site, with a few minor exceptions. This sample has the highest concentrations of selenium, arsenic and barium. Arsenic was detected across the Site in slag/fill material samples, but generally below the RSCO. Three slag/fill samples (MW-20, MW-25, and BH-12) and two native soil samples (MW-25 and MW-27) had concentrations of arsenic above the RSCO.

3.3 Sediment Data

The sediment soil data were compared to the NYSDEC Lowest Effect Level (LEL) and Severe Effect Level (SEL) provided in the document Technical Guidance for Screening Contaminated Sediments, dated January 1999. This comparison is conservative in that the sediment samples were collected from ditches which can be dry at certain times of the year. In general, chromium (total), copper, manganese, and zinc were detected at concentrations above the LELs and SELs in sediment samples. Elevated hexavalent chromium and pH values were also detected in sediments. A summary of these parameter concentrations is presented in the table below and the analytical results for chromium (total), chromium (hexavalent), copper, nickel, selenium, zinc, and pH are presented on Figure 2.11.

<i>Parameter</i>	<i>Lowest Effect Level (mg/kg)</i>	<i>Severe Effect Level (mg/kg)</i>	<i>Number of Samples</i>	<i>Number of Exceedances of LEL</i>	<i>Number of Exceedances of SEL</i>	<i>Range of Detects (mg/kg)</i>	<i>Location of Highest Concentration</i>
Antimony	2.0	25.0	22	9	0	0.971 – 16.9	SW-8
Arsenic	6.0	33.0	22	10	0	4.28 – 27.9	SW-11
Cadmium	0.6	9.0	22	5	1	0.0526 – 25.3	SW-8
Chromium (total)	26.0	110.0	22	19	10	7.17 - 1,840	SW-11
Chromium (hex.)	NS	NS	22	NA	NA	2.3 - 4.9	SW-23
Copper	16.0	110.0	22	14	5	2.65 - 323	SW-9
Iron	20,000	40,000	22	12	3	417 – 42,600	SW-11
Lead	31.0	110.0	22	12	5	8.55 - 1,710	SW-8
Manganese	460.0	1100.0	22	14	2	20.4 - 1,390	SW-8
Mercury	0.15	1.3	22	7	3	0.00865 – 2.77	SW-9
Nickel	16.0	50.0	22	14	8	1.63 - 209	SW-11
Silver	1.0	2.2	22	4	2	0.545 – 4.79	SW-9
Zinc	120.0	270.0	22	13	6	16.5 – 2,220	SW-9
pH	NS	NS	17	NA	NA	7.1 - 12	SW-13; SW-21

The pH was analyzed for 17 of the 22 samples. Results for pH ranged from 7.1 at SW-9 to 12 at SW-13 and SW-21.

The highest concentrations of total chromium were detected in the ditch at the north end of the Site (SW-23), north of and within the large pond in the middle of the Site (SW-20 and SW-22), as well at the western end of the ditch that runs along the southern portion of the Site adjacent to the fence line (SW-10 and 11) and across Witmer Road (SW-8 and 9). The highest concentrations of manganese and zinc were also found at the western end of this ditch and across Witmer Road (SW-8, SW-9, and SW-11).

Hexavalent chromium was only detected at two locations; SW-22 and SW-23, located north of the large pond in the centre of the Site. The highest pH values were detected around the large pond in the middle of the Site (SW-20 and SW-21), the ditch that runs along the fence line at the north end of the Site (SW-23), south of the slag area (SW-16), and the east end of the ditch running along the southern portion of the Site (SW-13 and 14).

3.4 Surface Water Data

The surface water data were compared to the NYSDEC Ambient Water Quality Standards (AWQS) for Human Consumption of Fish (fresh water) dated June 1998. In general, iron and thallium were detected at concentrations above the AWQS in the surface water samples. Elevated concentrations of hexavalent chromium were also detected in surface water. A summary of the parameter concentrations is presented in the table below and the analytical results for chromium (total), chromium (hexavalent), and pH are presented on Figure 2.12.

<i>Parameter</i>	<i>AWQS (mg/L)</i>	<i>Number of Samples</i>	<i>Number of Exceedances</i>	<i>Range of Detects (mg/L)</i>	<i>Location of Highest Concentration</i>
Chromium (hex.)	0.016	48	21	0.004 - 0.571	SW-14
Iron	0.300	48	25	0.0533 - 151	SW-11
Thallium	0.020	48	8	0.0086 - 0.0936	SW-20
Vanadium	0.190	48	1	0.00334 - 0.231	SW-11
pH	6.5 - 8.5	37	29	6.16 - 12.41	SW-13

The highest concentration of total chromium was detected at SW-11, located along the ditch at the southwestern end of the Site. The highest concentrations of hexavalent chromium were detected in samples collected along the western edge of the identified slag area [e.g., SW-23, down to the south ditch (SW-13, 14, and 15)].

There is some variability in the surface water data between sampling rounds for individual locations. For example, at location SW-14 the concentration of hexavalent chromium ranged from 0.0650 mg/L in December 2003 to 0.571 mg/L in October 2003. Similarly, the concentration of total chromium in the samples from location SW-11 ranged from 0.135 mg/L in December 2003 to 6.39 mg/L in October 2003. However, there does not appear to be a pattern of uniformly higher or lower concentrations for the different sampling rounds.

The surface water that flows off the Site to the east would enter Gill Creek, which ultimately discharges into the Niagara River approximately 2 miles to the south. The surface water that flows off the Site to the west enters a ditch on the west side of Witmer Road.

3.5 Groundwater Data

The groundwater data were compared to the NYSDEC AWQS for Class GA drinking water (groundwater), dated June 1998. A summary of the parameter concentrations is presented in the table below.

<i>Parameter</i>	<i>AWQS (mg/L)</i>	<i>Number of Samples</i>	<i>Number of Exceedances</i>	<i>Range of Detects (mg/L)</i>	<i>Location of Highest Concentration</i>
Chromium (total)	0.05	37	8	0.0839 - 0.655	MW-19
Chromium (diss.)	0.005	14	1	0.106	MW-23
Chromium (hex.) (total)	0.05	37	4	0.0110 - 0.181	MW-23
Chromium (hex.) (diss.)	0.05	14	1	0.008 - 0.090	MW-23
Iron (total)	0.3	37	29	0.128 - 85.5	MW-19
Iron (diss.)	0.3	14	8	0.495 - 3.92	MW-104A
Lead (total)	0.025	37	8	0.00539 - 0.379	MW-17
Manganese (total)	0.3	37	17	0.00203 - 2.47	MW-17
Manganese (diss.)	0.3	14	4	0.00316 - 0.858	MW-104A
Selenium (total)	0.010	37	27	0.00669 - 0.0739	MW-17
Selenium (diss.)	0.010	14	7	0.00725 - 0.0547	MW-103A
pH	6.5-8.5	47	23	6.65 - 12.76	MW-21

The analytical results for chromium (total), chromium (hexavalent), iron (total), lead (total), manganese (total), selenium (total), selenium (dissolved), and pH are presented on Figure 2.13. The highest concentrations of total chromium and total hexavalent chromium were detected in the centre of the Site at wells MW-18, MW-19, and MW-23.

3.6 Soil Cover Material Analysis

The soil that covers much of the slag material on OU3 ranges in thickness from approximately 6 inches at MW-18 and MW-21 to approximately 3 feet at MW-23. Based on the four monitoring wells installed on top of the covered area, the average thickness of the existing soil cover material is approximately 1.5 feet. Based on the analyses of the soil samples collected of the soil cover material, the soil generally consists of a clayey silt. The hydraulic conductivity ranged from 5.77×10^{-7} cm/sec to 8.72×10^{-8} cm/sec, with an average of approximately 2.46×10^{-7} cm/sec. This material could be used as a component for a cap in this area.

5.0 REFERENCES

Conestoga-Rovers & Associates, September 27, 2002. "Phase I Work Plan, Operable Unit 3, Vanadium Corporation of America, Niagara Falls, New York".

Revised November 4, 2004
August 6, 2004

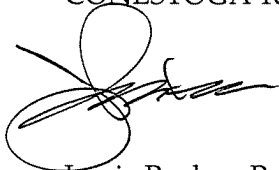
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If you have any questions or concerns, please feel free to contact us.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

A handwritten signature in black ink, appearing to read 'Jamie Puskas', written over a circular scribble.

Jamie Puskas, P. Eng.

CS/jdh/3
Encl.

c.c.: Matthew J. Forcucci (New York State Department of Health) (2 copies)
Director (Division of Environmental Remediation, NYSDEC)
Maura Desmond (Division of Environmental Enforcement)
Dan Johnson (Phelps Dodge Corporation)
Jim Hamula (Gallagher & Kennedy)
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August 6, 2004

Reference No. 19867

Mr. Michael J. Hinton, P.E.
Division of Environmental Remediation, Region 9
New York State Department of Environmental Conservation
270 Michigan Avenue
Buffalo, New York 14203-2999

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AUG 09 2004

NYSDEC REG 9
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Dear Mr. Hinton:

Re: Vanadium Corporation of America
Niagara Falls, New York

This letter report presents the data generated by Conestoga-Rovers & Associates (CRA) during the Phase I Investigation at the Vanadium Corporation of America Site (Site) in Niagara Falls, New York.

1.0 INTRODUCTION

The New York State Department of Environmental Conservation (NYSDEC) has designated the New York Power Authority and Niagara Mohawk Power Corporation parcel of the Site as Operable Unit 3 (OU3). The scope of work for conducting a Remedial Investigation/Feasibility Study (RI/FS) for OU3 is outlined in the Order on Consent.

As presented in the Order on Consent, the work to be performed is being done in a phased manner. The Phase I Work Plan (Work Plan) dated September 27, 2002 was prepared to meet the requirements of Phase I – Additional Data Collection. This letter report presents the data generated thus far during the Phase I investigation of OU3.

2.0 INVESTIGATION DESCRIPTION

This section provides a description of the field work performed on OU3, and is broken down into individual tasks as outlined in the Work Plan.

2.1 Shallow Monitoring Well Inventory, Survey, and Water Levels

An inventory of all existing shallow monitoring wells in the vicinity of the Site was completed during a Site visit on January 9, 2003. At that time, a total of 14 wells were located and inspected. Seven monitoring wells, including MW3R-88, WT-107-92, MW-101A, MW-101B,



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BW1-86-UC, BW5-86-US, and BW6-86-UC no longer exist in the field. No repairs were required to any of the existing wells. A well inspection log was completed for each well, and the logs are presented as Attachment A. A round of hydraulic water levels was taken on January 9, 2003, and is presented in Table 2.1.

2.2 Test Pit Excavations

A total of 32 test pits were completed on July 30 and 31, and August 1, 18, and 19, 2003. The purpose of the test pits was to further delineate the extent of buried slag at the Site, particularly in the northern portion of OU3 and east of the capped area. From these test pits, the approximate limit of slag material was further delineated. The locations of the test pits were surveyed. The test pit locations and the revised extent of the slag material are presented on Figure 2.1. Test pit logs are presented as Attachment B.

The slag limits were not delineated to the north of TP-13. Slag was identified at TP-13; however, the test trench was not continued beyond the edge of the densely vegetated marshy area. The slag limits were also not identified to the north of the ditch near TP-15 through TP-18. The property north of the ditch is currently fenced and is used as a paved parking lot for storing new automobiles.

During the test pit excavation at TP-20, a dark, metallic looking material was encountered in addition to the gray white slag material. A sample of this metallic material was collected and analyzed for Target Compound List (TAL) inorganics and hexavalent chromium. The analytical data for this sample is presented in Table 2.2 and is discussed in Section 3.2.

2.3 Boreholes and Subsurface Soil Sampling and Analysis

A total of 15 boreholes (MW-1 to MW-11, MW-13 to MW-15, and BH-12) were advanced on July 22 to 25, 28, 29, and August 20, 2003. All boreholes were completed using a 4 1/4-inch hollow-stem auger (HSA). The purpose of the soil borings was to gather information to be used to:

- determine the distribution and thickness of the slag material at the Site;
- determine the thickness of the existing cap material, where present;
- determine the topography of the subsurface silt layer; and
- determine where the slag material is saturated.

All drilling techniques and decontamination procedures were conducted in accordance with the Work Plan. A total of 14 of the 15 boreholes were completed as shallow monitoring wells. The locations of the monitoring wells and boreholes are presented on Figure 2.2.



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At each borehole location, subsurface soil samples were collected from two depths; the slag/fill material, where present, and the underlying native silt unit. At BH-12 and MW-18, both samples were collected from the slag/fill layer. No slag/fill material was observed at MW-15, MW-16, and MW-17. At these locations, the samples were taken from the native clay material at two different depths. All drill cuttings were collected and placed in 55-gallon drums for storage until proper waste disposal.

All subsurface soil samples were analyzed for pH, TAL inorganics, and hexavalent chromium. Table 2.2 presents the analytical data obtained from the subsurface soil sampling. An analysis of the data follows in Section 3.7.

2.4 Monitoring Well Installation

A total of 14 shallow groundwater monitoring wells were installed in the soil borings discussed above. The depths of the monitoring wells range from 10 to 24 feet below ground surface (bgs). The monitoring well stratigraphic logs are presented as Attachment C. All monitoring wells were installed and developed in accordance with the Work Plan.

Monitoring well construction details are summarized in Table 2.3.

2.5 Hydraulic Water Level Measurements

Three rounds of hydraulic water level measurements have been completed to date. The three rounds were completed on August 13, 2003, September 30, 2003, and December 19, 2003, respectively. The water level data are presented in Table 2.1. The groundwater contours for each of the three rounds are shown on Figures 2.3 to 2.5.

The contours presented of Figures 2.3 to 2.5 suggest that within OU3, the shallow groundwater appears to flow radially from the area around the large pond and the portion of the mound east of the pond. The data indicate relatively high fluctuations in water levels at several of the monitoring well locations. The greatest variability in water levels were observed at wells MW-17 (9.34 feet), MW-106A (7.45 feet), MW-103A (7.40 feet), MW-15 (7.37 feet) and MW-106B (7.25 feet). These wells are located at the southern end of the Site. The wells with the least variability are MW-20 (0.44 feet), MW-23 (0.81 feet), and MW-21 (0.95 feet). MW-21 is located on top of the mounded area, whereas MW-20 and MW-21 are located in the uncovered slag area west of the mound.

Although there is considerable variability in the water levels measured at some of the wells, the overall groundwater contour distribution over the three sampling rounds is relatively



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consistent with an overall shallow groundwater flow direction from the northwest towards the southeast with a groundwater mound in the vicinity of the pond.

2.6 Shallow Groundwater Sampling and Analysis

Following installation, all new wells were developed with a centrifugal pump using development protocols as outlined in the Work Plan. All wells were developed until two consecutive and consistent readings of temperature, pH, and conductivity were obtained and the turbidity was less than 50 NTUs, where possible. At locations MW-18, MW-21, and MW-28, the well recharge was insufficient to conduct the well development as previously described. At these locations, the wells were pumped to dryness on 3 consecutive days. All development water was collected and stored in drums until proper waste disposal.

Two rounds of groundwater samples were collected using low flow purging and sampling protocols as outlined in the Work Plan. The first round was completed on August 15, 18, 20, 25, and 28, 2003. The second round was completed on October 1, 3, 6, 7, and 22, 2003.

All groundwater samples were analyzed for pH, TAL inorganics, and hexavalent chromium. Additionally, a total of seven groundwater samples were field filtered using in-line filters and analyzed for dissolved TAL inorganics and hexavalent chromium. The groundwater analytical data are presented in Table 2.4 and discussed in Section 3.5.

2.7 Surface Soil Sampling and Analysis

A total of 31 surface soil samples, SS-10 to SS-40, were collected on July 18, 21, and 22, 2003. The samples were collected from 0 to 2 inches bgs using a stainless steel spoon and bowl. All surface soil sampling and decontamination was conducted in accordance with the Work Plan. The sample locations are shown on Figure 2.6.

All surface soil samples were analyzed for pH, TAL inorganics, and hexavalent chromium. The analytical data generated from this sampling event are presented in Table 2.5. An analysis of the data is presented in the Section 3.1.

2.8 Surface Water and Sediment Sampling and Analysis

A total of four rounds of surface water sampling and one round of sediment sampling were completed. All surface water and sediment sampling and decontamination was conducted in accordance with the Work Plan.

The first round of surface water sampling and the one sediment sampling round were completed on August 14 and 21, 2003. During this sampling round, a total of 10 surface water



samples and 16 sediment samples were collected. Six surface water locations from the Work Plan were not sampled as they were dry (SW-8, SW-9, SW-10, SW-16, SW-17, and SW-18). Additionally, no surface water or sediment sample was collected from location SW-12 as this area was inaccessible by field personnel during the summer. The area surrounding location SW-12 was densely vegetated with tall reeds during the summer, and was too swampy to reach on foot.

During the second round of surface water sampling conducted on October 7, 2003, a total of 9 surface water samples were collected. Seven locations were not sampled as they were dry (SW-8, SW-9, SW-10, SW-16, SW-17, SW-18, and SW-22). The location for SW-12 was still inaccessible by field personnel during this sampling round.

During the third round of surface water sampling conducted on December 17, 2003, a total of 15 surface water samples were collected. Two locations, SW-8 and SW-10, were not sampled as they were dry. A surface water sample was collected from SW-12 during this sampling round.

During the fourth round of surface water sampling conducted on May 12, 2004, a total of 15 surface water samples were collected. Two locations, SW-8 and SW-10, were not sampled as they were dry. Additionally, a sediment sample was collected at SW-12. Sediment samples were also collected at SW-8, SW-9, SW-16, and SW-17, as the pH was not collected during the initial sediment sampling round.

Surface water samples and sediment samples were analyzed for pH, TAL inorganics, and hexavalent chromium. Due to a field oversight, pH was not measured for surface water samples collected in August and December 2003 and sediment samples from SW-8, SW-9, SW-16, and SW-17. All sediment samples were analyzed for TAL inorganics and hexavalent chromium. A complete round of surface water pH measurements was completed on April 7, 2004. Readings were not obtained at three locations, SW-8, SW-10, and SW-22, as they were dry.

The surface water and sediment sampling locations are shown on Figure 2.7, and the analytical data are presented in Tables 2.6 and 2.7. An analysis of the data follows in Sections 3.3 and 3.4.

2.9 Soil Cover Material Sampling and Analysis

A soil cover currently overlays the slag material on the eastern side of the Site. One of the tasks as outlined in the Work Plan was to collect samples from the soil cover material and analyze the samples for physical soil parameters to determine if the existing cover could be used either by itself or as a part of a final cap design.



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A total of three samples were collected from the cap material on Site. The samples were collected from approximately 2 to 10 inches bgs at locations MW-21, MW-23, and MW-24. It was decided in the field that the Shelby tube method of collection would not be effective due to the shallow nature of the cap material. The three samples were collected in 5-gallon plastic containers. An excavator was used to scrape away the top vegetated layer, and then fill the 5-gallon containers with cap material. All samples were analyzed for particle size distribution, liquid limit, plastic limit, plasticity index, and hydraulic conductivity. The results are summarized in Table 2.9. The laboratory report containing all analyses performed is included as Attachment D.

2.10 Community Air Monitoring

A community air monitoring plan in accordance with the Work Plan and New York State Department of Health protocols was implemented at the Site during ground intrusive activities.

The ground intrusive activities included advancement of boreholes, installation of monitoring wells, and the test pit program. There were no exceedances of the maximum allowable 1-hour average PM-10 concentration of $150 \mu\text{g}/\text{m}^3$ during any of the drilling activities.

During the test pit program, the 1-hour average PM-10 concentration (Time Weighted Average) was not recorded due to frequent relocation of the excavator. The real-time PM-10 concentration was recorded approximately every hour during test pit. Tables 2.10 and 2.11 provide a summary of the data collected during the community air monitoring program. As shown in these tables, the TWA and PM-10 concentrations did not exceed $150 \mu\text{g}/\text{m}^3$.

2.11 Topographic/Property Survey

A topographic/property survey was completed between May 6 and June 30, 2004, and is presented on Figure 2.8. This survey will provide the topographic contouring required to generate geologic cross-sections across the Site and define surface water drainage patterns for the Remedial Investigation Report. The cross-sections will be used to further evaluate the slag and cap material depths across the Site, as well as the shallow groundwater flow patterns.

3.0 DATA ANALYSIS

The following sections provide an evaluation of the results obtained from the surface soil, subsurface soil, surface water, sediment, and groundwater sampling programs. The Analytical Data Assessment and Validation Report is included as Attachment E.



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3.1 Surface Soil Data

The surface soil data were compared to the Recommended Soil Cleanup Objectives (RSCOs) as presented in NYSDEC Technical and Administrative Guidance Memorandum (TAGM) 4046 dated January 1994. In general, beryllium, chromium (total), copper, iron, mercury, nickel, selenium, vanadium, and zinc were detected at concentrations above the RSCOs in surface soils. Elevated hexavalent chromium and pH values were also detected in surface soils. A summary of concentrations of these parameters in the surface soil samples is presented in the table below and the analytical results for chromium (total), chromium (hexavalent), copper, nickel, selenium, zinc, and pH are presented on Figure 2.9.

<i>Parameter</i>	<i>TAGM (mg/kg)</i>	<i>Number of Samples</i>	<i>Number of Exceedances</i>	<i>Range of Detects (mg/kg)</i>	<i>Location of Highest Concentration</i>
Beryllium	0.16	31	27	0.186 - 0.868	SS-21
Chromium (total)	50	31	21	15.4 - 10,300	SS-23
Chromium (hex.)	NS ¹	31	NA ²	1.4 - 16	SS-23
Cobalt	30	31	4	3.79 - 34.1	SS-23
Copper	25	31	20	17.8 - 462	SS-40
Iron	2,000	31	31	7,630 - 29,300	SS-21
Mercury	0.1	31	8	0.0115 - 0.784	SS-38
Nickel	13	31	31	13.8 - 1,570	SS-31
Selenium	2	31	14	0.950 - 26.3	SS-15
Vanadium	150	31	4	17.1 - 263	SS-20
Zinc	20	31	31	80.2 - 515	SS-13
pH	NS	31	NA	6.5 - 8.8	SS-27

In general, the highest concentrations of total and hexavalent chromium, copper, nickel, and selenium in the surface soils were detected in the areas of exposed slag (SS-15, SS-16, SS-20, SS-22, SS-23, SS-27, SS-30, SS-31, and SS-40). Lower concentrations were generally detected in areas where the slag is covered by common fill or topsoil.

3.2 Subsurface Soil Data

The subsurface soil data were compared to the RSCOs as presented in NYSDEC TAGM 4046 dated January 1994. For evaluation purposes, the data for the slag/fill samples has been separated from the data for samples collected from the native soils. The analytical results for

¹ NS - No Standard

² NA - Not Applicable



chromium (total), chromium (hexavalent), copper, nickel, selenium, zinc, and pH are presented on Figure 2.10.

A summary of the slag/fill material parameter concentrations is presented in the table below.

<i>Parameter</i>	<i>TAGM (mg/kg)</i>	<i>Number of Samples</i>	<i>Number of Exceedances</i>	<i>Range of Detects (mg/kg)</i>	<i>Average Concentration (mg/kg)</i>	<i>Location of Highest Concentration (ft bgs)</i>
Arsenic	7.5	16	3	3.00 - 70	10.7	MW-20 (4.5-6)
Beryllium	0.16	16	15	0.162 - 3.04	1.17	BH-12 (4-6.5)
Cadmium	1	16	2	0.164 - 3.75	1.61	MW-26 (2-4)
Chromium (total)	50	16	10	4.90 - 5790	1,544	MW-22 (6-8)
Chromium (hex.)	NS	16	NA	4.9 - 430	108	MW-21 (8-10)
Copper	25	16	7	2.31 - 354	42	MW-20 (4.5-6)
Iron	2,000	16	15	533 - 65,500	16,808	MW-25 (2-3)
Nickel	13	16	12	6.21 - 261	50	MW-25 (2-3)
Selenium	2	16	1	4.01	4.01	MW-17 (0-4)
Zinc	20	16	13	15.0 - 1160	144	MW-26 (2-4)
pH	NS	16	NA	8.1 - 12	10.9	See text below

A pH value of 12 was detected at MW-18 (2 to 4 feet bgs and 12 to 14 feet bgs), MW-19 (0.5 to 2 feet bgs), MW-20 (4.5 to 6 feet bgs), MW-21 (8 to 10 feet bgs), MW-22 (6 to 8 feet bgs), MW-23 (4 to 6 feet bgs), MW-24 (2 to 4 feet bgs), MW-27 (1.5 to 4 feet bgs), and MW-28 (1 to 2 feet bgs).

A summary of the native soil parameter concentrations is presented in the table below.

<i>Parameter</i>	<i>TAGM (mg/kg)</i>	<i>Number of Samples</i>	<i>Number of Exceedances</i>	<i>Range of Detects (mg/kg)</i>	<i>Average Concentration (mg/kg)</i>	<i>Location of Highest Concentration (ft bgs)</i>
Arsenic	7.5	14	2	2.95 - 9.44	5.93	MW-25 (8-10)
Beryllium	0.16	14	14	0.405 - 1.18	0.79	MW-27 (7-8)
Chromium (total)	50	14	0	9.66 - 30.4	22.7	MW-28 (7-8)
Chromium (hex.)	NS	14	0	ND ³	ND	NA
Copper	25	14	4	8.96 - 30.1	21.3	MW-27 (7-8); MW-20 (8-10)
Iron	2,000	14	14	10,600 - 33,100	25,221	MW-27 (7-8)
Nickel	13	14	13	9.97 - 32.8	24.9	MW-27 (7-8)
Selenium	2	14	3	1.67 - 6.21	2.62	MW-17 (11-13)

³ ND - Not Detected



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<i>Parameter</i>	<i>TAGM (mg/kg)</i>	<i>Number of Samples</i>	<i>Number of Exceedances</i>	<i>Range of Detects (mg/kg)</i>	<i>Average Concentration (mg/kg)</i>	<i>Location of Highest Concentration (ft bgs)</i>
Zinc	20	14	14	46.9 - 387	111	MW-26 (10-12)
pH	NS	14	NA	7.4 - 11	9.0	MW-26 (10-12)

The samples collected from the slag/fill material have elevated concentrations of primarily total chromium, hexavalent chromium, and pH relative to the underlying native soil. Some of the slag samples also had elevated concentrations of copper, nickel, and zinc relative to the native soils.

In addition to the 30 subsurface soil samples described above, the sample collected next to TP-20 had concentrations above the RSCOs for arsenic, total chromium, copper, iron, nickel, selenium, and zinc. This material was also observed at BH-12, but only in trace amounts from 2 to 4 feet bgs. The table below shows the parameter concentrations for this sample:

<i>Parameter</i>	<i>TAGM (mg/kg)</i>	<i>Concentration (mg/kg)</i>
Arsenic	7.5	35.8
Beryllium	0.16	0.965
Chromium (total)	50	317
Copper	25	379
Iron	2,000	52,200
Nickel	13	87.8
Selenium	2.0	7.27
Zinc	20	258

In summary, parameter concentrations in this sample are generally within the range of concentrations for the other slag/fill material on Site, with a few minor exceptions. This sample has the highest concentrations of selenium, arsenic and barium. Arsenic was detected across the Site in slag/fill material samples, but generally below the RSCO. Three slag/fill samples (MW-20, MW-25, and BH-12) and two native soil samples (MW-25 and MW-27) had concentrations of arsenic above the RSCO.

3.3 Sediment Data

The sediment soil data were compared to the NYSDEC Lowest Effect Level (LEL) and Severe Effect Level (SEL) provided in the document Technical Guidance for Screening Contaminated Sediments, dated January 1999. This comparison is conservative in that the sediment samples were collected from ditches which can be dry at certain times of the year. In general, chromium



(total), copper, manganese, and zinc were detected at concentrations above the LELs and SELs in sediment samples. Elevated hexavalent chromium and pH values were also detected in sediments. A summary of these parameter concentrations is presented in the table below and the analytical results for chromium (total), chromium (hexavalent), copper, nickel, selenium, zinc, and pH are presented on Figure 2.11.

<i>Parameter</i>	<i>Lowest Effect Level (mg/kg)</i>	<i>Severe Effect Level (mg/kg)</i>	<i>Number of Samples</i>	<i>Number of Exceedances of LEL</i>	<i>Number of Exceedances of SEL</i>	<i>Range of Detects (mg/kg)</i>	<i>Location of Highest Concentration</i>
Antimony	2.0	25.0	22	9	0	0.971 – 16.9	SW-8
Arsenic	6.0	33.0	22	10	0	4.28 – 27.9	SW-11
Cadmium	0.6	9.0	22	5	1	0.0526 – 25.3	SW-8
Chromium (total)	26.0	110.0	22	19	10	7.17 - 1,840	SW-11
Chromium (hex.)	NS	NS	22	NA	NA	2.3 - 4.9	SW-23
Copper	16.0	110.0	22	14	5	2.65 - 323	SW-9
Iron	20,000	40,000	22	12	3	417 – 42,600	SW-11
Lead	31.0	110.0	22	12	5	8.55 - 1,710	SW-8
Manganese	460.0	1100.0	22	14	2	20.4 - 1,390	SW-8
Mercury	0.15	1.3	22	7	3	0.00865 – 2.77	SW-9
Nickel	16.0	50.0	22	14	8	1.63 - 209	SW-11
Silver	1.0	2.2	22	4	2	0.545 – 4.79	SW-9
Zinc	120.0	270.0	22	13	6	16.5 – 2,220	SW-9
pH	NS	NS	17	NA	NA	7.1 - 12	SW-13; SW-21

The pH was analyzed for 17 of the 22 samples. Results for pH ranged from 7.1 at SW-9 to 12 at SW-13 and SW-21.

The highest concentrations of total chromium were detected in the ditch at the north end of the Site (SW-23), north of and within the large pond in the middle of the Site (SW-20 and SW-22), as well as at the western end of the ditch that runs along the southern portion of the Site adjacent to the fence line (SW-10 and 11) and across Witmer Road (SW-8 and 9). The highest concentrations of manganese and zinc were also found at the western end of this ditch and across Witmer Road (SW-8, SW-9, and SW-11).

Hexavalent chromium was only detected at two locations; SW-22 and SW-23, located north of the large pond in the centre of the Site. The highest pH values were detected around the large pond in the middle of the Site (SW-20 and SW-21), the ditch that runs along the fence line at the north end of the Site (SW-23), south of the slag area (SW-16), and the east end of the ditch running along the southern portion of the Site (SW-13 and 14).



3.4 Surface Water Data

The surface water data were compared to the NYSDEC Ambient Water Quality Standards (AWQS) for Human Consumption of Fish (fresh water) dated June 1998. In general, iron and thallium were detected at concentrations above the AWQS in the surface water samples. Elevated concentrations of hexavalent chromium were also detected in surface water. A summary of the parameter concentrations is presented in the table below and the analytical results for chromium (total), chromium (hexavalent), and pH are presented on Figure 2.12.

<i>Parameter</i>	<i>AWQS (mg/L)</i>	<i>Number of Samples</i>	<i>Number of Exceedances</i>	<i>Range of Detects (mg/L)</i>	<i>Location of Highest Concentration</i>
Chromium (hex.)	0.016	48	21	0.004 - 0.571	SW-14
Iron	0.300	48	25	0.0533 - 151	SW-11
Thallium	0.020	48	8	0.0086 - 0.0936	SW-20
Vanadium	0.190	48	1	0.00334 - 0.231	SW-11
pH	6.5 - 8.5	37	29	6.16 - 12.41	SW-13

The highest concentration of total chromium was detected at SW-11, located along the ditch at the southwestern end of the Site. The highest concentrations of hexavalent chromium were detected in samples collected along the western edge of the identified slag area [e.g., SW-23, down to the south ditch (SW-13, 14, and 15)].

There is some variability in the surface water data between sampling rounds for individual locations. For example, at location SW-14 the concentration of hexavalent chromium ranged from 0.0650 mg/L in December 2003 to 0.571 mg/L in October 2003. Similarly, the concentration of total chromium in the samples from location SW-11 ranged from 0.135 mg/L in December 2003 to 6.39 mg/L in October 2003. However, there does not appear to be a pattern of uniformly higher or lower concentrations for the different sampling rounds.

The surface water that flows off the Site to the east would enter Gill Creek, which ultimately discharges into the Niagara River approximately 2 miles to the south. The surface water that flows off the Site to the west enters a ditch on the west side of Witmer Road.

3.5 Groundwater Data

The groundwater data were compared to the NYSDEC AWQS for Class GA drinking water (groundwater), dated June 1998. A summary of the parameter concentrations is presented in the table below.



August 6, 2004

12

Reference No. 19867

<i>Parameter</i>	<i>AWQS (mg/L)</i>	<i>Number of Samples</i>	<i>Number of Exceedances</i>	<i>Range of Detects (mg/L)</i>	<i>Location of Highest Concentration</i>
Chromium (total)	0.05	37	8	0.0839 - 0.655	MW-19
Chromium (diss.)	0.005	14	1	0.106	MW-23
Chromium (hex.) (total)	0.05	37	4	0.0110 - 0.181	MW-23
Chromium (hex.) (diss.)	0.05	14	1	0.008 - 0.090	MW-23
Iron (total)	0.3	37	29	0.128 - 85.5	MW-19
Iron (diss.)	0.3	14	8	0.495 - 3.92	MW-104A
Lead (total)	0.025	37	8	0.00539 - 0.379	MW-17
Manganese (total)	0.3	37	17	0.00203 - 2.47	MW-17
Manganese (diss.)	0.3	14	4	0.00316 - 0.858	MW-104A
Selenium (total)	0.010	37	27	0.00669 - 0.0739	MW-17
Selenium (diss.)	0.010	14	7	0.00725 - 0.0547	MW-103A
pH	6.5-8.5	47	23	6.65 - 12.76	MW-21

The analytical results for chromium (total), chromium (hexavalent), iron (total), lead (total), manganese (total), selenium (total), selenium (dissolved), and pH are presented on Figure 2.13. The highest concentrations of total chromium and total hexavalent chromium were detected in the centre of the Site at wells MW-18, MW-19, and MW-23.

3.6 Soil Cover Material Analysis

The soil that covers much of the slag material on OU3 ranges in thickness from approximately 6 inches at MW-18 and MW-21 to approximately 3 feet at MW-23. Based on the four monitoring wells installed on top of the covered area, the average thickness of the existing soil cover material is approximately 1.5 feet. Based on the analyses of the soil samples collected of the soil cover material, the soil generally consists of a clayey silt. The hydraulic conductivity ranged from 5.77×10^{-7} cm/sec to 8.72×10^{-8} cm/sec, with an average of approximately 2.46×10^{-7} cm/sec. This material could be used as a component for a cap in this area.

5.0 REFERENCES

Conestoga-Rovers & Associates, September 27, 2002. "Phase I Work Plan, Operable Unit 3, Vanadium Corporation of America, Niagara Falls, New York".



**CONESTOGA-ROVERS
& ASSOCIATES**

August 6, 2004

13

Reference No. 19867

If you have any questions or concerns, please feel free to contact us.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

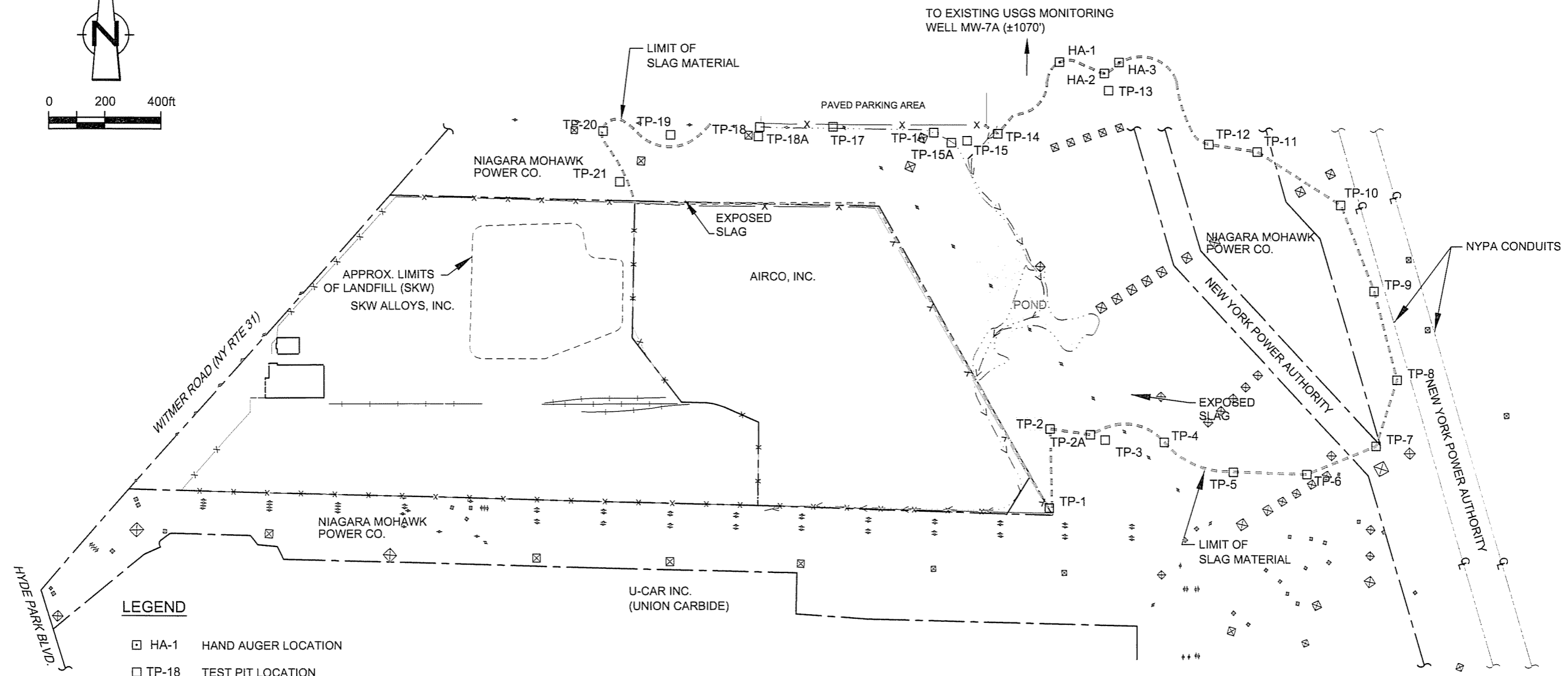
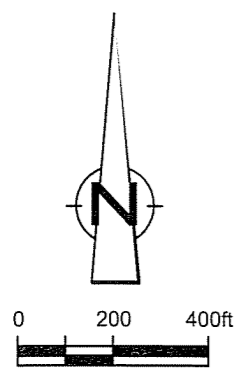
A handwritten signature in black ink, appearing to read 'Jamie Puskas', is written over a faint, circular watermark or stamp.

Jamie Puskas, P. Eng.

CS/jdh/3

Encl.

c.c.: Matthew J. Forcucci (New York State Department of Health) (2 copies)
Director (Division of Environmental Remediation, NYSDEC)
Maura Desmond (Division of Environmental Enforcement)
Dan Johnson (Phelps Dodge Corporation)
Jim Hamula (Gallagher & Kennedy)
Edward Neuhauser (Niagara Mohawk Power Corporation)
William Holzhauser (Niagara Mohawk Power Corporation)
Susan Kosikowski (New York Power Authority)
Mark Malone (New York Power Authority)
Ed Holman (New York Power Authority)
Gary A. Litwin (New York State Department of Health)



LEGEND

	HA-1	HAND AUGER LOCATION
	TP-18	TEST PIT LOCATION
		PROPERTY LINE
		UTILITY POLE
		TOWER
		FENCE
		RAILROAD
		LIMIT OF SLAG MATERIAL

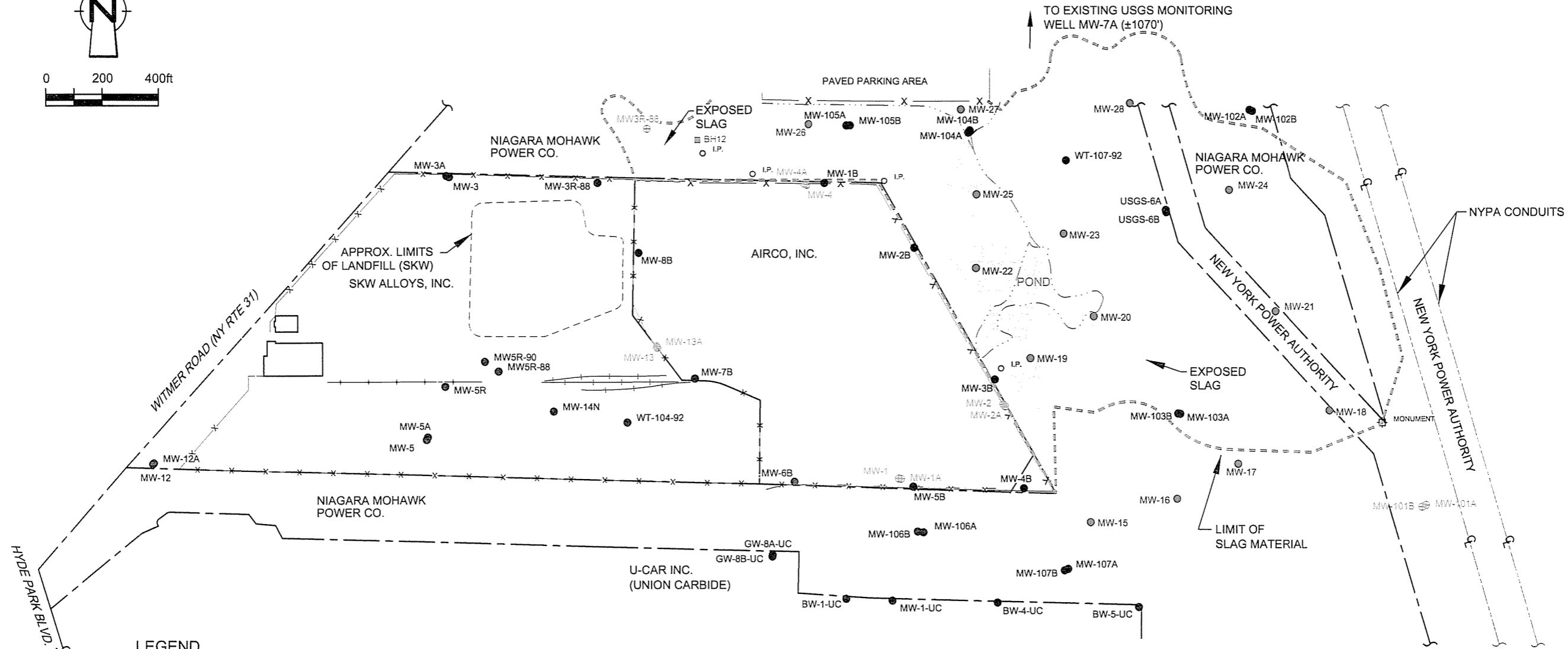
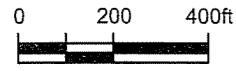
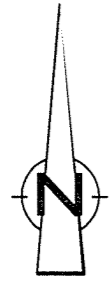
NOTES:

1. BASE MAP DIGITIZED FROM 'VANADIUM SITE NO. 932001' PROVIDED BY LU ENGINEERS, 2230 PENFIELD RD., PENFIELD, NY, (716) 377-1450. MAP DATA DIGITIZED FROM 'SITE PLAN AND SAMPLING LOCATION' PREPARED BY ABB ENVIRONMENTAL.
2. SITE FEATURES AND SAMPLE LOCATIONS ARE APPROXIMATE.

SOURCE:
 NIAGARA MOHAWK POWER CORPORATION, VANADIUM CORPORATION OF AMERICA SITE, NIAGARA FALLS, NY. FIGURES 1, 2 AND 3, BBL ENGINEERS & SCIENTISTS. 12/8/2000

figure 2.1
TEST PIT LOCATIONS AND SLAG DELINEATION
VANADIUM CORPORATION OF AMERICA SITE
Niagara Falls, NY





LEGEND

- — — — — PROPERTY LINE
- x-x-x-x- FENCE
- +—+—+ RAILROAD
- NYPA NEW YORK POWER AUTHORITY
- MW-7B EXISTING MONITORING WELL LOCATION
- ⊕ MW-1 MONITORING WELL NO LONGER EXISTS IN FIELD
- MW-19 EXISTING SHALLOW GROUNDWATER MONITORING WELL LOCATION (CRA 2003)
- BH-9 SOIL BORING LOCATION (CRA 2003)
- [---] LIMIT OF SLAG MATERIAL

NOTES:

1. BASE MAP DIGITIZED FROM 'VANADIUM SITE NO. 932001' PROVIDED BY LU ENGINEERS, 2230 PENFIELD RD., PENFIELD, NY, (716) 377-1450. MAP DATA DIGITIZED FROM 'SITE PLAN AND SAMPLING LOCATION' PREPARED BY ABB ENVIRONMENTAL.
2. SITE FEATURES AND SAMPLE LOCATIONS ARE APPROXIMATE.

SOURCE:

NIAGARA MOHAWK POWER CORPORATION, VANADIUM CORPORATION OF AMERICA SITE, NIAGARA FALLS, NY. FIGURES 1, 2 AND 3. BBL ENGINEERS & SCIENTISTS. 12/8/2000

figure 2.2
MONITORING WELL LOCATIONS
VANADIUM CORPORATION OF AMERICA SITE
Niagara Falls, NY



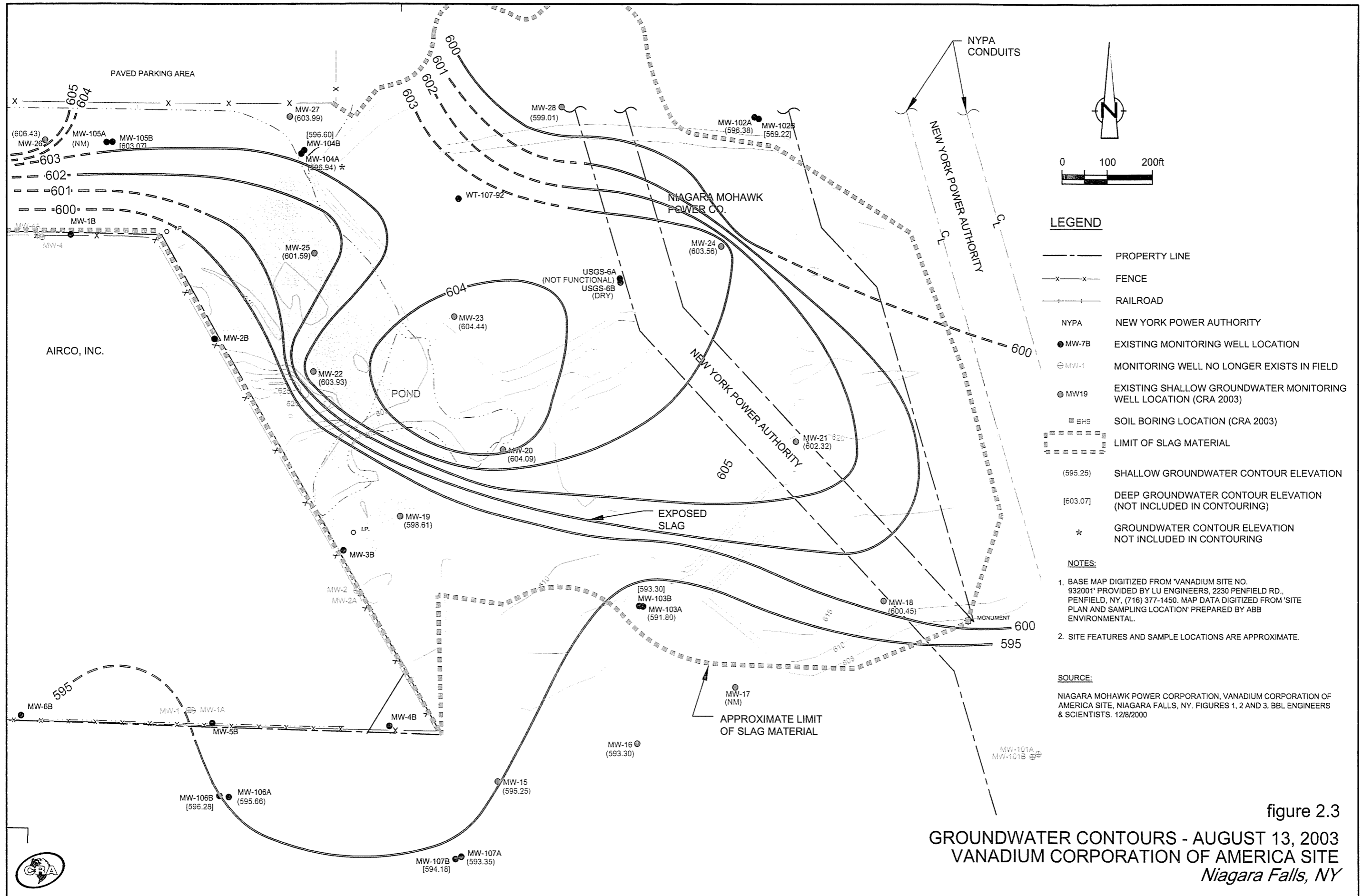


figure 2.3
 GROUNDWATER CONTOURS - AUGUST 13, 2003
 VANADIUM CORPORATION OF AMERICA SITE
 Niagara Falls, NY

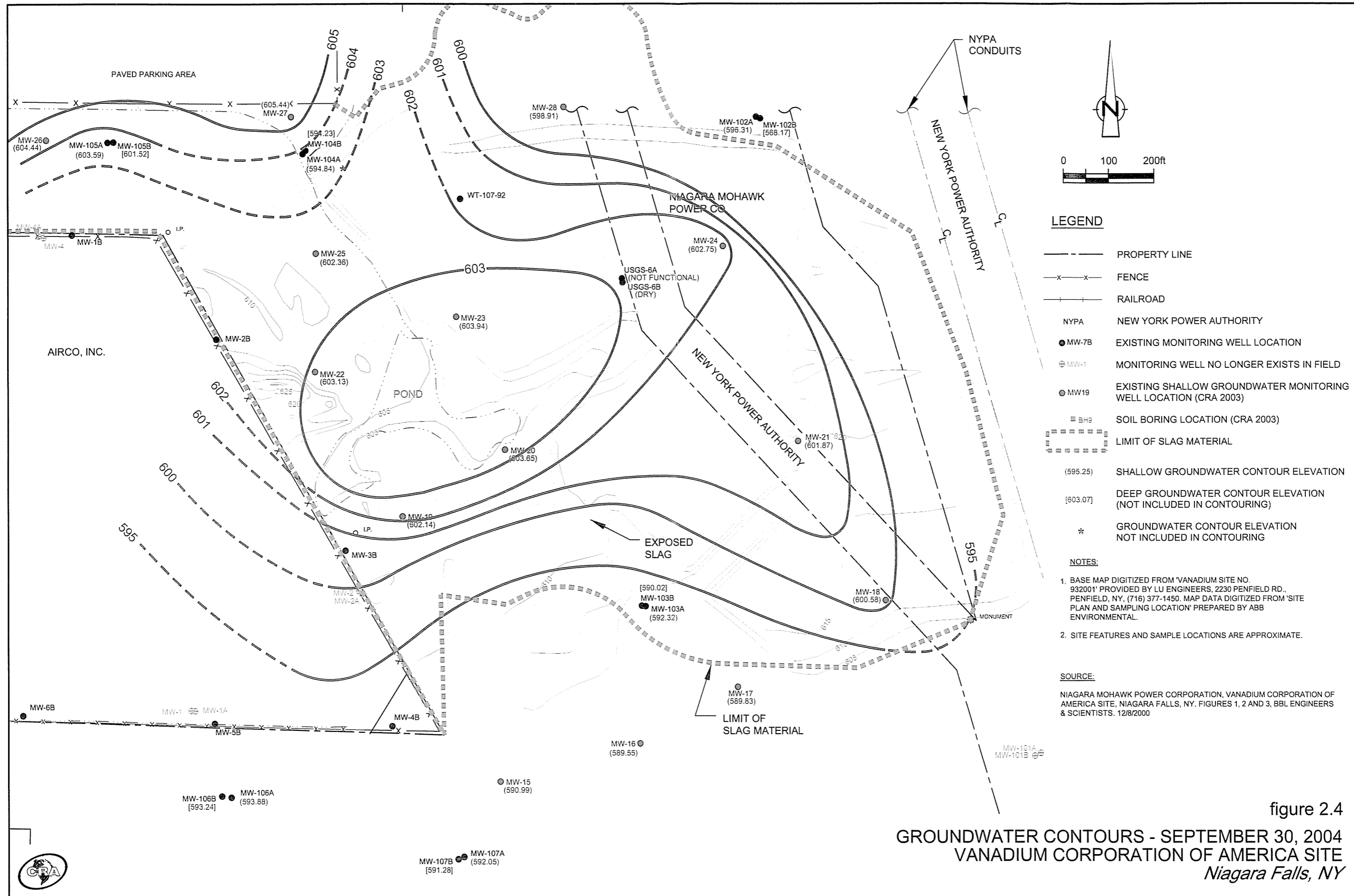
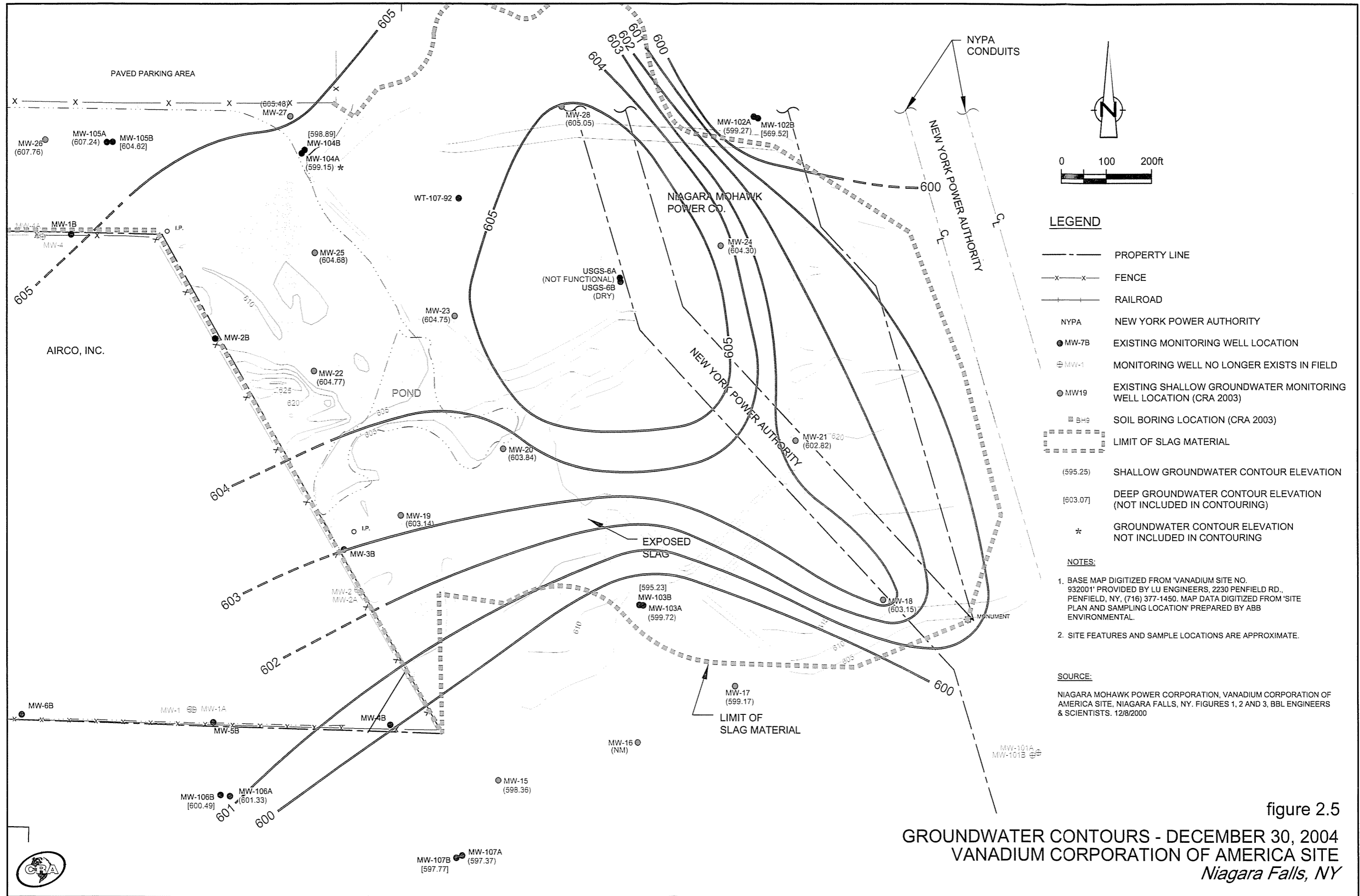


figure 2.4
 GROUNDWATER CONTOURS - SEPTEMBER 30, 2004
 VANADIUM CORPORATION OF AMERICA SITE
 Niagara Falls, NY



LEGEND

- PROPERTY LINE
- x-x- FENCE
- RAILROAD
- NYPA NEW YORK POWER AUTHORITY
- MW-7B EXISTING MONITORING WELL LOCATION
- ⊕ MW-1 MONITORING WELL NO LONGER EXISTS IN FIELD
- MW-19 EXISTING SHALLOW GROUNDWATER MONITORING WELL LOCATION (CRA 2003)
- ⊕ SB-1 SOIL BORING LOCATION (CRA 2003)
- LIMIT OF SLAG MATERIAL
- (595.25) SHALLOW GROUNDWATER CONTOUR ELEVATION
- (603.07) DEEP GROUNDWATER CONTOUR ELEVATION (NOT INCLUDED IN CONTOURING)
- * GROUNDWATER CONTOUR ELEVATION NOT INCLUDED IN CONTOURING

NOTES:

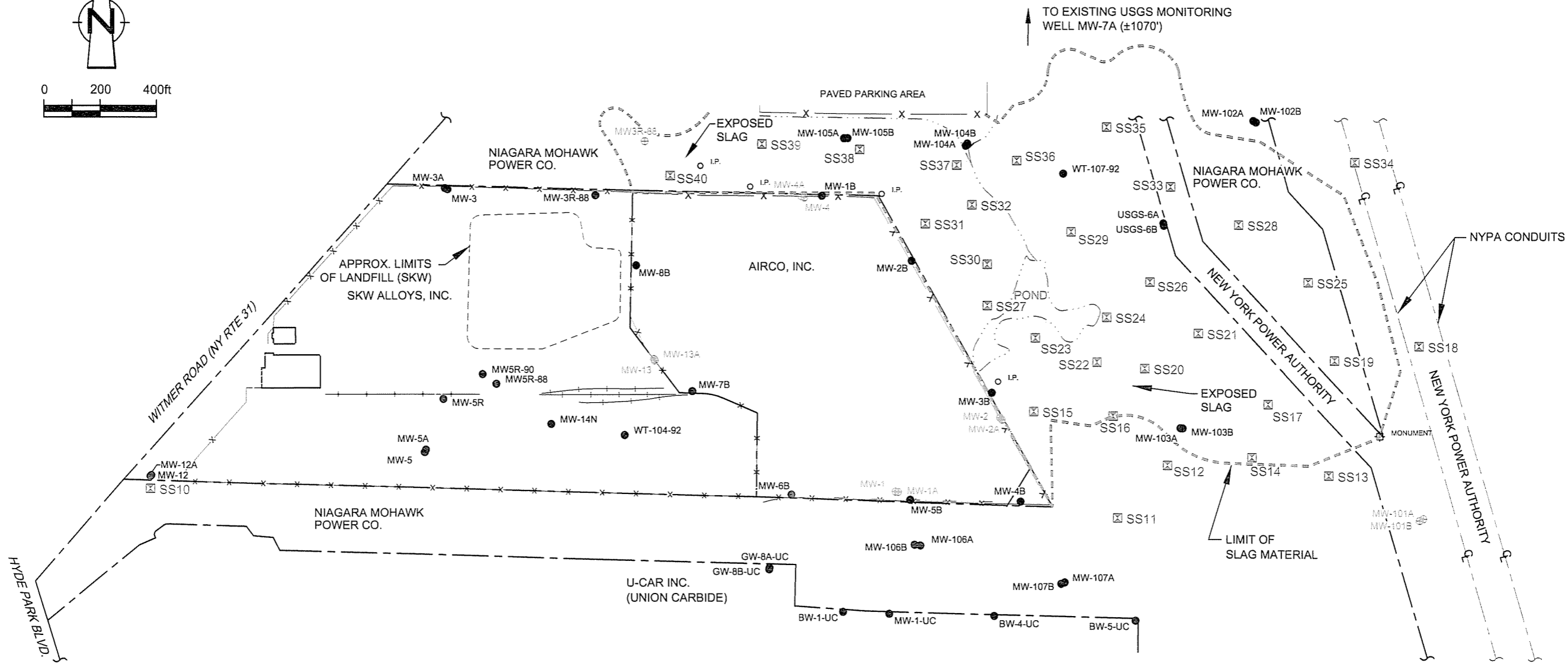
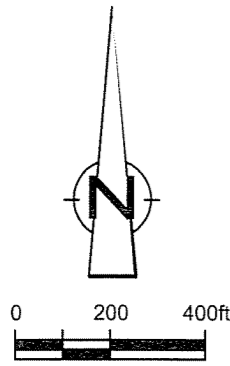
1. BASE MAP DIGITIZED FROM 'VANADIUM SITE NO. 932001' PROVIDED BY LU ENGINEERS, 2230 PENFIELD RD., PENFIELD, NY, (716) 377-1450. MAP DATA DIGITIZED FROM 'SITE PLAN AND SAMPLING LOCATION' PREPARED BY ABB ENVIRONMENTAL.
2. SITE FEATURES AND SAMPLE LOCATIONS ARE APPROXIMATE.

SOURCE:

NIAGARA MOHAWK POWER CORPORATION, VANADIUM CORPORATION OF AMERICA SITE, NIAGARA FALLS, NY. FIGURES 1, 2 AND 3, BBL ENGINEERS & SCIENTISTS. 12/8/2000

figure 2.5
GROUNDWATER CONTOURS - DECEMBER 30, 2004
VANADIUM CORPORATION OF AMERICA SITE
Niagara Falls, NY





LEGEND

- — — — — PROPERTY LINE
- x-x-x-x-x FENCE
- +—+—+ RAILROAD
- NYPA NEW YORK POWER AUTHORITY
- EXISTING MONITORING WELL LOCATION
- ⊕ MW-1 MONITORING WELL NO LONGER EXISTS IN FIELD
- ☒ SS34 SURFACE SOIL SAMPLING LOCATION
- ⋯⋯⋯ LIMIT OF SLAG MATERIAL

NOTES:

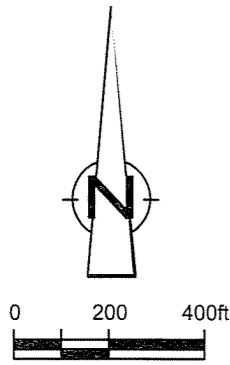
1. BASE MAP DIGITIZED FROM 'VANADIUM SITE NO. 932001' PROVIDED BY LU ENGINEERS, 2230 PENFIELD RD., PENFIELD, NY, (716) 377-1450. MAP DATA DIGITIZED FROM 'SITE PLAN AND SAMPLING LOCATION' PREPARED BY ABB ENVIRONMENTAL.
2. SITE FEATURES AND SAMPLE LOCATIONS ARE APPROXIMATE.

SOURCE:

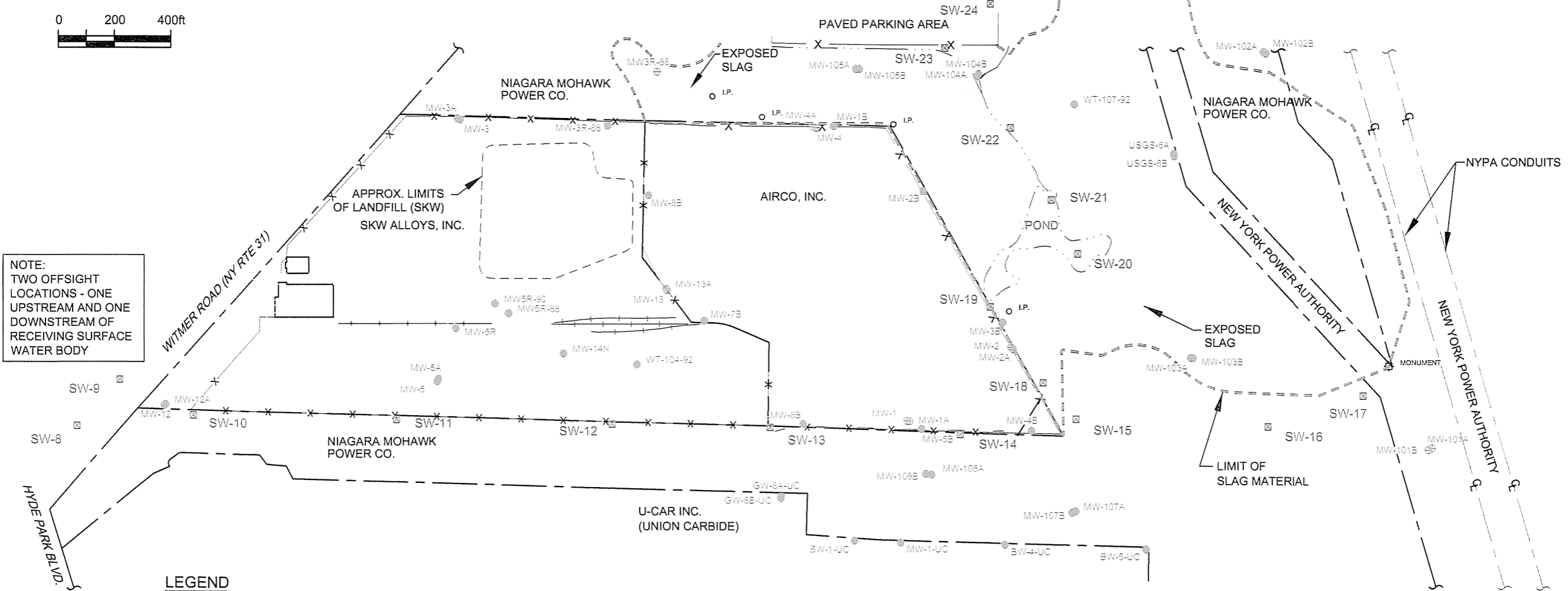
NIAGARA MOHAWK POWER CORPORATION, VANADIUM CORPORATION OF AMERICA SITE, NIAGARA FALLS, NY. FIGURES 1, 2 AND 3, BBL ENGINEERS & SCIENTISTS. 12/8/2000



figure 2.6
SURFACE SOIL SAMPLING LOCATIONS
VANADIUM CORPORATION OF AMERICA SITE
Niagara Falls, NY



NOTE:
TWO OFFSIGHT
LOCATIONS - ONE
UPSTREAM AND ONE
DOWNSTREAM OF
RECEIVING SURFACE
WATER BODY



LEGEND

- PROPERTY LINE
- x- FENCE
- + - RAILROAD
- NYPA NEW YORK POWER AUTHORITY
- EXISTING MONITORING WELL LOCATION
- ⊠ SW-10 SURFACE WATER / SEDIMENT SAMPLING LOCATION
- ⊕ MW-1 MONITORING WELL NO LONGER EXISTS IN FIELD
- ⌈⌋ LIMIT OF SLAG MATERIAL

NOTES:

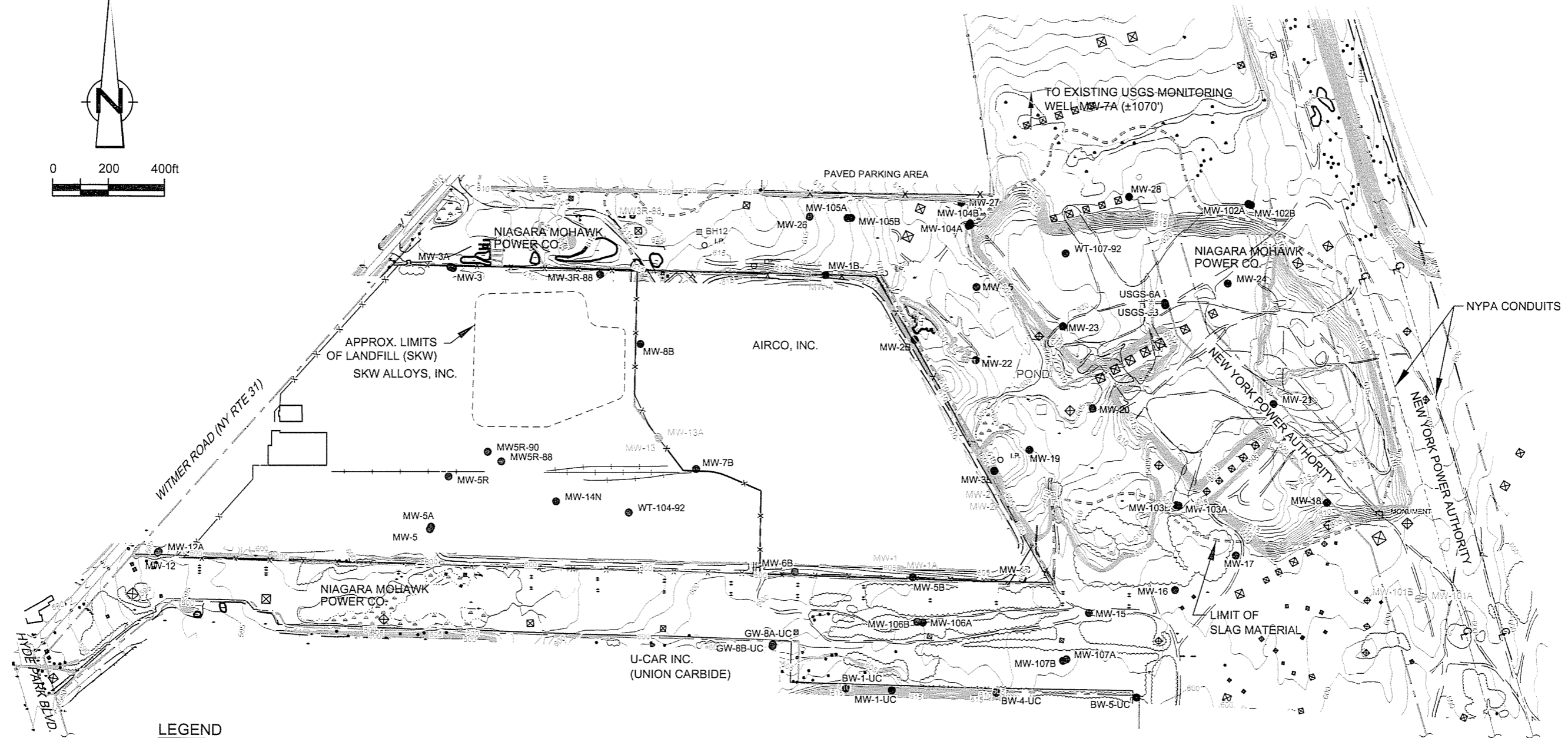
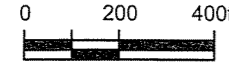
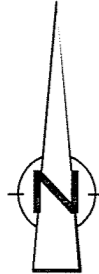
1. BASE MAP DIGITIZED FROM 'VANADIUM SITE NO. 932001' PROVIDED BY LU ENGINEERS, 2230 PENFIELD RD., PENFIELD, NY, (716) 377-1450. MAP DATA DIGITIZED FROM 'SITE PLAN AND SAMPLING LOCATION' PREPARED BY ABB ENVIRONMENTAL.
2. SITE FEATURES AND SAMPLE LOCATIONS ARE APPROXIMATE.

SOURCE:

NIAGARA MOHAWK POWER CORPORATION, VANADIUM CORPORATION OF AMERICA SITE, NIAGARA FALLS, NY. FIGURES 1, 2 AND 3, BBL ENGINEERS & SCIENTISTS. 12/8/2000

figure 2.7
SURFACE WATER / SEDIMENT SAMPLING LOCATIONS
VANADIUM CORPORATION OF AMERICA SITE
Niagara Falls, NY





LEGEND

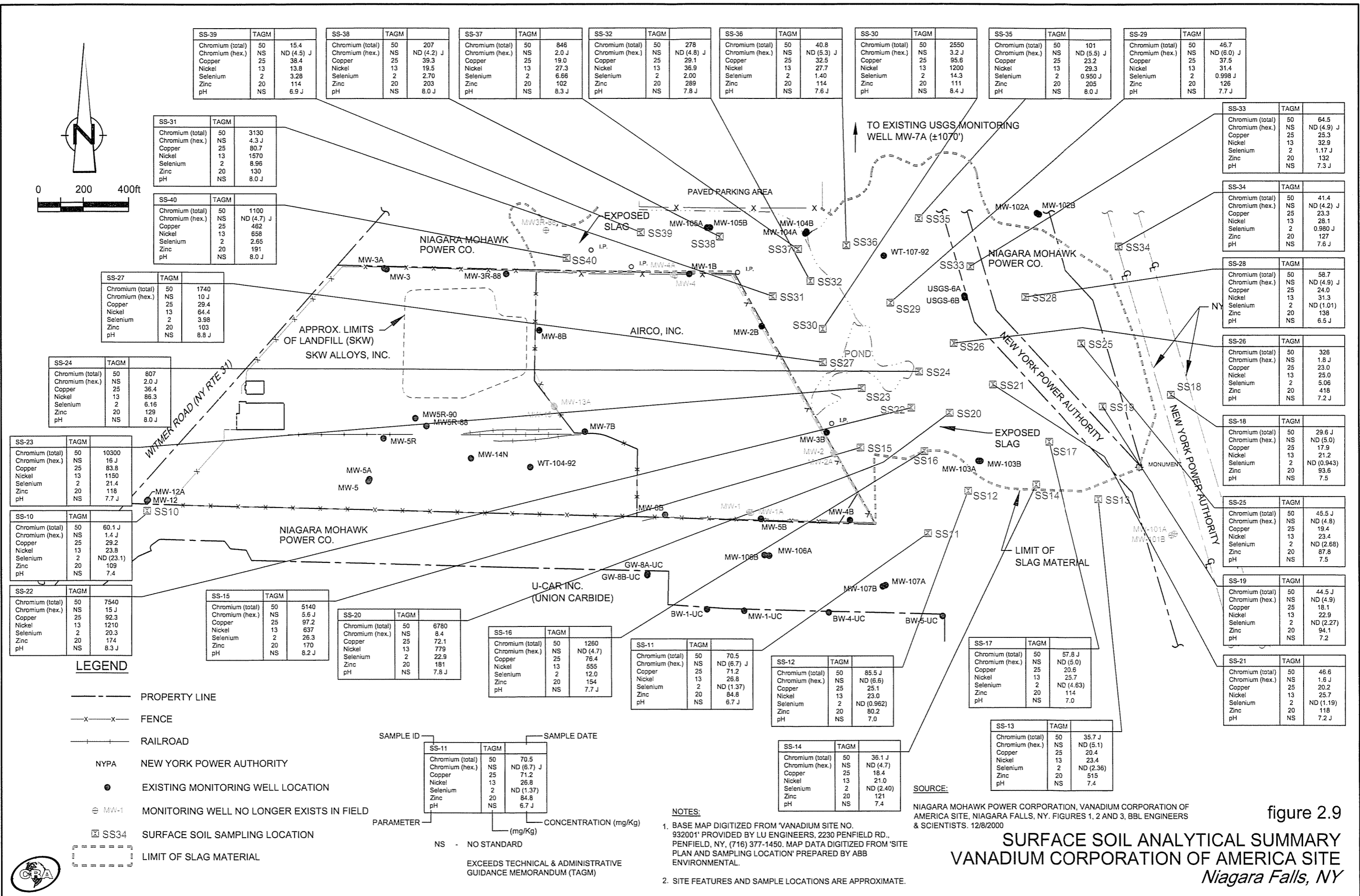
- PROPERTY LINE
- x-x- FENCE
- +--+ RAILROAD
- NYPA NEW YORK POWER AUTHORITY
- EXISTING MONITORING WELL LOCATION
- ⊕ MW-1 MONITORING WELL NO LONGER EXISTS IN FIELD
- LIMIT OF SLAG MATERIAL
- BRUSH
- TREELINE
- 600--- GROUND SURFACE CONTOUR (ft AMSL)

SOURCE:

SITE TOPOGRAPHY FROM ABRAMS AERIAL SURVEY INC., PHOTOGRAPHY DATE - MAY 6, 2004



figure 2.8
SITE TOPOGRAPHIC PLAN
VANADIUM CORPORATION OF AMERICA SITE
Niagara Falls, NY



SS-39	TAGM	SS-38	TAGM	SS-37	TAGM	SS-32	TAGM	SS-36	TAGM	SS-30	TAGM	SS-35	TAGM	SS-29	TAGM		
Chromium (total)	50	15.4	Chromium (total)	50	207	Chromium (total)	50	846	Chromium (total)	50	278	Chromium (total)	50	101	Chromium (total)	50	46.7
Chromium (hex.)	NS	ND (4.5) J	Chromium (hex.)	NS	ND (4.2) J	Chromium (hex.)	NS	ND (4.8) J	Chromium (hex.)	NS	ND (5.3) J	Chromium (hex.)	NS	ND (5.5) J	Chromium (hex.)	NS	ND (6.0) J
Copper	25	38.4	Copper	25	39.3	Copper	25	19.0	Copper	25	32.5	Copper	25	23.2	Copper	25	37.5
Nickel	13	13.8	Nickel	13	19.5	Nickel	13	27.3	Nickel	13	27.7	Nickel	13	29.3	Nickel	13	31.4
Selenium	2	3.28	Selenium	2	2.70	Selenium	2	6.66	Selenium	2	1.40	Selenium	2	0.950 J	Selenium	2	0.998 J
Zinc	20	114	Zinc	20	203	Zinc	20	102	Zinc	20	114	Zinc	20	205	Zinc	20	126
pH	NS	6.9 J	pH	NS	8.0 J	pH	NS	8.3 J	pH	NS	7.6 J	pH	NS	8.0 J	pH	NS	7.7 J

SS-31	TAGM	
Chromium (total)	50	3130
Chromium (hex.)	NS	4.3 J
Copper	25	80.7
Nickel	13	1570
Selenium	2	8.96
Zinc	20	130
pH	NS	8.0 J

SS-40	TAGM	
Chromium (total)	50	1100
Chromium (hex.)	NS	ND (4.7) J
Copper	25	462
Nickel	13	658
Selenium	2	2.65
Zinc	20	191
pH	NS	8.0 J

SS-27	TAGM	
Chromium (total)	50	1740
Chromium (hex.)	NS	10 J
Copper	25	29.4
Nickel	13	64.4
Selenium	2	3.98
Zinc	20	103
pH	NS	8.8 J

SS-24	TAGM	
Chromium (total)	50	807
Chromium (hex.)	NS	2.0 J
Copper	25	36.4
Nickel	13	86.3
Selenium	2	6.16
Zinc	20	129
pH	NS	8.0 J

SS-23	TAGM	
Chromium (total)	50	10300
Chromium (hex.)	NS	16 J
Copper	25	83.8
Nickel	13	1150
Selenium	2	21.4
Zinc	20	118
pH	NS	7.7 J

SS-10	TAGM	
Chromium (total)	50	60.1 J
Chromium (hex.)	NS	1.4 J
Copper	25	29.2
Nickel	13	23.8
Selenium	2	ND (23.1)
Zinc	20	109
pH	NS	7.4

SS-22	TAGM	
Chromium (total)	50	7540
Chromium (hex.)	NS	15 J
Copper	25	92.3
Nickel	13	1210
Selenium	2	20.3
Zinc	20	174
pH	NS	8.3 J

SS-15	TAGM	
Chromium (total)	50	5140
Chromium (hex.)	NS	5.6 J
Copper	25	97.2
Nickel	13	637
Selenium	2	26.3
Zinc	20	170
pH	NS	8.2 J

SS-20	TAGM	
Chromium (total)	50	6780
Chromium (hex.)	NS	8.4
Copper	25	72.1
Nickel	13	779
Selenium	2	22.9
Zinc	20	181
pH	NS	7.8 J

SS-16	TAGM	
Chromium (total)	50	1260
Chromium (hex.)	NS	ND (4.7)
Copper	25	76.4
Nickel	13	555
Selenium	2	12.0
Zinc	20	154
pH	NS	7.7 J

SS-11	TAGM	
Chromium (total)	50	70.5
Chromium (hex.)	NS	ND (6.7) J
Copper	25	71.2
Nickel	13	26.8
Selenium	2	ND (1.37)
Zinc	20	84.8
pH	NS	6.7 J

SS-12	TAGM	
Chromium (total)	50	85.5 J
Chromium (hex.)	NS	ND (6.6)
Copper	25	25.1
Nickel	13	23.0
Selenium	2	ND (0.962)
Zinc	20	80.2
pH	NS	7.0

SS-14	TAGM	
Chromium (total)	50	36.1 J
Chromium (hex.)	NS	ND (4.7)
Copper	25	18.4
Nickel	13	21.0
Selenium	2	ND (2.40)
Zinc	20	121
pH	NS	7.4

SS-17	TAGM	
Chromium (total)	50	57.8 J
Chromium (hex.)	NS	ND (5.0)
Copper	25	20.6
Nickel	13	25.7
Selenium	2	ND (4.63)
Zinc	20	114
pH	NS	7.0

SS-13	TAGM	
Chromium (total)	50	35.7 J
Chromium (hex.)	NS	ND (5.1)
Copper	25	20.4
Nickel	13	23.4
Selenium	2	ND (2.36)
Zinc	20	515
pH	NS	7.4

SS-33	TAGM	
Chromium (total)	50	64.5
Chromium (hex.)	NS	ND (4.9) J
Copper	25	25.3
Nickel	13	32.9
Selenium	2	1.17 J
Zinc	20	132
pH	NS	7.3 J

SS-34	TAGM	
Chromium (total)	50	41.4
Chromium (hex.)	NS	ND (4.2) J
Copper	25	23.3
Nickel	13	28.1
Selenium	2	0.980 J
Zinc	20	127
pH	NS	7.6 J

SS-28	TAGM	
Chromium (total)	50	58.7
Chromium (hex.)	NS	ND (4.9) J
Copper	25	24.0
Nickel	13	31.3
Selenium	2	ND (1.01)
Zinc	20	139
pH	NS	6.5 J

SS-26	TAGM	
Chromium (total)	50	326
Chromium (hex.)	NS	1.8 J
Copper	25	23.0
Nickel	13	25.0
Selenium	2	5.06
Zinc	20	418
pH	NS	7.2 J

SS-18	TAGM	
Chromium (total)	50	29.6 J
Chromium (hex.)	NS	ND (5.0)
Copper	25	17.9
Nickel	13	21.2
Selenium	2	ND (0.943)
Zinc	20	93.6
pH	NS	7.5

SS-25	TAGM	
Chromium (total)	50	45.5 J
Chromium (hex.)	NS	ND (4.8)
Copper	25	19.4
Nickel	13	23.4
Selenium	2	ND (2.68)
Zinc	20	87.8
pH	NS	7.5

SS-19	TAGM	
Chromium (total)	50	44.5 J
Chromium (hex.)	NS	ND (4.9)
Copper	25	18.1
Nickel	13	22.9
Selenium	2	ND (2.27)
Zinc	20	94.1
pH	NS	7.2

SS-21	TAGM	
Chromium (total)	50	46.6
Chromium (hex.)	NS	1.6 J
Copper	25	20.2
Nickel	13	25.7
Selenium	2	ND (1.19)
Zinc	20	118
pH	NS	7.2 J

LEGEND

- PROPERTY LINE
- x-x- FENCE
- + RAILROAD
- NYPA NEW YORK POWER AUTHORITY
- EXISTING MONITORING WELL LOCATION
- ⊕ MW-1 MONITORING WELL NO LONGER EXISTS IN FIELD
- ⊠ SS34 SURFACE SOIL SAMPLING LOCATION
- - - - - LIMIT OF SLAG MATERIAL

SS-11	TAGM	
Chromium (total)	50	70.5
Chromium (hex.)	NS	ND (6.7) J
Copper	25	71.2
Nickel	13	26.8
Selenium	2	ND (1.37)
Zinc	20	84.8
pH	NS	6.7 J

SAMPLE ID: SS-11 SAMPLE DATE: _____

PARAMETER: _____ CONCENTRATION (mg/Kg): _____

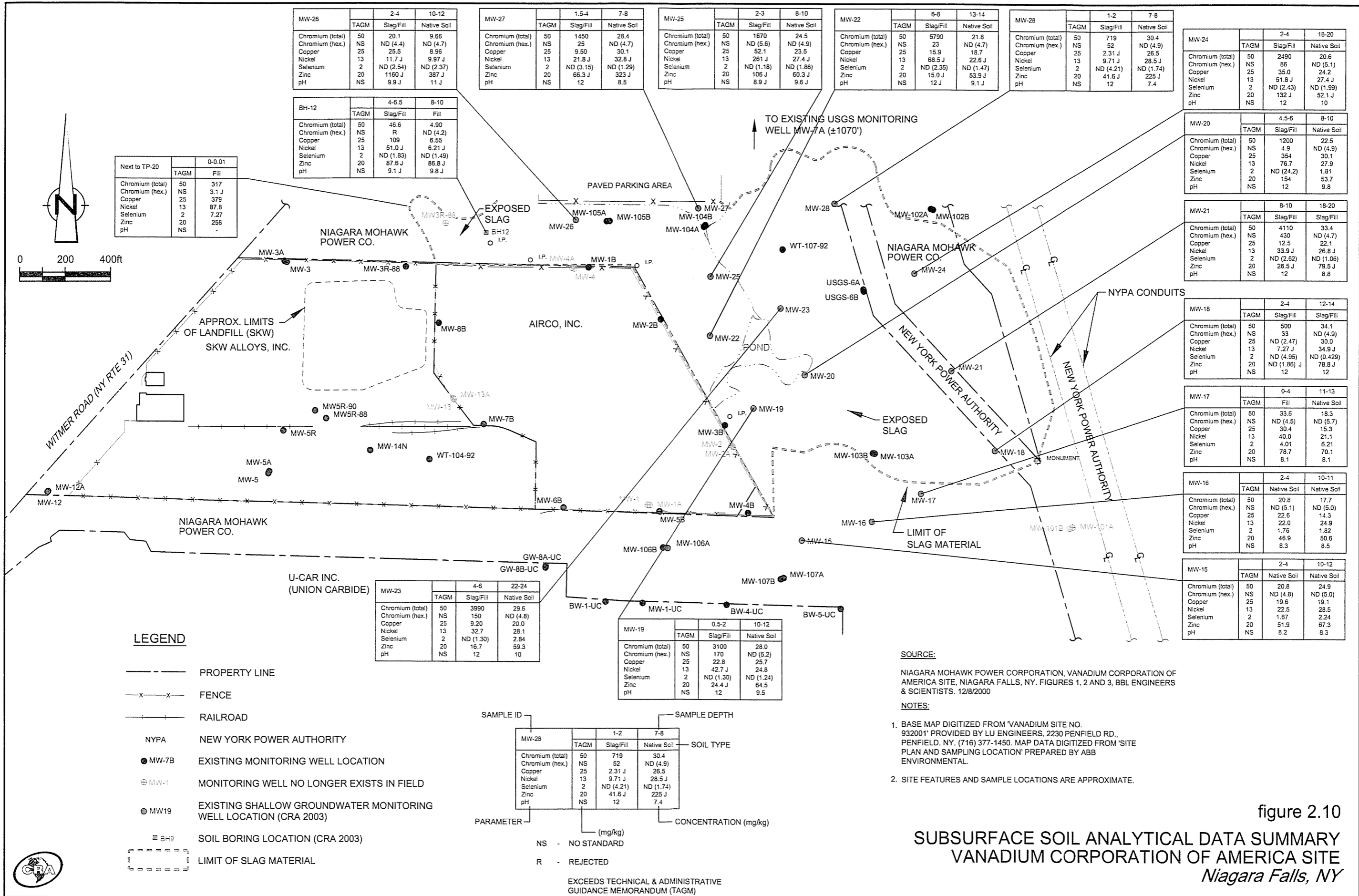
NS - NO STANDARD

EXCEEDS TECHNICAL & ADMINISTRATIVE GUIDANCE MEMORANDUM (TAGM)

- NOTES:**
- BASE MAP DIGITIZED FROM 'VANADIUM SITE NO. 932001' PROVIDED BY LU ENGINEERS, 2230 PENFIELD RD., PENFIELD, NY, (716) 377-1450. MAP DATA DIGITIZED FROM 'SITE PLAN AND SAMPLING LOCATION' PREPARED BY ABB ENVIRONMENTAL.
 - SITE FEATURES AND SAMPLE LOCATIONS ARE APPROXIMATE.

SOURCE:
 NIAGARA MOHAWK POWER CORPORATION, VANADIUM CORPORATION OF AMERICA SITE, NIAGARA FALLS, NY. FIGURES 1, 2 AND 3, BBL ENGINEERS & SCIENTISTS. 12/8/2000

figure 2.9
SURFACE SOIL ANALYTICAL SUMMARY
VANADIUM CORPORATION OF AMERICA SITE
Niagara Falls, NY



Next to TP-20		0-0.01	
TAGM	Fill	TAGM	Fill
Chromium (total)	50	317	
Chromium (hex.)	NS	3.1 J	
Copper	25	379	
Nickel	13	87.8	
Selenium	2	7.27	
Zinc	20	258	
pH	NS	-	

MW-26	2-4		10-12	
	TAGM	Slag/Fill	Native Soil	Native Soil
Chromium (total)	50	20.1	9.66	
Chromium (hex.)	NS	ND (4.4)	ND (4.7)	
Copper	25	25.5	8.96	
Nickel	13	11.7 J	9.97 J	
Selenium	2	ND (2.54)	ND (2.37)	
Zinc	20	1160 J	387 J	
pH	NS	9.9 J	11 J	

BH-12	4-6.5		8-10	
	TAGM	Slag/Fill	Fill	Fill
Chromium (total)	50	46.6	4.90	
Chromium (hex.)	NS	R	ND (4.2)	
Copper	25	109	6.55	
Nickel	13	51.0 J	6.21 J	
Selenium	2	ND (1.83)	ND (1.49)	
Zinc	20	87.6 J	86.8 J	
pH	NS	9.1 J	9.8 J	

MW-27	1.5-4		7-8	
	TAGM	Slag/Fill	Native Soil	Native Soil
Chromium (total)	50	1450	28.4	
Chromium (hex.)	NS	25	ND (4.7)	
Copper	25	9.50	30.1	
Nickel	13	21.8 J	32.8 J	
Selenium	2	ND (3.15)	ND (1.29)	
Zinc	20	66.3 J	323 J	
pH	NS	12	8.5	

MW-25	2-3		8-10	
	TAGM	Slag/Fill	Native Soil	Native Soil
Chromium (total)	50	1670	24.5	
Chromium (hex.)	NS	ND (5.6)	ND (4.9)	
Copper	25	52.1	23.5	
Nickel	13	261 J	27.4 J	
Selenium	2	ND (1.18)	ND (1.86)	
Zinc	20	106 J	60.3 J	
pH	NS	8.9 J	9.6 J	

MW-22	6-8		13-14	
	TAGM	Slag/Fill	Native Soil	Native Soil
Chromium (total)	50	5790	21.8	
Chromium (hex.)	NS	23	ND (4.7)	
Copper	25	15.9	18.7	
Nickel	13	68.5 J	22.6 J	
Selenium	2	ND (2.35)	ND (1.47)	
Zinc	20	15.0 J	53.9 J	
pH	NS	12 J	9.1 J	

MW-28	1-2		7-8	
	TAGM	Slag/Fill	Native Soil	Native Soil
Chromium (total)	50	719	30.4	
Chromium (hex.)	NS	52	ND (4.9)	
Copper	25	2.31 J	26.5	
Nickel	13	9.71 J	28.5 J	
Selenium	2	ND (4.21)	ND (1.74)	
Zinc	20	41.6 J	225 J	
pH	NS	12	7.4	

MW-24	2-4		18-20	
	TAGM	Slag/Fill	Native Soil	Native Soil
Chromium (total)	50	2490	30.4	
Chromium (hex.)	NS	85	ND (5.1)	
Copper	25	35.0	24.2	
Nickel	13	51.8 J	27.4 J	
Selenium	2	ND (2.43)	ND (1.99)	
Zinc	20	132 J	52.1 J	
pH	NS	12	10	

MW-20	4.5-6		8-10	
	TAGM	Slag/Fill	Native Soil	Native Soil
Chromium (total)	50	1200	22.5	
Chromium (hex.)	NS	4.9	ND (4.9)	
Copper	25	354	30.1	
Nickel	13	76.7	27.9	
Selenium	2	ND (24.2)	1.81	
Zinc	20	154	53.7	
pH	NS	12	9.8	

MW-21	8-10		18-20	
	TAGM	Slag/Fill	Slag/Fill	Slag/Fill
Chromium (total)	50	4110	33.4	
Chromium (hex.)	NS	430	ND (4.7)	
Copper	25	12.5	22.1	
Nickel	13	33.9 J	26.8 J	
Selenium	2	ND (2.62)	ND (1.06)	
Zinc	20	26.5 J	79.5 J	
pH	NS	12	8.8	

MW-18	2-4		12-14	
	TAGM	Slag/Fill	Slag/Fill	Slag/Fill
Chromium (total)	50	500	34.1	
Chromium (hex.)	NS	33	ND (4.9)	
Copper	25	ND (2.47)	30.0	
Nickel	13	7.27 J	34.9 J	
Selenium	2	ND (4.95)	ND (0.429)	
Zinc	20	ND (1.86) J	78.8 J	
pH	NS	12	12	

MW-17	0-4		11-13	
	TAGM	Fill	Native Soil	Native Soil
Chromium (total)	50	33.5	18.3	
Chromium (hex.)	NS	ND (4.5)	ND (5.7)	
Copper	25	30.4	15.3	
Nickel	13	40.0	21.1	
Selenium	2	4.01	6.21	
Zinc	20	78.7	70.1	
pH	NS	8.1	8.1	

MW-16	2-4		10-11	
	TAGM	Native Soil	Native Soil	Native Soil
Chromium (total)	50	20.8	17.7	
Chromium (hex.)	NS	ND (5.1)	ND (5.0)	
Copper	25	22.6	14.3	
Nickel	13	22.0	24.9	
Selenium	2	1.76	1.82	
Zinc	20	46.9	50.6	
pH	NS	8.3	8.5	

MW-15	2-4		10-12	
	TAGM	Native Soil	Native Soil	Native Soil
Chromium (total)	50	20.8	24.9	
Chromium (hex.)	NS	ND (4.8)	ND (5.0)	
Copper	25	19.6	19.1	
Nickel	13	22.5	28.5	
Selenium	2	1.57	2.24	
Zinc	20	51.9	67.3	
pH	NS	8.2	8.3	

MW-23	4-6		22-24	
	TAGM	Slag/Fill	Native Soil	Native Soil
Chromium (total)	50	3990	29.6	
Chromium (hex.)	NS	150	ND (4.8)	
Copper	25	9.20	20.0	
Nickel	13	32.7	28.1	
Selenium	2	ND (1.30)	2.84	
Zinc	20	16.7	59.3	
pH	NS	12	10	

MW-19	0.5-2		10-12	
	TAGM	Slag/Fill	Native Soil	Native Soil
Chromium (total)	50	3100	28.0	
Chromium (hex.)	NS	170	ND (5.2)	
Copper	25	22.8	25.7	
Nickel	13	42.7 J	24.8	
Selenium	2	ND (1.30)	ND (1.24)	
Zinc	20	24.4 J	84.5	
pH	NS	12	9.5	

MW-28	1-2		7-8	
	TAGM	Slag/Fill	Native Soil	Native Soil
Chromium (total)	50	719	30.4	
Chromium (hex.)	NS	52	ND (4.9)	
Copper	25	2.31 J	26.5	
Nickel	13	9.71 J	28.5 J	
Selenium	2	ND (4.21)	ND (1.74)	
Zinc	20	41.6 J	225 J	
pH	NS	12	7.4	

LEGEND

- PROPERTY LINE
- x-x- FENCE
- RAILROAD
- NYPA NEW YORK POWER AUTHORITY
- MW-7B EXISTING MONITORING WELL LOCATION
- ⊕ MW-1 MONITORING WELL NO LONGER EXISTS IN FIELD
- MW19 EXISTING SHALLOW GROUNDWATER MONITORING WELL LOCATION (CRA 2003)
- BH-9 SOIL BORING LOCATION (CRA 2003)
- - - - - LIMIT OF SLAG MATERIAL

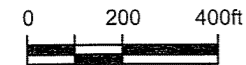
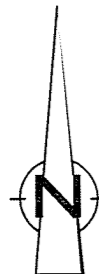
SOURCE:

NIAGARA MOHAWK POWER CORPORATION, VANADIUM CORPORATION OF AMERICA SITE, NIAGARA FALLS, NY. FIGURES 1, 2 AND 3, BBL ENGINEERS & SCIENTISTS. 12/8/2000

NOTES:

1. BASE MAP DIGITIZED FROM 'VANADIUM SITE NO. 932001' PROVIDED BY LU ENGINEERS, 2230 PENFIELD RD., PENFIELD, NY, (716) 377-1450. MAP DATA DIGITIZED FROM 'SITE PLAN AND SAMPLING LOCATION' PREPARED BY ABB ENVIRONMENTAL.
2. SITE FEATURES AND SAMPLE LOCATIONS ARE APPROXIMATE.

figure 2.10
SUBSURFACE SOIL ANALYTICAL DATA SUMMARY
VANADIUM CORPORATION OF AMERICA SITE
Niagara Falls, NY



SW-12	LEL	SEL	8/14/2003	5/12/2004
Chromium (total)	26.0	110.0	125	167
Chromium (hex.)	NS	NS	ND (7.1)	ND (8.4)
Copper	16.0	110.0	228	323
Nickel	16.0	50.0	59.3	51.2
Zinc	120.0	270.0	778	2,200
pH	NS	NS	-	7.1

SW-9	LEL	SEL	8/14/2003	5/12/2004
Chromium (total)	26.0	110.0	125	167
Chromium (hex.)	NS	NS	ND (7.1)	ND (8.4)
Copper	16.0	110.0	228	323
Nickel	16.0	50.0	59.3	51.2
Zinc	120.0	270.0	778	2,200
pH	NS	NS	-	7.1

SW-8	LEL	SEL	8/14/2003	5/12/2004
Chromium (total)	26.0	110.0	312	297
Chromium (hex.)	NS	NS	ND (4.9)	ND (5.1)
Copper	16.0	110.0	162	122
Nickel	16.0	50.0	158	188
Zinc	120.0	270.0	972	1,060
pH	NS	NS	-	8.2

SW-10	LEL	SEL	8/21/2003
Chromium (total)	26.0	110.0	335 J
Chromium (hex.)	NS	NS	ND (5.1)
Copper	16.0	110.0	185
Nickel	16.0	50.0	81.4
Zinc	120.0	270.0	203
pH	NS	NS	8.7

SW-11	LEL	SEL	8/21/2003
Chromium (total)	26.0	110.0	1840 J
Chromium (hex.)	NS	NS	ND (15)
Copper	16.0	110.0	307
Nickel	16.0	50.0	209
Zinc	120.0	270.0	798
pH	NS	NS	7.3

SW-13	LEL	SEL	8/21/2003
Chromium (total)	26.0	110.0	90.3 J
Chromium (hex.)	NS	NS	ND (8.5)
Copper	16.0	110.0	10.6
Nickel	16.0	50.0	12.8
Zinc	120.0	270.0	63
pH	NS	NS	12

SW-14	LEL	SEL	8/21/2003
Chromium (total)	26.0	110.0	97.7 J
Chromium (hex.)	NS	NS	ND (7.1)
Copper	16.0	110.0	12.4
Nickel	16.0	50.0	15.4
Zinc	120.0	270.0	77.3
pH	NS	NS	11

SW-15	LEL	SEL	8/21/2003
Chromium (total)	26.0	110.0	266 J
Chromium (hex.)	NS	NS	ND (7.1)
Copper	16.0	110.0	69.4
Nickel	16.0	50.0	56.3
Zinc	120.0	270.0	133
pH	NS	NS	8.2

SW-17	LEL	SEL	8/14/2003	5/12/2004
Chromium (total)	26.0	110.0	46.9	48.7
Chromium (hex.)	NS	NS	ND (5.3)	ND (5.9)
Copper	16.0	110.0	29.0	26.8
Nickel	16.0	50.0	28.9	25.2
Zinc	120.0	270.0	148	232
pH	NS	NS	-	7.3

SW-16	LEL	SEL	8/14/2003	5/12/2004
Chromium (total)	26.0	110.0	11.8	7.17
Chromium (hex.)	NS	NS	ND (6.0)	ND (6.8)
Copper	16.0	110.0	ND (2.80)	ND (4.99)
Nickel	16.0	50.0	1.53	ND (4.99)
Zinc	120.0	270.0	47.2	23.7
pH	NS	NS	-	11

SW-23	LEL	SEL	8/21/2003
Chromium (total)	26.0	110.0	364 J
Chromium (hex.)	NS	NS	-
Copper	16.0	110.0	26
Nickel	16.0	50.0	12.4
Zinc	120.0	270.0	296
pH	NS	NS	11

SW-24	LEL	SEL	8/21/2003
Chromium (total)	26.0	110.0	55.1 J
Chromium (hex.)	NS	NS	ND (5.8)
Copper	16.0	110.0	27.5
Nickel	16.0	50.0	33.3
Zinc	120.0	270.0	170
pH	NS	NS	7.7

SW-22	LEL	SEL	8/28/2003
Chromium (total)	26.0	110.0	1120
Chromium (hex.)	NS	NS	2.3 J
Copper	16.0	110.0	37.6
Nickel	16.0	50.0	52.6
Zinc	120.0	270.0	227
pH	NS	NS	7.7 J

SW-21	LEL	SEL	8/21/2003
Chromium (total)	26.0	110.0	63.5 J
Chromium (hex.)	NS	NS	ND (7.7)
Copper	16.0	110.0	6.43
Nickel	16.0	50.0	3.16 J
Zinc	120.0	270.0	85.6
pH	NS	NS	12

SW-20	LEL	SEL	8/21/2003
Chromium (total)	26.0	110.0	483 J
Chromium (hex.)	NS	NS	ND (7.9)
Copper	16.0	110.0	22.9
Nickel	16.0	50.0	30.2
Zinc	120.0	270.0	312
pH	NS	NS	11

SW-19	LEL	SEL	8/21/2003
Chromium (total)	26.0	110.0	49.1 J
Chromium (hex.)	NS	NS	ND (5.8)
Copper	16.0	110.0	24.9
Nickel	16.0	50.0	27.7
Zinc	120.0	270.0	72
pH	NS	NS	8.3

SW-18	LEL	SEL	8/21/2003
Chromium (total)	26.0	110.0	65.4 J
Chromium (hex.)	NS	NS	ND (5.3)
Copper	16.0	110.0	12.4
Nickel	16.0	50.0	12.6
Zinc	120.0	270.0	97.7
pH	NS	NS	8.2

LEGEND

- PROPERTY LINE
- x-x- FENCE
- RAILROAD
- NYP&A NEW YORK POWER AUTHORITY
- EXISTING MONITORING WELL LOCATION
- ⊠ SW-10 SURFACE WATER / SEDIMENT SAMPLING LOCATION
- ⊕ MW-1 MONITORING WELL NO LONGER EXISTS IN FIELD
- LIMIT OF SLAG MATERIAL

SAMPLE LOCATION

SW-23	LEL	SEL	8/21/2003
Chromium (total)	26.0	110.0	364 J
Chromium (hex.)	NS	NS	-
Copper	16.0	110.0	26
Nickel	16.0	50.0	12.4
Zinc	120.0	270.0	296
pH	NS	NS	11

PARAMETER

CONCENTRATION (mg/Kg)

- NS - NO STANDARD
- EXCEEDS LOWEST EFFECT LEVEL (LEL)
- EXCEEDS LOWEST EFFECT LEVEL (LEL) AND SEVERE EFFECT LEVEL (SEL)

NOTES:

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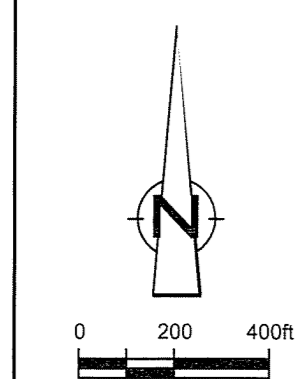
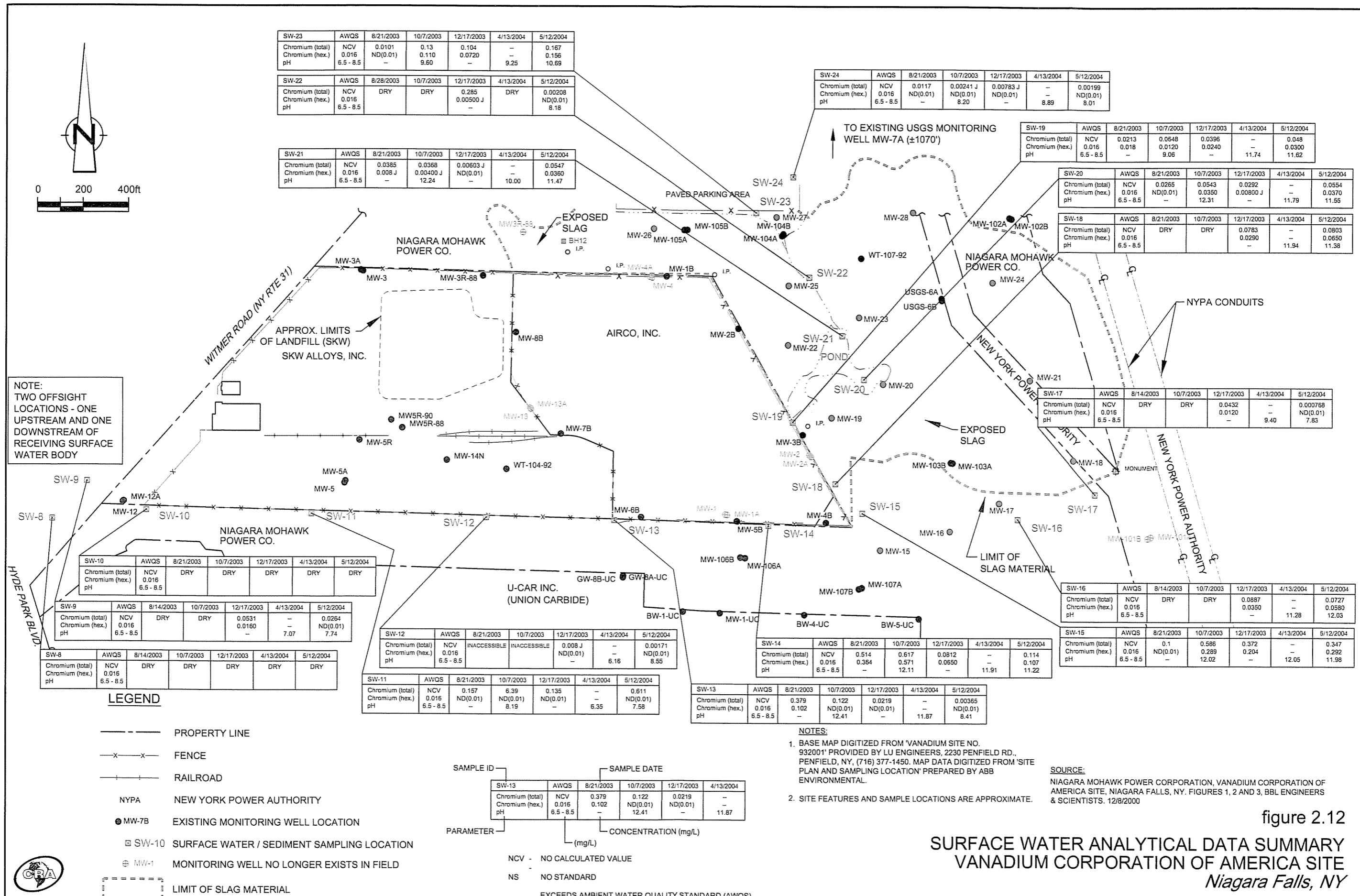
SOURCE:

NIAGARA MOHAWK POWER CORPORATION, VANADIUM CORPORATION OF AMERICA SITE, NIAGARA FALLS, NY. FIGURES 1, 2 AND 3, BBL ENGINEERS & SCIENTISTS. 12/8/2000

figure 2.11

**SEDIMENT ANALYTICAL DATA SUMMARY
VANADIUM CORPORATION OF AMERICA SITE
Niagara Falls, NY**





NOTE:
TWO OFFSIGHT
LOCATIONS - ONE
UPSTREAM AND ONE
DOWNSTREAM OF
RECEIVING SURFACE
WATER BODY

LEGEND

- PROPERTY LINE
- x-x- FENCE
- +--+ RAILROAD
- NYPA NEW YORK POWER AUTHORITY
- MW-7B EXISTING MONITORING WELL LOCATION
- ⊠ SW-10 SURFACE WATER / SEDIMENT SAMPLING LOCATION
- ⊕ MW-1 MONITORING WELL NO LONGER EXISTS IN FIELD
- LIMIT OF SLAG MATERIAL

SAMPLE ID: SW-13 SAMPLE DATE: 4/13/2004

PARAMETER	AWQS	8/21/2003	10/7/2003	12/17/2003	4/13/2004	5/12/2004
Chromium (total)	NCV	0.379	0.122	0.0219	-	-
Chromium (hex.)	0.016	0.102	ND(0.01)	ND(0.01)	-	-
pH	6.5 - 8.5	-	12.41	-	11.87	-

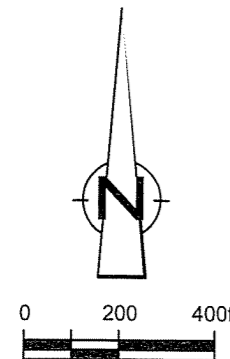
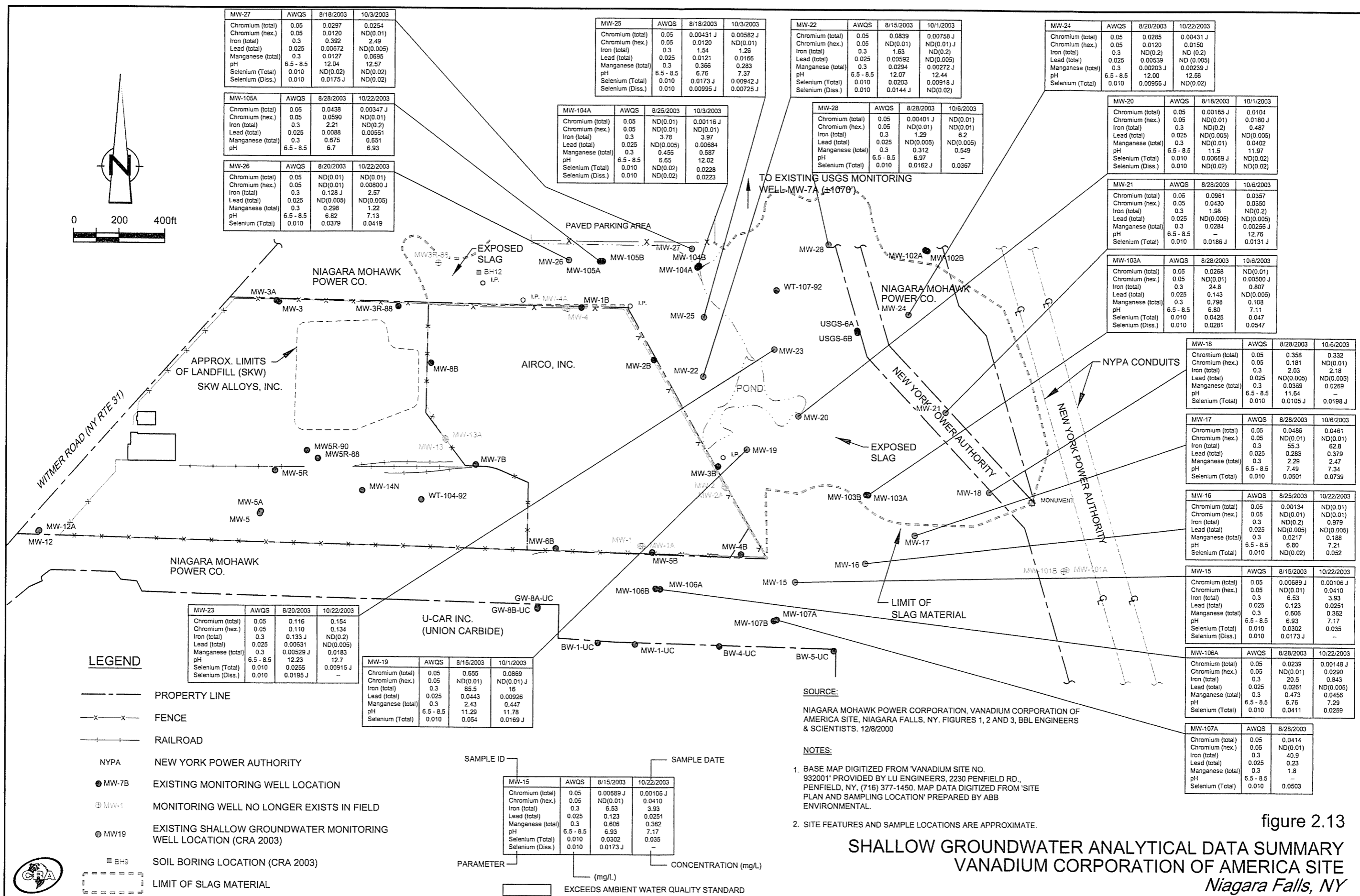
(mg/L)

NCV - NO CALCULATED VALUE
NS - NO STANDARD
EXCEEDS AMBIENT WATER QUALITY STANDARD (AWQS)

- NOTES:**
- BASE MAP DIGITIZED FROM 'VANADIUM SITE NO. 932001' PROVIDED BY LU ENGINEERS, 2230 PENFIELD RD., PENFIELD, NY, (716) 377-1450. MAP DATA DIGITIZED FROM 'SITE PLAN AND SAMPLING LOCATION' PREPARED BY ABB ENVIRONMENTAL.
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SOURCE:
NIAGARA MOHAWK POWER CORPORATION, VANADIUM CORPORATION OF AMERICA SITE, NIAGARA FALLS, NY. FIGURES 1, 2 AND 3, BBL ENGINEERS & SCIENTISTS. 12/8/2000

figure 2.12
SURFACE WATER ANALYTICAL DATA SUMMARY
VANADIUM CORPORATION OF AMERICA SITE
Niagara Falls, NY



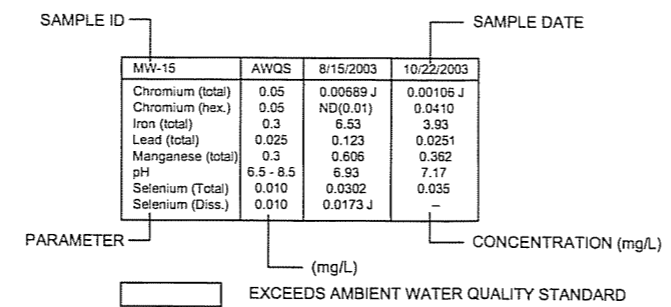
LEGEND

- PROPERTY LINE
- x-x- FENCE
- RAILROAD
- NYP&A NEW YORK POWER AUTHORITY
- MW-7B EXISTING MONITORING WELL LOCATION
- ⊕ MW-1 MONITORING WELL NO LONGER EXISTS IN FIELD
- MW19 EXISTING SHALLOW GROUNDWATER MONITORING WELL LOCATION (CRA 2003)
- BH9 SOIL BORING LOCATION (CRA 2003)
- LIMIT OF SLAG MATERIAL

MW-23	AWQS	8/20/2003	10/22/2003
Chromium (total)	0.05	0.116	0.154
Chromium (hex.)	0.05	0.110	0.134
Iron (total)	0.3	0.133 J	ND(0.2)
Lead (total)	0.025	0.00531	ND(0.005)
Manganese (total)	0.3	0.00529 J	0.0183
pH	6.5 - 8.5	12.23	12.7
Selenium (Total)	0.010	0.0255	0.00915 J
Selenium (Diss.)	0.010	0.0195 J	-

MW-19	AWQS	8/15/2003	10/1/2003
Chromium (total)	0.05	0.655	0.0869
Chromium (hex.)	0.05	ND(0.01)	ND(0.01) J
Iron (total)	0.3	85.5	16
Lead (total)	0.025	0.0443	0.00926
Manganese (total)	0.3	2.43	0.447
pH	6.5 - 8.5	11.29	11.78
Selenium (Total)	0.010	0.054	0.0169 J

MW-15	AWQS	8/15/2003	10/22/2003
Chromium (total)	0.05	0.00689 J	0.00106 J
Chromium (hex.)	0.05	ND(0.01)	0.0410
Iron (total)	0.3	6.53	3.93
Lead (total)	0.025	0.123	0.0251
Manganese (total)	0.3	0.606	0.362
pH	6.5 - 8.5	6.93	7.17
Selenium (Total)	0.010	0.0302	0.035
Selenium (Diss.)	0.010	0.0173 J	-



SOURCE:

NIAGARA MOHAWK POWER CORPORATION, VANADIUM CORPORATION OF AMERICA SITE, NIAGARA FALLS, NY. FIGURES 1, 2 AND 3, BBL ENGINEERS & SCIENTISTS. 12/8/2000

NOTES:

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- SITE FEATURES AND SAMPLE LOCATIONS ARE APPROXIMATE.

SHALLOW GROUNDWATER ANALYTICAL DATA SUMMARY
VANADIUM CORPORATION OF AMERICA SITE
Niagara Falls, NY

TABLES

TABLE 2.1
HYDRAULIC WATER LEVEL MEASUREMENTS
VANADIUM CORPORATION OF AMERICA SITE
NIAGARA FALLS, NEW YORK

<i>Monitoring Well ID</i>	<i>Hydraulic Water Level</i>			
	<i>9-Jan-03</i>	<i>13-Aug-03</i>	<i>30-Sep-03</i>	<i>19-Dec-03</i>
MW-15	--	5.94	10.20	2.83
MW-16	--	6.79	10.54	NM ⁽²⁾
MW-17	--	--	11.18	1.84
MW-18	--	11.53	11.40	8.83
MW-19	--	6.78	3.25	2.25
MW-20	--	3.08	3.52	3.33
MW-21	--	17.18	17.63	16.68
MW-22	--	1.60	2.40	0.76
MW-23	--	15.30	15.80	14.99
MW-24	--	14.02	14.83	13.28
MW-25	--	3.72	2.95	0.63
MW-26	--	7.90	9.89	6.57
MW-27	--	2.20	0.75	0.71
MW-28	--	6.95	7.05	0.91
MW-12	NM	8.40	9.63	7.54
MW-12A	NM	DRY	DRY	DRY
MW-102A	11.85	11.98	12.05	9.09
MW-102B	39.21	38.80	39.85	38.50
MW-103A	7.14	9.72	13.70	6.30
MW-103B	12.03	14.40	16.18	10.97
MW-104A	13.05	14.15	16.25	11.94
MW-104B	12.79	14.00	16.37	11.71
MW-105A	7.63	NM ⁽¹⁾	10.83	7.18
MW-105B	10.53	11.48	13.03	9.93
MW-106A	5.13	9.40	11.18	3.73
MW-106B	7.56	9.61	12.65	5.40
MW-107A	9.00	10.40	11.70	6.38
MW-107B	7.27	8.80	11.70	5.21
USGS-6A	NM ⁽³⁾	8.09 ⁽³⁾	8.1 ⁽³⁾	8.17 ⁽³⁾
USGS-6B	NM	DRY	DRY	DRY

Notes:

- NM - No measurement.
 -- - Well not yet installed.
 (1) - No measurement due to wasp nest in well.
 (2) - No measurement due to flooding at well location.
 (3) - Well was later found to be not functional.

TABLE 2.2

SUBSURFACE SOIL ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Sample Location: MW15 MW15 MW15 MW24 MW24 MW24
 Sample ID: S-19867-0703-PK-011 S-19867-0703-PK-012 S-19867-0703-PK-013 S-19867-07-03-PK-020 S-19867-07-03-PK-021
 Sample Date: 7/24/2003 7/24/2003 7/24/2003 7/28/2003 7/28/2003
 Sample Depth: 2-4 ft 10-12 ft 10-12 ft 2-4 ft 2-4 ft
 Duplicate Duplicate Duplicate Duplicate Duplicate

Metals	Eastern USA		TAGM ^a	Values
	Background Concentration	Units		
Aluminum	33000	mg/kg	SB	17300
Antimony	NS	mg/kg	SB	19300
Arsenic	3 - 12	mg/kg	7.5 or SB	ND (2.74) J
Barium	15 - 600	mg/kg	300 or SB	6.72
Beryllium	0 - 1.75	mg/kg	0.16 or SB	208 J
Cadmium	0.1 - 1.0	mg/kg	1 or SB	1.54
Calcium	130 - 35000	mg/kg	SB	ND (0.607)
Chromium Total	1.5 - 40	mg/kg	50 ^b or SB	180000
Chromium VI (Hexavalent)	NS	mg/kg	NS	2490
Cobalt	2.5 or 60	mg/kg	30 or SB	67
Copper	1.0 - 50	mg/kg	25 or SB	3.18
Cyanide (total)	2000 - 550000	mg/kg	NS	32.0
Iron	NS	mg/kg	2000 or SB	0.461 J
Lead	100 - 5000	mg/kg	SB	6590
Magnesium	50 - 5000	mg/kg	SB	18.3
Manganese	0.001 - 0.2	mg/kg	0.1	114000 J
Nickel	0.5 - 25	mg/kg	13 or SB	2050
Potassium	8500 - 43000	mg/kg	SB	ND (0.0462)
Selenium	0.1 - 3.9	mg/kg	2 or SB	51.8 J
Silver	NS	mg/kg	SB	432
Sodium	6000 - 8000	mg/kg	SB	ND (2.43)
Thallium	NS	mg/kg	SB	0.763 J
Vanadium	1.0 - 300	mg/kg	150 or SB	578 J
Zinc	9.0 - 50.0	mg/kg	20 or SB	120 J
				ND (9.70)
				25.2
				107 J
				54.3
				28.1 J
				132 J

General Chemistry

pH (soil)	S.U.	8.2	8.3	12	12
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TABLE 2.2

SUBSURFACE SOIL ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Metals	Units	Background Concentration	TAGM ^a	Values	Sample Location:			
					MW-26	MW-27	MW-28	
Aluminum	mg/kg	33000	SB	5970	20200	20500	15400	
Antimony	mg/kg	NS	SB	2.82 J	3.44 J	ND (2.58) J	3.85 J	
Arsenic	mg/kg	3 - 12	7.5 or SB	5.42	4.25	7.97	3.63	
Barium	mg/kg	15 - 600	300 or SB	37.4 J	62.2 J	159 J	29.4 J	
Beryllium	mg/kg	0 - 1.75	0.16 or SB	0.405	0.864	1.18	0.718	
Cadmium	mg/kg	0.1 - 1.0	1 or SB	0.737	ND (0.787)	0.743	ND (0.701)	
Calcium	mg/kg	130 - 35000	SB	124000	190000	4710	191000	
Chromium Total	mg/kg	1.5 - 40	50 ^b or SB	9.66	1450	28.4	719	
Chromium VI (Hexavalent)	mg/kg	NS	NS	ND (4.4)	25	ND (4.7)	52	
Cobalt	mg/kg	2.5 or 60	30 or SB	4.31	3.59	15.3	1.38 J	
Copper	mg/kg	1.0 - 50	25 or SB	4.45	9.50	30.1	2.31 J	
Cyanide (total)	mg/kg	2000 - 550000	NS	ND (0.540)	0.327 J	ND (0.619)	ND (0.708)	
Iron	mg/kg	NS	2000 or SB	11100	8150	33100	3390	
Lead	mg/kg	100 - 5000	SB	54.7	10.5	10.5	21.8	
Magnesium	mg/kg	50 - 5000	SB	77900	69200	7910	62900	
Manganese	mg/kg	0.001 - 0.2	0.1	475	463	824	318	
Mercury	mg/kg	0.5 - 25	13 or SB	ND (0.0345)	ND (0.0506)	0.0126 J	ND (0.0492)	
Nickel	mg/kg	8500 - 43000	SB	9.97 J	21.8 J	32.8 J	9.71 J	
Potassium	mg/kg	0.1 - 3.9	2 or SB	1460	942	3030	500	
Selenium	mg/kg	NS	SB	ND (2.54)	ND (3.15)	ND (1.29)	ND (4.21)	
Silver	mg/kg	6000 - 8000	SB	ND (0.847)	ND (0.592)	ND (0.861)	ND (1.40)	
Sodium	mg/kg	NS	SB	237	281	155	95.8 J	
Thallium	mg/kg	1.0 - 300	150 or SB	ND (2.54)	ND (6.29)	ND (2.58)	ND (7.01)	
Vanadium	mg/kg	9.0 - 50.0	20 or SB	15.7 J	48.9 J	40.0 J	35.7 J	
Zinc	mg/kg	NS	20 or SB	1160 J	66.3 J	323 J	41.6 J	
General Chemistry								
pH (soil)	S.U.			9.9 J	11 J	8.5	12	

TABLE 2.2

SUBSURFACE SOIL ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Metals	Units	Background Concentration	TAGM ^a	Values	Sample Location:			
					MW-18	MW-19	MW-20	
Aluminum	mg/kg	33000	SB	34500	25900	16100	20400	13100
Antimony	mg/kg	NS	SB	4.91 J	ND (2.57) J	3.83 J	ND (2.09)	ND (24.2) J
Arsenic	mg/kg	3 - 12	7.5 or SB	3.38	4.76	4.29	5.90	70.0
Barium	mg/kg	15 - 600	300 or SB	19.9 J	158 J	34.4 J	143	117
Beryllium	mg/kg	0 - 1.75	0.16 or SB	0.946	1.35	0.825	0.838	2.56 J
Cadmium	mg/kg	0.1 - 1.0	1 or SB	ND (0.618)	ND (0.429)	ND (0.651)	ND (0.620)	2.08 J
Calcium	mg/kg	130 - 35000	SB	249000	16500	176000	68000	105000
Chromium Total	mg/kg	1.5 - 40	50 ^b or SB	500	34.1	3100	28.0	1200
Chromium VI (Hexavalent)	mg/kg	NS	NS	33	ND (4.9)	170	ND (5.2)	4.9
Cobalt	mg/kg	2.5 or 60	30 or SB	0.265 J	15.7	2.53 J	11.8	31.5 J
Copper	mg/kg	1.0 - 50	25 or SB	ND (2.47)	30.0	22.8	25.7	354
Cyanide (total)	mg/kg	NS	NS	ND (0.674)	ND (0.639)	ND (0.591)	ND (0.557)	1.40
Iron	mg/kg	2000 - 550000	2000 or SB	533	33600	6990	28700	25300
Lead	mg/kg	NS	SB	12.2	13.0	9.77	8.86	81.4
Magnesium	mg/kg	100 - 5000	SB	78000	13100	70700	11800	37700
Manganese	mg/kg	50 - 5000	SB	154	811	524	668	49000
Mercury	mg/kg	0.001 - 0.2	0.1	ND (0.0434)	ND (0.0375)	ND (0.0435)	ND (0.0447)	0.0345 J
Nickel	mg/kg	0.5 - 25	13 or SB	7.27 J	34.9 J	42.7 J	24.8	76.7
Potassium	mg/kg	8500 - 43000	SB	89.7 J	3730	250	4860	1270 J
Selenium	mg/kg	0.1 - 3.9	2 or SB	ND (4.95)	ND (0.429)	ND (1.30)	ND (1.24)	ND (24.2)
Silver	mg/kg	NS	SB	0.371 J	ND (0.857)	0.279 J	0.433 J	7.06 J
Sodium	mg/kg	6000 - 8000	SB	83.7 J	304	118 J	294	ND (2420)
Thallium	mg/kg	NS	SB	ND (9.89)	ND (2.57)	ND (6.51)	ND (1.24)	89.6
Vanadium	mg/kg	1.0 - 300	150 or SB	16.3 J	45.9 J	62.8 J	38.2	58.8
Zinc	mg/kg	9.0 - 50.0	20 or SB	ND (1.86) J	78.8 J	24.4 J	64.5	154
Sample ID:				S-19867-07-03-PK-023	S-19867-07-03-PK-024	S-19867-07-03-PK-009	S-19867-07-03-PK-010	S-19867-0703-PK-016
Sample Date:				7/28/2003	7/28/2003	7/28/2003	7/28/2003	7/25/2003
Sample Depth:				2-4 ft	12-14 ft	0.5-2 ft	10-12 ft	4.5-6 ft

General Chemistry

pH (soil)	S.U.	12	12	12	9.5	12
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TABLE 2.2

SUBSURFACE SOIL ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Sample Location: MW-23 MW-23 Next to TP-20
Sample ID: S-19867-0703-PK-018 S-19867-0703-PK-019 S-19867-08-03-PK-031
Sample Date: 7/25/2003 7/25/2003 8/18/2003
Sample Depth: 4-6 ft 22-24 ft 0.5-1.5 ft

Metals	Eastern USA		TAGM ^a	Values
	Background Concentration	Units		
Aluminum	33000	mg/kg	SB	12700
Antimony	NS	mg/kg	SB	4.50
Arsenic	3 - 12	mg/kg	7.5 or SB	35.8
Barium	15 - 600	mg/kg	300 or SB	308
Beryllium	0 - 1.75	mg/kg	0.16 or SB	0.965
Cadmium	0.1 - 1.0	mg/kg	1 or SB	0.419 J
Calcium	130 - 35000	mg/kg	SB	68100
Chromium Total	1.5 - 40	mg/kg	50 ^b or SB	29.6
Chromium VI (Hexavalent)	NS	mg/kg	NS	ND (4.8)
Cobalt	2.5 or 60	mg/kg	30 or SB	11.5
Copper	1.0 - 50	mg/kg	25 or SB	20.0
Cyanide (total)	NS	mg/kg	NS	ND (0.549)
Iron	2000 - 550000	mg/kg	2000 or SB	25700
Lead	NS	mg/kg	SB	7.06
Magnesium	100 - 5000	mg/kg	SB	12900
Manganese	50 - 5000	mg/kg	SB	576
Mercury	0.001 - 0.2	mg/kg	0.1	ND (0.0394)
Nickel	0.5 - 25	mg/kg	13 or SB	28.1
Potassium	8500 - 43000	mg/kg	SB	3580
Selenium	0.1 - 3.9	mg/kg	2 or SB	2.84
Silver	NS	mg/kg	SB	0.349 J
Sodium	6000 - 8000	mg/kg	SB	241
Thallium	NS	mg/kg	SB	ND (1.15)
Vanadium	1.0 - 300	mg/kg	150 or SB	34.6
Zinc	9.0 - 50.0	mg/kg	20 or SB	59.3
				172
				9740 J
				2330 J
				0.216
				87.8
				1450
				7.27
				ND (1.07)
				302
				ND (1.07)
				28.1
				258

General Chemistry

pH (soil) S.U. NS 12 10 --

TABLE 2.2

SUBSURFACE SOIL ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Notes:

- NS - No Standard
- SB - Site Background
- ND () - Non Detect at associated value.
- J - Estimated Value
- - No Measurement
- a - New York State Technical and Administrative Guidance, Recommended Soil Cleanup Objectives, January 1994.
- b - Telephone Conversation, Jim Harrington, NYSDEC, February 3, 2004.

TABLE 2.3
MONITORING WELL SUMMARY
VANADIUM CORPORATION OF AMERICA SITE
NIAGARA FALLS, NEW YORK

Monitoring Well	Ground Elevation (ft AMSL) ⁽¹⁾	Casing Elevation (ft AMSL)	Top of Riser Elevation (ft AMSL)	Borehole Depth (ft bgs)	Bottom of Borehole Elevation (ft AMSL)	Screen Interval (ft bgs)	Screen Interval Elevation (ft AMSL)	Sandpack (ft bgs)
MW-15	601.35	601.51	601.19	13.5	587.85	8.4 - 13.4	592.95 - 587.95	6.4-13.5
MW-16	600.94	601.06	600.09	14	586.94	8.5 - 13.5	592.44 - 587.44	6.5-14
MW-17	601.68	601.69	601.01	14	587.68	8 - 13	593.68 - 588.68	6-14
MW-18	612.94	613.02	611.98	14	598.94	8.5 - 13.5	604.44 - 599.44	6.5-14
MW-19	605.50	605.63	605.39	12	593.5	5 - 10	600.50 - 595.50	3-12
MW-20	607.32	607.38	607.17	10.5	596.82	5 - 10	602.32 - 595.32	3-10.5
MW-21	619.97	620.02	619.50	20	599.97	9.5 - 19.5	610.47 - 600.47	7.5-20
MW-22	606.45	606.54	605.53	14	592.45	7 - 12	599.45 - 594.45	5-14
MW-23	619.88	620.09	619.74	24	595.88	13 - 23	606.88 - 596.88	11-24
MW-24	618.41	618.48	617.58	20	598.41	9 - 19	609.41 - 599.41	7-20
MW-25	605.96	606.05	605.31	10	596.05	4.5 - 9.5	601.46 - 596.46	2.5-10
MW-26	614.38	614.54	614.33	14	600.38	7 - 12	607.38 - 602.38	5-14
MW-27	606.72	607.02	606.19	9	597.72	3 - 8	603.72 - 598.72	2-9
MW-28	606.16	606.22	605.96	8.5	597.66	3 - 8	603.16 - 598.16	2-8.5

Note:

(1) - Datum used is NAVD 29.

TABLE 2.4

SHALLOW GROUNDWATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

	Sample Location: Sample ID: Sample Date:	MW-15 GW-19867-08-03-PK-004 8/15/2003	MW-15 GW-19867-08-03-PK-005 8/15/2003	MW-15 GW-19867-10-03-PK-024 10/22/2003	MW-16 GW-19867-08-03-PK-019 8/25/2003
Metals					
Aluminum (Total)	mg/L	5.14	—	1.18	0.124
Aluminum (Dissolved)	mg/L	—	ND(0.2)	—	—
Antimony (Total)	mg/L	ND(0.01)	—	ND(0.01)	ND(0.01)
Antimony (Dissolved)	mg/L	—	ND(0.01)	—	—
Arsenic (Total)	mg/L	0.0276	—	ND(0.025)	0.0139
Arsenic (Dissolved)	mg/L	—	0.0217 J	—	—
Barium (Total)	mg/L	0.0901	—	0.0698	0.0444
Barium (Dissolved)	mg/L	—	0.06	—	—
Beryllium (Total)	mg/L	ND(0.005)	—	ND(0.005)	ND(0.005)
Beryllium (Dissolved)	mg/L	—	ND(0.005)	—	—
Cadmium (Total)	mg/L	ND(0.005)	—	ND(0.005)	ND(0.005)
Cadmium (Dissolved)	mg/L	—	ND(0.005)	—	—
Calcium (Total)	mg/L	155	—	98.8	145
Calcium (Dissolved)	mg/L	—	97.3	—	—
Chromium (Total)	mg/L	0.00689 J	—	0.00106 J	0.00134
Chromium (Dissolved)	mg/L	—	0.000859 J	—	—
Chromium VI (Hexavalent) (Total)	mg/L	ND(0.01)	—	0.0410	ND(0.01)
Chromium VI (Hexavalent) (Dissolved)	mg/L	—	ND(0.01)	—	—
Cobalt (Total)	mg/L	0.00264 J	—	ND(0.02)	ND(0.02)
Cobalt (Dissolved)	mg/L	—	0.00135 J	—	—
Copper (Total)	mg/L	0.0793	—	ND(0.02)	0.00628
Copper (Dissolved)	mg/L	—	0.0102 J	—	—
Cyanide (Dissolved)	mg/L	—	ND(0.01)	—	—
Cyanide (Total)	mg/L	ND(0.01)	—	ND(0.01)	ND(0.01)
Iron (Total)	mg/L	6.53	—	3.93	ND(0.01)
Iron (Dissolved)	mg/L	—	2.01	—	ND(0.2)
Lead (Total)	mg/L	0.123	—	0.0251	ND(0.005)

NYSDEC Ambient
Water Quality ^a

TABLE 2.4

SHALLOW GROUNDWATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

	Sample Location: Sample ID: Sample Date:	MW-15 GW-19867-08-03-PK-004 8/15/2003	MW-15 GW-19867-08-03-PK-005 8/15/2003	MW-15 GW-19867-10-03-PK-024 10/22/2003	MW-16 GW-19867-08-03-PK-019 8/25/2003
	NYSDEC Ambient Water Quality "				
Lead (Dissolved)	0.025	0.00751	0.00751	0.00751	0.00751
Magnesium (Total)	NS	71.9	71.9	71.9	71.9
Magnesium (Dissolved)	NS	0.606	0.606	0.606	0.606
Manganese (Total)	0.3	0.421	0.421	0.421	0.421
Manganese (Dissolved)	0.3	ND(0.0004)	ND(0.0004)	ND(0.0004)	ND(0.0004)
Mercury (Total)	0.0007	0.00178 J	0.00178 J	0.00178 J	0.00178 J
Mercury (Dissolved)	0.0007	0.00178 J	0.00178 J	0.00178 J	0.00178 J
Nickel (Total)	0.1	3.13	3.13	3.13	3.13
Nickel (Dissolved)	0.1	3.13	3.13	3.13	3.13
Potassium (Total)	NS	0.0302	0.0302	0.0302	0.0302
Potassium (Dissolved)	NS	0.0302	0.0302	0.0302	0.0302
Selenium (Total)	0.010	0.0173 J	0.0173 J	0.0173 J	0.0173 J
Selenium (Dissolved)	0.010	0.0173 J	0.0173 J	0.0173 J	0.0173 J
Silver (Total)	0.050	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)
Silver (Dissolved)	0.050	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)
Sodium (Total)	20	32.2	32.2	32.2	32.2
Sodium (Dissolved)	20	32.2	32.2	32.2	32.2
Thallium (Total)	NS	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)
Thallium (Dissolved)	NS	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)
Vanadium (Total)	NS	0.00528 J	0.00528 J	0.00528 J	0.00528 J
Vanadium (Dissolved)	NS	0.00528 J	0.00528 J	0.00528 J	0.00528 J
Zinc (Total)	NS	0.144	0.144	0.144	0.144
Zinc (Dissolved)	NS	0.144	0.144	0.144	0.144

General Chemistry

pH (water)	S.U.	6.5 - 8.5	6.93	7.17	6.80
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TABLE 2.4

SHALLOW GROUNDWATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

	Sample Location:	MW-16	MW-17	MW-17	MW-18
	Sample ID:	GW-19867-10-03-PK-025	GW-19867-08-03-PK-024	GW-19867-10-03-PK-015	GW-19867-08-03-PK-023
	Sample Date:	10/22/2003	8/28/2003	10/6/2003	8/28/2003
	Units	NYSDEC Ambient			
		Water Quality ^a			
Metals					
Aluminum (Total)	mg/L	ND(0.2)	38.9	38	4.83
Aluminum (Dissolved)	mg/L	--	--	--	--
Antimony (Total)	mg/L	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)
Antimony (Dissolved)	mg/L	--	--	--	--
Arsenic (Total)	mg/L	ND(0.025)	0.0224 J	0.0288	0.0203 J
Arsenic (Dissolved)	mg/L	--	--	--	--
Barium (Total)	mg/L	0.0396	0.316	0.349	0.049
Barium (Dissolved)	mg/L	--	--	--	--
Beryllium (Total)	mg/L	ND(0.005)	0.00219 J	0.00177 J	ND(0.005)
Beryllium (Dissolved)	mg/L	--	--	--	--
Cadmium (Total)	mg/L	ND(0.005)	0.00211 J	0.00395 J	ND(0.005)
Cadmium (Dissolved)	mg/L	--	--	--	--
Calcium (Total)	mg/L	142	317	305	134
Calcium (Dissolved)	mg/L	--	--	--	--
Chromium (Total)	mg/L	ND(0.01)	0.0486	0.0461	0.358
Chromium (Dissolved)	mg/L	--	--	--	--
Chromium VI (Hexavalent) (Total)	mg/L	ND(0.01)	ND(0.01)	ND(0.01)	0.181
Chromium VI (Hexavalent) (Dissolved)	mg/L	--	--	--	--
Cobalt (Total)	mg/L	ND(0.02)	0.0303	0.0285	0.00442 J
Cobalt (Dissolved)	mg/L	--	--	--	--
Copper (Total)	mg/L	ND(0.02)	0.0955	0.0822	0.0794
Copper (Dissolved)	mg/L	--	--	--	--
Cyanide (Dissolved)	mg/L	--	--	--	--
Cyanide (Total)	mg/L	ND(0.01)	0.00331	ND(0.01) J	ND(0.01)
Iron (Total)	mg/L	0.979	55.3	62.8	2.03
Iron (Dissolved)	mg/L	--	--	--	--
Lead (Total)	mg/L	ND(0.005)	0.283	0.379	ND(0.005)

TABLE 2.4

SHALLOW GROUNDWATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

	MW-16 GW-19867-10-03-PK-025 10/22/2003	MW-17 GW-19867-08-03-PK-024 8/28/2003	MW-17 GW-19867-10-03-PK-015 10/6/2003	MW-18 GW-19867-08-03-PK-023 8/28/2003
Lead (Dissolved)	74.7	120	120	1.32 J
Magnesium (Total)	NS	NS	NS	NS
Magnesium (Dissolved)	NS	NS	NS	0.0369
Manganese (Total)	0.188	2.29	2.47	NS
Manganese (Dissolved)	NS	NS	NS	0.0000911 J
Mercury (Total)	ND(0.0004)	0.000291 J	0.000072 J	NS
Mercury (Dissolved)	NS	NS	NS	0.0135 J
Nickel (Total)	ND(0.02)	0.0512	0.0555	NS
Nickel (Dissolved)	NS	NS	NS	3.35
Potassium (Total)	NS	NS	NS	NS
Potassium (Dissolved)	NS	NS	NS	NS
Selenium (Total)	0.052	0.0501	0.0739	0.0105 J
Selenium (Dissolved)	NS	NS	NS	NS
Silver (Total)	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)
Silver (Dissolved)	NS	NS	NS	NS
Sodium (Total)	34.9	40.8	39.7	55.8
Sodium (Dissolved)	NS	NS	NS	NS
Thallium (Total)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)
Thallium (Dissolved)	NS	NS	NS	NS
Vanadium (Total)	0.0157 J	0.063	0.0772	0.0268
Vanadium (Dissolved)	NS	NS	NS	NS
Zinc (Total)	0.00752 J	1.44	1.79	0.0548
Zinc (Dissolved)	NS	NS	NS	NS

General Chemistry

pH (water)	S.U.	7.21	7.34	11.64
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TABLE 2.4

SHALLOW GROUNDWATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Sample Location: MW-18 MW-19 MW-19 MW-20
 Sample ID: GW-19867-10-03-PK-018 GW-19867-08-03-PK-003 GW-19867-10-03-PK-001 GW-19867-08-03-PK-009
 Sample Date: 10/16/2003 8/15/2003 10/1/2003 8/18/2003

NYSDEC Ambient
Water Quality ^a

Units	MW-18 GW-19867-10-03-PK-018 10/16/2003	MW-19 GW-19867-08-03-PK-003 8/15/2003	MW-19 GW-19867-10-03-PK-001 10/1/2003	MW-20 GW-19867-08-03-PK-009 8/18/2003
Metals				
Aluminum (Total)	3.18	64.3	12.8	1.82
Aluminum (Dissolved)				
Antimony (Total)	0.01	ND(0.01)	ND(0.01)	ND(0.01)
Antimony (Dissolved)				
Arsenic (Total)	0.0136 J	0.0437	0.0267	0.022 J
Arsenic (Dissolved)				
Barium (Total)	0.0226	0.388	0.0858	0.186
Barium (Dissolved)				
Beryllium (Total)	ND(0.005)	0.00208 J	0.000467 J	ND(0.005)
Beryllium (Dissolved)				
Cadmium (Total)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
Cadmium (Dissolved)				
Calcium (Total)	73.4	298	112	219
Calcium (Dissolved)				
Chromium (Total)	0.332	0.655	0.0869	0.00165 J
Chromium (Dissolved)				
Chromium VI (Hexavalent) (Total)	ND(0.01)	ND(0.01)	ND(0.01) J	ND(0.01)
Chromium VI (Hexavalent) (Dissolved)				
Cobalt (Total)	0.00167 J	0.0282	0.00423 J	ND(0.02)
Cobalt (Dissolved)				
Copper (Total)	0.0318	0.105	0.0191 J	ND(0.02)
Copper (Dissolved)				
Cyanide (Dissolved)				
Cyanide (Total)	ND(0.01) J	ND(0.01)	ND(0.01)	ND(0.01)
Iron (Total)	2.18	85.5	16	ND(0.2)
Iron (Dissolved)				
Lead (Total)	ND(0.005)	0.0443	0.00926	ND(0.005)

TABLE 2.4

SHALLOW GROUNDWATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

	MW-18	MW-19	MW-19	MW-20
Sample Location:	GW-19867-10-03-PK-018	GW-19867-08-03-PK-003	GW-19867-10-03-PK-001	GW-19867-08-03-PK-009
Sample ID:	10/6/2003	8/15/2003	10/1/2003	8/18/2003
Sample Date:				
NYSDEC Ambient				
Units	Water Quality ^a			
Lead (Dissolved)	0.025	--	--	--
Magnesium (Total)	5.87	43.9	8.65	0.0388 J
Magnesium (Dissolved)	--	--	--	--
Manganese (Total)	0.0269	2.43	0.447	ND(0.01)
Manganese (Dissolved)	--	--	--	--
Mercury (Total)	ND(0.0004)	0.0000718 J	ND(0.0004)	ND(0.0004)
Mercury (Dissolved)	--	--	--	--
Nickel (Total)	ND(0.02)	0.0769	0.0221	0.00459 J
Nickel (Dissolved)	--	--	--	--
Potassium (Total)	2.17	21.4	11.5	7.56
Potassium (Dissolved)	--	--	--	--
Selenium (Total)	0.0198 J	0.054	0.0169 J	0.00669 J
Selenium (Dissolved)	--	--	--	--
Silver (Total)	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)
Silver (Dissolved)	--	--	--	--
Sodium (Total)	33.6	71.8	67.3	66.3
Sodium (Dissolved)	--	--	--	--
Thallium (Total)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)
Thallium (Dissolved)	--	--	--	--
Vanadium (Total)	0.0345	0.161	0.0558	0.00721 J
Vanadium (Dissolved)	--	--	--	--
Zinc (Total)	0.171	0.213	0.0409	ND(0.01)
Zinc (Dissolved)	--	--	--	--
General Chemistry				
pH (water)	11.29		11.78	
	6.5 - 8.5			

TABLE 2.4

SHALLOW GROUNDWATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Metals	Units	NYSDEC Ambient Water Quality ^a				MW-21 GW-19867-08-03-PK-022 8/28/2003
		MW-20 GW-19867-08-03-PK-010 8/18/2003	MW-20 GW-19867-10-03-PK-005 10/11/2003	MW-20 GW-19867-10-03-PK-006 10/11/2003	MW-20 GW-19867-10-03-PK-005 10/11/2003	
Aluminum (Total)	mg/L	NS	2.21	--	3.89	
Aluminum (Dissolved)	mg/L	NS	--	1.82	0.0109	
Antimony (Total)	mg/L	0.003	ND(0.01)	--	--	
Antimony (Dissolved)	mg/L	0.003	0.0191 J	ND(0.01)	ND(0.025)	
Arsenic (Total)	mg/L	0.025	--	0.0217 J	--	
Arsenic (Dissolved)	mg/L	0.025	0.071	--	0.222	
Barium (Total)	mg/L	1	--	0.0718	--	
Barium (Dissolved)	mg/L	1	ND(0.005)	--	ND(0.005)	
Beryllium (Total)	mg/L	NS	--	ND(0.005)	--	
Beryllium (Dissolved)	mg/L	NS	ND(0.005)	--	ND(0.005)	
Cadmium (Total)	mg/L	0.005	ND(0.005)	--	--	
Cadmium (Dissolved)	mg/L	0.005	126	ND(0.005)	378	
Calcium (Total)	mg/L	NS	--	125	--	
Calcium (Dissolved)	mg/L	NS	0.0104	ND(0.01)	0.0961	
Chromium (Total)	mg/L	0.05	--	--	--	
Chromium (Dissolved)	mg/L	0.05	0.0180 J	0.0430	0.0430	
Chromium VI (Hexavalent) (Total)	mg/L	0.05	--	ND(0.01) J	--	
Chromium VI (Hexavalent) (Dissolved)	mg/L	0.05	ND(0.02)	--	0.00161	
Cobalt (Total)	mg/L	NS	--	ND(0.02)	--	
Cobalt (Dissolved)	mg/L	NS	ND(0.02)	--	0.0538	
Copper (Total)	mg/L	0.2	ND(0.02)	--	--	
Copper (Dissolved)	mg/L	0.2	--	ND(0.02)	--	
Cyanide (Dissolved)	mg/L	0.2	--	ND(0.01)	--	
Cyanide (Total)	mg/L	0.2	ND(0.01)	--	ND(0.01)	
Iron (Total)	mg/L	0.3	0.487	--	1.98	
Iron (Dissolved)	mg/L	0.3	ND(0.2)	ND(0.2)	ND(0.005)	
Lead (Total)	mg/L	0.025	--	--	--	

TABLE 2.4

SHALLOW GROUNDWATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

	Sample Location: Sample ID: Sample Date:	MW-20 GW-19867-08-03-PK-010 8/18/2003	MW-20 GW-19867-10-03-PK-005 10/1/2003	MW-20 GW-19867-10-03-PK-006 10/1/2003	MW-21 GW-19867-08-03-PK-022 8/28/2003
NYSDEC Ambient Water Quality^a					
Units					
Lead (Dissolved)	0.025	ND(0.005)	--	ND(0.005)	--
Magnesium (Total)	mg/L	--	0.613 J	--	1.56
Magnesium (Dissolved)	mg/L	ND(1.5)	--	ND(1.5)	--
Manganese (Total)	mg/L	--	0.0402	--	0.0284
Manganese (Dissolved)	mg/L	ND(0.01)	--	ND(0.01)	--
Mercury (Total)	mg/L	--	ND(0.0004)	--	ND(0.0004) J
Mercury (Dissolved)	mg/L	ND(0.0004)	--	ND(0.0004)	--
Nickel (Total)	mg/L	--	0.00806 J	--	0.0109 J
Nickel (Dissolved)	mg/L	0.00516 J	--	0.00714 J	--
Potassium (Total)	mg/L	--	5.48	--	22.8
Potassium (Dissolved)	mg/L	7.57	--	5.9	--
Selenium (Total)	mg/L	--	ND(0.02)	--	0.0186 J
Selenium (Dissolved)	mg/L	ND(0.02)	--	ND(0.02)	--
Silver (Total)	mg/L	--	ND(0.01)	--	ND(0.01)
Silver (Dissolved)	mg/L	ND(0.01)	--	ND(0.01)	--
Sodium (Total)	mg/L	65.8	58.2	59	90.3
Sodium (Dissolved)	mg/L	--	ND(0.02)	--	ND(0.02)
Thallium (Total)	mg/L	ND(0.02)	--	ND(0.02)	--
Thallium (Dissolved)	mg/L	--	0.0085 J	--	0.00691 J
Vanadium (Total)	mg/L	--	0.00591 J	--	0.0187
Vanadium (Dissolved)	mg/L	--	0.0127	--	--
Zinc (Total)	mg/L	ND(0.01)	--	0.00494 J	--
Zinc (Dissolved)	mg/L	--	--	--	--
General Chemistry					
pH (water)	S.U.	6.5 - 8.5	11.97	11.97	--

TABLE 2.4

SHALLOW GROUNDWATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

	Sample Location:	MW-21	MW-22	MW-22	MW-22
	Sample ID:	GW-19867-10-03-PK-017	GW-19867-08-03-PK-001	GW-19867-08-03-PK-002	GW-19867-10-03-PK-003
	Sample Date:	10/6/2003	8/15/2003	8/15/2003	10/1/2003
	NYSDEC Ambient				
	Water Quality ^a				
Units					
Metals					
Aluminum (Total)	mg/L	2.19	2.9	—	1
Aluminum (Dissolved)	mg/L	—	—	0.681	—
Antimony (Total)	mg/L	0.0119	ND(0.01)	—	ND(0.01)
Antimony (Dissolved)	mg/L	—	—	ND(0.01)	—
Arsenic (Total)	mg/L	0.0154 J	0.0132 J	—	ND(0.025)
Arsenic (Dissolved)	mg/L	—	—	0.0112 J	—
Barium (Total)	mg/L	0.146	0.135	—	0.085
Barium (Dissolved)	mg/L	—	—	0.123	—
Beryllium (Total)	mg/L	ND(0.005)	ND(0.005)	—	ND(0.005)
Beryllium (Dissolved)	mg/L	—	—	ND(0.005)	—
Cadmium (Total)	mg/L	ND(0.005)	ND(0.005)	—	ND(0.005)
Cadmium (Dissolved)	mg/L	—	—	ND(0.005)	—
Calcium (Total)	mg/L	267	388	—	395
Calcium (Dissolved)	mg/L	—	—	391	—
Chromium (Total)	mg/L	0.0357	0.0839	—	0.00758 J
Chromium (Dissolved)	mg/L	—	—	0.0372	—
Chromium VI (Hexavalent) (Total)	mg/L	0.0350	ND(0.01)	—	ND(0.01) J
Chromium VI (Hexavalent) (Dissolved)	mg/L	—	—	0.0120	—
Cobalt (Total)	mg/L	ND(0.02)	0.00124 J	—	ND(0.02)
Cobalt (Dissolved)	mg/L	—	—	0.000932 J	—
Copper (Total)	mg/L	0.0198 J	ND(0.02)	—	ND(0.02)
Copper (Dissolved)	mg/L	—	—	ND(0.02)	—
Cyanide (Dissolved)	mg/L	—	—	ND(0.01)	—
Cyanide (Total)	mg/L	ND(0.01) J	ND(0.01)	—	ND(0.01)
Iron (Total)	mg/L	ND(0.2)	1.63	—	ND(0.2)
Iron (Dissolved)	mg/L	—	—	—	—
Lead (Total)	mg/L	ND(0.005)	0.00592	—	ND(0.005)

TABLE 2.4

SHALLOW GROUNDWATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Sample Location: MW-21 MW-22 MW-22 MW-22 MW-22 MW-22
 Sample ID: GW-19867-10-03-PK-017 GW-19867-08-03-PK-001 GW-19867-08-03-PK-002 GW-19867-10-03-PK-003
 Sample Date: 10/6/2003 8/15/2003 8/15/2003 10/1/2003

Units	NYSDEC Ambient Water Quality ^a					
	MW-21 GW-19867-10-03-PK-017 10/6/2003	MW-22 GW-19867-08-03-PK-001 8/15/2003	MW-22 GW-19867-08-03-PK-002 8/15/2003	MW-22 GW-19867-10-03-PK-003 10/1/2003		
Lead (Dissolved)	0.025	--	ND(0.005)	--	ND(1.5)	--
Magnesium (Total)	mg/L	ND(1.5)	--	1.2 J	--	ND(1.5)
Magnesium (Dissolved)	mg/L	--	ND(1.5)	--	ND(1.5)	--
Manganese (Total)	mg/L	0.00256 J	0.0294	0.0294	0.00272 J	0.00272 J
Manganese (Dissolved)	mg/L	--	--	--	0.00414 J	--
Mercury (Total)	mg/L	ND(0.0004)	ND(0.0004)	ND(0.0004)	ND(0.0004)	ND(0.0004)
Mercury (Dissolved)	mg/L	--	--	--	--	--
Nickel (Total)	mg/L	0.0136 J	0.00172 J	0.00172 J	0.002 J	0.002 J
Nickel (Dissolved)	mg/L	--	--	--	--	--
Potassium (Total)	mg/L	20.6	6.54	6.54	5.5	5.5
Potassium (Dissolved)	mg/L	--	--	--	6.18	--
Selenium (Total)	mg/L	0.0131 J	0.0203	0.0144 J	0.00918 J	0.00918 J
Selenium (Dissolved)	mg/L	--	--	--	--	--
Silver (Total)	mg/L	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)
Silver (Dissolved)	mg/L	--	--	--	--	--
Sodium (Total)	mg/L	91.5	90.5	93	83	83
Sodium (Dissolved)	mg/L	--	--	--	--	--
Thallium (Total)	mg/L	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)
Thallium (Dissolved)	mg/L	--	--	--	--	--
Vanadium (Total)	mg/L	0.012 J	0.00563 J	0.00563 J	0.00563 J	0.00563 J
Vanadium (Dissolved)	mg/L	--	--	--	--	--
Zinc (Total)	mg/L	0.0343	0.00977 J	0.00977 J	0.00977 J	0.00977 J
Zinc (Dissolved)	mg/L	--	--	--	--	--
General Chemistry						
pH (water)	S.U.	12.76	12.07	12.07	12.07	12.44

TABLE 2.4

SHALLOW GROUNDWATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

	MW-22	MW-23	MW-23	MW-23
Sample Location:	GW-19867-10-03-PK-004	GW-19867-08-03-PK-014	GW-19867-08-03-PK-015	GW-19867-10-03-PK-021
Sample ID:	10/1/2003	8/20/2003	8/20/2003	10/22/2003
Sample Date:				
Units	NYSDEC Ambient Water Quality ^a			
Metals				
Aluminum (Total)	NS	0.384	--	0.792
Aluminum (Dissolved)	NS	--	0.184 J	--
Antimony (Total)	0.003	0.00767 J	--	0.0194
Antimony (Dissolved)	0.003	--	ND(0.01)	--
Arsenic (Total)	0.025	ND(0.025)	--	ND(0.025)
Arsenic (Dissolved)	0.025	--	ND(0.025)	--
Barium (Total)	1	0.209	--	0.237
Barium (Dissolved)	1	--	0.208	--
Beryllium (Total)	NS	ND(0.005)	--	ND(0.005)
Beryllium (Dissolved)	NS	--	ND(0.005)	--
Cadmium (Total)	0.005	ND(0.005)	--	ND(0.005)
Cadmium (Dissolved)	0.005	--	ND(0.005)	--
Calcium (Total)	NS	751	--	742
Calcium (Dissolved)	NS	--	732	--
Chromium (Total)	0.05	0.116	--	0.154
Chromium (Dissolved)	0.05	--	0.106	--
Chromium VI (Hexavalent) (Total)	0.05	0.110	--	0.134
Chromium VI (Hexavalent) (Dissolved)	0.05	--	0.0900	--
Cobalt (Total)	NS	ND(0.02)	--	ND(0.02)
Cobalt (Dissolved)	NS	--	ND(0.02)	--
Copper (Total)	0.2	ND(0.02)	--	ND(0.02)
Copper (Dissolved)	0.2	--	ND(0.02)	--
Cyanide (Dissolved)	0.2	ND(0.01)	--	ND(0.01)
Cyanide (Total)	0.2	--	--	ND(0.01)
Iron (Total)	0.3	0.133 J	--	ND(0.2)
Iron (Dissolved)	0.3	--	ND(0.2)	--
Lead (Total)	0.025	0.00631	--	ND(0.005)

TABLE 2.4

SHALLOW GROUNDWATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

MW-23
GW-19867-10-03-PK-021
10/22/2003

MW-23
GW-19867-08-03-PK-015
8/20/2003

MW-23
GW-19867-08-03-PK-014
8/20/2003

MW-22
GW-19867-10-03-PK-004
10/1/2003

Sample Location:
Sample ID:
Sample Date:

NYSDEC Ambient
Water Quality ^a

Units	0.025	NS	NS	0.3	0.3	0.0007	0.0007	0.1	0.1	NS	NS	0.010	0.010	0.050	0.050	20	20	NS	NS	NS	NS	NS	NS	NS		
Lead (Dissolved)	mg/L	ND(0.005)	0.44 J	0.00529 J	ND(0.0004)	ND(0.0004)	ND(0.02)	3.26	3.18	0.0255	0.0195 J	ND(0.01)	ND(0.01)	89.4	88.9	83.8	89.4	ND(0.04)	ND(0.04)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	0.0158 J	
Magnesium (Total)	mg/L	ND(0.005)	0.44 J	0.00529 J	ND(0.0004)	ND(0.0004)	ND(0.02)	3.26	3.18	0.0255	0.0195 J	ND(0.01)	ND(0.01)	89.4	88.9	83.8	89.4	ND(0.04)	ND(0.04)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	0.00687 J	
Magnesium (Dissolved)	mg/L	ND(0.005)	0.44 J	0.00529 J	ND(0.0004)	ND(0.0004)	ND(0.02)	3.26	3.18	0.0255	0.0195 J	ND(0.01)	ND(0.01)	89.4	88.9	83.8	89.4	ND(0.04)	ND(0.04)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	0.00687 J	
Manganese (Total)	mg/L	ND(0.005)	0.44 J	0.00529 J	ND(0.0004)	ND(0.0004)	ND(0.02)	3.26	3.18	0.0255	0.0195 J	ND(0.01)	ND(0.01)	89.4	88.9	83.8	89.4	ND(0.04)	ND(0.04)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	0.00687 J	
Manganese (Dissolved)	mg/L	ND(0.005)	0.44 J	0.00529 J	ND(0.0004)	ND(0.0004)	ND(0.02)	3.26	3.18	0.0255	0.0195 J	ND(0.01)	ND(0.01)	89.4	88.9	83.8	89.4	ND(0.04)	ND(0.04)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	0.00687 J	
Mercury (Total)	mg/L	ND(0.005)	0.44 J	0.00529 J	ND(0.0004)	ND(0.0004)	ND(0.02)	3.26	3.18	0.0255	0.0195 J	ND(0.01)	ND(0.01)	89.4	88.9	83.8	89.4	ND(0.04)	ND(0.04)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	0.00687 J	
Mercury (Dissolved)	mg/L	ND(0.005)	0.44 J	0.00529 J	ND(0.0004)	ND(0.0004)	ND(0.02)	3.26	3.18	0.0255	0.0195 J	ND(0.01)	ND(0.01)	89.4	88.9	83.8	89.4	ND(0.04)	ND(0.04)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	0.00687 J	
Nickel (Total)	mg/L	ND(0.005)	0.44 J	0.00529 J	ND(0.0004)	ND(0.0004)	ND(0.02)	3.26	3.18	0.0255	0.0195 J	ND(0.01)	ND(0.01)	89.4	88.9	83.8	89.4	ND(0.04)	ND(0.04)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	0.00687 J	
Nickel (Dissolved)	mg/L	ND(0.005)	0.44 J	0.00529 J	ND(0.0004)	ND(0.0004)	ND(0.02)	3.26	3.18	0.0255	0.0195 J	ND(0.01)	ND(0.01)	89.4	88.9	83.8	89.4	ND(0.04)	ND(0.04)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	0.00687 J	
Potassium (Total)	mg/L	ND(0.005)	0.44 J	0.00529 J	ND(0.0004)	ND(0.0004)	ND(0.02)	3.26	3.18	0.0255	0.0195 J	ND(0.01)	ND(0.01)	89.4	88.9	83.8	89.4	ND(0.04)	ND(0.04)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	0.00687 J	
Potassium (Dissolved)	mg/L	ND(0.005)	0.44 J	0.00529 J	ND(0.0004)	ND(0.0004)	ND(0.02)	3.26	3.18	0.0255	0.0195 J	ND(0.01)	ND(0.01)	89.4	88.9	83.8	89.4	ND(0.04)	ND(0.04)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	0.00687 J	
Selenium (Total)	mg/L	ND(0.005)	0.44 J	0.00529 J	ND(0.0004)	ND(0.0004)	ND(0.02)	3.26	3.18	0.0255	0.0195 J	ND(0.01)	ND(0.01)	89.4	88.9	83.8	89.4	ND(0.04)	ND(0.04)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	0.00687 J	
Selenium (Dissolved)	mg/L	ND(0.005)	0.44 J	0.00529 J	ND(0.0004)	ND(0.0004)	ND(0.02)	3.26	3.18	0.0255	0.0195 J	ND(0.01)	ND(0.01)	89.4	88.9	83.8	89.4	ND(0.04)	ND(0.04)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	0.00687 J	
Silver (Total)	mg/L	ND(0.005)	0.44 J	0.00529 J	ND(0.0004)	ND(0.0004)	ND(0.02)	3.26	3.18	0.0255	0.0195 J	ND(0.01)	ND(0.01)	89.4	88.9	83.8	89.4	ND(0.04)	ND(0.04)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	0.00687 J	
Silver (Dissolved)	mg/L	ND(0.005)	0.44 J	0.00529 J	ND(0.0004)	ND(0.0004)	ND(0.02)	3.26	3.18	0.0255	0.0195 J	ND(0.01)	ND(0.01)	89.4	88.9	83.8	89.4	ND(0.04)	ND(0.04)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	0.00687 J	
Sodium (Total)	mg/L	ND(0.005)	0.44 J	0.00529 J	ND(0.0004)	ND(0.0004)	ND(0.02)	3.26	3.18	0.0255	0.0195 J	ND(0.01)	ND(0.01)	89.4	88.9	83.8	89.4	ND(0.04)	ND(0.04)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	0.00687 J	
Sodium (Dissolved)	mg/L	ND(0.005)	0.44 J	0.00529 J	ND(0.0004)	ND(0.0004)	ND(0.02)	3.26	3.18	0.0255	0.0195 J	ND(0.01)	ND(0.01)	89.4	88.9	83.8	89.4	ND(0.04)	ND(0.04)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	0.00687 J	
Thallium (Total)	mg/L	ND(0.005)	0.44 J	0.00529 J	ND(0.0004)	ND(0.0004)	ND(0.02)	3.26	3.18	0.0255	0.0195 J	ND(0.01)	ND(0.01)	89.4	88.9	83.8	89.4	ND(0.04)	ND(0.04)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	0.00687 J	
Thallium (Dissolved)	mg/L	ND(0.005)	0.44 J	0.00529 J	ND(0.0004)	ND(0.0004)	ND(0.02)	3.26	3.18	0.0255	0.0195 J	ND(0.01)	ND(0.01)	89.4	88.9	83.8	89.4	ND(0.04)	ND(0.04)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	0.00687 J	
Vanadium (Total)	mg/L	ND(0.005)	0.44 J	0.00529 J	ND(0.0004)	ND(0.0004)	ND(0.02)	3.26	3.18	0.0255	0.0195 J	ND(0.01)	ND(0.01)	89.4	88.9	83.8	89.4	ND(0.04)	ND(0.04)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	0.00687 J	
Vanadium (Dissolved)	mg/L	ND(0.005)	0.44 J	0.00529 J	ND(0.0004)	ND(0.0004)	ND(0.02)	3.26	3.18	0.0255	0.0195 J	ND(0.01)	ND(0.01)	89.4	88.9	83.8	89.4	ND(0.04)	ND(0.04)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	0.00687 J	
Zinc (Total)	mg/L	ND(0.005)	0.44 J	0.00529 J	ND(0.0004)	ND(0.0004)	ND(0.02)	3.26	3.18	0.0255	0.0195 J	ND(0.01)	ND(0.01)	89.4	88.9	83.8	89.4	ND(0.04)	ND(0.04)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	0.00687 J	
Zinc (Dissolved)	mg/L	ND(0.005)	0.44 J	0.00529 J	ND(0.0004)	ND(0.0004)	ND(0.02)	3.26	3.18	0.0255	0.0195 J	ND(0.01)	ND(0.01)	89.4	88.9	83.8	89.4	ND(0.04)	ND(0.04)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	0.00687 J	
General Chemistry																										
pH (water)	S.U.	12.44	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.23	12.7

TABLE 2.4

SHALLOW GROUNDWATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

	Sample Location: Sample ID: Sample Date:	MW-24 GW-19867-08-03-PK-016 8/20/2003	MW-24 GW-19867-10-03-PK-022 10/22/2003	MW-25 GW-19867-08-03-PK-006 8/18/2003	MW-25 GW-19867-08-03-PK-007 8/18/2003
Metals					
Aluminum (Total)	NS	2.95	2.18	0.557	ND(0.2)
Aluminum (Dissolved)	NS	ND(0.01)	0.00706 J	ND(0.01)	ND(0.01)
Antimony (Total)	0.003	ND(0.01)	ND(0.025)	0.0215 J	0.0186 J
Antimony (Dissolved)	0.003	0.0173 J	ND(0.025)	0.0215 J	0.0186 J
Arsenic (Total)	0.025	0.836	1.12	0.173	0.164
Arsenic (Dissolved)	0.025	0.836	1.12	0.173	0.164
Barium (Total)	1	0.836	1.12	0.173	0.164
Barium (Dissolved)	1	0.836	1.12	0.173	0.164
Beryllium (Total)	NS	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
Beryllium (Dissolved)	NS	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
Cadmium (Total)	0.005	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
Cadmium (Dissolved)	0.005	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
Calcium (Total)	NS	322	352	80.2	78.7
Calcium (Dissolved)	NS	322	352	80.2	78.7
Chromium (Total)	NS	0.0285	0.00413 J	0.00431 J	0.00249 J
Chromium (Dissolved)	0.05	0.0285	0.00413 J	0.00431 J	0.00249 J
Chromium VI (Hexavalent) (Total)	0.05	0.0120	0.0150	0.0110	ND(0.01)
Chromium VI (Hexavalent) (Dissolved)	0.05	0.0120	0.0150	0.0110	ND(0.01)
Cobalt (Total)	NS	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)
Cobalt (Dissolved)	NS	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)
Copper (Total)	0.2	0.0165 J	ND(0.02)	ND(0.02)	ND(0.02)
Copper (Dissolved)	0.2	0.0165 J	ND(0.02)	ND(0.02)	ND(0.02)
Cyanide (Dissolved)	0.2	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)
Cyanide (Total)	0.2	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)
Iron (Total)	0.3	ND(0.2)	ND(0.2)	1.54	1.04
Iron (Dissolved)	0.3	ND(0.2)	ND(0.2)	1.54	1.04
Lead (Total)	0.025	0.00539	ND(0.005)	0.015	0.015

TABLE 2.4

SHALLOW GROUNDWATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

	Sample Location: Sample ID: Sample Date:	MW-24 GW-19867-08-03-PK-016 8/20/2003	MW-24 GW-19867-10-03-PK-022 10/22/2003	MW-25 GW-19867-08-03-PK-006 8/18/2003	MW-25 GW-19867-08-03-PK-007 8/18/2003
	NYSDEC Ambient Water Quality ^a				
Lead (Dissolved)	0.025	--	--	--	ND(0.005)
Magnesium (Total)	mg/L	0.115 J	0.0382 J	18.6	--
Magnesium (Dissolved)	mg/L	--	--	--	18
Magnesium (Total)	mg/L	0.00203 J	0.00239 J	0.36	0.347
Manganese (Total)	mg/L	--	--	--	--
Manganese (Dissolved)	mg/L	ND(0.0004)	ND(0.0004)	ND(0.0004)	ND(0.0004)
Mercury (Total)	mg/L	--	--	--	--
Mercury (Dissolved)	mg/L	0.00518 J	0.00606 J	ND(0.02)	ND(0.02)
Nickel (Total)	mg/L	--	--	--	--
Nickel (Dissolved)	mg/L	12.5	12.9	4.26	4.28
Potassium (Total)	mg/L	--	--	--	--
Potassium (Dissolved)	mg/L	0.00956 J	ND(0.02)	0.00777 J	--
Selenium (Total)	mg/L	--	--	--	0.00995 J
Selenium (Dissolved)	mg/L	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)
Silver (Total)	mg/L	--	--	--	--
Silver (Dissolved)	mg/L	87	71.5	71.3	71.2
Sodium (Total)	mg/L	--	--	--	--
Sodium (Dissolved)	mg/L	ND(0.02)	0.00941 J	ND(0.02)	ND(0.02)
Thallium (Total)	mg/L	--	--	--	--
Thallium (Dissolved)	mg/L	0.00318 J	0.00606 J	ND(0.02)	ND(0.02)
Vanadium (Total)	mg/L	--	--	--	--
Vanadium (Dissolved)	mg/L	ND(0.01)	0.00315 J	0.0123	ND(0.01)
Zinc (Total)	mg/L	--	--	--	--
Zinc (Dissolved)	mg/L	--	--	--	ND(0.01)
General Chemistry					
pH (water)	S.U.	12.00	12.56	6.76	6.76

TABLE 2.4

SHALLOW GROUNDWATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

	Sample Location:	MW-25	MW-25	MW-25	MW-26
	Sample ID:	GW-19867-08-03-PK-008	GW-19867-10-03-PK-002	GW-19867-10-03-PK-007	GW-19867-08-03-PK-013
	Sample Date:	8/18/2003	10/3/2003	10/3/2003	8/20/2003
		Duplicate			
	NYSDEC Ambient				
Units	Water Quality ^a				
Metals					
Aluminum (Total)	mg/L	NS	0.544	--	ND(0.2)
Aluminum (Dissolved)	mg/L	NS	--	ND(0.2)	--
Antimony (Total)	mg/L	0.003	ND(0.01)	--	ND(0.01)
Antimony (Dissolved)	mg/L	0.003	--	ND(0.01)	--
Arsenic (Total)	mg/L	0.025	ND(0.025)	--	0.022 J
Arsenic (Dissolved)	mg/L	0.025	--	ND(0.025)	--
Barium (Total)	mg/L	1	0.153	--	0.068
Barium (Dissolved)	mg/L	1	--	0.133	--
Beryllium (Total)	mg/L	NS	ND(0.005)	--	ND(0.005)
Beryllium (Dissolved)	mg/L	NS	--	ND(0.005)	--
Cadmium (Total)	mg/L	0.005	ND(0.005)	--	ND(0.005)
Cadmium (Dissolved)	mg/L	0.005	--	ND(0.005)	--
Calcium (Total)	mg/L	NS	69.4	--	132
Calcium (Dissolved)	mg/L	NS	80.9	66.8	--
Chromium (Total)	mg/L	NS	0.00356 J	--	ND(0.01)
Chromium (Dissolved)	mg/L	0.05	--	0.00174 J	--
Chromium VI (Hexavalent) (Total)	mg/L	0.05	0.0120	--	ND(0.01)
Chromium VI (Hexavalent) (Dissolved)	mg/L	0.05	--	ND(0.01)	--
Cobalt (Total)	mg/L	NS	ND(0.02)	--	ND(0.02)
Cobalt (Dissolved)	mg/L	NS	--	ND(0.02)	--
Copper (Total)	mg/L	0.2	ND(0.02)	--	ND(0.02)
Copper (Dissolved)	mg/L	0.2	--	ND(0.02)	--
Cyanide (Dissolved)	mg/L	0.2	--	0.00397 J	--
Cyanide (Total)	mg/L	0.2	ND(0.01)	--	ND(0.01)
Iron (Total)	mg/L	0.3	1.54	1.26	0.128 J
Iron (Dissolved)	mg/L	0.3	--	0.827	--
Lead (Total)	mg/L	0.025	0.0121	--	ND(0.005)

TABLE 2.4

SHALLOW GROUNDWATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

	Sample Location:	MW-25	MW-25	MW-25	MW-26	
	Sample ID:	GW-19867-08-03-PK-008	GW-19867-10-03-PK-002	GW-19867-10-03-PK-007	GW-19867-08-03-PK-013	
	Sample Date:	8/18/2003	10/3/2003	10/3/2003	8/20/2003	
		Duplicate				
	NYSDEC Ambient					
	Water Quality ^a					
Units						
Lead (Dissolved)	0.025	--	--	ND(0.005)	--	
Magnesium (Total)	mg/L	18.7	13.4	--	70.1	
Magnesium (Dissolved)	mg/L	--	--	13	--	
Manganese (Total)	0.3	0.366		--	0.298	
Manganese (Dissolved)	mg/L	--	0.283	0.275	--	
Mercury (Total)	0.0007	ND(0.0004)	ND(0.0004)	--	ND(0.0004)	
Mercury (Dissolved)	0.0007	--	--	ND(0.0004)	--	
Nickel (Total)	0.1	ND(0.02)	ND(0.02)	--	ND(0.02)	
Nickel (Dissolved)	mg/L	--	--	ND(0.02)	--	
Potassium (Total)	mg/L	4.19	3.85	--	3.46	
Potassium (Dissolved)	mg/L	--	--	3.78	--	
Selenium (Total)	0.010	0.0173 J		--	0.0379	
Selenium (Dissolved)	mg/L	--	0.00942 J	0.00725 J	--	
Silver (Total)	0.050	ND(0.01)	ND(0.01)	--	ND(0.01)	
Silver (Dissolved)	mg/L	--	--	ND(0.01)	--	
Sodium (Total)	20	71.5	60.6	--	48.4	
Sodium (Dissolved)	mg/L	--	--	59.7	--	
Thallium (Total)	NS	ND(0.02)	ND(0.02)	--	ND(0.02)	
Thallium (Dissolved)	mg/L	--	--	ND(0.02)	--	
Vanadium (Total)	NS	ND(0.02)	0.00332 J	--	ND(0.02)	
Vanadium (Dissolved)	mg/L	--	--	ND(0.02)	--	
Zinc (Total)	NS	0.0311	0.0332	--	ND(0.01)	
Zinc (Dissolved)	mg/L	--	--	ND(0.01)	--	
General Chemistry						
pH (water)	S.U.	6.76	7.37	7.37	6.82	

TABLE 2.4

SHALLOW GROUNDWATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Metals	Units	NYSDEC Ambient Water Quality ^a			
		MW-26 GW-19867-10-03-PK-019 10/22/2003	MW-27 GW-19867-08-03-PK-011 8/18/2003	MW-27 GW-19867-08-03-PK-012 8/18/2003	MW-27 GW-19867-10-03-PK-008 10/3/2003
Aluminum (Total)	mg/L	NS	1.53	--	4.36
Aluminum (Dissolved)	mg/L	NS	0.00683 J	0.982	0.00718 J
Antimony (Total)	mg/L	0.003	--	ND(0.01)	--
Antimony (Dissolved)	mg/L	0.003	ND(0.025)	ND(0.01)	ND(0.025)
Arsenic (Total)	mg/L	0.025	--	ND(0.025)	--
Arsenic (Dissolved)	mg/L	0.025	0.167	ND(0.025)	0.168
Barium (Total)	mg/L	1	--	0.169	--
Barium (Dissolved)	mg/L	1	--	--	ND(0.005)
Beryllium (Total)	mg/L	NS	ND(0.005)	ND(0.005)	ND(0.005)
Beryllium (Dissolved)	mg/L	NS	--	--	ND(0.005)
Cadmium (Total)	mg/L	0.005	ND(0.005)	ND(0.005)	--
Cadmium (Dissolved)	mg/L	0.005	--	ND(0.005)	551
Calcium (Total)	mg/L	NS	570	589	--
Calcium (Dissolved)	mg/L	NS	--	--	0.0254
Chromium (Total)	mg/L	0.05	0.0297	0.0264	--
Chromium (Dissolved)	mg/L	0.05	--	--	ND(0.01)
Chromium VI (Hexavalent) (Total)	mg/L	0.05	0.0120	0.00800 J	--
Chromium VI (Hexavalent) (Dissolved)	mg/L	0.05	--	--	ND(0.02)
Cobalt (Total)	mg/L	NS	0.00122 J	0.000855 J	--
Cobalt (Dissolved)	mg/L	NS	--	--	ND(0.02)
Copper (Total)	mg/L	0.2	ND(0.02)	ND(0.02)	--
Copper (Dissolved)	mg/L	0.2	--	--	ND(0.02)
Cyanide (Dissolved)	mg/L	0.2	--	--	--
Cyanide (Total)	mg/L	0.2	ND(0.01)	ND(0.01)	0.00385 J
Iron (Total)	mg/L	0.3	2.57	0.392	2.49
Iron (Dissolved)	mg/L	0.3	--	--	--
Lead (Total)	mg/L	0.025	ND(0.005)	ND(0.2)	ND(0.005)

TABLE 2.4

SHALLOW GROUNDWATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

	MW-26	MW-27	MW-27	MW-27
Sample Location:	GW-19867-10-03-PK-019	GW-19867-08-03-PK-011	GW-19867-08-03-PK-012	GW-19867-10-03-PK-008
Sample ID:				
Sample Date:	10/22/2003	8/18/2003	8/18/2003	10/3/2003
NYSDEC Ambient Water Quality^a				
Lead (Dissolved)	0.025	--	0.00467 J	--
Magnesium (Total)	mg/L	73	--	2.62
Magnesium (Dissolved)	mg/L	--	ND(1.5)	--
Manganese (Total)	mg/L	1.22	--	0.0695
Manganese (Dissolved)	mg/L	--	ND(0.01)	--
Mercury (Total)	mg/L	ND(0.0004)	--	ND(0.0004)
Mercury (Dissolved)	mg/L	--	ND(0.0004)	--
Nickel (Total)	mg/L	ND(0.02)	0.00534 J	0.00682 J
Potassium (Total)	mg/L	--	8.32	8.56
Potassium (Dissolved)	mg/L	3.4	--	--
Selenium (Total)	mg/L	0.0419	ND(0.02)	ND(0.02)
Selenium (Dissolved)	mg/L	--	ND(0.01)	--
Silver (Total)	mg/L	ND(0.01)	ND(0.01)	ND(0.01)
Silver (Dissolved)	mg/L	--	0.0175 J	--
Sodium (Total)	mg/L	52.2	191	184
Sodium (Dissolved)	mg/L	--	--	--
Thallium (Total)	mg/L	ND(0.02)	ND(0.02)	ND(0.02)
Thallium (Dissolved)	mg/L	--	ND(0.02)	0.00494 J
Vanadium (Total)	mg/L	0.0149 J	ND(0.02)	--
Vanadium (Dissolved)	mg/L	--	0.0114	0.0296
Zinc (Total)	mg/L	0.00518 J	--	--
Zinc (Dissolved)	mg/L	--	ND(0.01)	--
General Chemistry				
pH (water)	S.U.	7.13	12.04	12.57

TABLE 2.4

SHALLOW GROUNDWATER ANALYTICAL RESULTS
 VANADIUM CORPORATION OF AMERICA
 NIAGARA FALLS, NEW YORK

	MW-27	MW-28	MW-28	MW-103A
Sample Location:	GW-19867-10-03-PK-009	GW-19867-08-03-PK-021	GW-19867-10-03-PK-016	GW-19867-08-03-PK-025
Sample ID:	10/3/2003	8/28/2003	10/6/2003	8/28/2003
Sample Date:				
	NYSDEC Ambient Water Quality ^a			
Metals	Units			
Aluminum (Total)	mg/L	--	0.816	17.4
Aluminum (Dissolved)	mg/L	0.983	--	--
Antimony (Total)	mg/L	--	ND(0.01)	ND(0.01)
Antimony (Dissolved)	mg/L	0.00915 J	--	--
Arsenic (Total)	mg/L	--	0.0162 J	0.0262
Arsenic (Dissolved)	mg/L	ND(0.025)	--	--
Barium (Total)	mg/L	--	0.0825	0.199
Barium (Dissolved)	mg/L	0.162	--	--
Beryllium (Total)	mg/L	--	ND(0.005)	0.000719 J
Beryllium (Dissolved)	mg/L	ND(0.005)	--	--
Cadmium (Total)	mg/L	--	ND(0.005)	0.000891 J
Cadmium (Dissolved)	mg/L	ND(0.005)	--	--
Calcium (Total)	mg/L	--	57.2	168
Calcium (Dissolved)	mg/L	557	--	--
Chromium (Total)	mg/L	--	0.00401 J	0.0268
Chromium (Dissolved)	mg/L	0.0361	--	--
Chromium VI (Hexavalent) (Total)	mg/L	--	ND(0.01)	ND(0.01)
Chromium VI (Hexavalent) (Dissolved)	mg/L	ND(0.01)	--	--
Cobalt (Total)	mg/L	--	0.00168	0.00906 J
Cobalt (Dissolved)	mg/L	ND(0.02)	--	--
Copper (Total)	mg/L	--	0.00934	0.029
Copper (Dissolved)	mg/L	ND(0.02)	--	--
Cyanide (Total)	mg/L	--	ND(0.01)	0.00211
Cyanide (Dissolved)	mg/L	0.00436 J	--	--
Iron (Total)	mg/L	--	1.29	24.8
Iron (Dissolved)	mg/L	0.495	--	--
Lead (Total)	mg/L	--	ND(0.005)	0.143

TABLE 2.4

SHALLOW GROUNDWATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

	MW-27 GW-19867-10-03-PK-009 10/3/2003	MW-28 GW-19867-08-03-PK-021 8/28/2003	MW-28 GW-19867-10-03-PK-016 10/6/2003	MW-103A GW-19867-08-03-PK-025 8/28/2003
Sample Location:	MW-27	MW-28	MW-28	MW-103A
Sample ID:	GW-19867-10-03-PK-009	GW-19867-08-03-PK-021	GW-19867-10-03-PK-016	GW-19867-08-03-PK-025
Sample Date:	10/3/2003	8/28/2003	10/6/2003	8/28/2003
NYSDEC Ambient Water Quality ^a				
Units				
Lead (Dissolved)	0.025	ND(0.005)	--	--
Magnesium (Total)	NS	--	18.8	119
Magnesium (Dissolved)	NS	ND(1.5)	--	23.3
Manganese (Total)	0.3	0.312	0.549	0.798
Manganese (Dissolved)	0.3	0.00316 J	--	--
Mercury (Total)	0.0007	--	0.000144 J	ND(0.0004) J
Mercury (Dissolved)	0.0007	ND(0.0004)	0.00276	0.0167 J
Nickel (Total)	0.1	--	--	--
Nickel (Dissolved)	0.1	0.00695 J	2.77	4.95
Potassium (Total)	NS	--	2.23	--
Potassium (Dissolved)	NS	8.22	--	--
Selenium (Total)	0.010	--	0.0162 J	0.0425
Selenium (Dissolved)	0.010	ND(0.02)	--	--
Silver (Total)	0.050	--	ND(0.01)	ND(0.01)
Silver (Dissolved)	0.050	ND(0.01)	--	--
Sodium (Total)	20	--	119	47.9
Sodium (Dissolved)	20	185	--	--
Thallium (Total)	NS	--	ND(0.02)	ND(0.02)
Thallium (Dissolved)	NS	ND(0.02)	--	--
Vanadium (Total)	NS	0.00312 J	0.0145 J	0.0341
Vanadium (Dissolved)	NS	ND(0.02)	--	--
Zinc (Total)	NS	0.0199	0.0235	1.15
Zinc (Dissolved)	NS	ND(0.01)	--	--
General Chemistry				
pH (water)	6.5 - 8.5	12.57	6.97	6.80

TABLE 2.4

SHALLOW GROUNDWATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

	Sample Location: Sample ID: Sample Date:	MW-103A GW-19867-08-03-PK-026 8/28/2003	MW-103A GW-19867-10-03-PK-013 10/6/2003	MW-103A GW-19867-10-03-PK-014 10/6/2003	MW-103A GW-19867-10-03-PK-012 10/6/2003 Duplicate
Metals					
Aluminum (Total)	NS	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)
Aluminum (Dissolved)	NS	0.088	0.00865 J	ND(0.2)	ND(0.01)
Antimony (Total)	0.003	ND(0.01)	0.00817 J	0.00817 J	0.0104 J
Antimony (Dissolved)	0.003	0.0136 J	0.0136 J	0.0136 J	0.0732
Arsenic (Total)	0.025	0.0708	0.0789	0.0789	ND(0.005)
Arsenic (Dissolved)	0.025	0.0776	ND(0.005)	ND(0.005)	ND(0.005)
Barium (Total)	1	ND(0.005)	ND(0.005)	ND(0.005)	83.9
Barium (Dissolved)	1	ND(0.005)	82.2	91.3	ND(0.01)
Beryllium (Total)	NS	88.7	ND(0.01)	ND(0.01)	ND(0.01)
Beryllium (Dissolved)	NS	ND(0.01)	ND(0.01)	ND(0.01)	0.00500 J
Beryllium (Dissolved)	NS	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.02)
Cadmium (Total)	0.005	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.02)
Cadmium (Dissolved)	0.005	0.00134	ND(0.02)	ND(0.02)	ND(0.02)
Calcium (Total)	NS	0.00219	ND(0.02)	ND(0.02)	ND(0.02)
Calcium (Dissolved)	NS	0.00219	ND(0.01) J	ND(0.01) J	ND(0.01) J
Chromium (Total)	0.05	0.656	0.807	0.544 J	0.762 J
Chromium (Dissolved)	0.05	0.656	0.807	0.544 J	0.762 J
Chromium VI (Hexavalent) (Total)	0.05	0.656	0.807	0.544 J	0.762 J
Chromium VI (Hexavalent) (Dissolved)	0.05	0.656	0.807	0.544 J	0.762 J
Cobalt (Total)	NS	0.656	0.807	0.544 J	0.762 J
Cobalt (Dissolved)	NS	0.656	0.807	0.544 J	0.762 J
Copper (Total)	0.2	0.656	0.807	0.544 J	0.762 J
Copper (Dissolved)	0.2	0.656	0.807	0.544 J	0.762 J
Cyanide (Dissolved)	0.2	0.656	0.807	0.544 J	0.762 J
Cyanide (Total)	0.2	0.656	0.807	0.544 J	0.762 J
Iron (Total)	0.3	0.656	0.807	0.544 J	0.762 J
Iron (Dissolved)	0.3	0.656	0.807	0.544 J	0.762 J
Lead (Total)	0.025	0.656	0.807	0.544 J	0.762 J

TABLE 2.4

SHALLOW GROUNDWATER ANALYTICAL RESULTS
 VANADIUM CORPORATION OF AMERICA
 NIAGARA FALLS, NEW YORK

Sample Location: MW-104A MW-104A MW-104A MW-104A
 Sample ID: GW-19867-08-03-PK-017 GW-19867-08-03-PK-018 GW-19867-10-03-PK-010 GW-19867-10-03-PK-011
 Sample Date: 8/25/2003 8/25/2003 10/3/2003 10/3/2003

NYSDEC Ambient
 Water Quality^a

Metals	Units	GW-19867-08-03-PK-017 8/25/2003	GW-19867-08-03-PK-018 8/25/2003	GW-19867-10-03-PK-010 10/3/2003	GW-19867-10-03-PK-011 10/3/2003
Aluminum (Total)	mg/L	0.0384	0.0601	0.354	ND(0.2)
Aluminum (Dissolved)	mg/L	0.0384	ND(0.01)	ND(0.01)	ND(0.01)
Antimony (Total)	mg/L	ND(0.01)	0.0127	ND(0.025)	ND(0.025)
Antimony (Dissolved)	mg/L	0.0157	0.133	0.139	0.142
Arsenic (Total)	mg/L	0.127	ND(0.005)	ND(0.005)	ND(0.005)
Arsenic (Dissolved)	mg/L	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
Barium (Total)	mg/L	ND(0.005)	109	97.9	104
Barium (Dissolved)	mg/L	98.4	ND(0.01)	0.00116 J	ND(0.01)
Beryllium (Total)	mg/L	0.000817	ND(0.01)	ND(0.01)	ND(0.01)
Beryllium (Dissolved)	mg/L	ND(0.01)	ND(0.02)	ND(0.02)	ND(0.02)
Cadmium (Total)	mg/L	ND(0.02)	0.00706	ND(0.02)	ND(0.02)
Cadmium (Dissolved)	mg/L	0.00344	ND(0.01)	ND(0.02)	ND(0.02)
Calcium (Total)	mg/L	ND(0.01)	3.78	3.97	3.92
Calcium (Dissolved)	mg/L	2.92	ND(0.005)	0.00336 J	0.00684
Chromium (Total)	mg/L	ND(0.01)	ND(0.005)	ND(0.005)	ND(0.005)
Chromium (Dissolved)	mg/L	ND(0.01)	ND(0.005)	ND(0.005)	ND(0.005)
Chromium VI (Hexavalent) (Total)	mg/L	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)
Chromium VI (Hexavalent) (Dissolved)	mg/L	ND(0.02)	0.00706	ND(0.02)	ND(0.02)
Cobalt (Total)	mg/L	0.00344	ND(0.01)	ND(0.02)	ND(0.02)
Cobalt (Dissolved)	mg/L	ND(0.01)	ND(0.01)	ND(0.02)	ND(0.02)
Copper (Total)	mg/L	ND(0.01)	ND(0.01)	ND(0.02)	ND(0.02)
Copper (Dissolved)	mg/L	ND(0.02)	0.00706	ND(0.02)	ND(0.02)
Cyanide (Dissolved)	mg/L	0.00344	ND(0.01)	ND(0.02)	ND(0.02)
Cyanide (Total)	mg/L	ND(0.01)	ND(0.01)	ND(0.02)	ND(0.02)
Iron (Total)	mg/L	2.92	3.78	3.97	3.92
Iron (Dissolved)	mg/L	ND(0.005)	ND(0.005)	0.00684	0.00684
Lead (Total)	mg/L	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)

TABLE 2.4

SHALLOW GROUNDWATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Sample Location: MW-104A MW-104A MW-104A MW-104A MW-104A
 Sample ID: GW-19867-08-03-PK-017 GW-19867-08-03-PK-018 GW-19867-10-03-PK-010 GW-19867-10-03-PK-011
 Sample Date: 8/25/2003 8/25/2003 10/3/2003 10/3/2003

		NYSDEC Ambient Water Quality ^a			
Units					
Lead (Dissolved)	mg/L	ND(0.005)	--	--	ND(0.005)
Magnesium (Total)	mg/L	--	51.6	48.2	--
Magnesium (Dissolved)	mg/L	43.5	--	--	53.7
Manganese (Total)	mg/L	--	0.455	0.587	0.469
Manganese (Dissolved)	mg/L	0.858	--	--	--
Mercury (Total)	mg/L	--	ND(0.0004)	ND(0.0004)	ND(0.0004)
Mercury (Dissolved)	mg/L	ND(0.0004)	--	0.00262 J	--
Nickel (Total)	mg/L	--	ND(0.02)	--	0.00232 J
Nickel (Dissolved)	mg/L	0.1	1.23	1.11 J	--
Potassium (Total)	mg/L	0.1	--	--	1 J
Potassium (Dissolved)	mg/L	NS	--	--	--
Selenium (Total)	mg/L	1.1	ND(0.02)	0.0228	0.0223
Selenium (Dissolved)	mg/L	--	ND(0.02)	--	--
Silver (Total)	mg/L	ND(0.02)	ND(0.01)	ND(0.01)	ND(0.01)
Silver (Dissolved)	mg/L	ND(0.01)	--	--	--
Sodium (Total)	mg/L	--	139	137	136
Sodium (Dissolved)	mg/L	139	--	--	--
Thallium (Total)	mg/L	--	ND(0.02)	ND(0.02)	ND(0.02)
Thallium (Dissolved)	mg/L	ND(0.02)	--	0.00521 J	--
Vanadium (Total)	mg/L	--	ND(0.02)	--	0.00378 J
Vanadium (Dissolved)	mg/L	ND(0.02)	--	0.0403	--
Zinc (Total)	mg/L	--	0.0284	--	ND(0.01)
Zinc (Dissolved)	mg/L	0.0263	--	--	--
General Chemistry					
pH (water)	S.U.	6.5	6.65	12.02	12.02

TABLE 2.4

SHALLOW GROUNDWATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

	MW-105A GW-19867-08-03-PK-020 8/28/2003	MW-105A GW-19867-10-03-PK-020 10/22/2003	MW-106A GW-19867-08-03-PK-027 8/28/2003	MW-106A GW-19867-10-03-PK-023 10/22/2003
Sample Location:	MW-105A	MW-105A	MW-106A	MW-106A
Sample ID:	GW-19867-08-03-PK-020	GW-19867-10-03-PK-020	GW-19867-08-03-PK-027	GW-19867-10-03-PK-023
Sample Date:	8/28/2003	10/22/2003	8/28/2003	10/22/2003
	NYSDEC Ambient Water Quality ^a			
Units				
Metals				
Aluminum (Total)	NS	ND(0.2)	16.1	1.06
Aluminum (Dissolved)	NS	ND(0.01)	ND(0.01)	0.00828 J
Antimony (Total)	0.003	ND(0.01)	ND(0.01)	ND(0.005)
Antimony (Dissolved)	0.003	ND(0.025)	0.0251	0.0119 J
Arsenic (Total)	0.025	ND(0.005)	ND(0.005)	ND(0.005)
Arsenic (Dissolved)	0.025	0.107	0.121	0.0425
Barium (Total)	1	ND(0.005)	0.000608 J	ND(0.005)
Barium (Dissolved)	1	ND(0.005)	ND(0.005)	ND(0.005)
Beryllium (Total)	NS	ND(0.005)	ND(0.005)	ND(0.005)
Beryllium (Dissolved)	NS	ND(0.005)	ND(0.005)	ND(0.005)
Cadmium (Total)	0.005	ND(0.005)	ND(0.005)	ND(0.005)
Cadmium (Dissolved)	0.005	ND(0.005)	ND(0.005)	ND(0.005)
Calcium (Total)	120	108	172	104
Calcium (Dissolved)	NS	0.00347 J	0.0239	0.00148 J
Chromium (Total)	0.0438	0.00347 J	0.0239	0.00148 J
Chromium (Dissolved)	NS	ND(0.01)	ND(0.01)	0.0290
Chromium VI (Hexavalent) (Total)	0.05	ND(0.01)	ND(0.01)	ND(0.02)
Chromium VI (Hexavalent) (Dissolved)	0.05	ND(0.02)	0.00608 J	ND(0.02)
Cobalt (Total)	NS	ND(0.02)	ND(0.02)	ND(0.02)
Cobalt (Dissolved)	NS	ND(0.02)	0.0186	ND(0.02)
Copper (Total)	0.2	ND(0.02)	ND(0.02)	ND(0.02)
Copper (Dissolved)	0.2	ND(0.02)	ND(0.02)	ND(0.02)
Cyanide (Dissolved)	0.2	ND(0.01)	0.00195	ND(0.01)
Cyanide (Total)	0.2	ND(0.2)	20.5	0.843
Iron (Total)	0.3	2.21	ND(0.005)	ND(0.005)
Iron (Dissolved)	0.3	0.0088	0.0261	ND(0.005)
Lead (Total)	0.025	0.00551	0.00551	0.00551

TABLE 2.4

SHALLOW GROUNDWATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

	MW-105A GW-19867-08-03-PK-020 8/28/2003	MW-105A GW-19867-10-03-PK-020 10/22/2003	MW-106A GW-19867-08-03-PK-027 8/28/2003	MW-106A GW-19867-10-03-PK-023 10/22/2003
Sample Location:	MW-105A	MW-105A	MW-106A	MW-106A
Sample ID:	GW-19867-08-03-PK-020	GW-19867-10-03-PK-020	GW-19867-08-03-PK-027	GW-19867-10-03-PK-023
Sample Date:	8/28/2003	10/22/2003	8/28/2003	10/22/2003
	NYSDEC Ambient Water Quality^a			
Units				
Lead (Dissolved)	0.025	--	--	--
Magnesium (Total)	mg/L	66.7	60.1	33.5
Magnesium (Dissolved)	NS	--	78.6	--
Magnesium (Total)	NS	0.675	0.651	0.0456
Manganese (Total)	0.3	ND(0.0004) J	ND(0.0004) J	ND(0.0004)
Manganese (Dissolved)	0.3	0.0007	0.0004 J	0.0129 J
Mercury (Total)	0.0007	0.00887 J	0.00447 J	ND(0.02)
Mercury (Dissolved)	0.1	--	--	--
Nickel (Total)	0.1	3.41	2.89	1.81
Nickel (Dissolved)	NS	--	4.31	--
Potassium (Total)	NS	0.0303	0.0392	0.0259
Potassium (Dissolved)	NS	ND(0.01)	ND(0.01)	ND(0.01)
Selenium (Total)	0.010	117	118	7.18
Selenium (Dissolved)	0.010	ND(0.02)	ND(0.02)	ND(0.02)
Silver (Total)	0.050	0.00345 J	0.0161 J	0.0137 J
Silver (Dissolved)	0.050	0.357	0.237	0.059
Sodium (Total)	20	--	--	--
Sodium (Dissolved)	20	ND(0.02)	ND(0.02)	ND(0.02)
Thallium (Total)	NS	--	--	--
Thallium (Dissolved)	NS	0.00345 J	0.0161 J	0.0137 J
Vanadium (Total)	NS	0.00345 J	0.0161 J	0.0137 J
Vanadium (Dissolved)	NS	0.357	0.237	0.059
Zinc (Total)	NS	--	--	--
Zinc (Dissolved)	NS	--	--	--
General Chemistry				
pH (water)	S.U.	6.70	6.93	7.29

TABLE 2.4

SHALLOW GROUNDWATER ANALYTICAL RESULTS
 VANADIUM CORPORATION OF AMERICA
 NIAGARA FALLS, NEW YORK

Sample Location: MW-107A
 Sample ID: GW-19867-08-03-PK-028
 Sample Date: 8/28/2003

Metals	NYSDEC Ambient	
	Units	Water Quality ^a
Aluminum (Total)	mg/L	NS
Aluminum (Dissolved)	mg/L	NS
Antimony (Total)	mg/L	0.003
Antimony (Dissolved)	mg/L	0.003
Arsenic (Total)	mg/L	0.025
Arsenic (Dissolved)	mg/L	0.025
Barium (Total)	mg/L	1
Barium (Dissolved)	mg/L	1
Beryllium (Total)	mg/L	NS
Beryllium (Dissolved)	mg/L	NS
Cadmium (Total)	mg/L	0.005
Cadmium (Dissolved)	mg/L	0.005
Calcium (Total)	mg/L	NS
Calcium (Dissolved)	mg/L	NS
Chromium (Total)	mg/L	0.05
Chromium (Dissolved)	mg/L	0.05
Chromium VI (Hexavalent) (Total)	mg/L	0.05
Chromium VI (Hexavalent) (Dissolved)	mg/L	0.05
Cobalt (Total)	mg/L	NS
Cobalt (Dissolved)	mg/L	NS
Copper (Total)	mg/L	0.2
Copper (Dissolved)	mg/L	0.2
Cyanide (Dissolved)	mg/L	0.2
Cyanide (Total)	mg/L	0.2
Iron (Total)	mg/L	0.3
Iron (Dissolved)	mg/L	0.3
Lead (Total)	mg/L	0.025

28.4
--
ND(0.01)
--
0.0249 J
--
0.345
--
0.00112 J
--
0.00177 J
--
254
--
0.0414
--
ND(0.01)
--
0.0177 J
--
0.0521
--
ND(0.01)
40.9
--
0.23

TABLE 2.4

SHALLOW GROUNDWATER ANALYTICAL RESULTS
 VANADIUM CORPORATION OF AMERICA
 NIAGARA FALLS, NEW YORK

Sample Location: MW-107A
 Sample ID: GW-19867-08-03-PK-028
 Sample Date: 8/28/2003

	NYSDEC Ambient Water Quality ^a	
Units		
Lead (Dissolved)	0.025	--
Magnesium (Total)	NS	157
Magnesium (Dissolved)	NS	--
Manganese (Total)	0.3	1.8
Manganese (Dissolved)	0.3	--
Mercury (Total)	0.0007	ND(0.0004)J
Mercury (Dissolved)	0.0007	--
Nickel (Total)	0.1	0.03
Nickel (Dissolved)	0.1	--
Potassium (Total)	NS	7.85
Potassium (Dissolved)	NS	--
Selenium (Total)	0.010	0.0503
Selenium (Dissolved)	0.010	--
Silver (Total)	0.050	ND(0.01)
Silver (Dissolved)	0.050	--
Sodium (Total)	20	28.6
Sodium (Dissolved)	20	--
Thallium (Total)	NS	ND(0.02)
Thallium (Dissolved)	NS	--
Vanadium (Total)	NS	0.0574
Vanadium (Dissolved)	NS	--
Zinc (Total)	NS	1.05
Zinc (Dissolved)	NS	--

General Chemistry

pH (water) S.U. 6.5 - 8.5

TABLE 2.4
SHALLOW GROUNDWATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Notes:
ND () - Non detect at associated value.
J - Estimated Value
NS - No Standard
-- - Not Applicable.
a - New York State Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, Source of Drinking Water (Groundwater), June 1998.

TABLE 2.5

SURFACE SOIL ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Sample Location: SS-10 SS-11 SS-12 SS-13 SS-14
 Sample ID: SS-19867-0703-PK-027 SS-19867-0703-PK-014 SS-19867-0703-PK-026 SS-19867-0703-PK-029 SS-19867-0703-PK-030
 Sample Date: 7/21/2003 7/18/2003 7/21/2003 7/21/2003 7/21/2003

Metals	Units	Background Concentration	TAGM ^a	Values				
				SS-10	SS-11	SS-12	SS-13	SS-14
Aluminum	mg/kg	33000	SB	13000	14200	14700	16500	14900
Antimony	mg/kg	NS	SB	ND (0.926) J	R	ND (0.962) J	ND (1.03) J	ND (0.962) J
Arsenic	mg/kg	3 - 12	7.5 or SB	4.86	5.59	3.04	4.41	4.44
Barium	mg/kg	15 - 600	300 or SB	99.8 J	83.1	81.4 J	107 J	104 J
Beryllium	mg/kg	0 - 1.75	0.16 or SB	0.468	0.440 J	0.439 J	0.615	0.569
Cadmium	mg/kg	0.1 - 1.0	1 or SB	0.427 J	0.114 J	0.239 J	0.276 J	0.235 J
Calcium	mg/kg	130 - 35000	SB	6370	3170	10900	4030	6470
Chromium Total	mg/kg	1.5 - 40	50 ^b or SB	60.1 J	70.5	85.5 J	35.7 J	36.1 J
Chromium VI (Hexavalent)	mg/kg	NS	NS	1.4 J	ND (6.7) J	ND (6.6)	ND (5.1)	ND (4.7)
Cobalt	mg/kg	2.5 or 60	30 or SB	5.31	5.86	4.08	7.99	8.05
Copper	mg/kg	1.0 - 50	25 or SB	29.2	71.2	25.1	20.4	18.4
Cyanide (total)	mg/kg	NS	NS	0.311 J	ND (0.626)	0.368 J	ND (0.635)	0.273 J
Iron	mg/kg	2000 - 550000	2000 or SB	15100	17800	11000	20800	19800
Lead	mg/kg	NS	SB	70.8	50.9	35.9	37.2	25.7
Magnesium	mg/kg	100 - 5000	SB	4010	3030	2780	4890	5440
Manganese	mg/kg	50 - 5000	SB	239	270	134	663	527
Mercury	mg/kg	0.001 - 0.2	0.1	0.162	0.100	0.296	0.114	0.0802
Nickel	mg/kg	0.5 - 25	13 or SB	23.8	26.8	23.0	23.4	21.0
Potassium	mg/kg	8500 - 43000	SB	1670	1260	2200	2360	2380
Selenium	mg/kg	0.1 - 3.9	2 or SB	ND (23.1)	ND (1.37)	ND (0.962)	ND (2.36)	ND (2.40)
Silver	mg/kg	NS	SB	0.182 J	0.285 J	0.147 J	0.221 J	0.151 J
Sodium	mg/kg	6000 - 8000	SB	ND (92.6)	ND (137)	ND (96.2)	ND (94.3)	ND (96.2)
Thallium	mg/kg	NS	SB	0.762 J	1.21 J	0.715 J	0.486 J	0.603 J
Vanadium	mg/kg	1.0 - 300	150 or SB	26.0	35.3 J	22.5	31.9	30.5
Zinc	mg/kg	9.0 - 50.0	20 or SB	109	84.8	80.2	515	121

General Chemistry

pH (soil)	S.U.	7.4	6.7 J	7.0	7.4	7.4
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TABLE 2.5

SURFACE SOIL ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Sample Location: SS-15 SS-16 SS-17 SS-18
Sample ID: SS-19867-0703-PK-013 SS-19867-0703-PK-024 SS-19867-0703-PK-031 SS-19867-0703-PK-028
Sample Date: 7/18/2003 7/18/2003 7/21/2003 7/21/2003

Metals	Eastern USA		TAGM*	Values
	Background Concentration	Units		
Aluminum	33000	mg/kg	SB	16100
Antimony	NS	mg/kg	SB	R
Arsenic	3 - 12	mg/kg	7.5 or SB	11.7
Barium	15 - 600	mg/kg	300 or SB	209
Beryllium	0 - 1.75	mg/kg	0.16 or SB	0.301 J
Cadmium	0.1 - 1.0	mg/kg	1 or SB	ND (1.67)
Calcium	130 - 35000	mg/kg	SB	193000
Chromium Total	1.5 - 40	mg/kg	50 ^b or SB	5140
Chromium VI (Hexavalent)	NS	mg/kg	NS	5.6 J
Cobalt	2.5 or 60	mg/kg	30 or SB	19.8
Copper	1.0 - 50	mg/kg	25 or SB	97.2
Cyanide (total)	2000 - 550000	mg/kg	NS	0.302 J
Iron	NS	mg/kg	2000 or SB	23100
Lead	100 - 5000	mg/kg	SB	86.3
Magnesium	50 - 5000	mg/kg	SB	21300
Manganese	0.001 - 0.2	mg/kg	0.1	0.0413
Nickel	0.5 - 25	mg/kg	13 or SB	637
Potassium	8500 - 43000	mg/kg	SB	460
Selenium	0.1 - 3.9	mg/kg	2 or SB	26.3
Silver	NS	mg/kg	SB	4.38
Sodium	6000 - 8000	mg/kg	SB	ND (333)
Thallium	NS	mg/kg	SB	2.04 J
Vanadium	1.0 - 300	mg/kg	150 or SB	191 J
Zinc	9.0 - 50.0	mg/kg	20 or SB	170

Duplicate	
Sample	Value
Aluminum	13400
Antimony	ND (2.12)
Arsenic	45.3
Barium	278
Beryllium	0.706
Cadmium	ND (0.519)
Calcium	89800
Chromium Total	1260
Chromium VI (Hexavalent)	ND (4.7)
Cobalt	26.8
Copper	76.4
Cyanide (total)	0.176 J
Iron	25200
Lead	92.0
Magnesium	17700
Manganese	1610
Nickel	0.266
Potassium	555
Selenium	1380
Silver	12.0
Sodium	0.428 J
Thallium	ND (132)
Vanadium	0.792 J
Zinc	81.8

Sample	Value
Aluminum	16700
Antimony	ND (0.997) J
Arsenic	5.44
Barium	118 J
Beryllium	0.665
Cadmium	0.386 J
Calcium	2940
Chromium Total	57.8 J
Chromium VI (Hexavalent)	ND (5.0)
Cobalt	12.2
Copper	20.6
Cyanide (total)	0.421 J
Iron	28300
Lead	26.8
Magnesium	4120
Manganese	808
Nickel	0.0836
Potassium	25.7
Selenium	2340
Silver	ND (4.63)
Sodium	0.173 J
Thallium	ND (92.6)
Vanadium	0.922 J
Zinc	37.5

General Chemistry

pH (soil) S.U. 8.2 J NS 7.5 J 7.7 J 7.0 7.5

TABLE 2.5

SURFACE SOIL ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Sample Location: SS-19 SS-20 SS-21 SS-22 SS-23
 Sample ID: SS-19867-0703-PK-032 SS-19867-0703-PK-023 SS-19867-0703-PK-022 SS-19867-0703-PK-012 SS-19867-0703-PK-010
 Sample Date: 7/21/2003 7/18/2003 7/18/2003 7/18/2003 7/18/2003

Metals	Eastern USA		Units	Background Concentration	TAGM*	Values
	Background	Concentration				
Aluminum	33000	SB	mg/kg	15800	20800	21800
Antimony	NS	SB	mg/kg	ND (0.909) J	ND (3.03)	R
Arsenic	3 - 12	7.5 or SB	mg/kg	4.91	7.53	2.53
Barium	15 - 600	300 or SB	mg/kg	97.5 J	133	120
Beryllium	0 - 1.75	0.16 or SB	mg/kg	0.596	0.868	ND (0.629)
Cadmium	0.1 - 1.0	1 or SB	mg/kg	0.311 J	0.259 J	ND (0.629)
Calcium	130 - 35000	SB	mg/kg	2830	193000	212000
Chromium Total	1.5 - 40	50 ^b or SB	mg/kg	44.5 J	6780	7540
Chromium VI (Hexavalent)	NS	NS	mg/kg	ND (4.9)	8.4	15 J
Cobalt	2.5 or 60	30 or SB	mg/kg	10.2	31.7	30.2
Copper	1.0 - 50	25 or SB	mg/kg	18.1	72.1	92.3
Cyanide (total)	NS	NS	mg/kg	0.255 J	ND (0.587) J	0.257 J
Iron	2000 - 550000	2000 or SB	mg/kg	22200	22300	21300
Lead	NS	SB	mg/kg	25.4	44.9	32.2
Magnesium	100 - 5000	SB	mg/kg	4020	29900	20300
Manganese	50 - 5000	SB	mg/kg	657	3050	3510
Mercury	0.001 - 0.2	0.1	mg/kg	0.0560	0.0241 J	0.0469
Nickel	0.5 - 25	13 or SB	mg/kg	22.9	779	1210
Potassium	8500 - 43000	SB	mg/kg	2140	538	436
Selenium	0.1 - 3.9	2 or SB	mg/kg	ND (2.27)	22.9	20.3
Silver	NS	SB	mg/kg	ND (0.909)	1.23	1.44
Sodium	6000 - 8000	SB	mg/kg	ND (90.9)	ND (110)	ND (126)
Thallium	NS	SB	mg/kg	ND (0.909)	ND (1.10)	31.2
Vanadium	1.0 - 300	150 or SB	mg/kg	35.5	263	202 J
Zinc	9.0 - 50.0	20 or SB	mg/kg	94.1	181	174

General Chemistry

pH (soil) S.U. 7.2 7.8 J 7.2 J 8.3 J 7.7 J

TABLE 2.5

SURFACE SOIL ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Sample Location: SS-24 SS-25 SS-26 SS-27 SS-28
Sample ID: SS-19867-0703-PK-011 SS-19867-0703-PK-033 SS-19867-0703-PK-009 SS-19867-0703-PK-020
Sample Date: 7/18/2003 7/21/2003 7/18/2003 7/18/2003 7/18/2003

Metals	Eastern USA		TAGM*	Values
	Background Concentration	Units		
Aluminum	33000	mg/kg	SB	18700
Antimony	NS	mg/kg	SB	R
Arsenic	3 - 12	mg/kg	7.5 or SB	6.36
Barium	15 - 600	mg/kg	300 or SB	126
Beryllium	0 - 1.75	mg/kg	0.16 or SB	0.802
Cadmium	0.1 - 1.0	mg/kg	1 or SB	0.304 J
Calcium	130 - 35000	mg/kg	SB	3690
Chromium Total	1.5 - 40	mg/kg	50 ^b or SB	58.7
Chromium VI (Hexavalent)	NS	mg/kg	NS	ND (4.9) J
Cobalt	2.5 or 60	mg/kg	30 or SB	12.5
Copper	1.0 - 50	mg/kg	25 or SB	24.0
Cyanide (total)		mg/kg	NS	0.359 J
Iron	2000 - 550000	mg/kg	2000 or SB	25800
Lead	NS	mg/kg	SB	31.2
Magnesium	100 - 5000	mg/kg	SB	4820
Manganese	50 - 5000	mg/kg	SB	863
Mercury	0.001 - 0.2	mg/kg	0.1	0.0800
Nickel	0.5 - 25	mg/kg	13 or SB	31.3
Potassium	8500 - 43000	mg/kg	SB	2390
Selenium	0.1 - 3.9	mg/kg	2 or SB	ND (1.01)
Silver	NS	mg/kg	SB	0.429 J
Sodium	6000 - 8000	mg/kg	SB	ND (101)
Thallium	NS	mg/kg	SB	1.46
Vanadium	1.0 - 300	mg/kg	150 or SB	40.4 J
Zinc	9.0 - 50.0	mg/kg	20 or SB	138

General Chemistry

pH (soil) S.U. NS 8.0 J 7.5 7.2 J 8.8 J 6.5 J

TABLE 2.5
 SURFACE SOIL ANALYTICAL RESULTS
 VANADIUM CORPORATION OF AMERICA
 NIAGARA FALLS, NEW YORK

Sample Location: SS-29 SS-30 SS-31 SS-32 SS-33
 Sample ID: SS-19867-0703-PK-017 SS-19867-0703-PK-008 SS-19867-0703-PK-004 SS-19867-0703-PK-007 SS-19867-0703-PK-018
 Sample Date: 7/18/2003 7/18/2003 7/18/2003 7/18/2003 7/18/2003

Metals	Units	Eastern USA		TAGM*	Values
		Background	Concentration		
Aluminum	mg/kg	33000	SB		
Antimony	mg/kg	NS	SB		
Arsenic	mg/kg	3 - 12	7.5 or SB		
Barium	mg/kg	15 - 600	300 or SB		
Beryllium	mg/kg	0 - 1.75	0.16 or SB		
Cadmium	mg/kg	0.1 - 1.0	1 or SB		
Calcium	mg/kg	130 - 35000	SB		
Chromium Total	mg/kg	1.5 - 40	50 ^b or SB		
Chromium VI (Hexavalent)	mg/kg	NS	NS		
Cobalt	mg/kg	2.5 or 60	30 or SB		
Copper	mg/kg	1.0 - 50	25 or SB		
Cyanide (total)	mg/kg		NS		
Iron	mg/kg	2000 - 550000	2000 or SB		
Lead	mg/kg	NS	SB		
Magnesium	mg/kg	100 - 5000	SB		
Manganese	mg/kg	50 - 5000	SB		
Mercury	mg/kg	0.001 - 0.2	0.1		
Nickel	mg/kg	0.5 - 25	13 or SB		
Potassium	mg/kg	8500 - 43000	SB		
Selenium	mg/kg	0.1 - 3.9	2 or SB		
Silver	mg/kg	NS	SB		
Sodium	mg/kg	6000 - 8000	SB		
Thallium	mg/kg	NS	SB		
Vanadium	mg/kg	1.0 - 300	150 or SB		
Zinc	mg/kg	9.0 - 50.0	20 or SB		

Sample	SS-29	SS-30	SS-31	SS-32	SS-33
Aluminum	31900	12800	12800	19000	18800
Antimony	R	R	R	R	R
Arsenic	16.6	5.09	5.05	7.52	7.11
Barium	102	192	116	164	141
Beryllium	0.726	0.186 J	ND (0.613)	0.849	0.840
Cadmium	0.213 J	ND (0.630)	ND (0.613)	0.295 J	0.354 J
Calcium	16100	157000	141000	31500	3370
Chromium Total	46.7	2550	3130	278	64.5
Chromium VI (Hexavalent)	ND (6.0) J	3.2 J	4.3 J	ND (4.8) J	ND (4.9) J
Cobalt	11.1	33.9	17.0	13.1	13.0
Copper	37.5	95.6	80.7	29.1	25.3
Cyanide (total)	0.398 J	0.229 J	0.289 J	0.309 J	0.334 J
Iron	23800	26100	17800	27300	26900
Lead	26.2	40.4	72.2	38.5	30.1
Magnesium	8840	21400	52700	11300	4950
Manganese	620	2900	1930	846	943
Mercury	0.0849	0.0422	0.0589	0.0696	0.0666
Nickel	31.4	1200	1570	36.9	32.9
Potassium	2500	892	611	2730	2540
Selenium	0.998 J	14.3	8.96	2.00	1.17 J
Silver	0.285 J	0.768 J	0.843 J	0.484 J	0.490 J
Sodium	ND (108)	519	ND (123)	ND (126)	ND (121)
Thallium	1.37	ND (1.26)	ND (1.23)	1.81	1.66
Vanadium	33.8 J	86.6 J	82.2 J	40.7 J	41.3 J
Zinc	126	111	130	289	132

General Chemistry

pH (soil) S.U. 7.7 J 8.4 J 8.0 J 7.8 J 7.3 J

TABLE 2.5

SURFACE SOIL ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Sample Location: SS-34 SS-35 SS-36 SS-37 SS-37 SS-37
 Sample ID: SS-19867-0703-PK-019 SS-19867-0703-PK-016 SS-19867-0703-PK-015 SS-19867-0703-PK-005 SS-19867-0703-PK-006
 Sample Date: 7/18/2003 7/18/2003 7/18/2003 7/18/2003 7/18/2003

Duplicate

Metals	Eastern USA		TAGM ^a	Values
	Background Concentration	Units		
Aluminum	33000	mg/kg	SB	17700
Antimony	NS	mg/kg	SB	R
Arsenic	3 - 12	mg/kg	7.5 or SB	6.25
Barium	15 - 600	mg/kg	300 or SB	117
Beryllium	0 - 1.75	mg/kg	0.16 or SB	0.784
Cadmium	0.1 - 1.0	mg/kg	1 or SB	0.312 J
Calcium	130 - 35000	mg/kg	SB	6470
Chromium Total	1.5 - 40	mg/kg	50 ^b or SB	41.4
Chromium VI (Hexavalent)	NS	mg/kg	NS	ND (4.2) J
Cobalt	2.5 or 60	mg/kg	30 or SB	11.3
Copper	1.0 - 50	mg/kg	25 or SB	23.3
Cyanide (total)	NS	mg/kg	NS	ND (0.536) J
Iron	2000 - 550000	mg/kg	2000 or SB	24500
Lead	NS	mg/kg	SB	29.9
Magnesium	100 - 5000	mg/kg	SB	6120
Manganese	50 - 5000	mg/kg	SB	651
Mercury	0.001 - 0.2	mg/kg	0.1	0.0762
Nickel	0.5 - 25	mg/kg	13 or SB	28.1
Potassium	8500 - 43000	mg/kg	SB	2610
Selenium	0.1 - 3.9	mg/kg	2 or SB	0.980 J
Silver	NS	mg/kg	SB	0.368 J
Sodium	6000 - 8000	mg/kg	SB	ND (111)
Thallium	NS	mg/kg	SB	1.69
Vanadium	1.0 - 300	mg/kg	150 or SB	37.1 J
Zinc	9.0 - 50.0	mg/kg	20 or SB	127

Metals	SS-34	SS-35	SS-36	SS-37	SS-37
Aluminum	19800	29700	16000	16500	16500
Antimony	R	R	R	R	R
Arsenic	6.89	14.0	ND (1.15)	ND (1.22)	ND (1.22)
Barium	126	91.8	90.8	88.4	88.4
Beryllium	0.833	0.675	0.332 J	0.339 J	0.339 J
Cadmium	0.160 J	0.0696 J	ND (0.577)	ND (0.609)	ND (0.609)
Calcium	13800	23700	147000	145000	145000
Chromium Total	101	40.8	846	825	825
Chromium VI (Hexavalent)	ND (5.5) J	ND (5.3) J	ND (5.6) J	2.0 J	2.0 J
Cobalt	12.5	10.1	4.96	4.32	4.32
Copper	23.2	32.5	19.0	17.8	17.8
Cyanide (total)	0.323 J	0.258 J	0.227 J	0.299 J	0.299 J
Iron	27000	22000	10400	10400	10400
Lead	33.2	23.4	27.1	27.0	27.0
Magnesium	7410	11000	4000	42200	42200
Manganese	795	543	450	444	444
Mercury	0.0860	0.123	0.0267 J	0.0278 J	0.0278 J
Nickel	29.3	27.7	27.3	26.1	26.1
Potassium	2480	2100	1100	1070	1070
Selenium	0.950 J	1.40	6.66	5.82	5.82
Silver	0.412 J	0.306 J	0.215 J	0.231 J	0.231 J
Sodium	ND (115)	ND (123)	ND (115)	ND (122)	ND (122)
Thallium	1.78	1.54	16.2 J	ND (1.22) J	ND (1.22) J
Vanadium	41.3 J	30.0 J	36.3 J	38.4 J	38.4 J
Zinc	205	114	102	98.9	98.9

General Chemistry

pH (soil)

8.3 J

8.2 J

7.6 J

8.0 J

7.6 J

NS

S.U.

TABLE 2.5

SURFACE SOIL ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Sample Location: SS-38 SS-39 SS-40
Sample ID: SS-19867-0703-PK-003 SS-19867-0703-PK-002 SS-19867-0703-PK-001
Sample Date: 7/18/2003 7/18/2003 7/18/2003

Metals	Eastern USA		TAGM ^a	Values
	Background Concentration	Units		
Aluminum	33000	mg/kg	SB	6560
Antimony	NS	mg/kg	SB	R
Arsenic	3 - 12	mg/kg	7.5 or SB	2.46
Barium	15 - 600	mg/kg	300 or SB	70.1
Beryllium	0 - 1.75	mg/kg	0.16 or SB	0.224 J
Cadmium	0.1 - 1.0	mg/kg	1 or SB	0.191 J
Calcium	130 - 35000	mg/kg	SB	149000
Chromium Total	1.5 - 40	mg/kg	50 ^b or SB	1100
Chromium VI (Hexavalent)	NS	mg/kg	NS	ND (4.7) J
Cobalt	2.5 or 60	mg/kg	30 or SB	8.43
Copper	1.0 - 50	mg/kg	25 or SB	38.4
Cyanide (total)		mg/kg	NS	ND (0.532)
Iron	2000 - 550000	mg/kg	2000 or SB	11600
Lead	NS	mg/kg	SB	70.7
Magnesium	100 - 5000	mg/kg	SB	95.4
Manganese	50 - 5000	mg/kg	SB	12200
Mercury	0.001 - 0.2	mg/kg	0.1	797
Nickel	0.5 - 25	mg/kg	13 or SB	0.131
Potassium	8500 - 43000	mg/kg	SB	13.8
Selenium	0.1 - 3.9	mg/kg	2 or SB	1150
Silver	NS	mg/kg	SB	3.28
Sodium	6000 - 8000	mg/kg	SB	0.191 J
Thallium	NS	mg/kg	SB	ND (104)
Vanadium	1.0 - 300	mg/kg	150 or SB	0.934 J
Zinc	9.0 - 50.0	mg/kg	20 or SB	17.1 J
				114
				203
				191
				2.65
				1060
				658
				0.375
				690
				61500
				70.7
				95.4
				12200
				797
				0.131
				13.8
				1150
				3.28
				0.191 J
				ND (104)
				0.934 J
				17.1 J
				114
				203
				191
				2.65
				1060
				658
				0.375
				690
				61500
				70.7
				95.4
				12200
				797
				0.131
				13.8
				1150
				3.28
				0.191 J
				ND (104)
				0.934 J
				17.1 J
				114
				203
				191
				2.65
				1060
				658
				0.375
				690
				61500
				70.7
				95.4
				12200
				797
				0.131
				13.8
				1150
				3.28
				0.191 J
				ND (104)
				0.934 J
				17.1 J
				114
				203
				191
				2.65
				1060
				658
				0.375
				690
				61500
				70.7
				95.4
				12200
				797
				0.131
				13.8
				1150
				3.28
				0.191 J
				ND (104)
				0.934 J
				17.1 J
				114
				203
				191
				2.65
				1060
				658
				0.375
				690
				61500
				70.7
				95.4
				12200
				797
				0.131
				13.8
				1150
				3.28
				0.191 J
				ND (104)
				0.934 J
				17.1 J
				114
				203
				191
				2.65
				1060
				658
				0.375
				690
				61500
				70.7
				95.4
				12200
				797
				0.131
				13.8
				1150
				3.28
				0.191 J
				ND (104)
				0.934 J
				17.1 J
				114
				203
				191
				2.65
				1060
				658
				0.375
				690
				61500
				70.7
				95.4
				12200
				797
				0.131
				13.8
				1150
				3.28
				0.191 J
				ND (104)
				0.934 J
				17.1 J
				114
				203
				191
				2.65
				1060
				658
				0.375
				690
				61500
				70.7
				95.4
				12200
				797
				0.131
				13.8
				1150
				3.28
				0.191 J
				ND (104)
				0.934 J
				17.1 J
				114
				203
				191
				2.65
				1060
				658
				0.375
				690
				61500
				70.7
				95.4
				12200
				797
				0.131
				13.8
				1150
				3.28
				0.191 J
				ND (104)
				0.934 J
				17.1 J
				114
				203
				191
				2.65
				1060
				658
				0.375
				690
				61500
				70.7
				95.4
				12200
				797
				0.131
				13.8
				1150
				3.28
				0.191 J
				ND (104)
				0.934 J
				17.1 J
				114
				203
				191
				2.65
				1060
				658
				0.375
				690
				61500
				70.7
				95.4
				12200
				797
				0.131
				13.8
				1150
				3.28
				0.191 J
				ND (104)
				0.934 J
				17.1 J
				114
				203
				191
				2.65
				1060
				658
				0.375
				690
				61500
				70.7
				95.4
				12200
				797
				0.131
				13.8
				1150
				3.28
				0.191 J
				ND (104)
				0.934 J
				17.1 J
				114
				203
				191
				2.65
				1060
				658
				0.375
				690
				61500
				70.7
				95.4
				12200
				797
				0.131
				13.8
				1150
				3.28
				0.191 J
				ND (104)
				0.934 J
				17.1 J
				114
				203
				191
				2.65
				1060
				658
				0.375
				690
				61500
				70.7
				95.4
				12200

TABLE 2.6

SURFACE WATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

	Sample Location:	SW-9	SW-9	SW-11	SW-11	SW-11	SW-11
	Sample ID:	SW-19867-1203-009	SW-19867-0504-009	SW-19867-08-03-011	SW-19867-10-03-PK-011	SW-19867-1203-011	SW-19867-1203-011
	Sample Date:	12/17/2003	5/12/2004	8/21/2003	10/7/2003	12/17/2003	12/17/2003
	NYSDEC Ambient Water Quality ^a						
Metals	Units						
Aluminum	mg/L	NS	0.183	0.887	66.7	0.912	0.912
Antimony	mg/L	NS	ND(0.02)	ND(0.01)	ND(0.011)	ND(0.01)	ND(0.01)
Arsenic	mg/L	0.340	0.023 J	0.029	0.0648	0.0203 J	0.0203 J
Barium	mg/L	NS	0.103	0.171	2.53	0.14	0.14
Beryllium	mg/L	NS	0.000294 J	ND(0.005)	0.00304 J	0.000156 J	0.000156 J
Cadmium	mg/L	NCV ⁽¹⁾	ND(0.005)	ND(0.005)	0.00463 J	ND(0.005)	ND(0.005)
Calcium	mg/L	NS	143	86.1	338	66.5	66.5
Chromium Total	mg/L	NCV ⁽²⁾	0.0531	0.157	6.39	0.135	0.135
Chromium VI (Hexavalent)	mg/L	0.016	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)
Cobalt	mg/L	0.110	0.00462 J	0.000612 J	0.0753	0.00618 J	0.00618 J
Copper	mg/L	NCV ⁽³⁾	0.097	0.0264	1.09	0.0157 J	0.0157 J
Cyanide (total)	mg/L	0.022	ND(0.01)	0.00316 J	ND(0.01) UJ	ND(0.01)	ND(0.01)
Iron	mg/L	0.300	1.37 ^a	2.51	151	2.19	2.19
Lead	mg/L	NCV ⁽⁴⁾	0.0591	0.0203	0.865	0.0101	0.0101
Magnesium	mg/L	NS	35.9	30.4	103	61.7	61.7
Manganese	mg/L	NS	0.551	3.28	19.2	4.63	4.63
Mercury	mg/L	0.0014	0.00032 J	ND(0.0004)	0.0013	ND(0.0004)	ND(0.0004)
Nickel	mg/L	NCV ⁽⁵⁾	0.0113 J	0.0134 J	0.544	ND(0.02)	ND(0.02)
Potassium	mg/L	NS	8.29	8.85	27.1	13.3	13.3
Selenium	mg/L	NS	ND(0.02)	ND(0.02)	0.0957	0.0164 J	0.0164 J
Silver	mg/L	NCV ⁽⁶⁾	ND(0.01)	ND(0.01)	0.0016 J	ND(0.01)	ND(0.01)
Sodium	mg/L	NS	140	36.2	33.7	21	21
Thallium	mg/L	0.020	ND(0.04)	0.0664	0.0183 J	ND(0.02)	ND(0.02)
Vanadium	mg/L	0.190	0.00474	ND(0.02)	0.231	ND(0.02)	ND(0.02)
Zinc	mg/L	NCV ⁽⁷⁾	0.313	0.0597 B	2.84	0.0316	0.0316
General Chemistry							
Hardness	mg/L	NS	505	--	--	--	--
pH Field	S.U.	6.5 - 8.5	7.74	--	8.19	--	--

TABLE 2.6

SURFACE WATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Metals	Units	NYSDEC Ambient Water Quality ^a	Sample Location: SW-11		Sample Location: SW-12		Sample Location: SW-12		Sample Location: SW-13	
			SW-11	SW-11	SW-12	SW-12	SW-12	SW-12	SW-12	SW-13
			SW-11	SW-11	SW-12	SW-12	SW-12	SW-12	SW-12	SW-13
			SW-11	SW-11	SW-12	SW-12	SW-12	SW-12	SW-12	SW-13
			4/1/2004	5/12/2004	12/17/2003	4/1/2004	5/12/2004	5/12/2004	8/21/2003	8/21/2003
Aluminum	mg/L	NS	--	2.13	0.0879 J	--	--	ND(0.2)	5.13	
Antimony	mg/L	NS	--	ND(0.02)	ND(0.01)	--	--	ND(0.02)	0.0169	
Arsenic	mg/L	0.340	--	0.0139	0.0191 J	--	--	0.00868	0.0439	
Barium	mg/L	NS	--	0.193	0.0457	--	--	0.0393	0.404	
Beryllium	mg/L	NS	--	ND(0.005)	ND(0.005)	--	--	ND(0.005)	ND(0.005)	
Cadmium	mg/L	NCV ⁽¹⁾	--	ND(0.005)	ND(0.005)	--	--	ND(0.005)	ND(0.005)	
Calcium	mg/L	NS	--	59.2	56.7	--	--	33.9	675	
Chromium Total	mg/L	NCV ⁽²⁾	--	0.611	0.008 J	--	--	0.00171	0.379	
Chromium VI (Hexavalent)	mg/L	0.016	--	ND(0.01)	ND(0.01)	--	--	ND(0.01)	0.102	
Cobalt	mg/L	0.110	--	0.00244	0.00124 J	--	--	ND(0.02)	0.00194 J	
Copper	mg/L	NCV ⁽³⁾	--	0.0471	ND(0.02)	--	--	ND(0.02)	0.013 J	
Cyanide (total)	mg/L	0.022	--	ND(0.01)	ND(0.01)	--	--	ND(0.01)	0.00664 J	
Iron	mg/L	0.300	--	4.04 ^a	ND(0.2)	--	--	0.0533	6.44	
Lead	mg/L	NCV ⁽⁴⁾	--	0.0473	ND(0.005)	--	--	ND(0.005)	0.0191	
Magnesium	mg/L	NS	--	54.1	27.3	--	--	13.7	12.8	
Manganese	mg/L	NS	--	1.94	0.00807 J	--	--	0.119	0.203	
Mercury	mg/L	0.0014	--	ND(0.0002)	ND(0.0004)	--	--	ND(0.0002)	ND(0.0004)	
Nickel	mg/L	NCV ⁽⁵⁾	--	0.0187	ND(0.02)	--	--	0.00295	0.0079 J	
Potassium	mg/L	NS	--	9.65	11.8	--	--	13.6	27.9	
Selenium	mg/L	NS	--	0.0434	ND(0.02)	--	--	0.00904	ND(0.02)	
Silver	mg/L	NCV ⁽⁶⁾	--	ND(0.01)	ND(0.01)	--	--	ND(0.01)	ND(0.01)	
Sodium	mg/L	NS	--	27.7	28.1	--	--	38	56.8	
Thallium	mg/L	0.020	--	ND(0.02)	ND(0.02)	--	--	ND(0.03)	0.00866 J	
Vanadium	mg/L	0.190	--	0.0138	ND(0.02)	--	--	ND(0.02)	0.00464 J	
Zinc	mg/L	NCV ⁽⁷⁾	--	0.129	0.00498 J	--	--	0.00519	0.0567 B	
General Chemistry										
Hardness	mg/L	NS	--	416	--	--	--	198	--	--
pH Field	S.U.	6.5 - 8.5	6.35	7.58	--	6.16	8.55	--	--	--

TABLE 2.6

SURFACE WATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Sample Location: SW-13 SW-13 SW-13 SW-13 SW-14
 Sample ID: SW-19867-10-03-PK-013 SW-19867-1203-013 SW-19867-0504-013 SW-19867-08-03-014
 Sample Date: 10/7/2003 12/17/2003 5/12/2004 8/21/2003

NYSDEC Ambient
Water Quality^a

Metals	Units	NS	SW-13 10/7/2003	SW-13 12/17/2003	SW-13 5/12/2004	SW-14 8/21/2003
Aluminum	mg/L	NS	2.15	1.33	0.312	4.28
Antimony	mg/L	NS	0.0108	ND(0.01)	ND(0.02)	0.0112
Arsenic	mg/L	0.340	ND(0.025)	0.0317	ND(0.025)	0.0305
Barium	mg/L	NS	0.217	0.0545	0.0301	0.769
Beryllium	mg/L	NS	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
Cadmium	mg/L	NCV ⁽¹⁾	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
Calcium	mg/L	NS	412	180	31.1	378
Chromium Total	mg/L	NCV ⁽²⁾	0.122	0.0219	0.00365	0.514
Chromium VI (Hexavalent)	mg/L	0.016	ND(0.01)	ND(0.01)	ND(0.01)	0.364
Cobalt	mg/L	0.110	ND(0.02)	0.00253 J	ND(0.02)	0.00109 J
Copper	mg/L	NCV ⁽³⁾	0.00566 J	ND(0.02)	ND(0.02)	0.013 J
Cyanide (total)	mg/L	0.022	ND(0.01) UJ	ND(0.01)	ND(0.01)	0.00869 J
Iron	mg/L	0.300	2.96	8.26	0.848 ^a	3.72
Lead	mg/L	NCV ⁽⁴⁾	0.00853	ND(0.005)	ND(0.005)	0.00807
Magnesium	mg/L	NS	6.56	19.1	9.6	3.08
Manganese	mg/L	NS	0.107	0.272	0.031	0.121
Mercury	mg/L	0.0014	ND(0.0004)	ND(0.0004)	ND(0.0002)	ND(0.0004)
Nickel	mg/L	NCV ⁽⁵⁾	0.0112 J	ND(0.02)	0.00332	0.00483 J
Potassium	mg/L	NS	72.3	13	10	7.63
Selenium	mg/L	NS	0.0232	ND(0.02)	ND(0.02)	ND(0.02)
Silver	mg/L	NCV ⁽⁶⁾	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)
Sodium	mg/L	NS	66.2	29.4	29.7	48.9
Thallium	mg/L	0.020	ND(0.02)	ND(0.02)	ND(0.02)	0.0679
Vanadium	mg/L	0.190	0.00865 J	ND(0.02)	ND(0.02)	0.0061 J
Zinc	mg/L	NCV ⁽⁷⁾	0.0194 J	0.0124 J	0.00559	0.0394 B

General Chemistry

Hardness	mg/L	NS	166	--	--
pH Field	S.U.	6.5 - 8.5	12.41	11.87	8.41

TABLE 2.6

SURFACE WATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Metals	Units	NYSDEC Ambient Water Quality ^a	Sample Location:				
			SW-14 SW-19867-10-03-PK-014 10/7/2003	SW-14 SW-19867-1203-014 12/17/2003	SW-14 SW-19867-0504-014 5/12/2004	SW-14 SW-19867-08-03-015 8/21/2003	SW-15
Aluminum	mg/L	NS	2.34	0.0426 J	--	0.0493	6.98
Antimony	mg/L	NS	0.00744 J	ND(0.01)	--	ND(0.02)	ND(0.01)
Arsenic	mg/L	0.340	ND(0.025)	0.0211 J	--	0.0108	0.0345
Barium	mg/L	NS	1.24	0.0609	--	0.0868	0.141
Beryllium	mg/L	NS	ND(0.005)	ND(0.005)	--	ND(0.005)	ND(0.005)
Cadmium	mg/L	NCV ⁽¹⁾	ND(0.005)	ND(0.005)	--	ND(0.005)	ND(0.005)
Calcium	mg/L	NS	615	137	--	166	144
Chromium Total	mg/L	NCV ⁽²⁾	0.617	0.0812	--	0.114	0.1
Chromium VI (Hexavalent)	mg/L	0.016	0.571	0.0650	--	0.107 ^a	ND(0.01)
Cobalt	mg/L	0.110	ND(0.02)	0.00662 J	--	ND(0.02)	0.0043 J
Copper	mg/L	NCV ⁽³⁾	0.00803 J	ND(0.02)	--	ND(0.02)	0.0383
Cyanide (total)	mg/L	0.022	ND(0.01) UJ	ND(0.01)	--	0.00464	0.00342 J
Iron	mg/L	0.300	2.11	ND(0.2)	--	ND(0.2)	8.27
Lead	mg/L	NCV ⁽⁴⁾	0.00516	ND(0.005)	--	ND(0.005)	0.0256
Magnesium	mg/L	NS	1.86	0.429 J	--	0.194	15.2
Manganese	mg/L	NS	0.0695	0.00247 J	--	ND(0.01)	1.55
Mercury	mg/L	0.0014	ND(0.0004)	ND(0.0004)	--	ND(0.0002)	ND(0.0004)
Nickel	mg/L	NCV ⁽⁵⁾	0.00532 J	ND(0.02)	--	0.00181	0.0156 J
Potassium	mg/L	NS	9.16	2.75	--	3.6	7.34
Selenium	mg/L	NS	0.03	ND(0.02)	--	ND(0.02)	ND(0.02)
Silver	mg/L	NCV ⁽⁶⁾	ND(0.01)	ND(0.01)	--	ND(0.01)	ND(0.01)
Sodium	mg/L	NS	45.8	43.7	--	67.6	52.3
Thallium	mg/L	0.020	0.0107 J	ND(0.02)	--	ND(0.03)	0.0826
Vanadium	mg/L	0.190	0.00682 J	ND(0.02)	--	ND(0.02)	0.0162 J
Zinc	mg/L	NCV ⁽⁷⁾	0.0139 J	0.00657 J	--	0.0059	0.0554 B
General Chemistry							
Hardness	mg/L	NS	--	--	--	436	--
pH Field	S.U.	6.5 - 8.5	12.11	--	11.91	11.22	--

TABLE 2.6

SURFACE WATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Metals	Units	NYSDEC Ambient Water Quality ^a	Sample Location:		Sample ID:		Sample Date:		SW-16	
			SW-15	SW-15	SW-15	SW-15	SW-15	SW-16		
Aluminum	mg/L	NS	2.02	2.07	SW-19867-10-03-PK-015	SW-19867-1203-015	4/1/2004	SW-19867-0504-015	SW-19867-1203-016	SW-16
Antimony	mg/L	NS	ND(0.01)	ND(0.025)	10/7/2003	12/17/2003	4/1/2004	5/12/2004	12/17/2003	SW-16
Arsenic	mg/L	0.340	0.0249 J	0.0285						4/1/2004
Barium	mg/L	NS	0.321	0.0763						
Beryllium	mg/L	NS	ND(0.005)	ND(0.005)						
Cadmium	mg/L	NCV ⁽¹⁾	ND(0.005)	ND(0.005)						
Calcium	mg/L	NS	343	187						
Chromium Total	mg/L	NCV ⁽²⁾	0.586	0.372						
Chromium VI (Hexavalent)	mg/L	0.016	0.289	0.204						
Cobalt	mg/L	0.110	ND(0.02)	0.00139 J						
Copper	mg/L	NCV ⁽³⁾	0.0343	0.0395						
Cyanide (total)	mg/L	0.022	0.00364 J	ND(0.01)						
Iron	mg/L	0.300	0.691	1.03						
Lead	mg/L	NCV ⁽⁴⁾	0.00982	0.00523						
Magnesium	mg/L	NS	2.69	1.14 J						
Manganese	mg/L	NS	0.0562	0.193						
Mercury	mg/L	0.0014	ND(0.0004)	ND(0.0004)						
Nickel	mg/L	NCV ⁽⁵⁾	0.00719 J	0.00255 J						
Potassium	mg/L	NS	7.47	5.58						
Selenium	mg/L	NS	0.0194 J	ND(0.02)						
Silver	mg/L	NCV ⁽⁶⁾	ND(0.01)	ND(0.01)						
Sodium	mg/L	NS	43.7	34.3						
Thallium	mg/L	0.020	0.00776 J	ND(0.02)						
Vanadium	mg/L	0.190	0.0136 J	0.0122 J						
Zinc	mg/L	NCV ⁽⁷⁾	0.00972 J	0.0148 J						
General Chemistry										
Hardness	mg/L	NS	--	--				776	--	--
pH Field	S.U.	6.5 - 8.5	12.02				12.05	11.98		11.28

TABLE 2.6

SURFACE WATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

		Sample Location:	SW-16	SW-17	SW-17	SW-17	SW-17	SW-18	SW-18
		Sample ID:	SW-19867-0504-016	SW-19867-1203-017	SW-19867-0504-017	SW-19867-1203-018	SW-19867-1203-018	SW-18	SW-18
		Sample Date:	5/12/2004	12/17/2003	5/12/2004	4/1/2004	12/17/2003	4/1/2004	4/1/2004
		NYSDEC Ambient Water Quality ^a							
Metals	Units								
Aluminum	mg/L	NS	0.656	21.9	0.541		0.0415 J		
Antimony	mg/L	NS	ND(0.02)	ND(0.01)	ND(0.02)		ND(0.02)		
Arsenic	mg/L	0.340	ND(0.025)	0.0155 J	0.0151		0.0254		
Barium	mg/L	NS	0.299	0.173	0.0238		0.0569		
Beryllium	mg/L	NS	ND(0.005)	0.000916 J	ND(0.005)		ND(0.005)		
Cadmium	mg/L	NCV ⁽¹⁾	ND(0.005)	ND(0.005)	ND(0.005)		ND(0.005)		
Calcium	mg/L	NS	662	28.5	63.1		140		
Chromium Total	mg/L	NCV ⁽²⁾	0.0727	0.0432	0.000768		0.0783		
Chromium VI (Hexavalent)	mg/L	0.016	0.0580 ^a	0.0120	ND(0.01)		0.0290		
Cobalt	mg/L	0.110	ND(0.02)	0.00821 J	ND(0.02)		ND(0.02)		
Copper	mg/L	NCV ⁽³⁾	0.0118	0.0313	ND(0.02)		ND(0.02)		
Cyanide (total)	mg/L	0.022	ND(0.01)	ND(0.01)	ND(0.01)		ND(0.01)		
Iron	mg/L	0.300	0.148	23.4	3.06 ^a		ND(0.2)		
Lead	mg/L	NCV ⁽⁴⁾	ND(0.005)	0.0451	0.00531		ND(0.005)		
Magnesium	mg/L	NS	0.227	13.3	22.4		0.56 J		
Manganese	mg/L	NS	0.00608	0.564	0.267		0.00347 J		
Mercury	mg/L	0.0014	ND(0.0002)	ND(0.0004)	ND(0.0002)		ND(0.0004)		
Nickel	mg/L	NCV ⁽⁵⁾	0.00329	0.0186 J	0.00291		ND(0.02)		
Potassium	mg/L	NS	14.8	10.7	6.95		2.88		
Selenium	mg/L	NS	ND(0.02)	0.0123 J	0.024		ND(0.04)		
Silver	mg/L	NCV ⁽⁶⁾	ND(0.01)	ND(0.01)	ND(0.01)		ND(0.01)		
Sodium	mg/L	NS	23.3	1.47 J	2.36		43.7		
Thallium	mg/L	0.020	ND(0.02)	ND(0.02)	ND(0.02)		ND(0.02)		
Vanadium	mg/L	0.190	ND(0.02)	0.037	ND(0.02)		ND(0.02)		
Zinc	mg/L	NCV ⁽⁷⁾	0.0169	0.333	0.0171		0.00773 J		
General Chemistry									
Hardness	mg/L	NS	1600	--	319		--		
pH Field	S.U.	6.5 - 8.5	12.03	--	9.4		--		11.94

TABLE 2.6
 SURFACE WATER ANALYTICAL RESULTS
 VANADIUM CORPORATION OF AMERICA
 NIAGARA FALLS, NEW YORK

Metals	Units	NYSDEC Ambient Water Quality ^a	Sample Location:		Sample ID:		Sample Date:		
			SW-19	SW-20	SW-19867-0504-019	SW-19867-09-03-020	SW-19867-10-03-PK-020	SW-19867-1203-020	
Aluminum	mg/L	NS	ND(0.2)	0.62	0.516	0.218			
Antimony	mg/L	NS	ND(0.02)	ND(0.01)	ND(0.01)	ND(0.02)			
Arsenic	mg/L	0.340	0.00985	0.0296	0.0143 J	0.0239 J			
Barium	mg/L	NS	0.0433	0.0815	0.0611	0.0455			
Beryllium	mg/L	NS	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)			
Cadmium	mg/L	NCV ⁽¹⁾	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)			
Calcium	mg/L	NS	101	189	128	131			
Chromium Total	mg/L	NCV ⁽²⁾	0.048	0.0265	0.0543	0.0292			
Chromium VI (Hexavalent)	mg/L	0.016	0.0300 ^a	ND(0.01)	0.0350	0.00800 J			
Cobalt	mg/L	0.110	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)			
Copper	mg/L	NCV ⁽³⁾	ND(0.02)	0.00609 J	0.0143 J	ND(0.02)			
Cyanide (total)	mg/L	0.022	ND(0.01)	0.00349 J	ND(0.01)	ND(0.01)			
Iron	mg/L	0.300	ND(0.2)	0.22	ND(0.2)	0.0727 J			
Lead	mg/L	NCV ⁽⁴⁾	0.0051	ND(0.005)	ND(0.005)	ND(0.005)			
Magnesium	mg/L	NS	0.833	0.477 J	0.167 J	1.45 J			
Manganese	mg/L	NS	0.00467	0.0182	0.00465 J	0.0136			
Mercury	mg/L	0.0014	ND(0.0002)	ND(0.0004)	ND(0.0004)	ND(0.0004)			
Nickel	mg/L	NCV ⁽⁵⁾	ND(0.02)	0.00178 J	0.00241 J	ND(0.02)			
Potassium	mg/L	NS	3.14	4.37	5.67	2.12			
Selenium	mg/L	NS	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.04)			
Silver	mg/L	NCV ⁽⁶⁾	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)			
Sodium	mg/L	NS	68.6	75.7	63.8	36.9			
Thallium	mg/L	0.020	ND(0.03)	0.0936	ND(0.02)	ND(0.02)			
Vanadium	mg/L	0.190	ND(0.02)	ND(0.02)	0.0145 J	ND(0.02)			
Zinc	mg/L	NCV ⁽⁷⁾	0.00691	0.0151 B	0.00529 J	0.0301			
General Chemistry									
Hardness	mg/L	NS	283	--	--	--			
pH Field	S.U.	6.5 - 8.5	11.62	--	12.31	--			11.79

TABLE 2.6

SURFACE WATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Metals	Units	NYSDEC Ambient Water Quality ^a	Sample Location:			
			SW-20 SW-19867-0504-020 5/12/2004	SW-21 SW-19867-08-03-021 8/21/2003	SW-21 SW-19867-10-03-PK-021 10/7/2003	SW-21 SW-19867-1203-021 12/17/2003
Aluminum	mg/L	NS	0.0258	0.125 J	ND(0.2)	0.221
Antimony	mg/L	NS	ND(0.02)	ND(0.01)	ND(0.01)	ND(0.01)
Arsenic	mg/L	0.340	0.009	0.0313	0.012 J	0.019 J
Barium	mg/L	NS	0.0584	0.0549	0.0391	0.0941
Beryllium	mg/L	NS	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
Cadmium	mg/L	NCV ⁽¹⁾	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
Calcium	mg/L	NS	117	146	94.5	63.1
Chromium Total	mg/L	NCV ⁽²⁾	0.0554	0.0385	0.0368	0.06603 J
Chromium VI (Hexavalent)	mg/L	0.016	0.0370 ^a	0.008 J	0.00400 J	ND(0.01)
Cobalt	mg/L	0.110	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)
Copper	mg/L	NCV ⁽³⁾	0.00343	ND(0.02)	0.0105 J	ND(0.02)
Cyanide (total)	mg/L	0.022	ND(0.01)	0.00284 J	ND(0.01)	ND(0.01)
Iron	mg/L	0.300	ND(0.2)	0.0781 J	ND(0.2)	0.409
Lead	mg/L	NCV ⁽⁴⁾	0.00601	ND(0.005)	ND(0.005)	0.0159
Magnesium	mg/L	NS	0.0581	0.936 J	0.218 J	6.92
Manganese	mg/L	NS	ND(0.01)	0.01	0.00227 J	0.0758
Mercury	mg/L	0.0014	ND(0.0002)	ND(0.0004)	ND(0.0004)	ND(0.0004)
Nickel	mg/L	NCV ⁽⁵⁾	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)
Potassium	mg/L	NS	3.69	3.93	5.4	3.03
Selenium	mg/L	NS	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)
Silver	mg/L	NCV ⁽⁶⁾	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)
Sodium	mg/L	NS	60.4	83.6	77.7	59.1
Thallium	mg/L	0.020	ND(0.03)	0.0865	ND(0.02)	ND(0.02)
Vanadium	mg/L	0.190	ND(0.02)	ND(0.02)	0.00334 J	ND(0.02)
Zinc	mg/L	NCV ⁽⁷⁾	0.0129	ND(0.01)	0.00218 J	0.0181 J

General Chemistry

Hardness	mg/L	NS	319	--	--	--
pH Field	S.U.	6.5 - 8.5	11.55	--	12.24	10.00

TABLE 2.6
 SURFACE WATER ANALYTICAL RESULTS
 VANADIUM CORPORATION OF AMERICA
 NIAGARA FALLS, NEW YORK

Metals	Units	Sample Location:				
		SW-21 SW-19867-0504-021 5/12/2004	SW-22 SW-19867-1203-022 12/17/2003	SW-22 SW-19867-0504-022 5/12/2004	SW-23 SW-19867-08-03-023 8/21/2003	
					SW-23 SW-19867-08-03-025 8/21/2003	
					Duplicate	
NYSDEC Ambient						
	Water Quality ^a					
Aluminum	mg/L	NS	8.28	0.043	0.196 J	0.2
Antimony	mg/L	NS	ND(0.02)	ND(0.02)	ND(0.01)	ND(0.01)
Arsenic	mg/L	0.340	0.0278	0.00825	0.0122 J	0.0166 J
Barium	mg/L	NS	0.204	0.0412	0.0533	0.0579
Beryllium	mg/L	NS	0.000469 J	ND(0.005)	ND(0.005)	ND(0.005)
Cadmium	mg/L	NCV ⁽¹⁾	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
Calcium	mg/L	NS	103	32.6	31.4	35
Chromium Total	mg/L	NCV ⁽²⁾	0.285	0.00208	0.0101	0.00953 J
Chromium VI (Hexavalent)	mg/L	0.016	0.00500 J	ND(0.01)	ND(0.01)	ND(0.01)
Cobalt	mg/L	0.110	0.00238 J	ND(0.02)	ND(0.02)	ND(0.02)
Copper	mg/L	NCV ⁽³⁾	0.0418	0.00389	ND(0.02)	0.00372 J
Cyanide (total)	mg/L	0.022	ND(0.01)	ND(0.01)	0.00216 J	0.00727 J
Iron	mg/L	0.300	11.1	0.146	1.21	1.29
Lead	mg/L	NCV ⁽⁴⁾	0.00594	0.00557	ND(0.005)	ND(0.005)
Magnesium	mg/L	NS	1.6	3.57	3.93	3.97
Manganese	mg/L	NS	0.0121	0.208	0.101	0.125
Mercury	mg/L	0.0014	ND(0.0002)	ND(0.0002)	ND(0.0004)	ND(0.0004)
Nickel	mg/L	NCV ⁽⁵⁾	ND(0.02)	0.00271	0.00204 J	0.00177 J
Potassium	mg/L	NS	3.13	1.5	1.83	1.81
Selenium	mg/L	NS	ND(0.02)	ND(0.02)	ND(0.02)	0.00775 J
Silver	mg/L	NCV ⁽⁶⁾	ND(0.01)	ND(0.01)	ND(0.01)	0.00203 J
Sodium	mg/L	NS	63.8	50.1	72.3	75.4
Thallium	mg/L	0.020	ND(0.02)	ND(0.02)	0.0403	0.0419
Vanadium	mg/L	0.190	0.0229	ND(0.02)	ND(0.02)	ND(0.02)
Zinc	mg/L	NCV ⁽⁷⁾	0.00536	0.0351	0.0121 B	0.0124 B
General Chemistry						
Hardness	mg/L	NS	311	166	--	--
pH Field	S.U.	6.5 - 8.5	11.47	8.18	--	--

TABLE 2.6

SURFACE WATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Metals	Units	NYSDEC Ambient Water Quality ^a	Sample Location:				SW-23 SW-19867-1203-025 12/17/2003 Duplicate	SW-23 SW-19867-1203-025 12/17/2003 Duplicate	SW-23 SW-19867-1203-025 12/17/2003 Duplicate	SW-23 SW-19867-1203-025 4/1/2004
			SW-23 SW-19867-10-03-PK-023 10/7/2003 Duplicate	SW-23 SW-19867-10-03-PK-025 10/7/2003 Duplicate	SW-23 SW-19867-1203-023 12/17/2003	SW-23 SW-19867-1203-023 12/17/2003				
Aluminum	mg/L	NS	0.125 J	0.0969 J	0.264 J	0.512 J				
Antimony	mg/L	NS	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)				
Arsenic	mg/L	0.340	0.00722 J	ND(0.025)	0.0147 J	0.014 J				
Barium	mg/L	NS	0.0236	0.0241	0.0298	0.0307				
Beryllium	mg/L	NS	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)				
Cadmium	mg/L	NCV ⁽¹⁾	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)				
Calcium	mg/L	NS	22.3	22.2	30.5	32.4				
Chromium Total	mg/L	NCV ⁽²⁾	0.13	0.117	0.104	0.0958				
Chromium VI (Hexavalent)	mg/L	0.016	0.110	0.100	0.0560	0.0720				
Cobalt	mg/L	0.110	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)				
Copper	mg/L	NCV ⁽³⁾	0.00645 J	0.00555 J	ND(0.02)	ND(0.02)				
Cyanide (total)	mg/L	0.022	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)				
Iron	mg/L	0.300	0.076 J	ND(0.2)	0.2 J	0.513 J				
Lead	mg/L	NCV ⁽⁴⁾	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)				
Magnesium	mg/L	NS	3.82	3.59	6.57	6.64				
Manganese	mg/L	NS	0.00907 J	0.00401 J	0.0201	0.0295				
Mercury	mg/L	0.0014	ND(0.0004)	ND(0.0004)	ND(0.0004)	ND(0.0004)				
Nickel	mg/L	NCV ⁽⁵⁾	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)				
Potassium	mg/L	NS	2.74	2.28	1.72	1.83				
Selenium	mg/L	NS	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)				
Silver	mg/L	NCV ⁽⁶⁾	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)				
Sodium	mg/L	NS	38.8	36.7	35.5	35				
Thallium	mg/L	0.020	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)				
Vanadium	mg/L	0.190	0.00578 J	0.00542 J	ND(0.02)	ND(0.02)				
Zinc	mg/L	NCV ⁽⁷⁾	0.0214	0.017 J	0.0277	0.0356				
General Chemistry										
Hardness	mg/L	NS	--	--	--	--	--	--	--	
pH Field	S.U.	6.5 - 8.5	9.60	9.60	9.60	9.60	9.60	9.60	9.25	

TABLE 2.6

SURFACE WATER ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Metals	Units	NYSDEC Ambient Water Quality ^a	Sample Location:	SW-23	SW-24	SW-24	SW-24	SW-24	SW-24
			Sample ID:	SW-19867-0504-023	SW-19867-0504-025	SW-19867-08-03-024	SW-19867-10-03-PK-024	SW-19867-1203-024	
			Sample Date:	5/12/2004	5/12/2004	8/21/2003	8/21/2003	10/7/2003	12/17/2003
Aluminum	mg/L	NS		0.407	0.459	1.23	0.215	0.164 J	
Antimony	mg/L	NS		ND(0.02)	ND(0.02)	ND(0.01)	ND(0.01)	ND(0.01)	
Arsenic	mg/L	0.340		0.00793	0.00974	0.024 J	0.0207 J	0.0115 J	
Barium	mg/L	NS		0.0603	0.0611	0.0809	0.0483	0.0369	
Beryllium	mg/L	NS		ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	
Cadmium	mg/L	NCV ⁽¹⁾		ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	
Calcium	mg/L	NS		83.8	86.9	66.1	39.1	42.3	
Chromium Total	mg/L	NCV ⁽²⁾		0.158	0.167	0.0117	0.00241 J	0.00783 J	
Chromium VI (Hexavalent)	mg/L	0.016		0.124 ^a	0.156 ^a	ND(0.01)	ND(0.01)	ND(0.01)	
Cobalt	mg/L	0.110		ND(0.02)	ND(0.02)	0.000834 J	ND(0.02)	ND(0.02)	
Copper	mg/L	NCV ⁽³⁾		0.00729	0.0073	0.0142 J	0.0456	ND(0.02)	
Cyanide (total)	mg/L	0.022		ND(0.01)	ND(0.01)	0.0066 J	ND(0.01)	ND(0.01)	
Iron	mg/L	0.300		0.233	0.252	6.05	1	0.113 J	
Lead	mg/L	NCV ⁽⁴⁾		0.00676	0.00941	0.0389	0.0085	ND(0.005)	
Magnesium	mg/L	NS		2.23	2.21	18.9	12.6	13.6	
Manganese	mg/L	NS		0.0284	0.0278	0.499	0.286	0.0154	
Mercury	mg/L	0.0014		ND(0.0002)	ND(0.0002)	ND(0.0004)	ND(0.0004)	ND(0.0004)	
Nickel	mg/L	NCV ⁽⁵⁾		0.00261	0.0025	0.0053 J	ND(0.02)	ND(0.02)	
Potassium	mg/L	NS		3.28	3.39	0.327 J	8.4	0.341 J	
Selenium	mg/L	NS		ND(0.02)	ND(0.02)	ND(0.02)	0.00994 J	ND(0.02)	
Silver	mg/L	NCV ⁽⁶⁾		ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)	
Sodium	mg/L	NS		110	112	27.9	8.6	41.9	
Thallium	mg/L	0.020		ND(0.03)	ND(0.025)	0.0628	ND(0.02)	ND(0.02)	
Vanadium	mg/L	0.190		0.00363	ND(0.02)	ND(0.02)	0.00369 J	ND(0.02)	
Zinc	mg/L	NCV ⁽⁷⁾		0.0288	0.0289	0.148 B	0.0583	0.0569	
General Chemistry									
Hardness	mg/L	NS		259	287	--	--	--	
pH Field	S.U.	6.5 - 8.5		10.69	8.01	--	8.20	--	

TABLE 2.6

SURFACE WATER ANALYTICAL RESULTS
 VANADIUM CORPORATION OF AMERICA
 NIAGARA FALLS, NEW YORK

Sample Location: SW-24 SW-24
 Sample ID: SW-24 SW-19867-0504-024
 Sample Date: 4/1/2004 5/12/2004

Metals	NYSDEC Ambient	
	Units	Water Quality ^a
Aluminum	mg/L	NS
Antimony	mg/L	NS
Arsenic	mg/L	0.340
Barium	mg/L	NS
Beryllium	mg/L	NS
Cadmium	mg/L	NCV ⁽¹⁾
Calcium	mg/L	NS
Chromium Total	mg/L	NCV ⁽²⁾
Chromium VI (Hexavalent)	mg/L	0.016
Cobalt	mg/L	0.110
Copper	mg/L	NCV ⁽³⁾
Cyanide (total)	mg/L	0.022
Iron	mg/L	0.300
Lead	mg/L	NCV ⁽⁴⁾
Magnesium	mg/L	NS
Manganese	mg/L	NS
Mercury	mg/L	0.0014
Nickel	mg/L	NCV ⁽⁵⁾
Potassium	mg/L	NS
Selenium	mg/L	NS
Silver	mg/L	NCV ⁽⁶⁾
Sodium	mg/L	NS
Thallium	mg/L	0.020
Vanadium	mg/L	0.190
Zinc	mg/L	NCV ⁽⁷⁾
General Chemistry		
Hardness	mg/L	NS
pH Field	S.U.	6.5 - 8.5
		8.89
		275
		8.01

TABLE 2.6

SURFACE WATER ANALYTICAL RESULTS
 VANADIUM CORPORATION OF AMERICA
 NIAGARA FALLS, NEW YORK

Notes:	
NS	- No Standard
ND ()	- Non Detect at associated value
NCV	- No calculated value. Criteria depends on hardness values
J	- Estimated Value
-	- No Measurement
a	- New York State Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations, Human Consumption of Fish (fresh water), June 1998
(1)	- AWQC for cadmium = $(0.85) \exp(1.128 [\ln(\text{ppm hardness})] - 3.6876)$
(2)	- AWQC for chromium (total) = $(0.316) \exp(0.819 [\ln(\text{ppm hardness})] + 3.7256)$
(3)	- AWQC for copper = $(0.96) \exp(0.9422 [\ln(\text{ppm hardness})] - 1.7)$
(4)	- AWQC for lead = $(1.46203 - [\ln(\text{hardness}) (0.145712)]) \exp(1.273 [\ln(\text{ppm hardness})] - 1.052)$
(5)	- AWQC for nickel = $(0.998) \exp(0.846 [\ln(\text{hardness})] + 2.255)$
(6)	- AWQC for silver = $\exp(1.72 [\ln(\text{ppm hardness})] - 6.52)$
(7)	- AWQC for zinc = $(0.978) \exp(0.8473 [\ln(\text{ppm hardness})] + 0.884)$

TABLE 2.7

SEDIMENT ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

	Units	NYSDEC		SW-8		SW-9		SW-9	
		Lowest Effect Level ^c	Severe Effect Level ^c	Sample ID: S-19867-08-03-PK-008	Sample Date: 8/14/2003	Sample ID: S-19867-0504-008	Sample Date: 5/12/2004	Sample ID: S-19867-08-03-PK-009	Sample Date: 8/14/2003
Metals									
Aluminum	mg/kg	NS	NS	9380	7250	10200	8320		
Antimony	mg/kg	2.0	25.0	16.9 ^a	ND (2.21)	1.05	3.79 ^a		
Arsenic	mg/kg	6.0	33.0	14.9 ^a	8.58 ^a	16.2 ^a	ND (3.42)		
Barium	mg/kg	NS	NS	402	328	204	209		
Beryllium	mg/kg	NS	NS	0.375	0.575	0.520	0.420		
Cadmium	mg/kg	0.6	9.0	25.3 ^{ab}	7.55 ^a	3.37 ^a	6.95 ^a		
Calcium	mg/kg	NS	NS	41300	38000	66500	22000		
Chromium Total	mg/kg	26.0	110.0	312 ^{ab}	297 ^{ab}	125 ^{ab}	167 ^{ab}		
Chromium VI (Hexavalent)	mg/kg	NS	NS	ND (4.9)	ND (5.1)	ND (7.1)	ND (8.4)		
Cobalt	mg/kg	NS	NS	13.5	13.0	10.3	7.36		
Copper	mg/kg	16.0	110.0	162 ^{ab}	122 ^{ab}	228 ^{ab}	323 ^{ab}		
Cyanide (total)	mg/kg	NS	NS	0.924	0.847	0.465	ND (1.13)		
Iron	mg/kg	20000	40000	23000 ^a	25500 ^a	42500 ^{ab}	13800		
Lead	mg/kg	31.0	110.0	1710 ^{ab}	1490 ^{ab}	194 ^{ab}	257 ^{ab}		
Magnesium	mg/kg	NS	NS	22100	20400	7920	7440		
Manganese	mg/kg	460.0	1100.0	1320 ^{ab}	1390 ^{ab}	738 ^a	669 ^a		
Mercury	mg/kg	0.15	1.3	2.02 ^{ab}	0.959 ^a	1.71 ^{ab}	2.77 ^{ab}		
Nickel	mg/kg	16.0	50.0	158 ^{ab}	188 ^{ab}	59.3 ^{ab}	51.2 ^{ab}		
Potassium	mg/kg	NS	NS	1170	775	1860	1340		
Selenium	mg/kg	NS	NS	7.58	ND (2.21)	10.3	ND (5.47)		
Silver	mg/kg	1.0	2.2	0.545	0.985	0.868	4.79 ^{ab}		
Sodium	mg/kg	NS	NS	372	267	276	824		
Thallium	mg/kg	NS	NS	ND (1.04)	0.988	ND (1.42)	ND (8.21)		
Vanadium	mg/kg	NS	NS	36.9	37.0	35.5	32.4		
Zinc	mg/kg	120.0	270.0	972 ^{ab}	1060 ^{ab}	778 ^{ab}	2220 ^{ab}		
General Chemistry									
pH (soil)	S.U.	NS	NS	--	8.2	--	7.1		

TABLE 2.7

SEDIMENT ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Sample Location: SW-10 SW-11 SW-12
Sample ID: SED-19867-08-03-PK-010 SED-19867-08-03-PK-011 SD-19867-0504-012
Sample Date: 8/21/2003 8/21/2003 5/12/2004

Metals	Units	NYSDEC	
		Lowest Effect Level ^c	Severe Effect Level ^c
Aluminum	mg/kg	NS	15900
Antimony	mg/kg	2.0	ND (1.17)
Arsenic	mg/kg	6.0	8.9 ^a
Barium	mg/kg	NS	181
Beryllium	mg/kg	NS	0.633
Cadmium	mg/kg	0.6	0.23 J
Calcium	mg/kg	NS	17500
Chromium Total	mg/kg	26.0	335 J ^{ab}
Chromium VI (Hexavalent)	mg/kg	NS	ND (5.1)
Cobalt	mg/kg	NS	13.2
Copper	mg/kg	16.0	185 ^{ab}
Cyanide (total)	mg/kg	NS	0.361 J
Iron	mg/kg	20000	24600 ^a
Lead	mg/kg	31.0	81.8 ^a
Magnesium	mg/kg	NS	8870 J
Manganese	mg/kg	460.0	1180 J ^{ab}
Mercury	mg/kg	0.15	0.197 ^a
Nickel	mg/kg	16.0	81.4 ^{ab}
Potassium	mg/kg	NS	2350 J
Selenium	mg/kg	NS	7.01
Silver	mg/kg	1.0	ND (1.17)
Sodium	mg/kg	NS	145
Thallium	mg/kg	NS	ND (1.17)
Vanadium	mg/kg	NS	41.8
Zinc	mg/kg	120.0	203 ^a
			15900
			ND (3.66)
			27.9 ^a
			666
			0.989 J
			0.955 J ^a
			53000
			1840 J ^{ab}
			ND (15)
			27.8
			307 ^{ab}
			ND (1.78)
			42600 ^{ab}
			240 ^{ab}
			16700 J
			6330 J ^{ab}
			0.264 ^a
			209 ^{ab}
			3200 J
			25.1
			3.36 J ^{ab}
			327 J
			213
			ND (13.7)
			3.62
			16.5

General Chemistry

pH (soil) NS 8.7 7.3 8.2

TABLE 2.7

SEDIMENT ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Metals	Units	NYSDEC		Sample Location:		
		Lowest Effect Level ^c	Severe Effect Level ^c	SW-13 SED-19867-08-03-PK-013 8/21/2003	SW-14 SED-19867-08-03-PK-014 8/21/2003	SW-15 SED-19867-08-03-PK-015 8/21/2003
Aluminum	mg/kg	NS	NS	11400	10900	20000
Antimony	mg/kg	2.0	25.0	1.63 J	0.971 J	ND (1.56)
Arsenic	mg/kg	6.0	33.0	4.28	4.95	18.1 ^a
Barium	mg/kg	NS	NS	150	199	194
Beryllium	mg/kg	NS	NS	0.421 J	0.414 J	0.952
Cadmium	mg/kg	0.6	9.0	ND (0.939)	ND (0.779)	ND (0.779)
Calcium	mg/kg	NS	NS	180000	157000	37400
Chromium Total	mg/kg	26.0	110.0	90.3 J ^a	97.7 J ^a	266 J ^{ab}
Chromium VI (Hexavalent)	mg/kg	NS	NS	ND (8.5)	ND (7.1)	ND (7.1)
Cobalt	mg/kg	NS	NS	4.53	5.7	14.5
Copper	mg/kg	16.0	110.0	10.6	12.4	69.4 ^a
Cyanide (total)	mg/kg	NS	NS	ND (0.947)	ND (0.916)	ND (0.879)
Iron	mg/kg	20000	40000	14800	14500	41000 ^{ab}
Lead	mg/kg	31.0	110.0	15.6	21.8	67 ^a
Magnesium	mg/kg	NS	NS	11300 J	8890 J	5390 J
Manganese	mg/kg	460.0	1100.0	246 J	564 J ^a	979 J ^a
Mercury	mg/kg	0.15	1.3	ND (0.0585)	0.0129 J	0.216 ^a
Nickel	mg/kg	16.0	50.0	12.8	15.4	56.3 ^{ab}
Potassium	mg/kg	NS	NS	2130 J	1740 J	2840 J
Selenium	mg/kg	NS	NS	12.7	13	8.76
Silver	mg/kg	1.0	2.2	ND (1.88)	ND (1.6)	ND (1.56)
Sodium	mg/kg	NS	NS	175 J	273	204
Thallium	mg/kg	NS	NS	ND (1.88)	ND (1.6)	ND (1.56)
Vanadium	mg/kg	NS	NS	22.2	22.7	57.9
Zinc	mg/kg	120.0	270.0	63	77.3	133 ^a
General Chemistry						
pH (soil)	S.U.	NS	NS	12	11	8.2

TABLE 2.7

SEDIMENT ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Metals	Units	NYSDEC		SW-16		SW-17		SW-17	
		Lowest Effect Level ^c	Severe Effect Level ^c	Sample ID: S-19867-08-03-PK-016	Sample Date: 8/14/2003	Sample ID: S-19867-08-03-PK-017	Sample Date: 8/14/2003	Sample ID: S-19867-0504-017	Sample Date: 5/12/2004
Aluminum	mg/kg	NS	NS	593	334	16800	17500		
Antimony	mg/kg	2.0	25.0	3.55 ^a	6.21 ^a	ND (1.08)	ND (2.66)		
Arsenic	mg/kg	6.0	33.0	4.55	ND (15.6)	5.60	5.63		
Barium	mg/kg	NS	NS	121	98.9	106	113		
Beryllium	mg/kg	NS	NS	0.120	ND (0.623)	0.665	0.847		
Cadmium	mg/kg	0.6	9.0	ND (0.700)	ND (0.623)	0.136	0.542		
Calcium	mg/kg	NS	NS	342000	353000	4980	4870		
Chromium Total	mg/kg	26.0	110.0	11.8	7.17	46.9 ^a	48.7 ^a		
Chromium VI (Hexavalent)	mg/kg	NS	NS	ND (6.0)	ND (6.8)	ND (5.3)	ND (5.9)		
Cobalt	mg/kg	NS	NS	0.183	ND (2.49)	12.6	10.9		
Copper	mg/kg	16.0	110.0	ND (2.80)	ND (4.99)	29.0 ^a	26.8 ^a		
Cyanide (total)	mg/kg	NS	NS	ND (0.770)	ND (0.986)	0.242	ND (0.790)		
Iron	mg/kg	20000	40000	763	417	31400 ^a	26200 ^a		
Lead	mg/kg	31.0	110.0	8.55	10.4	33.1 ^a	33.1 ^a		
Magnesium	mg/kg	NS	NS	721	385	4680	4980		
Manganese	mg/kg	460.0	1100.0	47.3	20.4	679 ^a	514 ^a		
Mercury	mg/kg	0.15	1.3	ND (0.0524)	ND (0.0572)	0.101	0.0766		
Nickel	mg/kg	16.0	50.0	1.63	ND (4.99)	28.9 ^a	26.2 ^a		
Potassium	mg/kg	NS	NS	223	73.3	2020	2290		
Selenium	mg/kg	NS	NS	10.7	ND (4.99)	4.34	ND (2.66)		
Silver	mg/kg	1.0	2.2	ND (1.40)	2.18 ^a	ND (1.08)	ND (1.33)		
Sodium	mg/kg	NS	NS	205	243	22.5	79.8		
Thallium	mg/kg	NS	NS	3.26	ND (12.5)	ND (1.08)	2.51		
Vanadium	mg/kg	NS	NS	2.30	1.72	36.7	35.5		
Zinc	mg/kg	120.0	270.0	47.2	23.7	148 ^a	232 ^a		
General Chemistry									
pH (soil)	S.U.	NS	NS	-	11	-	-		7.3

TABLE 2.7

SEDIMENT ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Sample Location: SW-18 SW-19 SW-20
Sample ID: SED-19867-08-03-PK-018 SED-19867-08-03-PK-019 SED-19867-08-03-PK-020
Sample Date: 8/21/2003 8/21/2003 8/21/2003

Metals	Units	NYSDEC		NYSDEC	Severe Effect Level ^c
		Lowest Effect Level ^c	Severe Effect Level ^c		
Aluminum	mg/kg	NS	NS	12400	19100
Antimony	mg/kg	2.0	25.0	ND (1.3)	ND (1.47)
Arsenic	mg/kg	6.0	33.0	6.16 ^a	6.41 ^a
Barium	mg/kg	NS	NS	120	134
Beryllium	mg/kg	NS	NS	0.538 J	0.864
Cadmium	mg/kg	0.6	9.0	ND (0.651)	ND (0.734)
Calcium	mg/kg	NS	NS	95200	57200
Chromium Total	mg/kg	26.0	110.0	65.4 J ^a	49.1 J ^a
Chromium VI (Hexavalent)	mg/kg	NS	NS	ND (5.3)	ND (5.8)
Cobalt	mg/kg	NS	NS	6.61	11.5
Copper	mg/kg	16.0	110.0	12.4	24.9 ^a
Cyanide (total)	mg/kg	NS	NS	ND (0.638)	ND (0.699)
Iron	mg/kg	20000	40000	21300 ^a	28500 ^a
Lead	mg/kg	31.0	110.0	22.7	12.3
Magnesium	mg/kg	NS	NS	8000 J	13000 J
Manganese	mg/kg	460.0	1100.0	583 J ^a	690 J ^a
Mercury	mg/kg	0.15	1.3	0.062	0.00865 J
Nickel	mg/kg	16.0	50.0	12.6	27.7 ^a
Potassium	mg/kg	NS	NS	1700 J	4580 J
Selenium	mg/kg	NS	NS	9.08	10.1
Silver	mg/kg	1.0	2.2	ND (1.3)	ND (1.47)
Sodium	mg/kg	NS	NS	178	297
Thallium	mg/kg	NS	NS	ND (1.3)	ND (1.47)
Vanadium	mg/kg	NS	NS	28.5	40.9
Zinc	mg/kg	120.0	270.0	97.7	72
General Chemistry					
pH (soil)	S.U.	NS	NS	8.2	8.3
					11

TABLE 2.7

SEDIMENT ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Sample Location: SW-21 SW-22 SW-23
Sample ID: SED-19867-08-03-PK-021 SED-19867-08-03-PK-022 SED-19867-08-03-PK-023
Sample Date: 8/21/2003 8/28/2003 8/21/2003

Metals	Units	NYSDEC		NYSDEC	Severe Effect Level ^c
		Lowest Effect Level ^c	Severe Effect Level ^c		
Aluminum	mg/kg	NS	NS	2300	18800
Antimony	mg/kg	2.0	25.0	3.57 ^a	2.67 ^a
Arsenic	mg/kg	6.0	33.0	ND (1.79)	ND (1.34)
Barium	mg/kg	NS	NS	160	174
Beryllium	mg/kg	NS	NS	0.0558 J	0.306 J
Cadmium	mg/kg	0.6	9.0	ND (0.897)	0.213 J
Calcium	mg/kg	NS	NS	277000	127000
Chromium Total	mg/kg	26.0	110.0	63.5 J ^a	1120 ^{ab}
Chromium VI (Hexavalent)	mg/kg	NS	NS	ND (7.7)	2.3 J
Cobalt	mg/kg	NS	NS	0.779 J	6.97
Copper	mg/kg	16.0	110.0	6.43	37.6 ^a
Cyanide (total)	mg/kg	NS	NS	ND (0.948)	0.358 J
Iron	mg/kg	20000	40000	3110	20100 ^a
Lead	mg/kg	31.0	110.0	25.9	89.0 ^a
Magnesium	mg/kg	NS	NS	9620 J	32300
Manganese	mg/kg	460.0	1100.0	215 J	731 ^a
Mercury	mg/kg	0.15	1.3	ND (0.0559)	0.0482
Nickel	mg/kg	16.0	50.0	3.16 J	52.6 ^{ab}
Potassium	mg/kg	NS	NS	300 J	1740
Selenium	mg/kg	NS	NS	16.7	14.2
Silver	mg/kg	1.0	2.2	ND (1.79)	ND (1.83)
Sodium	mg/kg	NS	NS	366	156
Thallium	mg/kg	NS	NS	1.42 J	ND (4.01)
Vanadium	mg/kg	NS	NS	5.86	48.7
Zinc	mg/kg	120.0	270.0	85.6	227 ^a
General Chemistry					
pH (soil)	S.U.	NS	NS	12	7.7 J
					11

TABLE 2.7

SEDIMENT ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Metals	Units	NYSDEC		Sample Location: Sample ID: SED-19867-08-03-PK-023RA Sample Date: 8/21/2003	SW-23 SED-19867-08-03-PK-025 8/21/2003 Duplicate	SW-24 SED-19867-08-03-PK-024 8/21/2003
		Lowest Effect Level ^c	Severe Effect Level ^c			
Aluminum	mg/kg	NS	NS	--	15900	23300
Antimony	mg/kg	2.0	25.0	--	ND (1.97)	ND (1.45)
Arsenic	mg/kg	6.0	33.0	--	8.88 ^a	7.89 ^a
Barium	mg/kg	NS	NS	--	125	182
Beryllium	mg/kg	NS	NS	--	0.288 J	1.09
Cadmium	mg/kg	0.6	9.0	--	ND (0.985)	ND (0.726)
Calcium	mg/kg	NS	NS	--	142000	15200
Chromium Total	mg/kg	26.0	110.0	--	289 J ^b	55.1 J ^a
Chromium VI (Hexavalent)	mg/kg	NS	NS	4.9 J	ND (8.2)	ND (5.8)
Cobalt	mg/kg	NS	NS	--	4.46	15.9
Copper	mg/kg	16.0	110.0	--	25.6 ^a	27.5 ^a
Cyanide (total)	mg/kg	NS	NS	--	0.563 J	ND (0.68)
Iron	mg/kg	20000	40000	--	10300	32200 ^a
Lead	mg/kg	31.0	110.0	--	64.5 ^a	28.4
Magnesium	mg/kg	NS	NS	--	28100 J	11900 J
Manganese	mg/kg	460.0	1100.0	--	562 J ^a	923 J ^a
Mercury	mg/kg	0.15	1.3	--	0.0256 J	0.0354 J
Nickel	mg/kg	16.0	50.0	--	18 ^a	33.3 ^a
Potassium	mg/kg	NS	NS	--	1070 J	3520 J
Selenium	mg/kg	NS	NS	--	14.9	8.16
Silver	mg/kg	1.0	2.2	--	ND (1.97)	ND (1.45)
Sodium	mg/kg	NS	NS	--	382	181
Thallium	mg/kg	NS	NS	--	ND (1.97)	ND (1.45)
Vanadium	mg/kg	NS	NS	--	19	47.8
Zinc	mg/kg	120.0	270.0	--	248 ^a	170 ^a
General Chemistry						
pH (soil)	S.U.	NS	NS	--	11	7.7

TABLE 2.7

SEDIMENT ANALYTICAL RESULTS
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

Notes:

- ND () - Non detect at associated value.
- NS - No Standard.
- J - Estimated value.
- - Not Applicable.
- a - Indicates an exceedance of the NYSDEC Lowest Effect Level.
- b - Indicates an exceedance of the NYSDEC Severe Effect Level.
- c - Technical Guidance for Screening Contaminated Sediments, NYSDEC, January 25, 1999.

TABLE 2.8

pH MEASUREMENTS - APRIL 7, 2004
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK

<i>Surface Water Location</i>	<i>pH Measurement</i>
SW-8	DRY
SW-9	7.07
SW-10	DRY
SW-11	6.35
SW-12	6.16*
SW-13	11.87
SW-14	11.91
SW-15	12.05
SW-16	11.28*
SW-17	9.40*
SW-18	11.94
SW-19	11.74
SW-20	11.79
SW-21	10.00
SW-22	DRY
SW-23	9.25
SW-24	8.89

Note:

* - Measurement taken from approximate location as stake/marker not found.

TABLE 2.9
CAP MATERIAL ANALYSIS SUMMARY
VANADIUM CORPORATION OF AMERICA SITE
NIAGARA FALLS, NEW YORK

Location	Depth (bgs)	Percent Components (%)			Liquid Limit	Plastic Limit	Plasticity Index	Maximum Dry Density (pcf)	Optimum Moisture (%)	Hydraulic Conductivity (cm/sec)	
		Gravel	Sand	Silt Clay							
MW-23	0-6 inches	1.2	28.1	44.8	25.9	38	30	8	99.4	17.1	$5.77 \times 10^{-7(1)}$
MW-24	0-6 inches	2.6	19.3	39.2	38.9	37	22	15	104.8	15.0	$7.52 \times 10^{-8(2)}$
MW-21	0-6 inches	2.3	25.0	39.1	33.6	44	27	17	103.9	15.6	$8.72 \times 10^{-8(3)}$

Notes:

- (1) - 95.4% compaction at 17.2% moisture.
- (2) - 94.1% compaction at 14.8% moisture.
- (3) - 94.6% compaction at 15.3% moisture.

TABLE 2.10

**COMMUNITY AIR MONITORING SUMMARY - MONITORING WELLS
VANADIUM CORPORATION OF AMERICA SITE
NIAGARA FALLS, NEW YORK**

Monitoring Well ID	Date	Time Elapsed ⁽¹⁾ (minute)	Concentration (mg/m ³)	TWA (mg/m ³)	Distance Downwind of MW (feet)	Temperature (°F)	Relative Humidity (%)	Wind	
								Speed (mph)	Direction
<i>Monitoring Well Installation</i>									
MW-22	7/22/2003	18	0.022	0.038	20	73.7	73	5.6	From NE
MW-25	7/23/2003	5.9	0.029	0.034	20	65	94	2.5	From E
MW-26	7/23/2003	60	0.012	0.017					
		3	0.002	0.005	25				
		50	0.006	0.002					
		83	0.009	0.004					
BH-12	7/23/2003	2	0.025	0.039	15	67.2	85	5.4	From SSE
		68	0.070	0.000					
MW-19	7/23/2003	59	0.000	0.000	15				
MW-15	7/24/2003	7	0.093	0.028	25	73.5	77	5.6	From SW
		57	0.014	0.028					
MW-16	7/24/2003	1	0.017	0.012	15				
MW-20	7/25/2003	15	0.021	0.020	45	66.8	80	4.9	From S
		58	0.018	0.018					
MW-23	7/25/2003	10	0.016	0.018	20				
		135	0.015	0.018					
		218	0.016	0.018					
MW-24	7/28/2003	60	0.004	0.006	25	75	NM	NM	NM
MW-18	7/28/2003	100	0.003	0.005					
MW-27	7/28/2003	10	0.003	0.007	25				
		1	0.029	0.000	25	80	NM	NM	NM
		25	0.025	0.022					
<i>Cap Sampling</i>									
MW-23	8/19/2003	2	0.005	NA	25	77	NM	NM	NM

Notes:

- (1) - Time elapsed since start of drilling at a particular monitoring well location.
NM - No measurement recorded.

TABLE 2.11

COMMUNITY AIR MONITORING SUMMARY - TEST PITS
 VANADIUM CORPORATION OF AMERICA SITE
 NIAGARA FALLS, NEW YORK

Monitoring Well ID	Date	Time	Concentration (mg/m ³)	TWA (mg/m ³)	Distance Downwind of MW ⁽¹⁾ (feet)	Weather Conditions	
TP-1	7/30/2003	9:51	0.024	0.030	25	Sunny; approx. 80°F; very light breeze from SSW; humidity approx. 60%	
		10:02	0.028	0.028	20		
		10:06	0.033	0.110	20		
TP-2	7/30/2003	10:23	0.048	0.042	10		
		10:51	0.039	0.038	20		
		11:07	0.040	0.058	20		
TP-3	7/30/2003	11:15	0.060	0.047	20		
		11:45	0.045	--	20		
TP-6	7/30/2003	13:05	0.035	--	25		
TP-7	7/30/2003	14:05	0.022	--	25		
TP-8	7/30/2003	14:45	NR	--	NA		
TP-9	7/30/2003	15:30	NR	--	NA		
TP-21	7/31/2003	8:46	0.062	--	20	Overcast with breaks; approx. 75°F	
TP-20	7/31/2003	9:50	0.070	--	20		
TP-10	7/31/2003	10:45	0.060	--	20		
TP-11	7/31/2003	14:10	0.080	--	20		
TP-12	7/31/2003	15:20	0.071	--	20		
TP-13	8/1/2003	7:55	0.101	--	25		
TP-14	8/1/2003	9:00	0.090	--	25		
TP-17	8/18/2003	9:46	0.054	--	25		
TP-16	8/18/2003	10:27	0.065	--	25		Sunny; approx. 72°F
		10:37	0.048	--	25		
TP-15	8/18/2003	11:35	0.076	--	25		
		15:10	0.096	--	25		
TP-18	8/18/2003	15:23	0.072	--	25		
TP-19	8/18/2003	15:52	0.068	--	25		
		16:55	0.057	--	25		
TP-5	8/19/2003	8:18	0.043	--	25	Sunny; approx. 72°F	
		9:20	0.035	--	25		

TABLE 2.11

COMMUNITY AIR MONITORING SUMMARY - TEST PITS
 VANADIUM CORPORATION OF AMERICA SITE
 NIAGARA FALLS, NEW YORK

Monitoring Well ID	Date	Time	Concentration (mg/m ³)	TWA (mg/m ³)	Distance Downwind of MW ⁽¹⁾ (feet)	Weather Conditions
TP-4	8/19/2003	10:20	0.026	--	25	
		11:25	0.040	--	25	
TP-2 (Attempt 3)	8/19/2003	13:12	0.054	--	25	
		14:10	0.066	--	25	

Notes:

- (1) - Several distances may exist for one Test Pit location. Relocated meter to compensate for additional attempts at delineating slag.
- (2) - Stopped taking TWA readings due to frequent movement and relocation.
- TWA - Time Weighted Average
- NA - Not Applicable
- NM - No measurement taken
- NR - No reading because battery dead; replaced

ATTACHMENT A
WELL INSPECTION LOGS

19867
FIELD FILE

WELL INSPECTION LOG

Project No. 19867

Well ID: MW105A

Well Depth: 4.74 + tip (8.4 cm) BTOR

Size and Type of Riser: 2" PVC

Inspection Item

Condition (check)

Inspection Item	Condition (check)		Comments
	Satisfactory	Unsatisfactory	
Well Cap		✓	
Locking Device	✓		
Surface Seal	✓		
Sampling Device	✓		teflon bailer
Protective Casing	✓		
Identification	✓		

Yes

No

Comments

Change In Measuring
Point Elevation

✓

Re-survey Required

✓

Repairs Required

✓

Comments

Water level = 2.327 m + ~~0.084 m~~ BTOR

+ 8.4 cm

Inspected By:

Jamie Puskas / John Hoffman

Date:

1/9/03

WELL INSPECTION LOG

Project No. 19867

Well ID: MW105B

Well Depth: 9.73 m + 8.4 cm

Size and Type of Riser: 2" PVC

Inspection Item	Condition (check)		Comments
	Satisfactory	Unsatisfactory	
Well Cap	✓	✗	
Locking Device	✓		
Surface Seal	✓		
Sampling Device	✓		<u>teflon bailer</u>
Protective Casing	✓		
Identification	✓		
	Yes	No	Comments
Change In Measuring Point Elevation		✓	
Re-survey Required		✓	
Repairs Required		✓	

Comments WL = 3.211 m BTOR

Inspected By: Jamie Pustas/John Hoffman

Date: 1/9/03

WELL INSPECTION LOG

Project No. 19867

Well ID: MW104A

Well Depth: 6.45 m + 8.4 cm

Size and Type of Riser: 2" PVC

Inspection Item	Condition (check)		Comments
	Satisfactory	Unsatisfactory	
Well Cap	✓		
Locking Device	✓		
Surface Seal	✓		
Sampling Device	✓		<u>teflon boater</u>
Protective Casing	✓		
Identification	✓		
	Yes	No	Comments
Change In Measuring Point Elevation		✓	
Re-survey Required		✓	
Repairs Required		✓	

Comments WL = 3.977 m

Inspected By: Jamie P. / John H.

Date: 1/9/03

WELL INSPECTION LOG

Project No. 19867

Well ID: MW104B

Well Depth: 11.435 m + 8.4 cm

Size and Type of Riser: 2" PVC

Inspection Item	Condition (check)		Comments
	Satisfactory	Unsatisfactory	
Well Cap	✓		
Locking Device	✓		
Surface Seal	✓		
Sampling Device	✓		<u>teflon hoister</u>
Protective Casing	✓		
Identification	✓		
	Yes	No	Comments
Change In Measuring Point Elevation		✓	
Re-survey Required		✓	
Repairs Required		✓	

Comments WE = 3.899 m BTOR

Inspected By: Jamie P. / John H.

Date: 1/9/03

WELL INSPECTION LOG

Project No. 19867

Well ID: MW102B

Well Depth: 16.480 m + 8.4 cm

Size and Type of Riser: 2" PVC

Inspection Item	Condition (check)		Comments
	Satisfactory	Unsatisfactory	
Well Cap	✓		
Locking Device	✓		
Surface Seal		✓	- cracked
Sampling Device		✓	
Protective Casing	✓		
Identification	✓		
	Yes	No	Comments
Change In Measuring Point Elevation		✓	
Re-survey Required		✓	
Repairs Required		✓	

Comments WL = 11.951 m

Inspected By: Janie Parker / John Hoffman

Date: 1/9/03

WELL INSPECTION LOG

Project No. 19867

Well ID: MW102A

Well Depth: 3.635 m + 8.4 cm

Size and Type of Riser: 2" PVC

Inspection Item	Condition (check)		Comments
	Satisfactory	Unsatisfactory	
Well Cap	✓		
Locking Device	✓		
Surface Seal	✓		
Sampling Device	✓		<u>fe flon heater</u>
Protective Casing	✓		
Identification	✓		
	Yes	No	Comments
Change In Measuring Point Elevation		✓	
Re-survey Required		✓	
Repairs Required		✓	

Comments WL = 3.613 m

Inspected By: Jamie P. / John H.

Date: 1/9/03

WELL INSPECTION LOG

Project No. 19867

Well ID: - MW-7A

Well Depth: 3.52 m + 8.4 cm

Size and Type of Riser: 2" PVC

Inspection Item

Condition (check)

Inspection Item	Condition (check)		Comments
	Satisfactory	Unsatisfactory	
Well Cap	✓		
Locking Device	✓		
Surface Seal		✓	<u>none</u>
Sampling Device	✓		<u>telfon bailer</u>
Protective Casing	✓		
Identification	✓ X	✓ X	

Yes

No

Comments

Change In Measuring Point Elevation

 ✓

Re-survey Required

 ✓

Repairs Required

 ✓

Comments

WL = ~~2.75~~ 2.744m

Inspected By:

Jamie P. / John H.

Date:

1/9/03

WELL INSPECTION LOG

Project No. 19867

Well ID: MW-7B

Well Depth: 7.38m + 8.4 cm

Size and Type of Riser: 2" PVC

Inspection Item

Condition (check)

	Condition (check)		Comments
	Satisfactory	Unsatisfactory	
Well Cap	✓		
Locking Device	✓		
Surface Seal		✓	none
Sampling Device	✓		teflon bailer
Protective Casing	✓		
Identification	✓		

	Yes	No	Comments
Change In Measuring Point Elevation		✓	
Re-survey Required		✓	
Repairs Required		✓	

Comments WL = 2.215 m

Inspected By: Jamie P. / John H.

Date: 1/9/03

WELL INSPECTION LOG

Project No. 19867

Well ID: MW-6B

Well Depth: 7.345 m + 8.4 cm

Size and Type of Riser: 2" PVC

Inspection Item	Condition (check)		Comments
	Satisfactory	Unsatisfactory	
Well Cap	✓		
Locking Device	✓		
Surface Seal		✓	<u>None</u>
Sampling Device	✓		<u>teflon baiter</u>
Protective Casing	✓		
Identification	✓		

	Yes	No	Comments
Change In Measuring Point Elevation		✓	
Re-survey Required		✓	
Repairs Required		✓	

Comments WL = 2.304 m

Inspected By: Jamie P. / John H.

Date: 1/9/03

WELL INSPECTION LOG

Project No. 19867

Well ID: MW-6A

Well Depth: 4.245m + 8.4cm

Size and Type of Riser: 2" PVC

Inspection Item	Condition (check)		Comments
	Satisfactory	Unsatisfactory	
Well Cap	✓		
Locking Device	✓		
Surface Seal		✓	<u>none</u>
Sampling Device	✓		<u>teflon</u>
Protective Casing	✓		
Identification	✓		
	Yes	No	Comments
Change In Measuring Point Elevation		✓	
Re-survey Required		✓	
Repairs Required		✓	

Comments WL = 1.565 m

Inspected By: Jamie P. / John H.

Date: 1/9/03

WELL INSPECTION LOG

Project No. 19867

Well ID: MW-103

Well Depth: 10.734m + 8.4cm

Size and Type of Riser: 2" PVC

Inspection Item	Condition (check)		
	Satisfactory	Unsatisfactory	Comments
Well Cap	✓		
Locking Device	✓		
Surface Seal	✓		
Sampling Device	✓		<u>left on baiter</u>
Protective Casing	✓		
Identification	✓		

	Yes	No	Comments
Change In Measuring Point Elevation		✓	
Re-survey Required		✓	
Repairs Required		✓	

Comments WL = 3.667m

Inspected By: Jamie P. / John H.

Date: 1/9/13

WELL INSPECTION LOG

Project No. 19867

Well ID: MW-103A

Well Depth: 5.655 m + 8.4

Size and Type of Riser: _____

Inspection Item	Condition (check)		Comments
	Satisfactory	Unsatisfactory	
Well Cap	✓		
Locking Device	✓		
Surface Seal	✓		-but hole in seal by casing
Sampling Device	✓		
Protective Casing	✓		
Identification	✓		
	Yes	No	Comments
Change In Measuring Point Elevation		✓	
Re-survey Required		✓	
Repairs Required		✓	

Comments WL = 2.175 m

Inspected By: Jamie P. / John H.

Date: 1/9/03

WELL INSPECTION LOG

USGS-6A

Project No. 10367

Well ID:

Well Depth: 2.67 m + 8.4 cm

Size and Type of Riser: 2" PVC

Inspection Item	Condition (check)		Comments
	Satisfactory	Unsatisfactory	
Well Cap	✓		
Locking Device		✓	
Surface Seal		✓	none
Sampling Device		✓	none
Protective Casing	✓		
Identification	✓		
	Yes	No	Comments
Change In Measuring Point Elevation		✓	
Re-survey Required		✓	
Repairs Required		✓	

Comments - PVC stick-up is ~~is~~ detached from riser section at ground surface

Inspected By: Jamie P. / John H.

Date: 1/9/23

WELL INSPECTION LOG

USGS-6B

Project No. 19867

Well ID: _____

Well Depth: 1.05 m + 8.4 cm

Size and Type of Riser: 2" PVC

Inspection Item

Condition (check)

Inspection Item	Condition (check)		Comments
	Satisfactory	Unsatisfactory	
Well Cap	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Locking Device	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Surface Seal	<input type="checkbox"/>	<input checked="" type="checkbox"/>	None
Sampling Device	<input type="checkbox"/>	<input type="checkbox"/>	None
Protective Casing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Identification	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

	Yes	No	Comments
Change In Measuring Point Elevation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Re-survey Required	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Repairs Required	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Comments _____

Inspected By: Jamie P. / John H.

Date: 1/9/03

ATTACHMENT B

TEST PIT LOGS

TEST PIT STRATIGRAPHY LOG

PROJECT NAME VANADIUM
 PROJECT NUMBER 19867
 CLIENT PHELPS DODGE
 LOCATION AS PER PLAN (NIAGARA FALLS, NY)
 CONTRACTOR SUB ANDY
 SURFACE ELEVATION _____
 WEATHER (A.M.) _____
 (P.M.) _____

TEST PIT DESIGNATION TP-4
 DATE/TIME STARTED 08/19/03 10:15
 DATE/TIME COMPLETED 08/19/03 11:20
 TEST PIT METHOD BACK HOE
 CRA SUPERVISOR C. SIMMONS

STRATIGRAPHIC INTERVALS (DEPTHS IN ft./m BGS)		SAMPLE DESCRIPTION	SAMPLE DETAILS		GEOLOGIC PROFILE
FORM	DEPTH	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 #	INTERVAL / FIELD (ppm)	
0	1.5	FILL AND SLAG - DARK BROWN FILL AND LIGHT GREY-WHITE SLAG (SLAG ~1ft. THICK)			
1.0	3.0	CLAY (NATIVE) - MEDIUM BROWN, CLAYEY (VISIBLE BUCKET MARKS), GRAY AND BROWN MOTTLING			
					LOOKING SOUTH
					LOOKING NORTH

NOTES AND COMMENTS



TEST PIT STRATIGRAPHY LOG

PROJECT NAME VANADIUM
 PROJECT NUMBER 19867
 CLIENT PHELPS DODGE
 LOCATION AS PER PLAN (NIAGARA FALLS, NY)
 CONTRACTOR SJB
 SURFACE ELEVATION JEFF
 WEATHER (A.M.)
 (P.M.)

TEST PIT DESIGNATION TP-11
 DATE/TIME STARTED 07/31/03 13:10
 DATE/TIME COMPLETED 07/31/03 14:15
 TEST PIT METHOD BACK HOE
 CRA SUPERVISOR C. SIMMONS

STRATIGRAPHIC INTERVALS (DEPTHS IN ft/m BGS)		SAMPLE DESCRIPTION	SAMPLE DETAILS	GEOLOGIC PROFILE
F R O M	T O	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 <small>NOTE: PLASTICITY DETERMINATION REQUIRES THE ADDITION OF MOISTURE IF THE SAMPLE IS TOO DRY TO ROLL (INDICATE IF MOISTURE WAS ADDED OR NOT).</small>	S A M P L E #	P I D / F I D (ppm)
0	0.5	FILL - TRACE ORGANICS AND TRACE SLAG		
0.5	1.0	SLAG - LIGHT GREY, FROM SOUTH END IT RUNS APPROX. 1.5 ft.		
1.0	1.7	FILL - MEDIUM BROWN		
1.7	2.0	ROCK - LIGHT BLuish-GREY, TOO HARD TO DIG THROUGH		
		SAME LOG DESCRIPTION AS ABOVE		

NOTES AND COMMENTS



TEST PIT STRATIGRAPHY LOG

PROJECT NAME VANADIUM CONTRACTOR SUB ANDY TEST PIT DESIGNATION TP-15A
 PROJECT NUMBER 19867 SURFACE ELEVATION _____ DATE/TIME STARTED 08/18/03 13:00
 CLIENT PHELPS DODGE WEATHER (A.M.) _____ DATE/TIME COMPLETED 08/18/03 15:00
 LOCATION (NIAGARA FALLS, NY) (P.M.) _____ TEST PIT METHOD BACK HOE
 _____ _____ CRA SUPERVISOR C. SIMMONS

STRATIGRAPHIC INTERVALS (DEPTHS IN ft./m BGS)		SAMPLE DESCRIPTION	SAMPLE DETAILS	GEOLOGIC PROFILE
FROM	TO	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).	S I D / F I D (ppm) S A M P L E # S A M P L E #	
0	1.0	FILL - MEDIUM BROWN, TRACE ORGANICS		
1.0	~2	SLAG - LIGHT GRAY		
~2	5.0	FILL - MOST OF THE TEST PIT TO 5ft BGS; SOME AREAS ONLY TO 2 OR 3ft. BGS (SEE GEOLOGIC PROFILE)		
		SAME LOG DESCRIPTION AS ABOVE		

NOTES AND COMMENTS



TEST PIT STRATIGRAPHY LOG

PROJECT NAME VANADIUM
 PROJECT NUMBER 19867
 CLIENT PHELPS DODGE
 LOCATION AS PER PLAN
(NIAGARA FALLS, NY)

CONTRACTOR SUB
ANDY
 SURFACE ELEVATION _____
 WEATHER (A.M.)
(P.M.)

TEST PIT DESIGNATION TP-19
 DATE/TIME STARTED 08/18/03 15:50
 DATE/TIME COMPLETED 08/18/03 16:55
 TEST PIT METHOD BACK HOE
 CRA SUPERVISOR J. RABY / C. SIMMONS

STRATIGRAPHIC INTERVALS (DEPTHS IN ft/m BGS)		SAMPLE DESCRIPTION	SAMPLE DETAILS	GEOLOGIC PROFILE
FROM	TO	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).	S A M P L E #	S I D E I N T E R V A L
			P I D / F I D (ppm)	
0	2.0	FILL - GREYISH BROWN. TRACE ORGANICS IN TOP 1ft. BGS.		
2.0	6.0	SILTY SAND - MEDIUM BROWN w/ GREY MOTTLING		
		SAME LOG DESCRIPTION AS ABOVE		

NOTES AND COMMENTS



ATTACHMENT C

MONITORING WELL/BOREHOLE STRATIGRAPHIC LOGS



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: PHASE I RFI
 PROJECT NUMBER: 19867-00
 CLIENT: Vanadium Corporation of America
 LOCATION: Niagara Falls, New York

HOLE DESIGNATION: BH-12
 DATE COMPLETED: July 23, 2003
 DRILLING METHOD: 4 1/4 Inch HSA
 FIELD PERSONNEL: P. Kryger/ C. Simmons

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	Borehole	SAMPLE			
				NUMBER	INTERVAL	REC (%)	'N' VALUE
2	<p>TOPSOIL - silty material with roots and other organics, non-plastic, slightly cohesive, dark brown, dry, no odor</p> <p>SLAG (FILL) - silt sized particles, fine to coarse grained, non-cohesive, yellow to gray, dry, no odor</p> <p>FILL - silt to sand sized grains, with clayey silt inclusions, trace fine gravel, dark brown with trace yellow coloring, trace slightly metallic silt</p> <p>SLAG (FILL) - fine to coarse grained, non-cohesive, medium to dark gray, dry</p>	0.50 2.00 4.00 6.50	<p style="text-align: center;">8" Ø Borehole</p> <p style="text-align: center;">Bentonite</p>	1	X	50	10
4	<p>FILL - fine grained, poorly graded, non-cohesive, medium brown, dry, no odor</p> <p>- silt to coarse gravel sized particles, non-cohesive, dry, fracturing like a shale at 6.8ft BGS</p> <p>- silt with sand, trace fine gravel, non-cohesive, medium brown, very slightly damp at 7.2ft BGS</p> <p>- trace clay, light to medium brown, very slightly moist, no odor, with pieces of rock at 8.0ft BGS</p>	6.50		2	X	29	>50
6	END OF BOREHOLE @ 10.0ft BGS	12.00		3	X	25	43
8	Refusal at 10 ft bgs.			4	X	75	57
10				5	X	46	>50
12				6	X	25	>50

OVERBURDEN LOG 19867 BH AND MW/GPJ CRA CORP GDT 7/13/04

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
 WATER FOUND ▼ 07/23/2003
 CHEMICAL ANALYSIS ○



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: PHASE I RFI
 PROJECT NUMBER: 19867-00
 CLIENT: Vanadium Corporation of America
 LOCATION: Niagara Falls, New York

HOLE DESIGNATION: MW-15
 DATE COMPLETED: July 24, 2003
 DRILLING METHOD: 4 1/4 Inch HSA
 FIELD PERSONNEL: P. Kryger/ C. Simmons

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE			
				NUMBER	INTERVAL	REC (%)	'N' VALUE
	TOP OF CASING GROUND SURFACE TOP OF RISER	601.51 601.35 601.19					
2	CL - SILTY CLAY - trace sand and gravel, non-cohesive, medium brown, slightly moist, no odor, trace organics - no trace sand or gravel, slightly plastic, cohesive, light to medium brown at 0.5ft BGS		<p style="text-align: center;">WELL DETAILS Screened interval: 592.95 to 587.95ft AMSL 8.40 to 13.40ft BGS Length: 5ft Diameter: 2in Slot Size: 10 Material: PVC Seal: 598.35 to 594.95ft AMSL 3.00 to 6.40ft BGS Material: Bentonite Chips Sand Pack: 594.95 to 587.85ft AMSL 6.40 to 13.50ft BGS Material: #2 Sand</p>	1		42	7
4	CL - SILTY CLAY - slightly plastic, cohesive, medium to reddish brown with gray mottling, very slightly moist, no odor	597.35		2		50	29
6	CL - CLAY - plastic, cohesive, light to medium reddish brown with gray mottling, slightly moist, no odor, malleable	595.35		3		100	14
8				4		100	22
10	- very plastic, trace organics at 10.0ft BGS			5		33	3
12	CH - SANDY CLAY - with gravel, plastic, cohesive, medium brown with gray mottling, very moist, no odor - wet at 12.0ft BGS	590.05		6		100	7
14	- with fractured bedrock, dark brown, non-plastic, non-cohesive at 12.5ft BGS END OF BOREHOLE @ 14.0ft BGS	587.35		7		50	28

OVERBURDEN LOG 19867 BH AND MW.GPJ, CRA, CORP.GDT 7/13/04

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
 WATER FOUND ∇ 07/24/2003
 CHEMICAL ANALYSIS ○



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: PHASE I RFI

HOLE DESIGNATION: MW-16

PROJECT NUMBER: 19867-00

DATE COMPLETED: July 23, 2003

CLIENT: Vanadium Corporation of America

DRILLING METHOD: 4 1/4 Inch HSA

LOCATION: Niagara Falls, New York

FIELD PERSONNEL: P. Kryger

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE			
				NUMBER	INTERVAL	REC (%)	'N' VALUE
	TOP OF CASING GROUND SURFACE TOP OF RISER	601.06 600.94 600.09					
2	TOPSOIL - clay with silt, trace fine gravel, plastic, medium brown, very slightly moist, no odor, trace organics			1	X	25	6
		598.94		2	X	37.5	10
4	CL - SILTY CLAY - trace very fine gravel, slightly plastic, cohesive, light to medium brown with gray mottling, dry, no odor			3	X	83	12
6	CL - CLAY - with silt, very slightly plastic, cohesive, light to medium brown with light beige to gray mottling, very slightly moist, no odor - slight plasticity at 6.0ft BGS	596.94		4	X	87.5	20
8	- slightly moist at 7.5ft BGS - trace silt, trace gray mottling at 8.0ft BGS			5	X	83	8
10	- moist at 9.5ft BGS			6	X	75	8
12	CH - CLAY - plastic, cohesive, medium reddish brown with trace faint mottling, moist, no odor - with bedrock pieces at 12.3ft BGS	590.44		7	X	42	26
14	END OF BOREHOLE @ 14.0ft BGS	586.94					
16			WELL DETAILS Screened interval: 592.44 to 587.44ft AMSL 8.50 to 13.50ft BGS Length: 5ft Diameter: 2in Slot Size: 10 Material: PVC Seal: 597.94 to 594.44ft AMSL 3.00 to 6.50ft BGS Material: Bentonite Chips Sand Pack: 594.44 to 586.94ft AMSL 6.50 to 14.00ft BGS Material: #2 Sand				

OVERBURDEN LOG 19867 BH AND MW/GPJ CRA_CORP.GDT 7/13/04

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
 WATER FOUND ∇ 07/23/2003
 CHEMICAL ANALYSIS ○



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: PHASE I RFI
 PROJECT NUMBER: 19867-00
 CLIENT: Vanadium Corporation of America
 LOCATION: Niagara Falls, New York

HOLE DESIGNATION: MW-17
 DATE COMPLETED: August 20, 2003
 DRILLING METHOD: 4 1/4 Inch HSA
 FIELD PERSONNEL: C. Simmons

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE			
				NUMBER	INTERVAL	REC (%)	'N' VALUE
	TOP OF CASING GROUND SURFACE TOP OF RISER	601.69 601.68 601.01					
2	FILL - silty clay, trace fine gravel, low plasticity, cohesive, medium brown with gray mottling, dry, no odor, trace organics		<p style="font-size: small;">Concrete 8" Ø Borehole 2" Ø Riser Bentonite Chips Sand Pack 2" Ø Screen</p>	1	X	17	7
4	CL - SILTY CLAY - slightly plastic, cohesive, medium brown with gray mottling, very slightly moist, no odor	597.68		2	X	25	26
6	- slightly moist at 7.2ft BGS			3	X	50	22
8				4	X	83	28
10	- plastic, very moist at 10.6ft BGS			5	X	75	13
12	- wet at 12.0ft BGS - with rounded rock fragments that are coarse gravel in size at 12.6ft BGS			6	X	58	14
14	END OF BOREHOLE @ 14.0ft BGS	587.68		7	X	92	9
16			<p style="font-size: small;"><u>WELL DETAILS</u> Screened interval: 593.68 to 588.68ft AMSL 8.00 to 13.00ft BGS Length: 5ft Diameter: 2in Slot Size: 10 Material: PVC Seal: 598.68 to 595.68ft AMSL 3.00 to 6.00ft BGS Material: Bentonite Chips Sand Pack: 595.68 to 587.68ft AMSL 6.00 to 14.00ft BGS Material: #2 Sand</p>				
18							
20							
22							
24							
26							
28							

OVERBURDEN LOG 19867 BH AND MW.GPJ, GRA, CORP.GDT 7/13/04

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
 WATER FOUND ∇ 08/20/2003
 CHEMICAL ANALYSIS



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: PHASE I RFI
 PROJECT NUMBER: 19867-00
 CLIENT: Vanadium Corporation of America
 LOCATION: Niagara Falls, New York

HOLE DESIGNATION: MW-18
 DATE COMPLETED: July 28, 2003
 DRILLING METHOD: 4 1/4 Inch HSA
 FIELD PERSONNEL: J. Raby

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE			
				NUMBER	INTERVAL	REC (%)	'N' VALUE
	TOP OF CASING GROUND SURFACE TOP OF RISER	613.02 612.94 611.98					
2	TOPSOIL	612.34	<p style="font-size: small;">8" Ø Borehole Bentonite Chips 2" Ø Riser Sand Pack 2" Ø Screen</p>	1	X	45	27
4	SLAG (FILL)			2	X	10	20
6				3	X	15	7
8				4	X	15	>50
10				5	X	10	11
12				6	X	55	19
14	CL - CLAY	599.94		7	X	40	13
14	END OF BOREHOLE @ 14.0ft BGS	598.94					
16			<p style="font-size: small;">WELL DETAILS Screened interval: 604.44 to 599.44ft AMSL 8.50 to 13.50ft BGS Length: 5ft Diameter: 2in Slot Size: 10 Material: PVC Seal: 611.94 to 606.44ft AMSL 1.00 to 6.50ft BGS Material: Bentonite Chips Sand Pack: 606.44 to 598.94ft AMSL 6.50 to 14.00ft BGS Material: #2 Sand</p>				
18							
20							
22							
24							
26							
28							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 19867 BH AND MW.GPJ CRA_CORP.GDT 7/13/04



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: PHASE I RFI

HOLE DESIGNATION: MW-19

PROJECT NUMBER: 19867-00

DATE COMPLETED: July 23, 2003

CLIENT: Vanadium Corporation of America

DRILLING METHOD: 4 1/4 Inch HSA

LOCATION: Niagara Falls, New York

FIELD PERSONNEL: P. Kryger/ C. Simmons

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE			
				NUMBER	INTERVAL	REC (%)	'N' VALUE
	TOP OF CASING GROUND SURFACE TOP OF RISER	605.63 605.50 605.39					
2	TOPSOIL - with slag and sand sized grains, trace gravel, non-cohesive, medium brown to gray, dry, no odor, with organics	605.25	<p style="font-size: small;">Bentonite Chips 2" Ø Riser 8" Ø Borehole Sand Pack 2" Ø Screen</p>	1	X	79	43
4	SLAG (FILL) - sand sized with graded sized particles, non-cohesive, light to medium gray with trace brown, dry, no odor			2	X	100	50
6	- becomes wet at 3.8ft BGS	601.50		3	X	100	42
8	CL - SILTY CLAY - trace fine gravel, non-plastic, cohesive, gray, very slightly moist, trace organics	600.50		4	X	12.5	>50
10	CL - CLAY - trace silt, non-plastic, cohesive, medium brown to gray, dry, no odor			5	X	67	26
12	- medium brown with trace gray mottling, moist to slightly wet (more moisture from 9 to 10 ft), slightly pliable at 8.0ft BGS			6	X	100	13
12	- trace fine gravel, medium to reddish brown with trace gray to light beige mottling, moist, pliable at 10.8ft BGS						
12	END OF BOREHOLE @ 12.0ft BGS	593.50					
14							
16							
18							
20							
22							
24							
26							
28							

WELL DETAILS
 Screened interval:
 600.50 to 595.50ft AMSL
 5.00 to 10.00ft BGS
 Length: 5ft
 Diameter: 2in
 Slot Size: 10
 Material: PVC
 Seal:
 604.50 to 602.50ft AMSL
 1.00 to 3.00ft BGS
 Material: Bentonite Chips
 Sand Pack:
 602.50 to 593.50ft AMSL
 3.00 to 12.00ft BGS
 Material: #2 Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
 WATER FOUND ▼ 07/23/2003
 CHEMICAL ANALYSIS ○

OVERBURDEN LOG 19867 BH AND MW.GPJ CRA_CORP.GDT 7/13/04



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: PHASE I RFI
 PROJECT NUMBER: 19867-00
 CLIENT: Vanadium Corporation of America
 LOCATION: Niagara Falls, New York

HOLE DESIGNATION: MW-20
 DATE COMPLETED: July 25, 2003
 DRILLING METHOD: 4 1/4 Inch HSA
 FIELD PERSONNEL: P. Kryger

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE			
				NUMBER	INTERVAL	REC (%)	'N' VALUE
	TOP OF CASING GROUND SURFACE TOP OF RISER	607.38 607.32 607.17					
2	FILL - sand and gravel, with slag, well graded, non-cohesive, medium brown and gray, dry, no odor	605.32	<p style="font-size: small;">Bentonite Chips 2" Ø Riser 8" Ø Borehole Sand Pack 2" Ø Screen</p>	1	X	37.5	22
4	FILL - silt, with sand and gravel, trace clay, pieces of slag throughout, non-cohesive, light to medium brown with some gray, dry, no odor			2	X	79	19
6	- trace clay, sand, and fine gravel, slightly cohesive, non-plastic, medium reddish brown changing to dark gray to black at base of return, dry, no odor at 4.5ft BGS - wet at 6.0ft BGS	601.07		3	X	75	83
8	CL - CLAY - with silt, trace sand, slight plasticity, stiff, medium brown, wet at contact with above silt layer - trace silt, plastic, cohesive, medium to reddish brown, moist, no odor, malleable at 8.0ft BGS	599.32		4	X	50	32
10	END OF BOREHOLE @ 10.0ft BGS			5	X	50	23
<p style="font-size: small;">WELL DETAILS Screened interval: 602.32 to 597.32ft AMSL 5.00 to 10.00ft BGS Length: 5ft Diameter: 2in Slot Size: 10 Material: PVC Seal: 606.32 to 604.32ft AMSL 1.00 to 3.00ft BGS Material: Bentonite Chips Sand Pack: 604.32 to 596.82ft AMSL 3.00 to 10.50ft BGS Material: #2 Sand</p>							

OVERBURDEN LOG 19867 BH AND MW/GPJ CRA - CORP GDT 7/13/04

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
 WATER FOUND ∇ 07/25/2003
 CHEMICAL ANALYSIS \bigcirc



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: PHASE I RFI
 PROJECT NUMBER: 19867-00
 CLIENT: Vanadium Corporation of America
 LOCATION: Niagara Falls, New York

HOLE DESIGNATION: MW-21
 DATE COMPLETED: July 28, 2003
 DRILLING METHOD: 4 1/4 Inch HSA
 FIELD PERSONNEL: J. Raby

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE			
				NUMBER	INTERVAL	REC (%)	'N' VALUE
	TOP OF CASING 620.02 GROUND SURFACE 619.97 TOP OF RISER 619.50						
	TOPSOIL FILL - silt with slag, with clay and coarse sand, non-plastic, light gray, dry	619.77	<p style="font-size: small;">8" Ø Borehole Bentonite Chips 2" Ø Riser Sand Pack 2" Ø Screen</p>	1	X	35	31
2				2	X	55	24
4				3	X	65	15
6				4	X	90	17
8				5	X	65	51
10				6	X	45	37
12				7	X	50	18
14				8	X	30	>50
16				9	X	40	>50
18				10	X	30	16
20	CL - CLAY END OF BOREHOLE @ 20.0ft BGS	600.47 599.97	WELL DETAILS Screened interval: 610.47 to 600.47ft AMSL 9.50 to 19.50ft BGS Length: 10ft Diameter: 2in Slot Size: 10 Material: PVC Seal: 618.97 to 612.47ft AMSL 1.00 to 7.50ft BGS Material: Bentonite Chips Sand Pack: 612.47 to 599.97ft AMSL 7.50 to 20.00ft BGS Material: #2 Sand				

OVERBURDEN LOG: 19867 BH AND MW.GPJ CRA_CORP.GDT 7/13/04

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: PHASE I RFI

HOLE DESIGNATION: MW-22

PROJECT NUMBER: 19867-00

DATE COMPLETED: July 22, 2003

CLIENT: Vanadium Corporation of America

DRILLING METHOD: 4 1/4 Inch HSA

LOCATION: Niagara Falls, New York

FIELD PERSONNEL: P. Kryger/ C. Simmons

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	
	TOP OF CASING GROUND SURFACE TOP OF RISER	606.54 606.45 605.53						
2	FILL - silt sized particles, non-plastic, non-cohesive, dark brown to gray, no odor, metallic grains SLAG (FILL) - gravel sized, non-plastic, cohesive, gray, dry, no odor	605.95	<p style="font-size: small;">Concrete 8" Ø Borehole 2" Ø Riser Bentonite Chips Sand Pack 2" Ø Screen</p>	1	X	42	12	
4	- silt sized particles, fine grained, poorly graded, with trace gravel sized particles, non-cohesive at 4.0ft BGS			2	X	71	40	
6	- trace clay, saturated at 6.0ft BGS			3	X	87.5	43	
8				4	X	71	31	
10	CL - SILTY CLAY - trace gravel and pebbles, plastic, cohesive, dark brown, saturated - trace fine gravel, medium to dark brown with gray mottling, saturated, no odor at 10.0ft BGS	597.75		5	X	50	8	
12				6	X	50	6	
14	- non-plastic, cohesive, medium to reddish brown with gray mottling, slightly moist at 13.0ft BGS			7	X	87.5	25	
16	END OF BOREHOLE @ 16.0ft BGS	590.45		8	X	58	18	

WELL DETAILS
 Screened interval:
 599.45 to 594.45ft AMSL
 7.00 to 12.00ft BGS
 Length: 5ft
 Diameter: 2in
 Slot Size: 10
 Material: PVC
 Seal:
 603.45 to 601.45ft AMSL
 3.00 to 5.00ft BGS
 Material: Bentonite Chips
 Sand Pack:
 601.45 to 592.45ft AMSL
 5.00 to 14.00ft BGS
 Material: #2 Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
 WATER FOUND ∇ 07/22/03
 CHEMICAL ANALYSIS ○

OVERBURDEN LOG 19867 BH AND MW.GPJ CRA_CORP.GDT 7/13/04



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: PHASE I RFI
 PROJECT NUMBER: 19867-00
 CLIENT: Vanadium Corporation of America
 LOCATION: Niagara Falls, New York

HOLE DESIGNATION: MW-23
 DATE COMPLETED: July 25, 2003
 DRILLING METHOD: 4 1/4 Inch HSA
 FIELD PERSONNEL: P. Kryger

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE			
				NUMBER	INTERVAL	REC (%)	'N' VALUE
	TOP OF CASING GROUND SURFACE TOP OF RISER	620.09 619.88 619.74					
0	TOPSOIL - clay with silt, with abundant organic matter, non-cohesive, dry, no odor	619.78	<p style="font-size: small;">Concrete 8" Ø Borehole 2" Ø Riser Bentonite Chips Sand Pack 2" Ø Screen</p>	1		33	12
2	FILL - clay, with silt, trace sand and fine gravel, trace organics, soft to firm, very dry, no odor	617.88		2		58	37
4	FILL - slag, non-cohesive, light to medim gray, dry, no odor, breaks into coarse gravel sized particles, porous			3		100	27
6	- slight moist at 5.5ft BGS			4		75	48
8				5		83	48
10	- slightly finer grained when broken up at 10.0ft BGS			6		50	44
12				7		67	50
14				8		67	67
16				9		42	26
18				10		75	70
20	- moist at 19.5ft BGS - wet at 20.0ft BGS			11		17	12
22	- saturated at 22.0ft BGS	597.63		12		100	28
24	CL - CLAY - cohesive, stiff, medium to reddish brown, wet, no odor, pliable						
24	END OF BOREHOLE @ 24.0ft BGS	595.88					

WELL DETAILS
 Screened interval:
 606.88 to 596.88ft AMSL
 13.00 to 23.00ft BGS
 Length: 10ft
 Diameter: 2in
 Slot Size: 10
 Material: PVC
 Seal:
 616.88 to 608.88ft AMSL
 3.00 to 11.00ft BGS
 Material: Bentonite Chips
 Sand Pack:
 608.88 to 595.88ft AMSL
 11.00 to 24.00ft BGS
 Material: #2 Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
 WATER FOUND ∇ 07/25/2003
 CHEMICAL ANALYSIS ○

OVERBURDEN LOG - 19867 BH AND MW GPJ - CRA - CORP GDT 7/13/04



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: PHASE I RFI
 PROJECT NUMBER: 19867-00
 CLIENT: Vanadium Corporation of America
 LOCATION: Niagara Falls, New York

HOLE DESIGNATION: MW-24
 DATE COMPLETED: July 28, 2003
 DRILLING METHOD: 4 1/4 Inch HSA
 FIELD PERSONNEL: J. Raby

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE			
				NUMBER	INTERVAL	REC (%)	'N' VALUE
	TOP OF CASING GROUND SURFACE TOP OF RISER	618.48 618.41 617.58					
2	TOPSOIL			1	X	40	16
2	FILL - silt with clay and coarse sand sized particles, with slag, non-plastic, light gray, dry	616.41	Concrete	2	X	80	>50
4			2" Ø Riser	3	X	90	38
6			8" Ø Borehole	4	X	90	35
8			Bentonite Chips	5	X	100	59
10	- slightly moist at 10.0ft BGS			6	X	55	>50
12	- with clay, with slag at 12.0ft BGS			7	X	90	18
14			Sand Pack	8	X	85	14
16			2" Ø Screen	9	X	20	18
18	CL - CLAY - trace silt, plastic, brown to brownish-green, dry, some vegetative matter	600.71		10	X	50	12
20	END OF BOREHOLE @ 20.0ft BGS	598.41					

WELL DETAILS
 Screened interval:
 609.41 to 599.41ft AMSL
 9.00 to 19.00ft BGS
 Length: 10ft
 Diameter: 2in
 Slot Size: 10
 Material: PVC
 Seal:
 613.41 to 611.41ft AMSL
 5.00 to 7.00ft BGS
 Material: Bentonite Chips
 Sand Pack:
 611.41 to 598.41ft AMSL
 7.00 to 20.00ft BGS
 Material: #2 Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
 WATER FOUND ∇ 07/28/2003
 CHEMICAL ANALYSIS ○

OVERBURDEN LOG 19867.BH AND MW.GPJ CRA CORP.GDT 7/13/04



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: PHASE I RFI
 PROJECT NUMBER: 19867-00
 CLIENT: Vanadium Corporation of America
 LOCATION: Niagara Falls, New York

HOLE DESIGNATION: MW-25
 DATE COMPLETED: July 23, 2003
 DRILLING METHOD: 4 1/4 Inch HSA
 FIELD PERSONNEL: P. Kryger/ C. Simmons

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE			
				NUMBER	INTERVAL	REC (%)	'N' VALUE
	TOP OF CASING GROUND SURFACE TOP OF RISER	606.05 605.96 605.31					
2	FILL - silty clay, trace fine gravel, non-plastic, cohesive, dry, no odor, some gray fine to coarse grained gray slag, some organic matter	603.96 603.66	<p>WELL DETAILS Screened interval: 601.46 to 596.46ft AMSL 4.50 to 9.50ft BGS Length: 5ft Diameter: 2in Slot Size: 10 Material: PVC Seal: 604.96 to 602.46ft AMSL 1.00 to 3.50ft BGS Material: Bentonite Chips Sand Pack: 602.46 to 595.96ft AMSL 3.50 to 10.00ft BGS Material: #2 Sand</p>	1	X	29	5
	SLAG (FILL) - sand to fine gravel sized particles, non-cohesive, moist, no odor, slight metallic sheen at base of slag			2	X	54	37
4	FILL - silty clay, trace fine to coarse grained gravel, dark brown, slightly moist, no odor, trace organics	601.96		3	X	71	WOH
6	CL - SILTY CLAY - trace sand and gravel, high plasticity, slightly cohesive, dark gray to brown, saturated, no odor, trace organics - cohesive, dark brown, at 5.1ft BGS	599.16		4	X	71	6
8	CL - CLAY - trace silt, slightly plastic, cohesive, dark brown, saturated - trace fine gravel, no silt, with gray mottling, slightly moist, no odor at 8.0ft BGS			5	X	92	20
10	END OF BOREHOLE @ 10.0ft BGS	595.96					

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
 WATER FOUND ∇ 07/23/2003
 CHEMICAL ANALYSIS

OVERBURDEN LOG 19867 BH AND MW.GPJ CRA_CORP.GDT 7/13/04



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: PHASE I RFI
 PROJECT NUMBER: 19867-00
 CLIENT: Vanadium Corporation of America
 LOCATION: Niagara Falls, New York

HOLE DESIGNATION: MW-26
 DATE COMPLETED: July 23, 2003
 DRILLING METHOD: 4 1/4 Inch HSA
 FIELD PERSONNEL: P. Kryger

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE			
				NUMBER	INTERVAL	REC (%)	'N' VALUE
	TOP OF CASING GROUND SURFACE TOP OF RISER	614.54 614.38 614.33					
2	TOPSOIL (FILL) - fine grained, poorly graded, with silt and sand, trace fine gravel, non-cohesive, medium brown, dry, no odor, abundant roots and organics	612.38	<p style="font-size: small;">Concrete 8" Ø Borehole 2" Ø Riser Bentonite Chips Sand Pack 2" Ø Screen</p>	1	X	25	17
4	FILL - very fine silt and sand with large gravel pieces, with light gray porous slag, dry			2	X	25	30
6	- sand to fine gravel sized particles, trace silt, non-cohesive, dark brown, very slightly moist, no odor at 4.0ft BGS - fine grained, medium to dark gray at 4.2ft BGS			3	X	17	15
8				4	X	37.5	18
10	CL - SILTY CLAY - trace fine gravel, medium to dark brown, moist, no odor, malleable, ductile, pliable - with large pieces of broken rock, with abundant fine gravel at 10.0ft BGS	606.18		5	X	50	10
12				6	X	54	26
14	END OF BOREHOLE @ 12.9ft BGS Refusal at 12.9 ft bgs.	601.48		7	X	8	>50

WELL DETAILS
 Screened interval:
 607.38 to 602.38ft AMSL
 7.00 to 12.00ft BGS
 Length: 5ft
 Diameter: 2in
 Slot Size: 10
 Material: PVC
 Seal:
 611.38 to 609.38ft AMSL
 3.00 to 5.00ft BGS
 Material: Bentonite Chips
 Sand Pack:
 609.38 to 602.38ft AMSL
 5.00 to 12.00ft BGS
 Material: #2 Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
 WATER FOUND ▼ 07/23/2003
 CHEMICAL ANALYSIS ○

OVERBURDEN LOG 19867 BH AND MW/GPJ CRA CORP GDT 7/13/04



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: PHASE I RFI
 PROJECT NUMBER: 19867-00
 CLIENT: Vanadium Corporation of America
 LOCATION: Niagara Falls, New York

HOLE DESIGNATION: MW-27
 DATE COMPLETED: July 29, 2003
 DRILLING METHOD: 4 1/4 Inch HSA
 FIELD PERSONNEL: J. Raby/ C. Simmons

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE			
				NUMBER	INTERVAL	REC (%)	'N' VALUE
	TOP OF CASING GROUND SURFACE TOP OF RISER	607.02 606.72 606.19					
2	FILL - silt-sized particles, trace fine gravel, slightly plastic, medium to dark brown, dry, no odor	605.62	<p>WELL DETAILS Screened interval: 603.72 to 598.72ft AMSL 3.00 to 8.00ft BGS Length: 5ft Diameter: 2in Slot Size: 10 Material: PVC Seal: 605.72 to 604.72ft AMSL 1.00 to 2.00ft BGS Material: Bentonite Chips Sand Pack: 604.72 to 597.72ft AMSL 2.00 to 9.00ft BGS Material: #2 Sand</p>	1	X	62.5	8
4	SLAG (FILL) - with silt to fine gravel-sized particles, non-plastic, gray, dry, no odor - light brown mottling at 2.0ft BGS			2	X	67	7
6	- slightly moist at 4.0ft BGS			3	X	12.5	7
8	- saturated at 6.0ft BGS	600.22		4	X	83	13
10	CL - SILTY CLAY - plastic, cohesive, dark brown, moist, no odor - medium to dark brown, less moisture at 7.6ft BGS			5	X	83	25
10	END OF BOREHOLE @ 10.0ft BGS	596.72					

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
 WATER FOUND ▼ 07/29/2003

OVERBURDEN LOG 19867 BH AND MW.GPJ CRA CORP.GDT 7/13/04



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: PHASE I RFI
 PROJECT NUMBER: 19867-00
 CLIENT: Vanadium Corporation of America
 LOCATION: Niagara Falls, New York

HOLE DESIGNATION: MW-28
 DATE COMPLETED: July 29, 2003
 DRILLING METHOD: 4 1/4 Inch HSA
 FIELD PERSONNEL: J. Raby/ C. Simmons

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	Monitoring Well	SAMPLE			
				NUMBER	INTERVAL	REC (%)	'N' VALUE
	TOP OF CASING GROUND SURFACE TOP OF RISER	606.22 606.16 605.96					
2	CL - SILTY CLAY (FILL) - with trace vegetative matter, moderately plastic, medium to dark brown, dry, no odor SLAG (FILL) - silt-sized particles with fine grained gravel, non-plastic, gray with brown mottling, dry, no odor	605.66	<p style="font-size: small;">Bentonite Chips 2" Ø Riser 8" Ø Borehole Sand Pack 2" Ø Screen</p> <p>WELL DETAILS Screened interval: 603.16 to 598.16ft AMSL 3.00 to 8.00ft BGS Length: 5ft Diameter: 2in Slot Size: 10 Material: PVC Seal: 605.16 to 604.16ft AMSL 1.00 to 2.00ft BGS Material: Bentonite Chips Sand Pack: 604.16 to 597.66ft AMSL 2.00 to 8.50ft BGS Material: #2 Sand</p>	1	X	62.5	14
4				2	X	46	54
6	FILL - silty clay, trace slag, plastic, medium to dark brown, very slightly moist, no odor	601.16		3	X	0	13
8	CL - CLAY - trace silt, plastic, gray to light brown, slightly moist, no odor	599.46		4	X	75	20
10	END OF BOREHOLE @ 10.0ft BGS	596.16		5	X	75	7

OVERBURDEN LOG 19867 BH AND MW GPJ CRA_CORP.GDT 7/13/04

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

ATTACHMENT D

SOIL COVER MATERIAL ANALYSIS LABORATORY REPORT

FEB. 16. 2004 2:31PM

SJB SERVICES HAMBURG

VO, 049

P. 2



**Contract
Drilling
and
Testing**

BUFFALO OFFICE

5167 South Park Avenue
Hamburg, NY 14075

Phone: (716) 649-8110

Fax: (716) 649-8051

Laboratory Test Report

PROJECT: Vanadium Corp. of America

CLIENT: CRA

DATE: September 29, 2003

PROJECT NO.: BD-03-006

Attached are the results of laboratory testing conducted on various samples from the above referenced project. P. Kryger representing CRA, chose samples contained in this report.

The testing conducted was as follows:

ASTM D-422: Particle Size Analysis of Soils

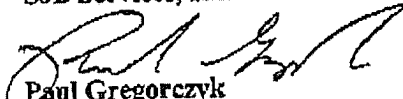
ASTM D-4318: Liquid Limit, Plastic Limit, and Plasticity Index of Soil

ASTM D-5084: Measurement of Hydraulic Conductivity of Saturated Porous Material
Using a Flexible Wall Permeameter

Samples were received at the SJB Services, Inc. laboratory on August 21, 2003 where they were processed for testing.

If the reviewer should have any questions concerning this report, please do not hesitate to contact our office at any time.

SJB Services, Inc.


Paul Gregorczyk
Laboratory Manager

Albany, NY
(518) 899-7491

Cortland, NY
(807) 758-7182

Cuba, NY
(585) 968-9686

Rochester, NY
(585) 359-2730

Syracuse, NY
(315) 437-3890

FEB. 16. 2004 2:31PM

SJB SERVICES HAMBURG

NO. 049 4. 3



**Contract
Drilling
and
Testing**

BUFFALO OFFICE
5157 South Park Avenue
Hamburg, NY 14075
Phone: (716) 649-8110
Fax: (716) 649-8051

Laboratory Test Report

PROJECT: Vanadium Corp. of America

CLIENT: CRA

DATE: September 29, 2003

PROJECT NO.: BD-03-006

REPORT NO.: LTR-1

PAGE 1 OF 3

SJB Sample Number: 03-1763

CRA Sample Number: GT-19867-08-03-PK-001

ASTM D-422: Particle Size Analysis of Soils

Sieve Size	Percent Passing
1 1/2"	100.0
1"	99.9
3/4"	99.6
1/2"	99.3
1/4"	99.0
#4	98.8
#10	93.4
#20	90.0
#40	85.4
#100	77.4
#200	70.7

PERCENT COMPONENTS

GRAVEL	SAND	SILT	CLAY
1.2 %	28.1 %	44.8 %	25.9 %

ASTM D-4318: Liquid Limit, Plastic Limit, and Plasticity Index of Soil

Liquid Limit	Plastic Limit	Plasticity Index
38	30	8

ASTM D-1557-91: Laboratory Compaction Characteristics of Soil Using Method C Modified Effort

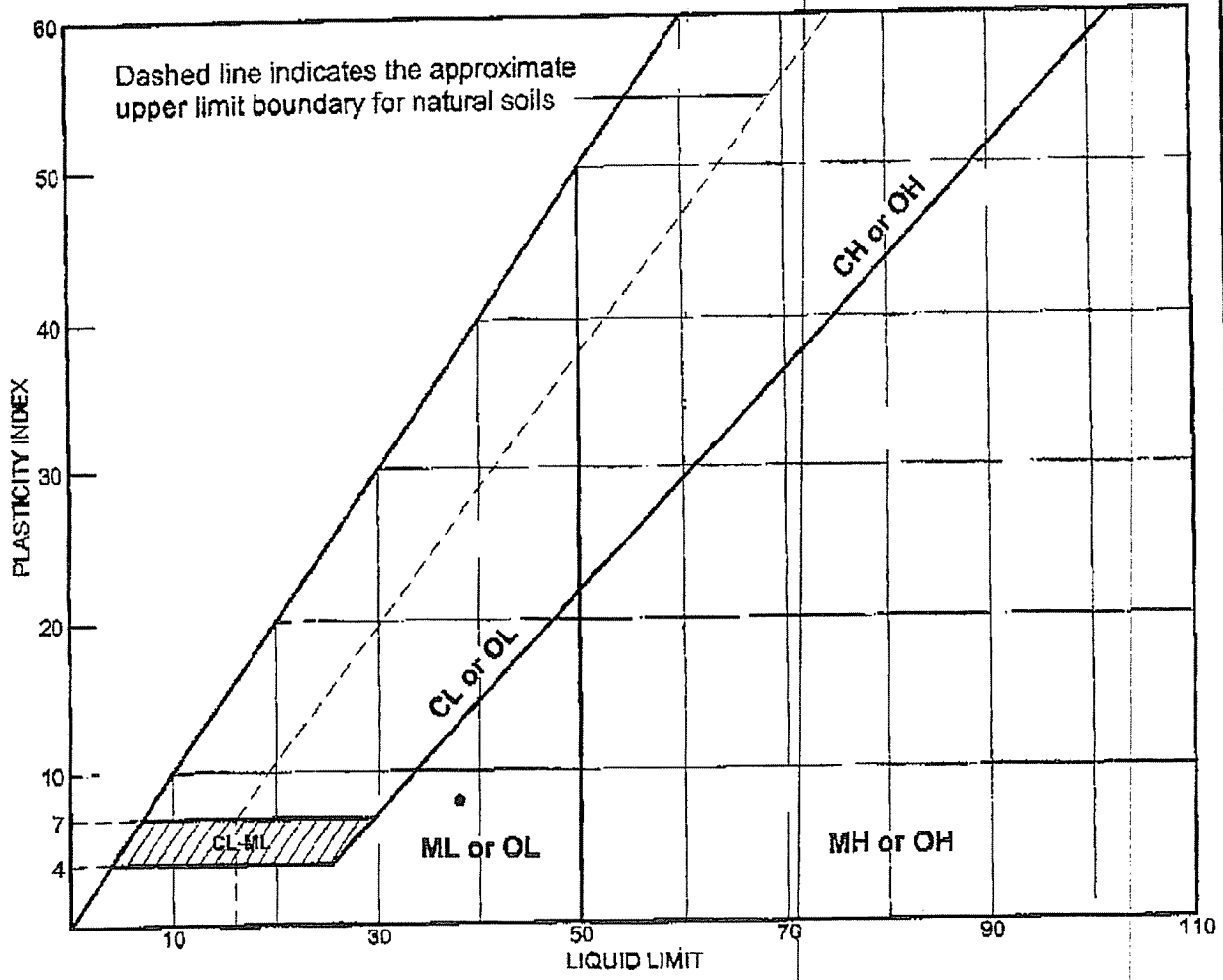
Maximum Dry Density: 99.4 pcf
Optimum Moisture: 17.1 %

ASTM D-5084: Measurement of Hydraulic Conductivity of Saturated Porous Material Using a Flexible Wall Permeameter

Coefficient of Permeability: 5.77×10^{-7} cm/sec (95.4% compaction at 17.2% moisture)

<u>Albany, NY</u> (518) 899-7491	<u>Cortland, NY</u> (607) 758-7182	<u>Cuba, NY</u> (585) 968-9686	<u>Rochester, NY</u> (585) 359-2730	<u>Syracuse, NY</u> (315) 437-3890
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LIQUID AND PLASTIC LIMITS TEST REPORT



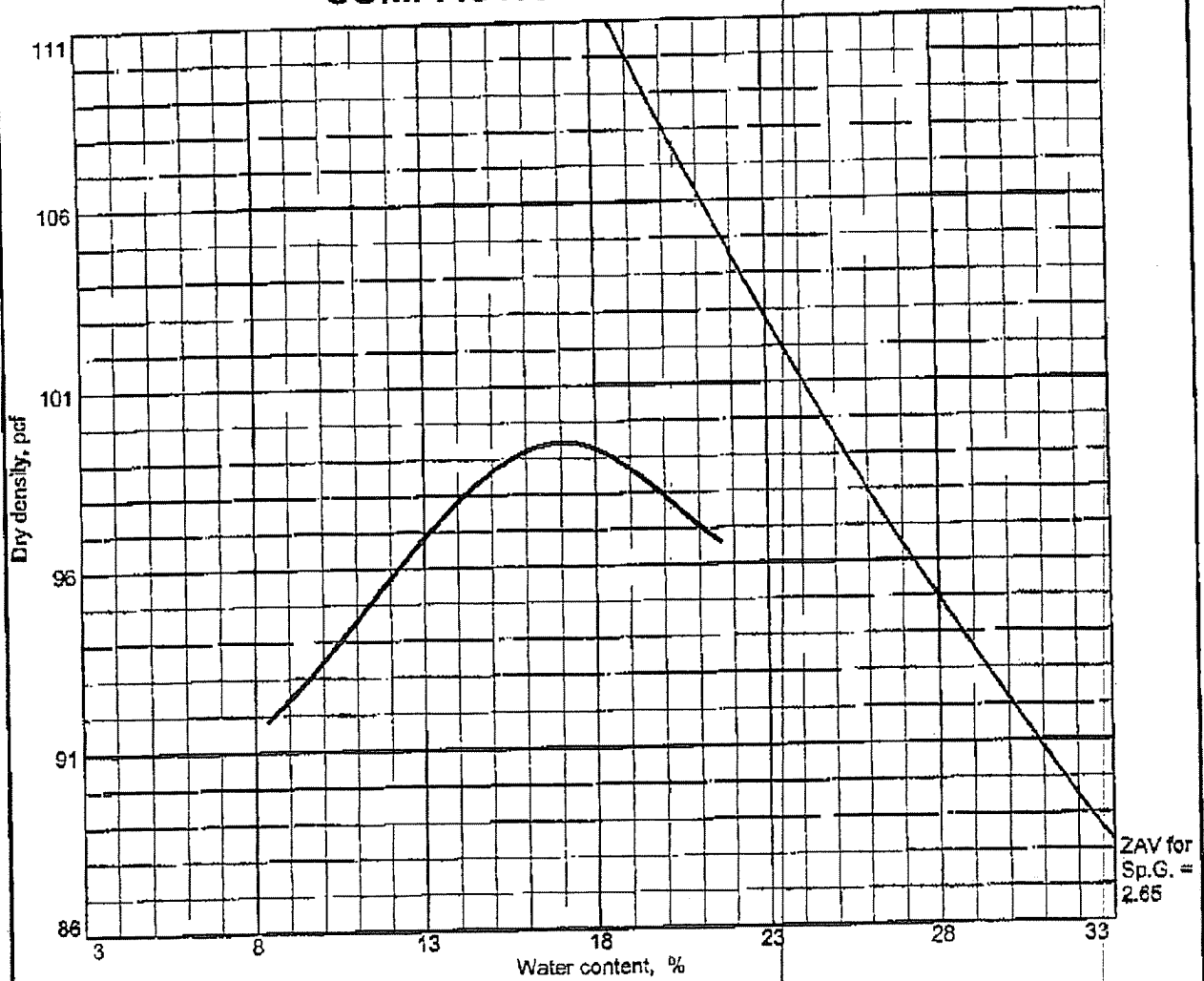
SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
•	PK-001	03-1763			30	38	8	

LIQUID AND PLASTIC LIMITS TEST REPORT
SJB
SERVICES, INC.

Client: CRA
 Project: VANADIUM CORP. OF AMERICA
 Project No.: BD-03-006

Plate

COMPACTION TEST REPORT



Test specification: ASTM D 1557-91 Procedure A Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
				2.65	38	8	1.2	70.7

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 99.4 pcf Optimum moisture = 17.1 %	GT-19867-08-03-PK-001
Project No. BD-03-006 Client: CRA Project: VANADIUM CORP. OF AMERICA Location: GT-19867-08-03-PK-001	Remarks: LTR-1 SAMPLE NUMBER: 03-1763

COMPACTION TEST REPORT
SJB SERVICES, INC.

Plate

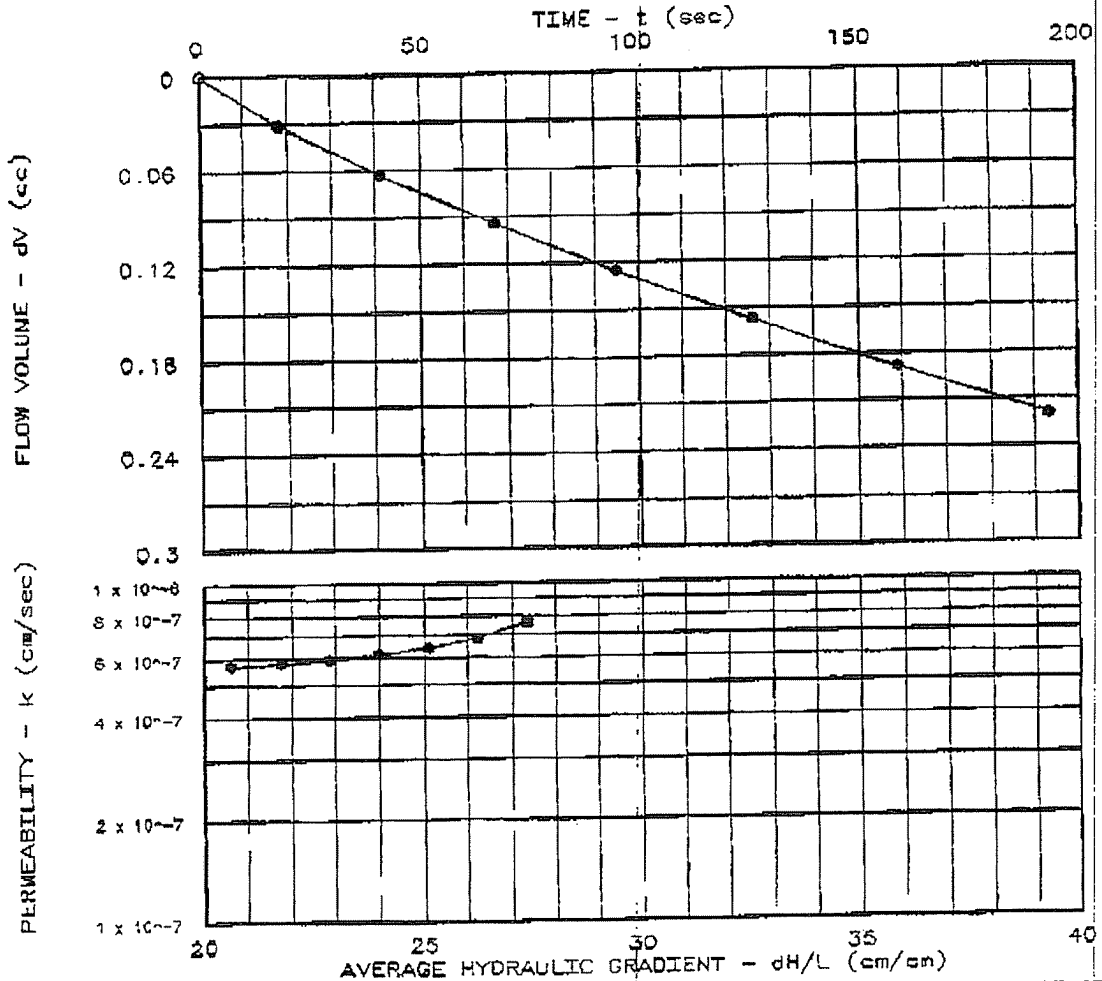
PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 11.67
 Specimen Diameter (cm): 10.21
 Dry Unit Weight (pcf): 94.9
 Moisture Before Test (%): 17.2
 Moisture After Test (%): 25.3
 Run Number: 1 ♦ 2 ▲
 Cell Pressure (psi): 95.0
 Sat. Pressure (psi): 80.0
 Diff. Head (psi): 4.1
 Perm. (cm/sec): 5.77×10^{-7}

SAMPLE DATA:

Sample Identification:
 GT-19887-08-03-PK-001
 Visual Description: Silt, some sand & clay trace gravel
 Remarks: ASTM D5084
 Maximum Dry Density (pcf): 99.4
 Optimum Moisture Content (%): 17.1
 ASTM(D1557)
 Percent Compaction: 85.4%
 Permeameter type: FLEXIBLE WALL
 Sample type: REMOLDED



Project: Vanadium Corp. of America
 Location:
 Date: 8/1/03

Project No.: 8D-03-006
 File No.: LTR-1
 Lab No.: 03-1763
 Tested by: pg
 Checked by: pg
 Test: CV - Constant volume

PERMEABILITY TEST REPORT
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5167 South Park Avenue
Hamburg, NY 14075
Phone: (716) 649-8110
Fax: (716) 649-8051

Laboratory Test Report

PROJECT: Vanadium Corp. of America

CLIENT: CRA

DATE: September 29, 2003

PROJECT NO.: BD-03-006

REPORT NO.: LTR-2

PAGE 2 OF 3

SJB Sample Number: 03-1764

CRA Sample Number: GT-19867-08-03-PK-002

ASTM D-422: Particle Size Analysis of Soils

Sieve Size	Percent Passing
2"	100.0
1 1/4"	99.6
1"	99.3
3/4"	99.2
1/2"	99.0
3/8"	98.3
#4	97.4
#10	94.4
#20	91.5
#40	89.3
#100	83.6
#200	78.1

PERCENT COMPONENTS

GRAVEL	SAND	SILT	CLAY
2.6 %	19.3 %	39.2 %	38.9 %

ASTM D-4318: Liquid Limit, Plastic Limit, and Plasticity Index of Soil

Liquid Limit	Plastic Limit	Plasticity Index
37	22	15

ASTM D-1557-91: Laboratory Compaction Characteristics of Soil Using Method C Modified Effort

Maximum Dry Density: 1104.8 pcf
Optimum Moisture: 15.0 %

ASTM D-5084: Measurement of Hydraulic Conductivity of Saturated Porous Material Using a Flexible Wall Permeameter

Coefficient of Permeability: 7.52×10^{-8} cm/sec (94.1% compaction at 14.8% moisture)

<u>Albany, NY</u>	<u>Cortland, NY</u>	<u>Cuba, NY</u>	<u>Rochester, NY</u>	<u>Syracuse, NY</u>
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Fax: (716) 649-8051

Particle Size Distribution Report

Project: VANADIUM CORP. OF AMERICA

Project No.: BD-03-006

Client: CRA

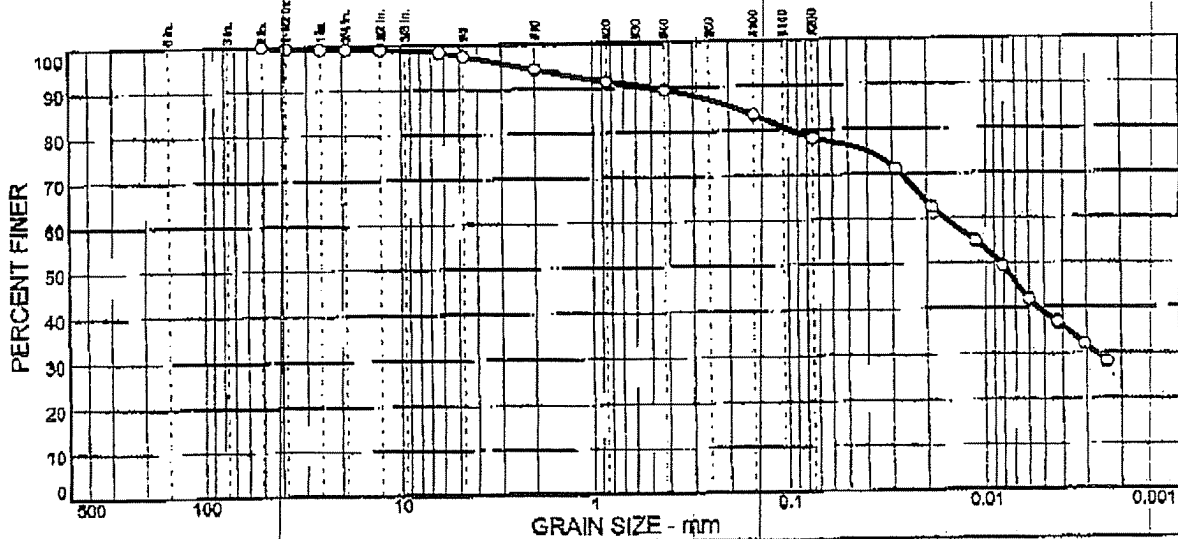
Sample No: 03-1764

Source of Sample: PK-002

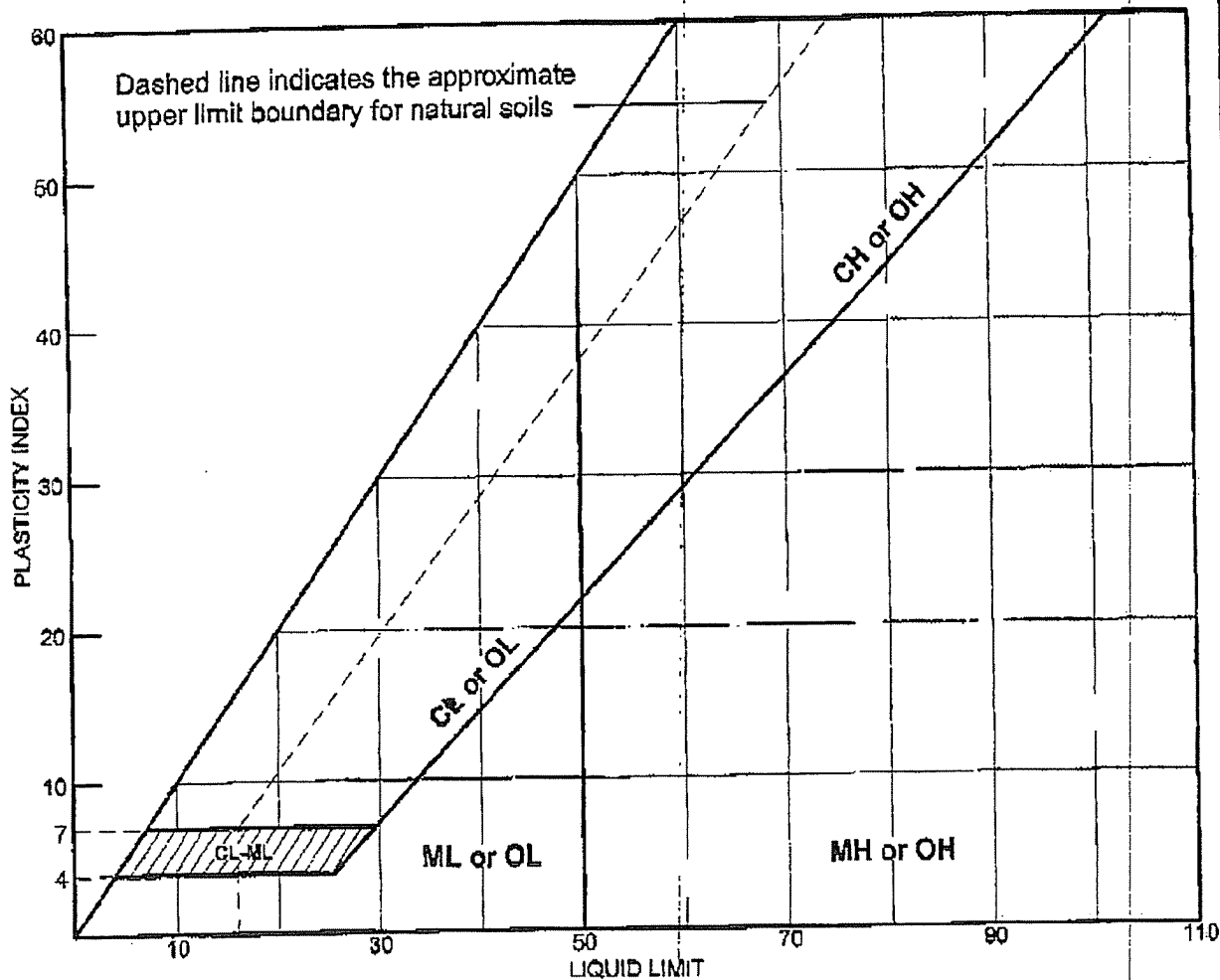
Date: 9/29/03

Location: GT-19867-08-03-PK-002

Elev/Depth:



LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
•	PK-002	03-1764			22	37	15	

LIQUID AND PLASTIC LIMITS TEST REPORT

**SJB
 SERVICES, INC.**

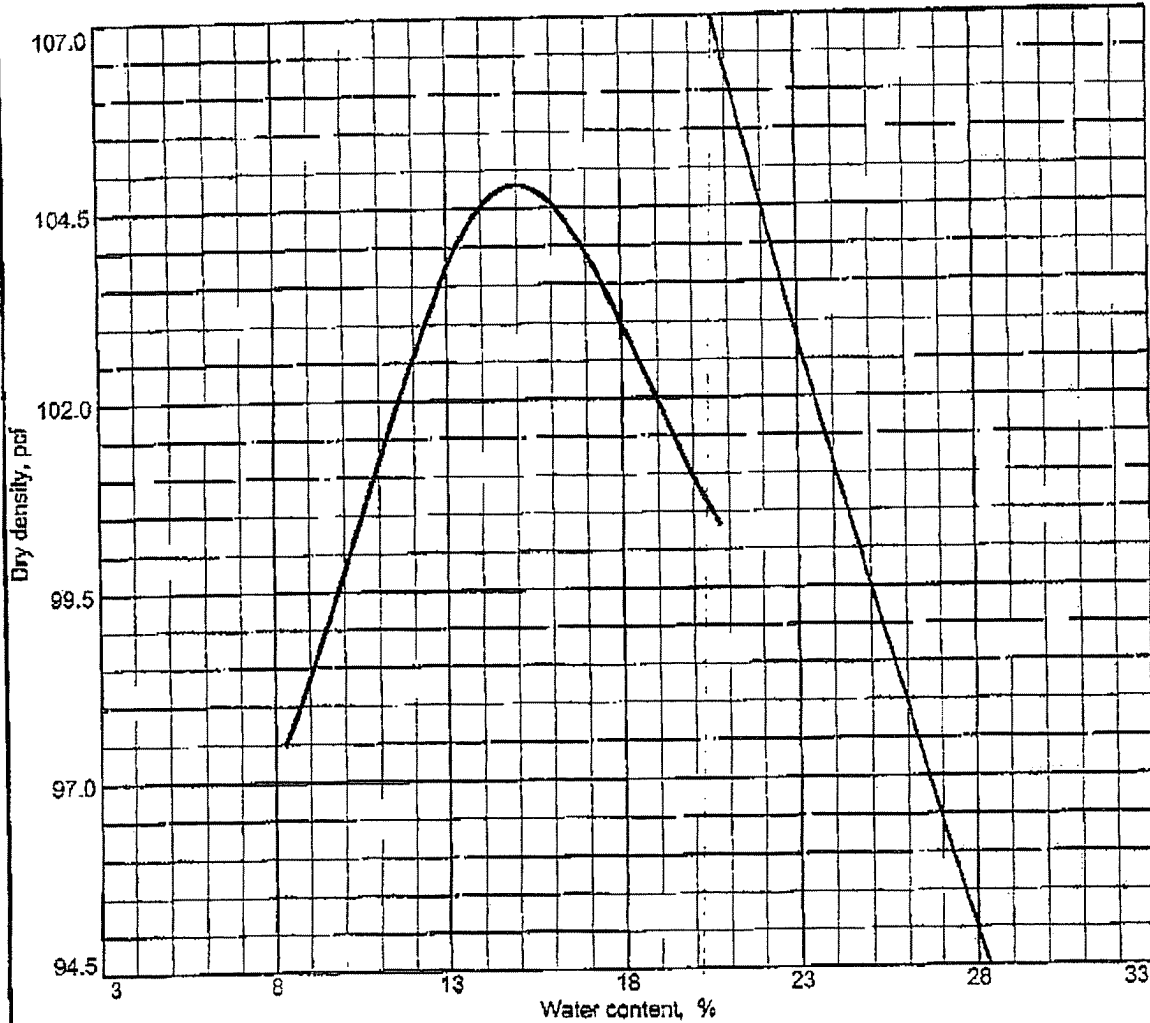
Client: CRA

Project: VANADIUM CORP. OF AMERICA

Project No.: BD-03-006

Plate

COMPACTION TEST REPORT



ZAV for
 Sp.G. =
 2.65

Test specification: ASTM D 1557-91 Procedure A Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
				2.65	37	15	2.6	78.1

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 104.8 pcf Optimum moisture = 15.0 %	GT-19867-08-03-PK-002
Project No. BD-03-006 Client: CRA Project: VANADIUM CORP. OF AMERICA Location: GT-19867-08-03-PK-002	Remarks: LTR-2 SAMPLE NUMBER: 03-1764
COMPACTION TEST REPORT SJB SERVICES, INC.	
	Plate

PERMEABILITY TEST REPORT

TEST DATA:

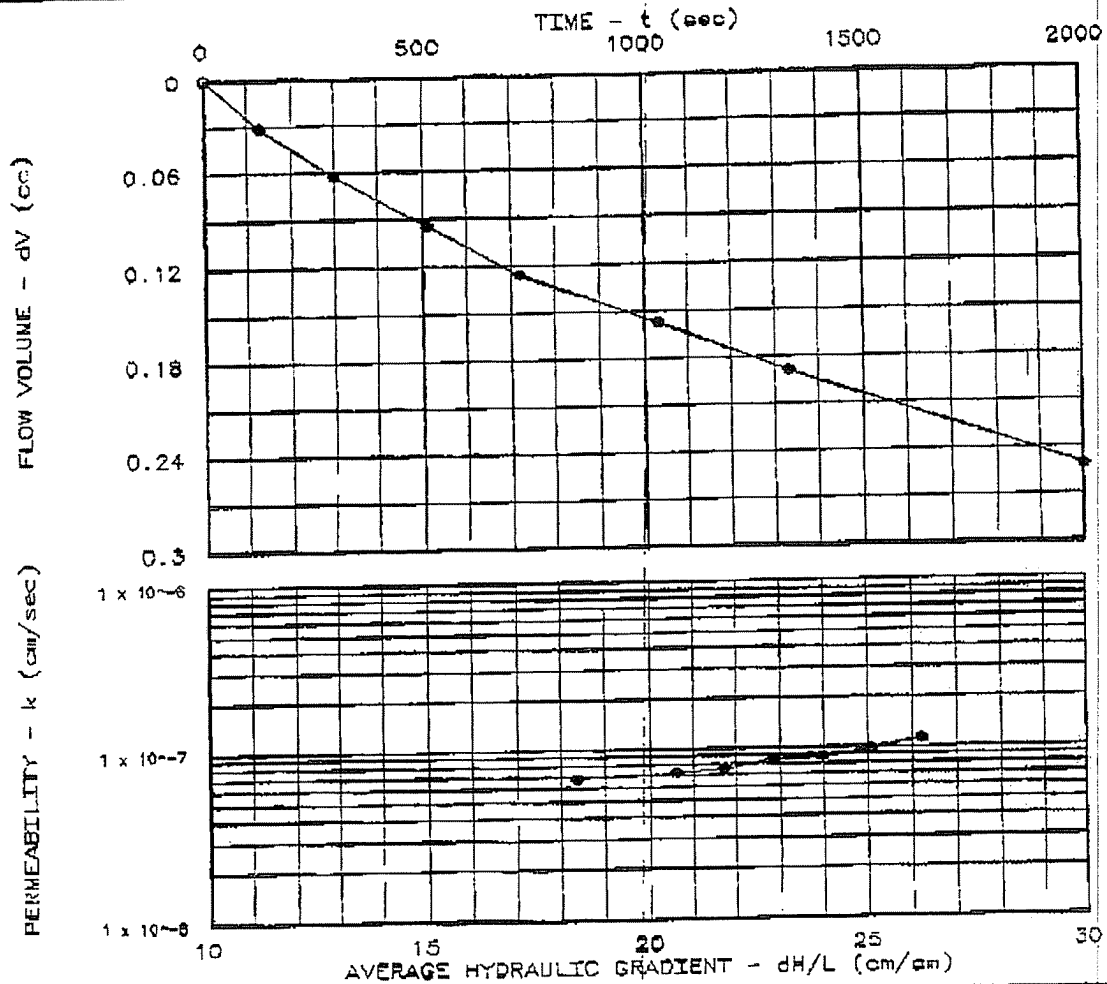
Specimen Height (cm): 11.68
 Specimen Diameter (cm): 10.23
 Dry Unit Weight (pcf): 98.6
 Moisture Before Test (%): 14.8
 Moisture After Test (%): 22.6
 Run Number: 1 ● 2 ▲
 Cell Pressure (psi): 95.0

Sat. Pressure (psi): 80.0
 Diff. Head (psi): 3.8

Perm. (cm/sec): 7.52×10^{-8}

SAMPLE DATA:

Sample Identification:
 GT-19867-08-03-PK-002
 Visual Description: Silt & clay,
 little sand, trace gravel
 Remarks: ASTM D5084
 Maximum Dry Density (pcf): 104.8
 Optimum Moisture Content (%): 18.0
 ASTM(D1557)
 Percent Compaction: 94.1%
 Permeameter type: FLEXIBLE WALL
 Sample type: REMOLDED



Project: Vanadium Corp. of America
 Location:
 Date: 9/6/03

Project No.: BD-03-006
 File No.: LTR-2
 Lab No.: 03-1764
 Tested by: pg
 Checked by: ps
 Test: CV - Constant volume

PERMEABILITY TEST REPORT
SJB SERVICES, INC.

FEB. 16. 2004 2:32PM

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VU. 049 7. 13



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Laboratory Test Report

PROJECT: Vanadium Corp. of America

CLIENT: CRA

DATE: September 29, 2003

PROJECT NO.: BD-03-006

REPORT NO.: LTR-3

PAGE 3 OF 3

SJB Sample Number: 03-1765

CRA Sample Number: GT-19867-08-03-PK-003

ASTM D-422: Particle Size Analysis of Soils

Sieve Size	Percent Passing
1"	100.0
3/4"	99.7
1/2"	99.5
3/8"	98.6
#4	97.7
#10	82.8
#20	80.5
#40	78.3
#100	75.2
#200	72.7

PERCENT COMPONENTS			
GRAVEL	SAND	SILT	CLAY
2.3 %	25.0 %	39.1 %	33.6 %

ASTM D-4318: Liquid Limit, Plastic Limit, and Plasticity Index of Soil

Liquid Limit	Plastic Limit	Plasticity Index
44	27	17

ASTM D-1557-91: Laboratory Compaction Characteristics of Soil Using Method C Modified Effort

Maximum Dry Density: 103.9 pcf
Optimum Moisture: 15.6 %

ASTM D-5084: Measurement of Hydraulic Conductivity of Saturated Porous Material Using a Flexible Wall Permeameter

Coefficient of Permeability: 8.72×10^{-8} cm/sec (94.6% compaction at 15.3% moisture)

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Particle Size Distribution Report

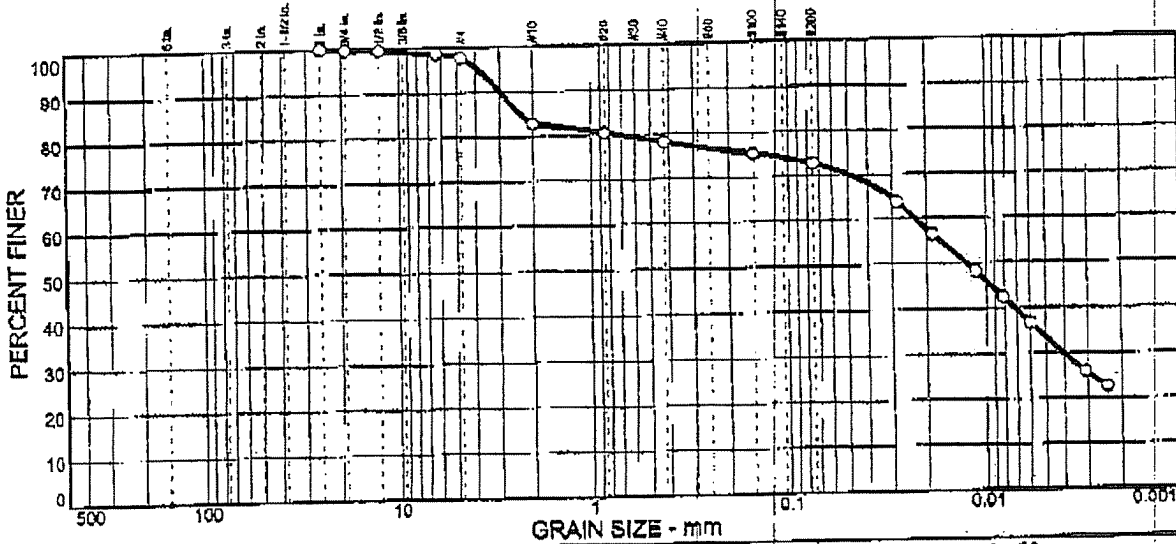
Project: VANADIUM CORP. OF AMERICA

Project No.: BD-03-006

Client: CRA

Sample No: 03-1765 Source of Sample: PK-003
Location: GT-19867-08-03-PK-003

Date: 9/29/03
Elev./Depth:



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.3	2.0	14.9	4.5	5.6	39.1	33.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
.75 in.	99.7		
.5 in.	99.5		
.25 in.	98.6		
#4	97.7		
#10	82.8		
#20	80.5		
#40	78.3		
#100	75.2		
#200	72.7		

Soil Description	
GT-19867-08-03-PK-003	
PL= 27	Atterberg Limits LL= 44 PI= 17
D ₈₅ = 2.31 D ₃₀ = 0.0041 C _u =	Coefficients D ₆₀ = 0.0229 D ₁₅ = C _c = D ₆₀ = 0.0126 D ₁₀ =
USCS=	Classification AASHTO=
Remarks	
LTR: 3 DATE RECEIVED: 9/19/03 SAMPLED BY: SJB	

* (no specification provided)

Plate

Albany, NY
(518) 899-7491

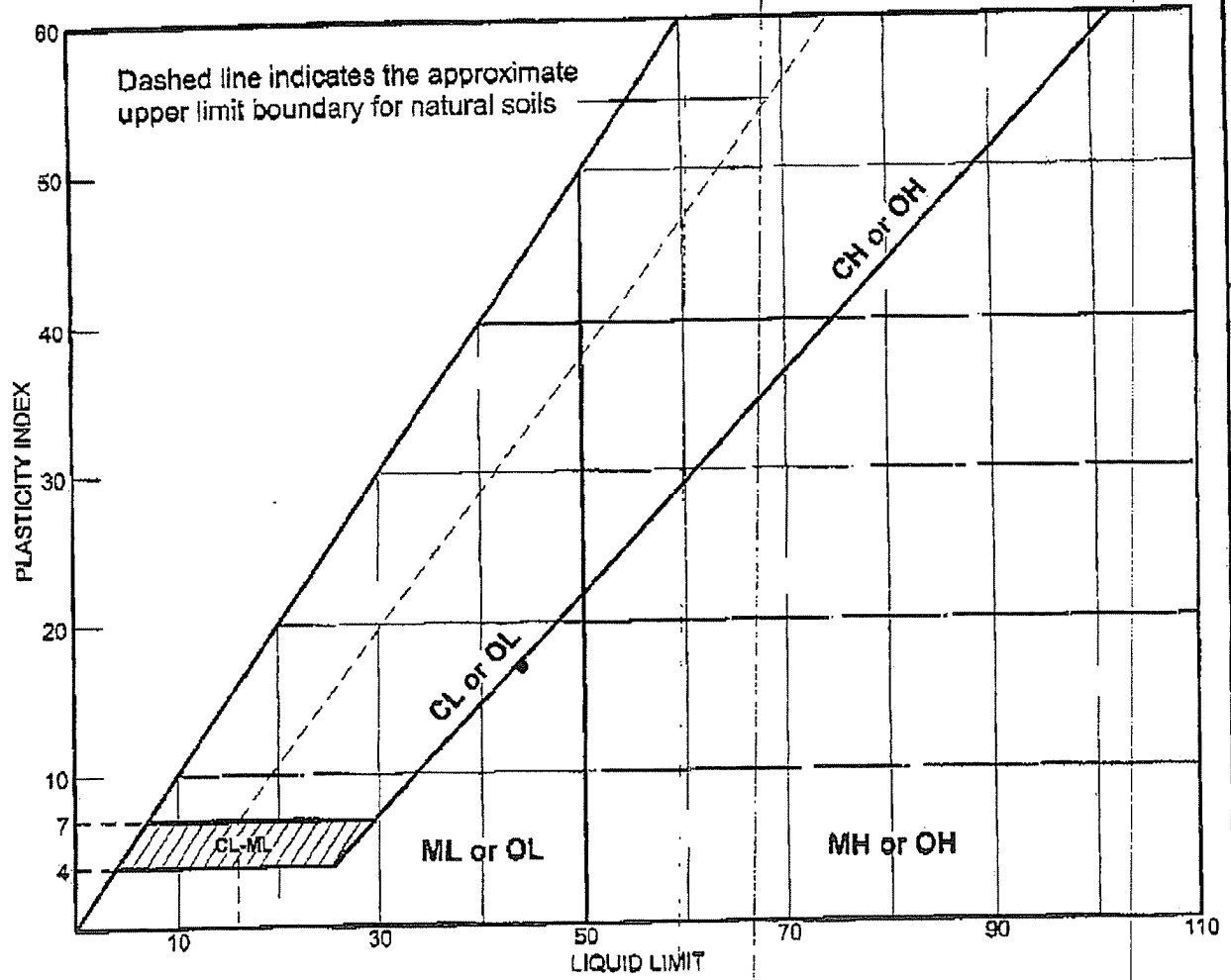
Cortland, NY
(607) 758-7182

Cuba, NY
(585) 968-9686

Rochester, NY
(585) 369-2730

Syracuse, NY
(315) 437-3890

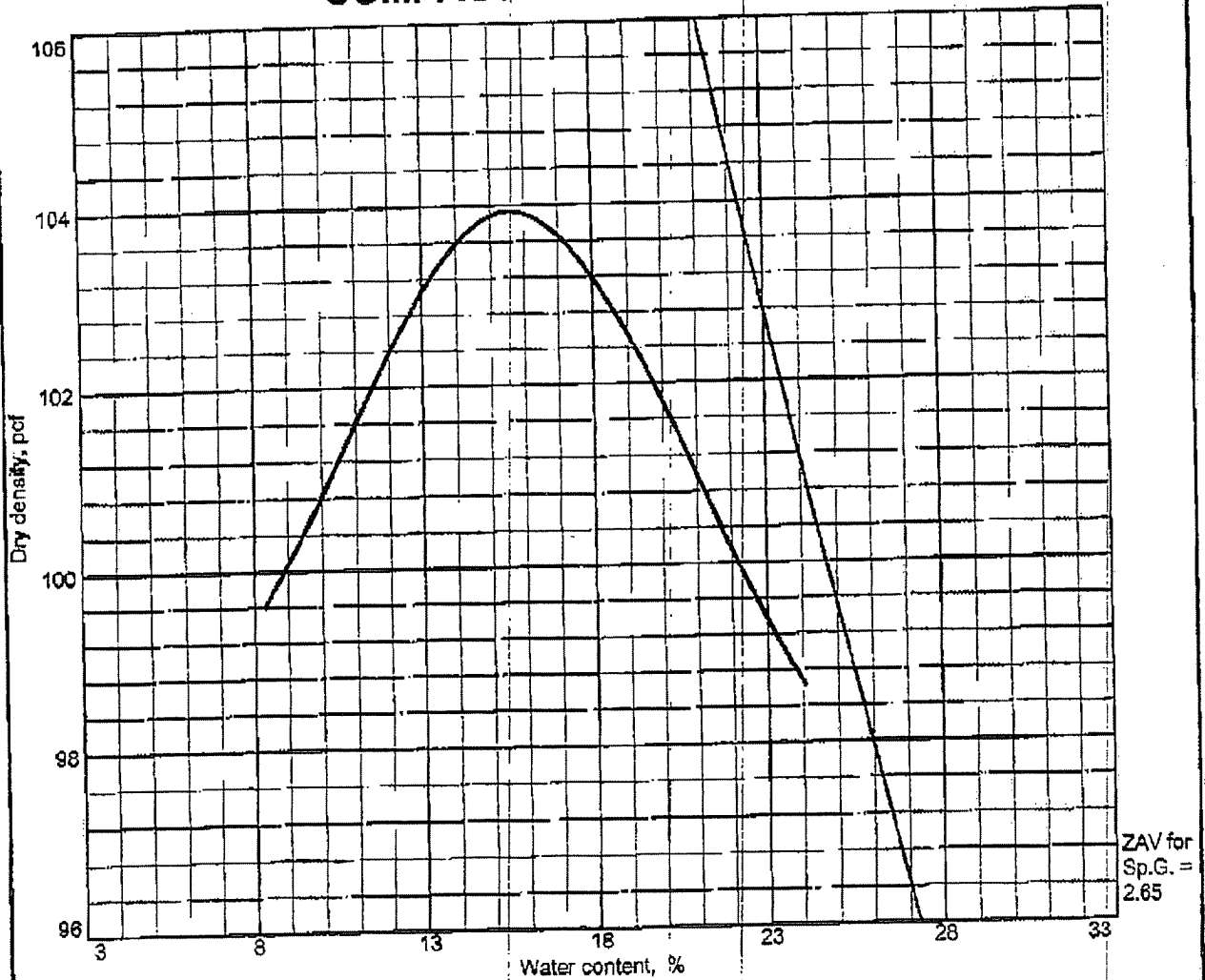
LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
•	PK-003	03-1765			27	44	17	

LIQUID AND PLASTIC LIMITS TEST REPORT <h2 style="text-align: center;">SJB SERVICES, INC.</h2>	Client: CRA Project: VANADIUM CORP. OF AMERICA Project No.: BD-03-006 Plate
--	--

COMPACTION TEST REPORT



Test specification: ASTM D 1557-91 Procedure A Modified

Elev/ Depth	Classification		Nat. Moist	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
			5.9	2.65	44	17	2.3	72.7

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 103.9 pcf Optimum moisture = 15.6 %	GT-19867-08-03-PK-003
Project No. BD-03-006 Client: CRA Project: VANADIUM CORP. OF AMERICA Location: GT-19867-08-03-PK-003	Remarks: LTR-3 SAMPLE NUMBER: 03-1765

COMPACTION TEST REPORT
SJB SERVICES, INC.

Plate

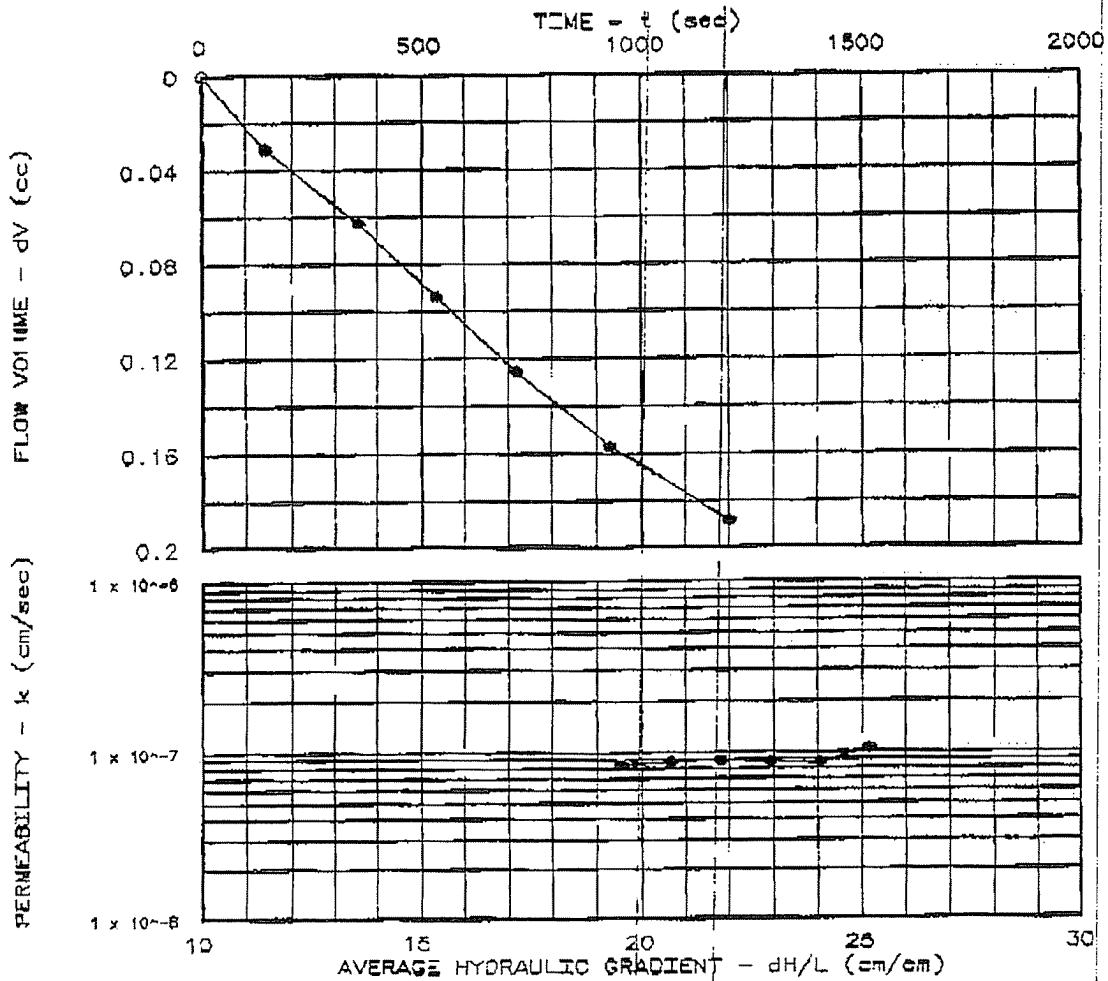
PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 11.63
 Specimen Diameter (cm): 10.21
 Dry Unit Weight (pcf): 98.5
 Moisture Before Test (%): 15.3
 Moisture After Test (%): 21.9
 Run Number: 1 • 2 ▲
 Cell Pressure (psi): 95.0
 Sat. Pressure (psi): 80.0
 Diff. Head (psi): 3.8
 Perm. (cm/sec): 8.72×10^{-8}

SAMPLE DATA:

Sample Identification:
 GT-19887-08-03-PK-003
 Visual Description: Silt & clay, some sand
 trace gravel
 Remarks: ASTM D5084
 Maximum Dry Density (pcf): 103.9
 Optimum Moisture Content (%): 15.6
 ASTM(D1557)
 Percent Compaction: 94.6%
 Permeameter type: FLEXIBLE WALL
 Sample type: REMOLDED



Project: Vanadium Corp. of America
 Location:
 Date: 9/15/03

Project No.: BD-03-006
 File No.: LTR-3
 Lab No.: 03-1755

PERMEABILITY TEST REPORT
SJB SERVICES, INC.

Tested by: pg
 Checked by: pg
 Test: CV - Constant volume

ATTACHMENT E
ANALYTICAL DATA ASSESSMENT AND VALIDATION

ANALYTICAL DATA ASSESSMENT AND VALIDATION
REMEDIAL INVESTIGATION
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK
JULY TO AUGUST 2003

PREPARED BY:
CONESTOGA-ROVERS & ASSOCIATES
2055 Niagara Falls Blvd., Suite #3
Niagara Falls, New York 14304
Telephone: 716-297-6150 Fax: 716-297-2265
Contact: Susan Scrocchi [js]
Date: November 6, 2003
www.CRAworld.com

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5.0 MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) ANALYSES.....	2
6.0 DUPLICATE ANALYSES.....	3
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(Following Text)

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TABLE 2	QUALIFIED SAMPLE DATA DUE TO HOLDING TIME EXCEEDANCES
TABLE 3	QUALIFIED SAMPLE RESULTS DUE TO ANALYTE CONCENTRATIONS IN THE METHOD BLANKS
TABLE 4	QUALIFIED SAMPLE RESULTS DUE TO OUTLYING MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERIES
TABLE 5	QUALIFIED SAMPLE DATA DUE TO VARIABILITY IN FIELD DUPLICATE RESULTS
TABLE 6	QUALIFIED SAMPLE RESULTS DUE TO ANALYTE CONCENTRATIONS IN THE RINSE BLANKS

1.0 INTRODUCTION

The following document details an assessment and validation of analytical results reported by Ecology and Environment, Inc. (E&E), located in Lancaster, New York, for samples collected at the Vanadium Site (Site) located in Niagara Falls, New York. Groundwater, surface water, surface soil, sediment, and borehole soils were collected during July and August 2003 to conduct a Remedial Investigation (RI). For sample identification, a sampling and analysis summary is presented in Table 1.

The quality assurance/quality control (QA/QC) criteria by which these data have been assessed are outlined in the analytical methods and the document entitled "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review", February 1994, EPA-540/R-94-013.

The data quality assessment and validation presented in the following subsections were performed based on information from data sheets including matrix spike (MS) recoveries, duplicate results, laboratory control sample (LCS) recoveries, and blank results for all parameters.

All soil, surface soil and sediment results are reported on a dry weight basis.

2.0 SAMPLE HOLDING TIMES

The method-specified holding time criteria for this program were as follows:

<i>Parameter</i>	<i>Matrix</i>	<i>Holding Time</i>
TAL Metals (except Mercury)	Water	180 days from collection to analysis
TAL Metals (except Mercury)	Soil/Sediment	180 days from collection to analysis
Mercury	Water	28 days from collection to analysis
Mercury	Soil/Sediment	28 days from collection to analysis
Chromium VI	Water	24 hours from collection to analysis
Chromium VI	Soil/Sediment	30 days from collection to extraction 7 days from extraction to analysis
Cyanide	Water	14 days from collection to analysis
Cyanide	Soil/Sediment	14 days from collection to analysis
pH	Soil/Sediment	ASAP

A holding time of 48 hours from collection to analysis was utilized for the pH analysis. All sample analyses were performed within the required holding times with the

exception of various soils/sediments for pH analysis. All associated results were qualified as estimated (see Table 2). All samples were properly preserved and cooled at 4°C ($\pm 2^\circ\text{C}$) after collection and all samples were received by the laboratory in good condition.

3.0 LABORATORY BLANK ANALYSES

The purpose of assessing the results of laboratory blank analyses is to determine the existence and magnitude of sample contamination introduced during analysis. Laboratory blanks are prepared from deionized water and analyzed as samples.

Most blank results were non-detect for the analytes of interest with the exception of metals and cyanide present at low concentrations. All associated sample results with concentrations similar to the blank concentrations were qualified as non-detect (see Table 3).

For this study, laboratory blanks were analyzed at a minimum frequency of one per analytical batch.

4.0 LABORATORY CONTROL SAMPLE ANALYSES

The LCS serves as a monitor of the overall performance of all steps in the analysis, including the sample preparation. LCSs were analyzed using the same sample preparation, analytical methods, and QA/QC procedures employed for the investigative samples.

LCSs were reported for all inorganic analyses. All LCS samples yielded recoveries within the established control limits, indicating acceptable overall analytical accuracy.

5.0 MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) ANALYSES

The recoveries of MS/MSD analyses are used to assess the analytical accuracy achieved on individual sample matrices. The relative percent difference (RPD) between the MS and MSD is used to assess analytical precision.

An MS/MSD was analyzed at the required frequency for all parameters.

Most recoveries were acceptable indicating adequate analytical accuracy and precision with the exception of some outlying results. The associated samples were qualified as follows:

- i) where high recoveries were observed, all positive results were qualified as estimated and all non-detect results would not have been impacted by the implied high bias;
- ii) where low recoveries were observed, all associated results were qualified as estimated to reflect the implied low bias;
- iii) where extremely low recoveries were observed (<30 percent), all positive results were qualified as estimated and all non-detect results were rejected due to the poor analyte efficiency; and
- iv) where a high RPD is observed, all positive results were qualified as estimated and all non-detect results would not have been impacted by the implied variability.

A summary of the outlying recoveries and qualified samples is presented in Table 4.

6.0 DUPLICATE ANALYSES

To assess analytical precision, samples were analyzed in duplicate for chromium VI and pH. The results were compared and must agree within 35 percent difference to be acceptable.

All results were acceptable indicating adequate analytical precision.

7.0 FIELD QA/QC

7.1 FIELD DUPLICATES

To assess the analytical and sampling protocol precision, field duplicates (as identified in Table 1) were collected and submitted "blind" to the laboratory. All data outside of estimated regions of detection demonstrated acceptable agreement indicating adequate sampling and analytical procedures with the exception of variability observed between some metal results. The results were qualified as estimated to reflect the implied variability (see Table 5).

7.2 RINSE BLANKS

Rinse blanks were submitted for analysis of all parameters to assess the possibility of cross-contamination during sample collection. Most results were non-detect with the exception of low concentration of metals and cyanide. All associated results with similar concentrations were qualified as non-detect (see Table 6).

8.0 CONCLUSION

Based on the assessment detailed in the foregoing, the data produced by E&E are acceptable with the noted qualifications and exceptions.

TABLES

TABLE 1
 COLLECTION AND ANALYSIS SUMMARY
 REMEDIAL INVESTIGATION
 VANADIUM CORPORATION OF AMERICA
 NIAGARA FALLS, NEW YORK
 JULY - AUGUST 2003

Sample I.D.	Location I.D.	Matrix	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Analysis/Parameters	Comment
SS-19867-0703-PK-001	SS-40	Surface Soil	07/18/03	10:05	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-002	SS-39	Surface Soil	07/18/03	10:15	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-003	SS-38	Surface Soil	07/18/03	10:30	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-004	SS-31	Surface Soil	07/18/03	10:45	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-005	SS-37	Surface Soil	07/18/03	10:55	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-006	SS-37	Surface Soil	07/18/03	11:00	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-007	SS-32	Surface Soil	07/18/03	11:05	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-008	SS-30	Surface Soil	07/18/03	11:15	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-009	SS-27	Surface Soil	07/18/03	11:20	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-010	SS-23	Surface Soil	07/18/03	11:30	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-011	SS-24	Surface Soil	07/18/03	11:35	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-012	SS-22	Surface Soil	07/18/03	11:45	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-013	SS-15	Surface Soil	07/18/03	11:55	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-014	SS-11	Surface Soil	07/18/03	12:10	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-015	SS-36	Surface Soil	07/18/03	13:25	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-016	SS-35	Surface Soil	07/18/03	13:35	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-017	SS-29	Surface Soil	07/18/03	13:40	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-018	SS-33	Surface Soil	07/18/03	13:45	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-019	SS-34	Surface Soil	07/18/03	13:55	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-020	SS-28	Surface Soil	07/18/03	14:00	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-021	SS-26	Surface Soil	07/18/03	14:10	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-022	SS-21	Surface Soil	07/18/03	14:20	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-023	SS-20	Surface Soil	07/18/03	14:30	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-024	SS-16	Surface Soil	07/18/03	14:40	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-025	SS-16	Surface Soil	07/18/03	14:45	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-026	SS-12	Surface Soil	07/21/03	13:10	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-027	SS-10	Surface Soil	07/21/03	9:20	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-028	SS-18	Surface Soil	07/21/03	12:20	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-029	SS-13	Surface Soil	07/21/03	12:30	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-030	SS-14	Surface Soil	07/21/03	12:40	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-031	SS-17	Surface Soil	07/21/03	12:50	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-032	SS-19	Surface Soil	07/21/03	13:00	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-033	SS-25	Surface Soil	07/21/03	13:20	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	

Duplicate of 005 (from SS-37)

MS/MSD

MS/MSD

TABLE 1
COLLECTION AND ANALYSIS SUMMARY
REMEDIAL INVESTIGATION
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK
JULY - AUGUST 2003

Sample I.D.	Location I.D.	Matrix	Collection Date (mm/dd/yy)	Collection Time (hr:min)	Analysis/Parameters	Comment
SS-19867-0703-PK-RB	Rinsate Blank	-	07/18/03	16:10	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SS-19867-0703-PK-RB	Rinsate Blank	-	07/21/03	13:50	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-001	BH-8/MW-22	6-8' BGS	07/22/03	13:20	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-002	BH-8/MW-22	13-14' BGS	07/22/03	14:30	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-003	BH-11/MW-25	2-3' BGS	07/23/03	8:30	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-004	BH-11/MW-25	8-10' BGS	07/23/03	9:30	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-005	BH-13/MW-26	2-4' BGS	07/23/03	10:30	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-006	BH-13/MW-26	10-12' BGS	07/23/03	11:30	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-007	BH-12	4-6.5' BGS	07/23/03	14:30	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-008	BH-12	8-10' BGS	07/23/03	15:00	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-009	BH-5/MW-19	0.5-2' BGS	07/23/03	15:45	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-010	BH-5/MW-19	10-12' BGS	07/23/03	16:50	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-011	BH-1/MW15	2-4' BGS	07/24/03	15:00	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	MS/MSD
S-19867-0703-PK-012	BH-1/MW15	10-12' BGS	07/24/03	15:45	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	Duplicate of -012
S-19867-0703-PK-013	BH-1/MW15	10-12' BGS	07/24/03	16:15	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-014	BH-2/MW-16	2-4' BGS	07/24/03	16:00	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-015	BH-2/MW-16	10-11' BGS	07/24/03	16:20	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-016	BH-6/MW-20	4.5-6' BGS	07/25/03	8:45	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-017	BH-6/MW-20	8-10' BGS	07/25/03	9:15	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-018	BH-9/MW-23	4-6' BGS	07/25/03	11:35	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-019	BH-9/MW-23	22-24' BGS	07/25/03	14:00	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-020	BH-10/MW-24	2-4' BGS	07/28/03	8:25	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-021	BH-10/MW-24	2-4' BGS	07/28/03	8:30	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-022	BH-10/MW-24	18-20' BGS	07/28/03	9:35	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-023	BH-4/MW-18	2-4' BGS	07/28/03	11:50	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-024	BH-4/MW-18	12-14' BGS	07/28/03	11:45	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-025	BH-7/MW-21	8-10' BGS	07/28/03	14:25	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-026	BH-7/MW-21	18-20' BGS	07/28/03	15:15	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-027	BH-15/MW-28	1-2' BGS	07/29/03	8:20	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-028	BH-15/MW-28	7-8' BGS	07/29/03	8:30	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-029	BH-14/MW-27	1.5-4' BGS	07/29/03	9:50	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-030	BH-14/MW-27	7-8' BGS	07/29/03	10:05	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-031	Next to TP-20	just below surface	08/18/03	17:20	TAL Metals, Cyanide, Hex. Chromium	

TABLE 1
COLLECTION AND ANALYSIS SUMMARY
REMEDIAL INVESTIGATION
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK
JULY - AUGUST 2003

Sample I.D.	Location I.D.	Matrix	Collection Date (mm/dd/yy)	Collection Time (hr:min)	Analysis/Parameters	Comment
S-19867-0703-PK-032	BH-3/MW-17	0-4' BGS	08/20/03	11:40	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-033	BH-3/MW-17	11-13' BGS	08/20/03	11:45	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-RB 1	Rinsate Blank	-	07/25/03	15:00	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0703-PK-RB 2	Rinsate Blank	-	07/25/03	15:05	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
GW-19867-0803-PK-001	MW-22	Groundwater	08/15/03	8:50	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-0803-PK-002	MW-22	Groundwater	08/15/03	9:00	TAL Metals, Cyanide, Hex. Chromium	Field Filtered
GW-19867-0803-PK-003	MW-19	Groundwater	08/15/03	9:30	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-0803-PK-004	MW-15	Groundwater	08/15/03	10:20	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-0803-PK-005	MW-15	Groundwater	08/15/03	10:30	TAL Metals, Cyanide, Hex. Chromium	
RINSATE BLANK	Rinsate Blank	-	08/15/03	-	TAL Metals, Cyanide, Hex. Chromium	Field Filtered
GW-19867-0803-PK-006	MW-25	Groundwater	08/18/03	15:40	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-0803-PK-007	MW-25	Groundwater	08/18/03	15:50	TAL Metals, Hex. Chromium	
GW-19867-0803-PK-008	MW-25	Groundwater	08/18/03	16:00	TAL Metals, Cyanide, Hex. Chromium	Field Filtered
GW-19867-0803-PK-009	MW-20	Groundwater	08/18/03	16:40	TAL Metals, Cyanide, Hex. Chromium	Duplicate of 006 MS/MSD
GW-19867-0803-PK-010	MW-20	Groundwater	08/18/03	16:50	TAL Metals, Hex. Chromium	Field Filtered
GW-19867-0803-PK-011	MW-27	Groundwater	08/18/03	17:20	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-0803-PK-012	MW-27	Groundwater	08/18/03	17:30	TAL Metals, Hex. Chromium	
GW-19867-0803-PK-013	MW-26	Groundwater	08/20/03	15:30	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-0803-PK-014	MW-23	Groundwater	08/20/03	16:10	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-0803-PK-015	MW-23	Groundwater	08/20/03	16:30	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-0803-PK-016	MW-24	Groundwater	08/20/03	17:00	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-0803-PK-017	MW-104A	Groundwater	08/25/03	13:00	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-0803-PK-018	MW-104A	Groundwater	08/25/03	13:10	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-0803-PK-019	MW-16	Groundwater	08/25/03	14:30	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-0803-PK-020	MW-105A	Groundwater	08/28/03	11:40	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-0803-PK-021	MW-28	Groundwater	08/28/03	12:00	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-0803-PK-022	MW-21	Groundwater	08/28/03	12:30	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-0803-PK-023	MW-18	Groundwater	08/28/03	12:50	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-0803-PK-024	MW-17	Groundwater	08/28/03	13:10	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-0803-PK-025	MW-103A	Groundwater	08/28/03	14:00	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-0803-PK-026	MW-103A	Groundwater	08/28/03	14:15	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-0803-PK-027	MW-106A	Groundwater	08/28/03	14:45	TAL Metals, Cyanide, Hex. Chromium	Field Filtered
GW-19867-0803-PK-028	MW-107A	Groundwater	08/28/03	15:00	TAL Metals, Cyanide, Hex. Chromium	

TABLE 1
COLLECTION AND ANALYSIS SUMMARY
REMEDIAL INVESTIGATION
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK
JULY - AUGUST 2003

Sample I.D.	Location I.D.	Matrix	Collection Date (mm/dd/yy)	Collection Time (hr:min)	Analysis/Parameters	Comment
SW-19867-08-03-011	SW-11	Surface Water	08/21/03	12:20	TAL Metals, Cyanide, Hex. Chromium	
SW-19867-08-03-013	SW-13	Surface Water	08/21/03	10:00	TAL Metals, Cyanide, Hex. Chromium	
SW-19867-08-03-014	SW-14	Surface Water	08/21/03	10:20	TAL Metals, Cyanide, Hex. Chromium	
SW-19867-08-03-015	SW-15	Surface Water	08/21/03	13:00	TAL Metals, Cyanide, Hex. Chromium	
SW-19867-08-03-019	SW-19	Surface Water	08/21/03	13:10	TAL Metals, Cyanide, Hex. Chromium	
SW-19867-08-03-020	SW-20	Surface Water	08/21/03	10:40	TAL Metals, Cyanide, Hex. Chromium	
SW-19867-08-03-021	SW-21	Surface Water	08/21/03	11:00	TAL Metals, Cyanide, Hex. Chromium	
SW-19867-08-03-022	SW-22	Surface Water	08/28/03	14:20	TAL Metals, Cyanide, Hex. Chromium	
SW-19867-08-03-023	SW-23	Surface Water	08/21/03	11:15	TAL Metals, Cyanide, Hex. Chromium	MS/MSD
SW-19867-08-03-024	SW-24	Surface Water	08/21/03	13:30	TAL Metals, Cyanide, Hex. Chromium	
SW-19867-08-03-025	SW-23	Surface Water	08/21/03	13:40	TAL Metals, Cyanide, Hex. Chromium	Duplicate of -023
Rinsate Blank						
S-19867-0803-PK-009	SW-9	Soil	08/28/03	-	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
S-19867-0803-PK-008	SW-8	Soil	08/14/08	8:40	TAL Metals, Cyanide, Hex. Chromium	
S-19867-0803-PK-017	SW-17	Soil	08/14/08	8:50	TAL Metals, Cyanide, Hex. Chromium	
S-19867-0803-PK-016	SW-16	Soil	08/14/08	10:50	TAL Metals, Cyanide, Hex. Chromium	
SED-19867-08-03-010	SW-10	Sediment	08/14/08	11:00	TAL Metals, Cyanide, Hex. Chromium	
SED-19867-08-03-011	SW-11	Sediment	08/21/03	12:10	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SED-19867-08-03-013	SW-13	Sediment	08/21/03	12:20	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SED-19867-08-03-014	SW-14	Sediment	08/21/03	10:00	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SED-19867-08-03-015	SW-15	Sediment	08/21/03	10:20	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SED-19867-08-03-018	SW-18	Sediment	08/21/03	13:00	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SED-19867-08-03-019	SW-19	Sediment	08/21/03	13:05	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SED-19867-08-03-020	SW-20	Sediment	08/21/03	13:10	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SED-19867-08-03-021	SW-21	Sediment	08/21/03	10:40	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SED-19867-08-03-022	SW-22	Sediment	08/21/03	11:00	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SED-19867-08-03-023	SW-23	Sediment	08/28/03	14:20	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	
SED-19867-08-03-024	SW-24	Sediment	08/21/03	11:15	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	MS-MSD
SED-19867-08-03-025	SW-23	Sediment	08/21/03	13:30	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	Duplicate of -023
			08/21/03	13:40	TAL Metals, Cyanide, Hex. Chromium, Corrosivity (pH)	

Notes:

* BGS Feet Below Ground Surface.

Hex. Hexavalent.

TABLE 1
COLLECTION AND ANALYSIS SUMMARY
REMEDIAL INVESTIGATION
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK
JULY - AUGUST 2003

<i>Sample I.D.</i>	<i>Location I.D.</i>	<i>Matrix</i>	<i>Collection Date (mm/dd/yy)</i>	<i>Collection Time (hr:min)</i>	<i>Analysis/Parameters</i>	<i>Comment</i>
MS						
MSD						
TAL						

TABLE 2
 QUALIFIED SAMPLE DATA DUE TO HOLDING TIME EXCEEDANCES
 REMEDIAL INVESTIGATION
 VANADIUM CORPORATION OF AMERICA
 NIAGARA FALLS, NEW YORK
 JULY - AUGUST 2003

<i>Parameter</i>	<i>Sample ID</i>	<i>Holding Time (days)</i>	<i>Holding Time Criteria (days)</i>	<i>Sample Result</i>	<i>Units</i>	<i>Qualifier</i>
pH	SS-19867-0703-PK-003	4	2	8.0	S.U.	J
	S-19867-07-03-PK-006	7	2	11	S.U.	J
	S-19867-07-03-PK-005	7	2	9.9	S.U.	J
	SS-19867-0703-PK-002	4	2	6.9	S.U.	J
	S-19867-07-03-PK-007	7	2	9.1	S.U.	J
	S-19867-07-03-PK-008	7	2	9.8	S.U.	J
	SS-19867-0703-PK-018	4	2	7.3	S.U.	J
	SS-19867-0703-PK-001	4	2	8.0	S.U.	J
	SS-19867-0703-PK-004	4	2	8.0	S.U.	J
	S-19867-07-03-PK-001	8	2	12	S.U.	J
	SS-19867-0703-PK-014	4	2	6.7	S.U.	J
	SS-19867-0703-PK-025	4	2	7.7	S.U.	J
	SS-19867-0703-PK-024	5	2	7.5	S.U.	J
	SS-19867-0703-PK-013	4	2	8.2	S.U.	J
	SS-19867-0703-PK-015	4	2	7.6	S.U.	J
	SS-19867-0703-PK-012	4	2	8.3	S.U.	J
	SS-19867-0703-PK-023	4	2	7.8	S.U.	J
	SS-19867-0703-PK-011	4	2	8.0	S.U.	J
	SS-19867-0703-PK-022	4	2	7.2	S.U.	J
	SS-19867-0703-PK-010	4	2	7.7	S.U.	J
	S-19867-07-03-PK-002	8	2	9.1	S.U.	J
	SS-19867-0703-PK-016	4	2	8.0	S.U.	J
	S-19867-07-03-PK-003	7	2	8.9	S.U.	J
	SS-19867-0703-PK-007	4	2	7.8	S.U.	J
	SS-19867-0703-PK-005	4	2	8.2	S.U.	J
	SS-19867-0703-PK-020	4	2	6.5	S.U.	J
	SS-19867-0703-PK-006	4	2	8.3	S.U.	J
	SS-19867-0703-PK-009	4	2	8.8	S.U.	J
	SS-19867-0703-PK-017	4	2	7.7	S.U.	J
	SS-19867-0703-PK-019	4	2	7.6	S.U.	J
	SS-19867-0703-PK-008	4	2	8.4	S.U.	J
	SS-19867-0703-PK-021	4	2	7.2	S.U.	J
	S-19867-07-03-PK-004	7	2	9.6	S.U.	J
	SED-19867-08-03-PK-022	5	2	7.7	S.U.	J

Notes:

J Estimated.
 S.U. Standard Units.

TABLE 3
 QUALIFIED SAMPLE RESULTS DUE TO ANALYTE CONCENTRATIONS IN THE METHOD BLANKS
 REMEDIAL INVESTIGATION
 VANADIUM CORPORATION OF AMERICA
 NIAGARA FALLS, NEW YORK
 JULY - AUGUST 2003

<i>Parameter</i>	<i>Blank ID/Date</i>	<i>Analyte</i>	<i>Blank Result</i>	<i>Sample ID</i>	<i>Sample Result</i>	<i>Qualified Sample Result</i>	<i>Units</i>
Metals	07/31/03	Sodium	14.24 J	SS-19867-0703-PK-019	68.8 J	ND 68.8	mg/Kg
				SS-19867-0703-PK-016	49.4 J	ND 49.4	mg/Kg
				SS-19867-0703-PK-018	35.6 J	ND 35.6	mg/Kg
				SS-19867-0703-PK-004	58.9 J	ND 58.9	mg/Kg
				SS-19867-0703-PK-007	64.9 J	ND 64.9	mg/Kg
				SS-19867-0703-PK-013	27.0 J	ND 27.0	mg/Kg
				SS-19867-0703-PK-006	64.6 J	ND 64.6	mg/Kg
				SS-19867-0703-PK-031	28.2 J	ND 28.2	mg/Kg
				SS-19867-0703-PK-027	66.8 J	ND 66.8	mg/Kg
				SS-19867-0703-PK-028	41.5 J	ND 41.5	mg/Kg
				SS-19867-0703-PK-029	47.4 J	ND 47.4	mg/Kg
				SS-19867-0703-PK-026	67.0 J	ND 67.0	mg/Kg
				SS-19867-0703-PK-030	27.5 J	ND 27.5	mg/Kg
				SS-19867-0703-PK-032	33.4 J	ND 33.4	mg/Kg
				SS-19867-0703-PK-033	41.4 J	ND 41.4	mg/Kg
SS-19867-0703-PK-020	35.0 J	ND 35.0	mg/Kg				
Metals	08/30/03	Aluminum	27.88	GW-9867-08-03-PK-013	48.5 J	ND 200	µg/L
Metals	09/04/03	Aluminum	85.97	GW-9867-08-03-PK-008	357	ND 400	µg/L
				GW-9867-08-03-PK-005	71.8 J	ND 200	µg/L
				GW-9867-08-03-PK-007	92.7 J	ND 200	µg/L
Metals	08/30/03	Zinc	2.802	GW-9867-08-03-PK-016	3.27 J	ND 10.0	µg/L
				GW-9867-08-03-PK-013	7.77 J	ND 10.0	µg/L
Metals	09/11/03	Iron	46.49	GW-9867-08-03-PK-019	134 J	ND 200	µg/L
Metals	09/11/03	Nickel	2.197	GW-9867-08-03-PK-019	9.02 J	ND 20.0	µg/L
				GW-9867-08-03-PK-018	10.5 J	ND 20.0	µg/L
				GW-9867-08-03-PK-017	10.2 J	ND 20.0	µg/L
Metals	09/12/03	Aluminum	78.93	GW-19867-08-03-PK-026	88.0 J	ND 200	µg/L
Metals	09/12/03	Cobalt	0.7059	GW-19867-08-03-PK-020	2.22 J	ND 20.0	µg/L
				GW-19867-08-03-PK-026	1.34 J	ND 20.0	µg/L
				GW-19867-08-03-PK-021	1.68 J	ND 20.0	µg/L
				GW-19867-08-03-PK-022	1.61 J	ND 20.0	µg/L
Metals	09/12/03	Copper	4.314	GW-19867-08-03-PK-020	17.2 J	ND 20.0	µg/L
				GW-19867-08-03-PK-027	18.6 J	ND 20.0	µg/L
				GW-19867-08-03-PK-021	9.34 J	ND 20.0	µg/L
Metals	09/15/03	Zinc	16.13	GW-19867-08-03-PK-021	19.9 J	ND 19.9	µg/L
				GW-19867-08-03-PK-026	11.3	ND 11.3	µg/L
				GW-19867-08-03-PK-022	18.7	ND 18.7	µg/L
Metals	08/29/03	Zinc	2.257	SW-19867-08-03-021	9.61 J	ND 10	µg/L
Gen Chem	08/22/03	Cyanide	0.004142	GW-9867-08-03-PK-001	0.00613 J	ND 0.01	mg/L
				GW-9867-08-03-PK-002	0.00418 J	ND 0.01	mg/L
				GW-9867-08-03-PK-003	0.00343 J	ND 0.01	mg/L
				GW-9867-08-03-PK-004	0.00334 J	ND 0.01	mg/L

TABLE 3
 QUALIFIED SAMPLE RESULTS DUE TO ANALYTE CONCENTRATIONS IN THE METHOD BLANKS
 REMEDIAL INVESTIGATION
 VANADIUM CORPORATION OF AMERICA
 NIAGARA FALLS, NEW YORK
 JULY - AUGUST 2003

<i>Parameter</i>	<i>Blank ID/Date</i>	<i>Analyte</i>	<i>Blank Result</i>	<i>Sample ID</i>	<i>Sample Result</i>	<i>Qualified Sample Result</i>	<i>Units</i>
Gen Chem	08/20/03	Cyanide	0.4239	S-9867-08-03-PK-008	0.924	ND 0.924	mg/Kg
				S-9867-08-03-PK-009	0.465	ND 0.862	mg/Kg
				S-9867-08-03-PK-017	0.242	ND 0.607	mg/Kg
				S-9867-08-03-PK-031	0.603	ND 0.603	mg/Kg

Notes:

J Estimated.
 ND Non-detect at associated value.

TABLE 4
QUALIFIED SAMPLE RESULTS DUE TO OUTLYING MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERIES
REMEDIAL INVESTIGATION
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK
JULY - AUGUST 2003

Parameter	Analyte	Sample ID	MS Recovery (percent)	MSD Recovery (percent)	RPD	Control Limits (percent)	RPD Control Limits (percent)	Associated Sample ID	Sample Result	Units	Qualifier
Metals	Antimony	SS-19867-0703-PK-029	49	50	2	75-125	35	SS-19867-0703-PK-024	ND 0.980	mg/Kg	J
		SS-19867-0703-PK-026						SS-19867-0703-PK-026	ND 0.962	mg/Kg	J
		SS-19867-0703-PK-027						SS-19867-0703-PK-027	ND 0.926	mg/Kg	J
		SS-19867-0703-PK-028						SS-19867-0703-PK-028	ND 0.943	mg/Kg	J
		SS-19867-0703-PK-029						SS-19867-0703-PK-029	ND 1.03	mg/Kg	J
		SS-19867-0703-PK-030						SS-19867-0703-PK-030	ND 0.962	mg/Kg	J
		SS-19867-0703-PK-031						SS-19867-0703-PK-031	ND 0.997	mg/Kg	J
		SS-19867-0703-PK-032						SS-19867-0703-PK-032	ND 0.909	mg/Kg	J
		SS-19867-0703-PK-033						SS-19867-0703-PK-033	ND 0.893	mg/Kg	J
		SS-19867-0703-PK-001						SS-19867-0703-PK-001	ND 1.03	mg/Kg	R
		SS-19867-0703-PK-002						SS-19867-0703-PK-002	ND 1.22	mg/Kg	R
Metals	Antimony	SS-19867-0703-PK-003	27	28	4	75-125	35	SS-19867-0703-PK-003	ND 1.52	mg/Kg	R
		SS-19867-0703-PK-004						SS-19867-0703-PK-004	ND 1.23	mg/Kg	R
		SS-19867-0703-PK-006						SS-19867-0703-PK-006	ND 1.22	mg/Kg	R
		SS-19867-0703-PK-007						SS-19867-0703-PK-007	ND 2.79	mg/Kg	R
		SS-19867-0703-PK-008						SS-19867-0703-PK-008	ND 1.26	mg/Kg	R
		SS-19867-0703-PK-011						SS-19867-0703-PK-011	ND 1.07	mg/Kg	R
		SS-19867-0703-PK-014						SS-19867-0703-PK-014	ND 1.83	mg/Kg	R
		SS-19867-0703-PK-015						SS-19867-0703-PK-015	ND 1.30	mg/Kg	R
		SS-19867-0703-PK-016						SS-19867-0703-PK-016	ND 3.18	mg/Kg	R
		SS-19867-0703-PK-017						SS-19867-0703-PK-017	ND 2.15	mg/Kg	R
		SS-19867-0703-PK-018						SS-19867-0703-PK-018	ND 2.62	mg/Kg	R
Metals	Antimony	SS-19867-0703-PK-019						SS-19867-0703-PK-019	ND 2.63	mg/Kg	R
		SS-19867-0703-PK-020						SS-19867-0703-PK-020	ND 2.91	mg/Kg	R
		SS-19867-0703-PK-005						SS-19867-0703-PK-005	ND 2.31	mg/Kg	R
		SS-19867-0703-PK-009						SS-19867-0703-PK-009	ND 2.10	mg/Kg	R
		SS-19867-0703-PK-010						SS-19867-0703-PK-010	ND 2.24	mg/Kg	R
		SS-19867-0703-PK-012						SS-19867-0703-PK-012	ND 2.52	mg/Kg	R
		SS-19867-0703-PK-013						SS-19867-0703-PK-013	ND 3.33	mg/Kg	R

TABLE 4
 QUALIFIED SAMPLE RESULTS DUE TO OUTLYING MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERIES
 REMEDIAL INVESTIGATION
 VANADIUM CORPORATION OF AMERICA
 NIAGARA FALLS, NEW YORK
 JULY - AUGUST 2003

Parameter	Analyte	Sample ID	MS Recovery (percent)	MSD Recovery (percent)	RPD	Control Limits (percent)	RPD Control Limits (percent)	Associated Sample ID	Sample Result	Units	Qualifier
Metals	Antimony	S-19867-0703-PK-011	50	49	2	75-125	35	S-19867-0703-PK-011	ND 1.22	mg/Kg	J
		S-19867-0703-PK-012						S-19867-0703-PK-012	ND 2.03	mg/Kg	J
		S-19867-0703-PK-013						S-19867-0703-PK-013	ND 1.21	mg/Kg	J
		S-19867-0703-PK-014						S-19867-0703-PK-014	ND 1.13	mg/Kg	J
		S-19867-0703-PK-015						S-19867-0703-PK-015	ND 1.33	mg/Kg	J
		S-19867-0703-PK-017						S-19867-0703-PK-017	ND 1.19	mg/Kg	J
		S-19867-0703-PK-019						S-19867-0703-PK-019	ND 1.92	mg/Kg	J
		S-19867-0703-PK-016						S-19867-0703-PK-016	ND 24.2	mg/Kg	J
		S-19867-0703-PK-001						S-19867-0703-PK-001	5.55	mg/Kg	J
		S-19867-0703-PK-002						S-19867-0703-PK-002	ND 0.736	mg/Kg	J
		S-19867-0703-PK-003						S-19867-0703-PK-003	ND 3.54	mg/Kg	J
		S-19867-0703-PK-004						S-19867-0703-PK-004	ND 0.931	mg/Kg	J
		S-19867-0703-PK-005						S-19867-0703-PK-005	3.01	mg/Kg	J
		S-19867-0703-PK-006						S-19867-0703-PK-006	2.82	mg/Kg	J
S-19867-0703-PK-007						S-19867-0703-PK-007	1.77	mg/Kg	J		
S-19867-0703-PK-008						S-19867-0703-PK-008	4.37	mg/Kg	J		
S-19867-0703-PK-009						S-19867-0703-PK-009	3.83	mg/Kg	J		
S-19867-0703-PK-018						S-19867-0703-PK-018	4.49	mg/Kg	J		
S-19867-0703-PK-020						S-19867-0703-PK-020	ND 2.74	mg/Kg	J		
S-19867-0703-PK-021						S-19867-0703-PK-021	3.85	mg/Kg	J		
S-19867-0703-PK-022						S-19867-0703-PK-022	ND 0.995	mg/Kg	J		
S-19867-0703-PK-023						S-19867-0703-PK-023	4.91	mg/Kg	J		
S-19867-0703-PK-024						S-19867-0703-PK-024	ND 2.57	mg/Kg	J		
S-19867-0703-PK-025						S-19867-0703-PK-025	5.98	mg/Kg	J		
S-19867-0703-PK-026						S-19867-0703-PK-026	ND 3.17	mg/Kg	J		
S-19867-0703-PK-027						S-19867-0703-PK-027	3.85	mg/Kg	J		
S-19867-0703-PK-028						S-19867-0703-PK-028	ND 1.74	mg/Kg	J		
S-19867-0703-PK-029						S-19867-0703-PK-029	3.44	mg/Kg	J		
S-19867-0703-PK-030						S-19867-0703-PK-030	ND 2.58	mg/Kg	J		
Metals	Antimony	S-19867-07-03-PK-020	39	41	5	75-125	35	S-19867-0703-PK-001	5.55	mg/Kg	J
		S-19867-07-03-PK-002						S-19867-0703-PK-002	ND 0.736	mg/Kg	J

TABLE 4
 QUALIFIED SAMPLE RESULTS DUE TO OUTLYING MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERIES
 REMEDIAL INVESTIGATION
 VANADIUM CORPORATION OF AMERICA
 NIAGARA FALLS, NEW YORK
 JULY - AUGUST 2003

Parameter	Analyte	Sample ID	MS Recovery (percent)	MSD Recovery (percent)	RPD	RPD Control Limits (percent)		Associated Sample ID	Sample Result	Units	Qualifier
						Control Limits (percent)	Control Limits (percent)				
Metals	Barium	SS-19867-0703-PK-029	200	116	53	35	75-125	SS-19867-0703-PK-024	215 J	mg/Kg	*
		SS-19867-0703-PK-026						SS-19867-0703-PK-026	81.4 J	mg/Kg	*
		SS-19867-0703-PK-027						SS-19867-0703-PK-027	99.8 J	mg/Kg	*
		SS-19867-0703-PK-028						SS-19867-0703-PK-028	94.2 J	mg/Kg	*
		SS-19867-0703-PK-029						SS-19867-0703-PK-029	107 J	mg/Kg	*
		SS-19867-0703-PK-030						SS-19867-0703-PK-030	104 J	mg/Kg	*
		SS-19867-0703-PK-031						SS-19867-0703-PK-031	118 J	mg/Kg	*
		SS-19867-0703-PK-032						SS-19867-0703-PK-032	97.5 J	mg/Kg	*
		SS-19867-0703-PK-033						SS-19867-0703-PK-033	118 J	mg/Kg	*
		SS-19867-0703-PK-018						S-19867-0703-PK-018	66.7 J	mg/Kg	*
		SS-19867-0703-PK-001						S-19867-07-03-PK-001	49.5 J	mg/Kg	*
		SS-19867-0703-PK-002						S-19867-07-03-PK-002	110 J	mg/Kg	*
		SS-19867-0703-PK-003						S-19867-07-03-PK-003	169 J	mg/Kg	*
Metals	Barium	SS-19867-0703-PK-004			45	35	75-125	S-19867-07-03-PK-004	108 J	mg/Kg	*
		SS-19867-0703-PK-005						S-19867-07-03-PK-005	174 J	mg/Kg	*
		SS-19867-0703-PK-006						S-19867-07-03-PK-006	37.4 J	mg/Kg	*
		SS-19867-0703-PK-007						S-19867-07-03-PK-007	131 J	mg/Kg	*
		SS-19867-0703-PK-008						S-19867-07-03-PK-008	11.3 J	mg/Kg	*
		SS-19867-0703-PK-009						S-19867-07-03-PK-009	34.4 J	mg/Kg	*
		SS-19867-0703-PK-020						S-19867-07-03-PK-020	208 J	mg/Kg	*
		SS-19867-0703-PK-021						S-19867-07-03-PK-021	95.7 J	mg/Kg	*
		SS-19867-0703-PK-022						S-19867-07-03-PK-022	100 J	mg/Kg	*
		SS-19867-0703-PK-023						S-19867-07-03-PK-023	19.9 J	mg/Kg	*
		SS-19867-0703-PK-024						S-19867-07-03-PK-024	158 J	mg/Kg	*
		SS-19867-0703-PK-025						S-19867-07-03-PK-025	24.7 J	mg/Kg	*
		SS-19867-0703-PK-026						S-19867-07-03-PK-026	102 J	mg/Kg	*
SS-19867-0703-PK-028						S-19867-07-03-PK-028	29.4 J	mg/Kg	*		
SS-19867-0703-PK-029						S-19867-07-03-PK-029	224 J	mg/Kg	*		
SS-19867-0703-PK-030						S-19867-07-03-PK-030	62.2 J	mg/Kg	*		
SS-19867-0703-PK-030						S-19867-07-03-PK-030	159 J	mg/Kg	*		

TABLE 4
QUALIFIED SAMPLE RESULTS DUE TO OUTLYING MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERIES
REMEDIAL INVESTIGATION
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK
JULY - AUGUST 2003

Parameter	Analyte	Sample ID	MS Recovery (percent)	MSD Recovery (percent)	RPD	Control Limits (percent)	RPD Control Limits (percent)	Associated Sample ID	Sample Result	Units	Qualifier	
Metals	Chromium Total	SS-19867-0703-PK-029	91	146	46	75-125	35	SS-19867-0703-PK-033	45.5 J	mg/Kg	*	
		SS-19867-0703-PK-031						SS-19867-0703-PK-030	57.8 J	mg/Kg	*	
		SS-19867-0703-PK-030						SS-19867-0703-PK-029	36.1 J	mg/Kg	*	
		SS-19867-0703-PK-032						SS-19867-0703-PK-027	35.7 J	mg/Kg	*	
		SS-19867-0703-PK-027						SS-19867-0703-PK-026	44.5 J	mg/Kg	*	
		SS-19867-0703-PK-026						SS-19867-0703-PK-028	60.1 J	mg/Kg	*	
		SS-19867-0703-PK-028						SS-19867-0703-PK-024	85.5 J	mg/Kg	*	
		SS-19867-0703-PK-024							29.6 J	mg/Kg	*	
									997 J	mg/Kg	*	
Metals	Manganese	SS-19867-0703-PK-018	425	131	106	75-125	35	SS-19867-0703-PK-018	510	mg/Kg	J	
Metals	Nickel	S-19867-07-03-PK-020	64	62	3	75-125	35	S-19867-07-03-PK-001	68.5 J	mg/Kg	*	
		S-19867-07-03-PK-006						S-19867-07-03-PK-005	9.97 J	mg/Kg	*	
		S-19867-07-03-PK-005						S-19867-07-03-PK-002	11.7 J	mg/Kg	*	
		S-19867-07-03-PK-002						S-19867-07-03-PK-004	22.6 J	mg/Kg	*	
		S-19867-07-03-PK-004						S-19867-07-03-PK-003	27.4 J	mg/Kg	*	
		S-19867-07-03-PK-003						S-19867-07-03-PK-028	261 J	mg/Kg	*	
		S-19867-07-03-PK-028						S-19867-07-03-PK-025	28.5 J	mg/Kg	*	
		S-19867-07-03-PK-025						S-19867-07-03-PK-021	33.9 J	mg/Kg	*	
		S-19867-07-03-PK-021						S-19867-07-03-PK-029	21.7 J	mg/Kg	*	
		S-19867-07-03-PK-029						S-19867-07-03-PK-024	21.8 J	mg/Kg	*	
		S-19867-07-03-PK-024						S-19867-07-03-PK-027	34.9 J	mg/Kg	*	
		S-19867-07-03-PK-027						S-19867-07-03-PK-023	9.71 J	mg/Kg	*	
		S-19867-07-03-PK-023						S-19867-07-03-PK-022	7.27 J	mg/Kg	*	
S-19867-07-03-PK-022						S-19867-07-03-PK-008	27.4 J	mg/Kg	*			
S-19867-07-03-PK-008						S-19867-07-03-PK-026	6.21 J	mg/Kg	*			
S-19867-07-03-PK-026						S-19867-07-03-PK-007	26.8 J	mg/Kg	*			
S-19867-07-03-PK-007						S-19867-07-03-PK-020	51.0 J	mg/Kg	*			
S-19867-07-03-PK-020						S-19867-07-03-PK-030	51.8 J	mg/Kg	*			
S-19867-07-03-PK-030						S-19867-07-03-PK-009	32.8 J	mg/Kg	*			
S-19867-07-03-PK-009						S-19867-07-03-PK-021	42.7 J	mg/Kg	*			
S-19867-07-03-PK-021						S-19867-07-03-PK-020	21.7 J	mg/Kg	*			
S-19867-07-03-PK-020							51.8 J	mg/Kg	*			

TABLE 4
 QUALIFIED SAMPLE RESULTS DUE TO OUTLYING MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERIES
 REMEDIAL INVESTIGATION
 VANADIUM CORPORATION OF AMERICA
 NIAGARA FALLS, NEW YORK
 JULY - AUGUST 2003

Parameter	Analyte	Sample ID	MS Recovery (percent)	MSD Recovery (percent)	RPD	Control Limits (percent)	RPD Control Limits (percent)	Associated Sample ID	Sample Result	Units	Qualifier		
Metals	Silver	S-19867-07-03-PK-020	126	118	7	75-125	35	S-19867-07-03-PK-001	0.283 J	mg/Kg	*		
		S-19867-07-03-PK-003						S-19867-07-03-PK-003	0.575 J	mg/Kg	*		
									S-19867-07-03-PK-021	0.525 J	mg/Kg	*	
									S-19867-07-03-PK-025	0.262 J	mg/Kg	*	
									S-19867-07-03-PK-023	0.371 J	mg/Kg	*	
									S-19867-07-03-PK-008	0.172 J	mg/Kg	*	
									S-19867-07-03-PK-007	0.321 J	mg/Kg	*	
									S-19867-07-03-PK-020	0.763 J	mg/Kg	*	
									S-19867-07-03-PK-009	0.279 J	mg/Kg	*	
									S-19867-07-03-PK-007	0.321 J	mg/Kg	*	
									S-19867-07-03-PK-003	0.575 J	mg/Kg	*	
									S-19867-07-03-PK-001	0.283 J	mg/Kg	*	
									S-19867-07-03-PK-008	0.172 J	mg/Kg	*	
									S-19867-07-03-PK-025	0.262 J	mg/Kg	*	
									S-19867-07-03-PK-023	0.371 J	mg/Kg	*	
									S-19867-07-03-PK-020	0.763 J	mg/Kg	*	
									S-19867-07-03-PK-009	0.279 J	mg/Kg	*	
									S-19867-07-03-PK-021	0.525 J	mg/Kg	*	
		Metals	Vanadium	SS-19867-0703-PK-004	103	131	24	75-125	35	SS-19867-0703-PK-001	19.7	mg/Kg	J
										SS-19867-0703-PK-002	17.1	mg/Kg	J
								SS-19867-0703-PK-003	21.2	mg/Kg	J		
								SS-19867-0703-PK-004	82.2	mg/Kg	J		
								SS-19867-0703-PK-005	36.3	mg/Kg	J		
								SS-19867-0703-PK-006	38.4	mg/Kg	J		
								SS-19867-0703-PK-007	40.7	mg/Kg	J		
								SS-19867-0703-PK-008	86.6	mg/Kg	J		
								SS-19867-0703-PK-009	42.9	mg/Kg	J		
								SS-19867-0703-PK-010	227	mg/Kg	J		
								SS-19867-0703-PK-011	44.5	mg/Kg	J		
								SS-19867-0703-PK-012	202	mg/Kg	J		
								SS-19867-0703-PK-014	35.3	mg/Kg	J		
								SS-19867-0703-PK-015	30.0	mg/Kg	J		
								SS-19867-0703-PK-016	41.3	mg/Kg	J		
								SS-19867-0703-PK-017	33.8	mg/Kg	J		

TABLE 4
QUALIFIED SAMPLE RESULTS DUE TO OUTLYING MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERIES
REMEDIAL INVESTIGATION
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK
JULY - AUGUST 2003

Parameter	Analyte	Sample ID	MS Recovery (percent)	MSD Recovery (percent)	RPD	Control Limits (percent)	RPD Control Limits (percent)	Associated Sample ID	Sample Result	Units	Qualifier
Metals (Cont'd)	Vanadium	SS-19867-0703-PK-004	103	131	24	75-125	35	SS-19867-0703-PK-018	41.3	mg/Kg	J
		SS-19867-0703-PK-019						SS-19867-0703-PK-019	37.1	mg/Kg	J
		SS-19867-0703-PK-020						SS-19867-0703-PK-020	40.4	mg/Kg	J
		SS-19867-0703-PK-013						SS-19867-0703-PK-013	191	mg/Kg	J
Metals	Vanadium	S-19867-0703-PK-018	132	118	11	75-125	35	S-19867-0703-PK-018	80.9	mg/Kg	J
		S-19867-0703-PK-020	327	74	126	75-125	35	S-19867-0703-PK-001	82.7	mg/Kg	J
Metals	Vanadium	S-19867-0703-PK-002						S-19867-0703-PK-002	28.9	mg/Kg	J
		S-19867-0703-PK-003						S-19867-0703-PK-003	74.4	mg/Kg	J
		S-19867-0703-PK-004						S-19867-0703-PK-004	32.8	mg/Kg	J
		S-19867-0703-PK-005						S-19867-0703-PK-005	15.7	mg/Kg	J
		S-19867-0703-PK-006						S-19867-0703-PK-006	13.6	mg/Kg	J
		S-19867-0703-PK-007						S-19867-0703-PK-007	29.3	mg/Kg	J
		S-19867-0703-PK-008						S-19867-0703-PK-008	6.48	mg/Kg	J
		S-19867-0703-PK-009						S-19867-0703-PK-009	62.8	mg/Kg	J
		S-19867-0703-PK-020						S-19867-0703-PK-020	107	mg/Kg	J
		S-19867-0703-PK-021						S-19867-0703-PK-021	74.3	mg/Kg	J
		S-19867-0703-PK-022						S-19867-0703-PK-022	31.1	mg/Kg	J
		S-19867-0703-PK-023						S-19867-0703-PK-023	16.3	mg/Kg	J
		S-19867-0703-PK-024						S-19867-0703-PK-024	45.9	mg/Kg	J
		S-19867-0703-PK-025						S-19867-0703-PK-025	73.9	mg/Kg	J
		S-19867-0703-PK-026						S-19867-0703-PK-026	48.1	mg/Kg	J
		S-19867-0703-PK-027						S-19867-0703-PK-027	35.7	mg/Kg	J
		S-19867-0703-PK-028						S-19867-0703-PK-028	38.2	mg/Kg	J
		S-19867-0703-PK-029						S-19867-0703-PK-029	48.9	mg/Kg	J
		S-19867-0703-PK-030						S-19867-0703-PK-030	40.0	mg/Kg	J
		Metals	Zinc	S-19867-0703-PK-020	95	34	94	75-125	35	S-19867-0703-PK-001	15.0
S-19867-0703-PK-002								S-19867-0703-PK-002	53.9	mg/Kg	J
S-19867-0703-PK-003								S-19867-0703-PK-003	106	mg/Kg	J
S-19867-0703-PK-004								S-19867-0703-PK-004	60.3	mg/Kg	J
S-19867-0703-PK-005								S-19867-0703-PK-005	1160	mg/Kg	J
S-19867-0703-PK-006								S-19867-0703-PK-006	387	mg/Kg	J
S-19867-0703-PK-007								S-19867-0703-PK-007	87.6	mg/Kg	J

TABLE 4
 QUALIFIED SAMPLE RESULTS DUE TO OUTLYING MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERIES
 REMEDIAL INVESTIGATION
 VANADIUM CORPORATION OF AMERICA
 NIAGARA FALLS, NEW YORK
 JULY - AUGUST 2003

Parameter	Analyte	Sample ID	MS Recovery (percent)	MSD Recovery (percent)	RPD	Control Limits (percent)	RPD Control Limits (percent)	Associated Sample ID	Sample Result	Units	Qualifier
Metals (Cont'd)	Zinc	S-19867-07-03-PK-020	95	34	94	75-125	35	S-19867-07-03-PK-008	86.8	mg/Kg	J
		S-19867-07-03-PK-009						S-19867-07-03-PK-020	24.4	mg/Kg	J
		S-19867-07-03-PK-021						S-19867-07-03-PK-021	28.1	mg/Kg	J
		S-19867-07-03-PK-022						S-19867-07-03-PK-021	132	mg/Kg	J
		S-19867-07-03-PK-023						S-19867-07-03-PK-021	132	mg/Kg	J
		S-19867-07-03-PK-024						S-19867-07-03-PK-022	52.1	mg/Kg	J
		S-19867-07-03-PK-025						S-19867-07-03-PK-023	ND 1.86	mg/Kg	J
		S-19867-07-03-PK-026						S-19867-07-03-PK-024	78.8	mg/Kg	J
		S-19867-07-03-PK-027						S-19867-07-03-PK-025	26.5	mg/Kg	J
		S-19867-07-03-PK-028						S-19867-07-03-PK-026	79.5	mg/Kg	J
		S-19867-07-03-PK-029						S-19867-07-03-PK-027	41.6	mg/Kg	J
		S-19867-07-03-PK-030						S-19867-07-03-PK-028	225	mg/Kg	J
		S-19867-07-03-PK-031						S-19867-07-03-PK-029	66.3	mg/Kg	J
		S-19867-07-03-PK-033						S-19867-07-03-PK-030	323	mg/Kg	J
Metals	Mercury	GW-9867-08-03-PK-017	56	58	4	80-120	20	GW-9867-08-03-PK-019	ND 0.400	ug/L	J
		GW-9867-08-03-PK-018						GW-9867-08-03-PK-018	ND 0.400	ug/L	J
		GW-9867-08-03-PK-017						GW-9867-08-03-PK-017	ND 0.400	ug/L	J
		GW-9867-08-03-PK-025						GW-19867-08-03-PK-025	ND 0.400	ug/L	J
		GW-9867-08-03-PK-028						GW-19867-08-03-PK-028	ND 0.400	ug/L	J
		GW-9867-08-03-PK-020						GW-19867-08-03-PK-020	ND 0.400	ug/L	J
		GW-9867-08-03-PK-022						GW-19867-08-03-PK-022	ND 0.400	ug/L	J
		GW-9867-08-03-PK-027						GW-19867-08-03-PK-027	ND 0.400	ug/L	J
		GW-9867-08-03-PK-026						GW-19867-08-03-PK-026	ND 0.400	ug/L	J
		GW-9867-08-03-PK-024						GW-19867-08-03-PK-024	0.291 J	ug/L	*
GW-9867-08-03-PK-021						GW-19867-08-03-PK-021	0.144 J	ug/L	*		
GW-9867-08-03-PK-023						GW-19867-08-03-PK-023	0.0911 J	ug/L	*		
Metals	Chromium Total	SED-19867-08-03-PK-023	95	13	152	75-125	35	S-19867-08-03-PK-008	312	mg/Kg	J
								S-19867-08-03-PK-009	125	mg/Kg	J
								S-19867-08-03-PK-016	11.8	mg/Kg	J
								S-19867-08-03-PK-017	46.9	mg/Kg	J
								S-19867-08-03-PK-031	317	mg/Kg	J
								S-19867-08-03-PK-032	33.6	mg/Kg	J
						S-19867-08-03-PK-033	18.3	mg/Kg	J		

TABLE 4
QUALIFIED SAMPLE RESULTS DUE TO OUTLYING MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERIES
REMEDIATION INVESTIGATION
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK
JULY - AUGUST 2003

Parameter	Analyte	Sample ID	MS Recovery (percent)	MSD Recovery (percent)	RPD	Control Limits (percent)	RPD Control Limits (percent)	Associated Sample ID	Sample Result	Units	Qualifier		
Metals (Cont'd.)	Chromium Total	SED-19867-08-03-PK-023	95	13	152	75-125	35	SED-19867-08-03-PK-014	97.7	mg/Kg	J		
		SED-19867-08-03-PK-015						SED-19867-08-03-PK-015	266	mg/Kg	J		
		SED-19867-08-03-PK-018						SED-19867-08-03-PK-018	65.4	mg/Kg	J		
		SED-19867-08-03-PK-019						SED-19867-08-03-PK-019	49.1	mg/Kg	J		
		SED-19867-08-03-PK-020						SED-19867-08-03-PK-020	483	mg/Kg	J		
		SED-19867-08-03-PK-021						SED-19867-08-03-PK-021	63.5	mg/Kg	J		
		SED-19867-08-03-PK-023						SED-19867-08-03-PK-023	364	mg/Kg	J		
		SED-19867-08-03-PK-010						SED-19867-08-03-PK-010	335	mg/Kg	J		
		SED-19867-08-03-PK-011						SED-19867-08-03-PK-011	1840	mg/Kg	J		
		SED-19867-08-03-PK-013						SED-19867-08-03-PK-013	90.3	mg/Kg	J		
		SED-19867-08-03-PK-024						SED-19867-08-03-PK-024	55.1	mg/Kg	J		
		SED-19867-08-03-PK-025						SED-19867-08-03-PK-025	289	mg/Kg	J		
		Metals	Magnesium	SED-19867-08-03-PK-023	NA	NA	67	NA	35	S-19867-08-03-PK-008	22100	mg/Kg	J
				SED-19867-08-03-PK-009					S-19867-08-03-PK-009	7920	mg/Kg	J	
				SED-19867-08-03-PK-016					S-19867-08-03-PK-016	721	mg/Kg	J	
				SED-19867-08-03-PK-017					S-19867-08-03-PK-017	4680	mg/Kg	J	
				SED-19867-08-03-PK-031					S-19867-08-03-PK-031	9740	mg/Kg	J	
				SED-19867-08-03-PK-032					S-19867-08-03-PK-032	8480	mg/Kg	J	
				SED-19867-08-03-PK-033					S-19867-08-03-PK-033	11100	mg/Kg	J	
				SED-19867-08-03-PK-014					SED-19867-08-03-PK-014	8890	mg/Kg	J	
SED-19867-08-03-PK-015							SED-19867-08-03-PK-015	5390	mg/Kg	J			
SED-19867-08-03-PK-018							SED-19867-08-03-PK-018	8000	mg/Kg	J			
Metals	Magnesium	SED-19867-08-03-PK-019					SED-19867-08-03-PK-019	13000	mg/Kg	J			
		SED-19867-08-03-PK-020					SED-19867-08-03-PK-020	10700	mg/Kg	J			
		SED-19867-08-03-PK-021					SED-19867-08-03-PK-021	9620	mg/Kg	J			
		SED-19867-08-03-PK-023					SED-19867-08-03-PK-023	26900	mg/Kg	J			
		SED-19867-08-03-PK-010					SED-19867-08-03-PK-010	8870	mg/Kg	J			
		SED-19867-08-03-PK-011					SED-19867-08-03-PK-011	16700	mg/Kg	J			
		SED-19867-08-03-PK-013					SED-19867-08-03-PK-013	11300	mg/Kg	J			
		SED-19867-08-03-PK-024					SED-19867-08-03-PK-024	11900	mg/Kg	J			
		SED-19867-08-03-PK-025					SED-19867-08-03-PK-025	28100	mg/Kg	J			

TABLE 4
QUALIFIED SAMPLE RESULTS DUE TO OUTLYING MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERIES
REMEDIAL INVESTIGATION
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK
JULY - AUGUST 2003

Parameter	Analyte	Sample ID	MS		MSD		RPD		Associated Sample ID	Sample Result	Units	Qualifier
			Recovery (percent)	Recovery (percent)	Recovery (percent)	Recovery (percent)	Control Limits (percent)	Control Limits (percent)				
Metals	Manganese	SED-19867-08-03-PK-023	85	37	79	75-125	35	S-19867-08-03-PK-008	1320	mg/Kg	J	
		S-19867-08-03-PK-009						S-19867-08-03-PK-009	738	mg/Kg	J	
		S-19867-08-03-PK-016						S-19867-08-03-PK-016	473	mg/Kg	J	
		S-19867-08-03-PK-017						S-19867-08-03-PK-017	679	mg/Kg	J	
		S-19867-08-03-PK-031						S-19867-08-03-PK-031	2330	mg/Kg	J	
		S-19867-08-03-PK-032						S-19867-08-03-PK-032	997	mg/Kg	J	
		S-19867-08-03-PK-033						S-19867-08-03-PK-033	597	mg/Kg	J	
		SED-19867-08-03-PK-014						SED-19867-08-03-PK-014	564	mg/Kg	J	
		SED-19867-08-03-PK-015						SED-19867-08-03-PK-015	979	mg/Kg	J	
		SED-19867-08-03-PK-018						SED-19867-08-03-PK-018	583	mg/Kg	J	
		SED-19867-08-03-PK-019						SED-19867-08-03-PK-019	690	mg/Kg	J	
		SED-19867-08-03-PK-020						SED-19867-08-03-PK-020	606	mg/Kg	J	
		SED-19867-08-03-PK-021						SED-19867-08-03-PK-021	215	mg/Kg	J	
		SED-19867-08-03-PK-023						SED-19867-08-03-PK-023	558	mg/Kg	J	
		SED-19867-08-03-PK-010						SED-19867-08-03-PK-010	1180	mg/Kg	J	
		SED-19867-08-03-PK-011						SED-19867-08-03-PK-011	6330	mg/Kg	J	
		SED-19867-08-03-PK-013						SED-19867-08-03-PK-013	246	mg/Kg	J	
		SED-19867-08-03-PK-024						SED-19867-08-03-PK-024	923	mg/Kg	J	
SED-19867-08-03-PK-025						SED-19867-08-03-PK-025	562	mg/Kg	J			
Metals	Mercury	S-19867-08-03-PK-009	162	101	46	83-122	35	S-19867-08-03-PK-008	2.02	mg/Kg	J	
		S-19867-08-03-PK-009						S-19867-08-03-PK-009	1.71	mg/Kg	J	
		S-19867-08-03-PK-017						S-19867-08-03-PK-017	0.101	mg/Kg	J	
		S-19867-08-03-PK-031						S-19867-08-03-PK-031	0.216	mg/Kg	J	
Metals	Potassium	SED-19867-08-03-PK-023	132	112	16	75-125	35	S-19867-08-03-PK-008	1170	mg/Kg	J	
		S-19867-08-03-PK-009						S-19867-08-03-PK-009	1860	mg/Kg	J	
		S-19867-08-03-PK-016						S-19867-08-03-PK-016	223	mg/Kg	J	
		S-19867-08-03-PK-017						S-19867-08-03-PK-017	2020	mg/Kg	J	
		S-19867-08-03-PK-031						S-19867-08-03-PK-031	1450	mg/Kg	J	
		S-19867-08-03-PK-032						S-19867-08-03-PK-032	3460	mg/Kg	J	
		S-19867-08-03-PK-033						S-19867-08-03-PK-033	2740	mg/Kg	J	
		SED-19867-08-03-PK-014						SED-19867-08-03-PK-014	1740	mg/Kg	J	
SED-19867-08-03-PK-015						SED-19867-08-03-PK-015	2840	mg/Kg	J			
SED-19867-08-03-PK-018						SED-19867-08-03-PK-018	1700	mg/Kg	J			

TABLE 4
 QUALIFIED SAMPLE RESULTS DUE TO OUTLYING MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERIES
 REMEDIAL INVESTIGATION
 VANADIUM CORPORATION OF AMERICA
 NIAGARA FALLS, NEW YORK
 JULY - AUGUST 2003

Parameter	Analyte	Sample ID	MS Recovery (percent)	MSD Recovery (percent)	RPD	Control Limits (percent)	RPD Control Limits (percent)	Associated Sample ID	Sample Result	Units	Qualifier
Metals (Cont'd.)	Potassium	SED-19867-08-03-PK-023	132	112	16	75-125	35	SED-19867-08-03-PK-019	4580	mg/Kg	J
		SED-19867-08-03-PK-020						SED-19867-08-03-PK-020	1010	mg/Kg	J
		SED-19867-08-03-PK-021						SED-19867-08-03-PK-021	300	mg/Kg	J
		SED-19867-08-03-PK-023						SED-19867-08-03-PK-023	779	mg/Kg	J
		SED-19867-08-03-PK-010						SED-19867-08-03-PK-010	2350	mg/Kg	J
		SED-19867-08-03-PK-011						SED-19867-08-03-PK-011	3200	mg/Kg	J
		SED-19867-08-03-PK-013						SED-19867-08-03-PK-013	2130	mg/Kg	J
		SED-19867-08-03-PK-024						SED-19867-08-03-PK-024	3520	mg/Kg	J
		SED-19867-08-03-PK-025						SED-19867-08-03-PK-025	1070	mg/Kg	J
		Gen Chem	Chromium, Hexavalent	S-19867-08-03-PK-009	9	-	-	75-125	-	S-19867-08-03-PK-008	ND 4.9
								S-19867-08-03-PK-009	ND 7.1	mg/Kg	R
								S-19867-08-03-PK-016	ND 6	mg/Kg	R
								S-19867-08-03-PK-017	ND 5.3	mg/Kg	R
								S-19867-08-03-PK-032	ND 4.5	mg/Kg	R
								S-19867-08-03-PK-033	ND 5.7	mg/Kg	R
								SED-19867-08-03-PK-022	2.3 J	mg/Kg	*
Gen Chem	Chromium, Hexavalent	S-19867-07-03-PK-007	24	-	-	75-125	-	S-19867-07-03-PK-007	ND 4.8	mg/Kg	R
		SS-19867-0703-PK-024	77	100	26	79-130	35	SS-19867-0703-PK-026	0.368 J	mg/Kg	*
Gen Chem	Cyanide (total)							SS-19867-0703-PK-017	0.398 J	mg/Kg	*
								SS-19867-0703-PK-028	ND 0.535	mg/Kg	J
								SS-19867-0703-PK-019	ND 0.536	mg/Kg	J
								SS-19867-0703-PK-015	0.258 J	mg/Kg	*
								SS-19867-0703-PK-016	0.323 J	mg/Kg	*
								SS-19867-0703-PK-017	0.398 J	mg/Kg	*
								SS-19867-0703-PK-018	0.334 J	mg/Kg	*
								SS-19867-0703-PK-019	ND 0.536	mg/Kg	J
								SS-19867-0703-PK-020	0.359 J	mg/Kg	*
								SS-19867-0703-PK-021	0.604	mg/Kg	J
Gen Chem	Chromium, Hexavalent							SS-19867-0703-PK-022	0.193 J	mg/Kg	*
								SS-19867-0703-PK-023	ND 0.587	mg/Kg	J
								SS-19867-0703-PK-024	0.303 J	mg/Kg	*

TABLE 4
 QUALIFIED SAMPLE RESULTS DUE TO OUTLYING MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERIES
 REMEDIAL INVESTIGATION
 VANADIUM CORPORATION OF AMERICA
 NIAGARA FALLS, NEW YORK
 JULY - AUGUST 2003

Parameter	Analyte	Sample ID	MS Recovery (percent)	MSD Recovery (percent)	RPD	Control Limits (percent)	RPD Control Limits (percent)	Associated Sample ID	Sample Result	Units	Qualifier
Gen Chem (Cont'd.)	Cyanide (total)	SS-19867-0703-PK-024	77	100	26	79-130	35	SS-19867-0703-PK-025	0.176 J	mg/Kg	*
								SS-19867-0703-PK-026	0.368 J	mg/Kg	*
								SS-19867-0703-PK-027	0.311 J	mg/Kg	*
								SS-19867-0703-PK-028	ND 0.535	mg/Kg	J
Gen Chem	Chromium, Hexavalent	SS-19867-0703-PK-004	40	-	-	75-125	-	SS-19867-0703-PK-001	ND 4.7	mg/Kg	J
								SS-19867-0703-PK-002	ND 4.5	mg/Kg	J
								SS-19867-0703-PK-003	ND 4.2	mg/Kg	J
								SS-19867-0703-PK-004	4.3 J	mg/Kg	*
								SS-19867-0703-PK-005	ND 5.6	mg/Kg	J
								SS-19867-0703-PK-006	2.0 J	mg/Kg	*
								SS-19867-0703-PK-007	ND 4.8	mg/Kg	J
								SS-19867-0703-PK-008	3.2 J	mg/Kg	*
								SS-19867-0703-PK-009	10	mg/Kg	J
								SS-19867-0703-PK-010	16	mg/Kg	J
								SS-19867-0703-PK-011	2.0 J	mg/Kg	*
								SS-19867-0703-PK-012	15	mg/Kg	J
								SS-19867-0703-PK-013	5.6	mg/Kg	J
								SS-19867-0703-PK-014	ND 6.7	mg/Kg	J
								SS-19867-0703-PK-015	ND 5.3	mg/Kg	J
								SS-19867-0703-PK-016	ND 5.5	mg/Kg	J
						SS-19867-0703-PK-017	ND 6.0	mg/Kg	J		
						SS-19867-0703-PK-018	ND 4.9	mg/Kg	J		
						SS-19867-0703-PK-019	ND 4.2	mg/Kg	J		
						SS-19867-0703-PK-020	ND 4.9	mg/Kg	J		

Notes:
 J Sample results were previously qualified as estimated by the laboratory
 E Estimated
 ND Non-detect at associated value.
 R Rejected.
 RPD Relative Percent Difference.

TABLE 5
QUALIFIED SAMPLE DATA DUE TO VARIABILITY IN FIELD DUPLICATE RESULTS
REMEDIAL INVESTIGATION
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK
JULY - AUGUST 2003

Parameter	Analyte	Original		Duplicate		RPD	Units	Qualifier ⁽¹⁾
		Sample ID	Result	Sample ID	Result			
Metals	Thallium	SS-19867-0703-PK-005	16.2	SS-19867-0703-PK-006	ND 1.22	NA	mg/Kg	J
Metals	Magnesium Zinc Barium Sodium Nickel	S-9867-07-03-PK-020	114000	S-9867-07-03-PK-021	65300	54	mg/Kg	J
		S-9867-07-03-PK-020	28.1	S-9867-07-03-PK-021	132	130	mg/Kg	J
		S-9867-07-03-PK-020	208	S-9867-07-03-PK-021	95.7	74	mg/Kg	J
		S-9867-07-03-PK-020	578	S-9867-07-03-PK-021	250	79	mg/Kg	J
		S-9867-07-03-PK-020	51.8	S-9867-07-03-PK-021	21.7	82	mg/Kg	J

Notes:
(1)
J Estimated.
NA Not Applicable.
ND Non-detect at associated value.
RPD Relative Percent Difference.

TABLE 6
QUALIFIED SAMPLE RESULTS DUE TO ANALYTE CONCENTRATIONS IN THE RINSE BLANKS
REMEDIAL INVESTIGATION
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK
JULY - AUGUST 2003

<i>Parameter</i>	<i>Rinse Blank Date</i>	<i>Analyte</i>	<i>Blank Result</i>	<i>Sample ID</i>	<i>Sample Result</i>	<i>Qualified Sample Result</i>	<i>Units</i>
Metals	07/18/03	Antimony	0.734	SS-19867-0703-PK-002	1.22	ND 1.04	mg/Kg
				SS-19867-0703-PK-003	1.52	ND 1.04	mg/Kg
				SS-19867-0703-PK-007	2.79	ND 1.26	mg/Kg
				SS-19867-0703-PK-012	1.54	ND 2.52	mg/Kg
				SS-19867-0703-PK-014	1.83	ND 1.37	mg/Kg
				SS-19867-0703-PK-015	1.3	ND 1.23	mg/Kg
				SS-19867-0703-PK-016	3.18	ND 1.15	mg/Kg
				SS-19867-0703-PK-017	2.15	ND 1.08	mg/Kg
				SS-19867-0703-PK-018	2.62	ND 1.21	mg/Kg
				SS-19867-0703-PK-019	2.63	ND 1.11	mg/Kg
				SS-19867-0703-PK-020	2.91	ND 1.01	mg/Kg
				SS-19867-0703-PK-021	1.09	ND 1.26	mg/Kg
				SS-19867-0703-PK-022	3.03	ND 1.19	mg/Kg
				SS-19867-0703-PK-025	2.12	ND 1.04	mg/Kg
Metals	07/21/03	Antimony	0.479	SS-19867-0703-PK-026	0.91	ND 0.962	mg/Kg
				SS-19867-0703-PK-027	0.631	ND 0.926	mg/Kg
				SS-19867-0703-PK-028	0.669	ND 0.943	mg/Kg
				SS-19867-0703-PK-029	1.03	ND 0.943	mg/Kg
				SS-19867-0703-PK-031	0.997	ND 0.926	mg/Kg
				SS-19867-0703-PK-032	0.671	ND 0.909	mg/Kg
				SS-19867-0703-PK-033	0.597	ND 0.893	mg/Kg
Metals	07/24/03	Antimony	0.664	S-19867-0703-PK-011	0.848	ND 1.22	mg/Kg
				S-19867-0703-PK-012	2.03	ND 1.23	mg/Kg
				S-19867-0703-PK-013	1.2	ND 1.21	mg/Kg
				S-19867-0703-PK-014	0.958	ND 1.13	mg/Kg
				S-19867-0703-PK-015	1.33	ND 1.14	mg/Kg
				S-19867-0703-PK-017	1.19	ND 1.06	mg/Kg
				S-19867-0703-PK-019	1.92	ND 1.15	mg/Kg
Metals	07/28/03	Antimony	0.664	S-19867-07-03-PK-010	2.74	ND 1.24	mg/Kg
				S-19867-07-03-PK-020	2.09	ND 1.21	mg/Kg
Metals	07/18/03	Arsenic	0.436	SS-19867-0703-PK-010	2.06	ND 2.06	mg/Kg
				SS-19867-0703-PK-011	1.97	ND 1.97	mg/Kg
				SS-19867-0703-PK-005	0.805	ND 1.15	mg/Kg
				SS-19867-0703-PK-009	0.969	ND 1.05	mg/Kg
				SS-19867-0703-PK-006	1.07	ND 1.22	mg/Kg
Metals	07/18/03	Sodium	35.3	SS-19867-0703-PK-011	144	ND 144	mg/Kg
				SS-19867-0703-PK-015	79.8	ND 123	mg/Kg
				SS-19867-0703-PK-014	92.3	ND 137	mg/Kg
				SS-19867-0703-PK-012	109	ND 126	mg/Kg
				SS-19867-0703-PK-001	168	ND 168	mg/Kg
				SS-19867-0703-PK-005	72.6	ND 115	mg/Kg
				SS-19867-0703-PK-002	87.4	ND 104	mg/Kg
				SS-19867-0703-PK-009	152	ND 152	mg/Kg
				SS-19867-0703-PK-017	83.1	ND 108	mg/Kg
				SS-19867-0703-PK-025	132	ND 132	mg/Kg
				SS-19867-0703-PK-023	69.3	ND 110	mg/Kg
				SS-19867-0703-PK-022	40.6	ND 119	mg/Kg
				SS-19867-0703-PK-021	150	ND 150	mg/Kg

TABLE 6
QUALIFIED SAMPLE RESULTS DUE TO ANALYTE CONCENTRATIONS IN THE RINSE BLANKS
REMEDIAL INVESTIGATION
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK
JULY - AUGUST 2003

<i>Parameter</i>	<i>Rinse Blank Date</i>	<i>Analyte</i>	<i>Blank Result</i>	<i>Sample ID</i>	<i>Sample Result</i>	<i>Qualified Sample Result</i>	<i>Units</i>
Metals	7/18/2003	Thallium	9.46	GW-9867-08-03-PK-007	10.9 J	ND 20.0	µg/L
				GW-9867-08-03-PK-008	10.9 J	ND 20.0	µg/L
				GW-9867-08-03-PK-005	8.34 J	ND 20.0	µg/L
				GW-9867-08-03-PK-010	8.88 J	ND 20.0	µg/L
				GW-9867-08-03-PK-006	7.98 J	ND 20.0	µg/L
Metals	08/28/03	Barium	23.3	GW-19867-08-03-PK-021	82.5	ND 82.5	ug/L
				GW-19867-08-03-PK-023	49.0	ND 49.0	ug/L
				GW-19867-08-03-PK-026	77.6	ND 77.6	ug/L
Metals	08/28/03	Nickel	1.62	GW-19867-08-03-PK-021	2.76 J	ND 20.0	ug/L
Gen Chem	8/15/2003	Cyanide	0.00233	GW-9867-08-03-PK-005	0.00196 J	ND 0.01	mg/L
				GW-9867-08-03-PK-006	0.00528 J	ND 0.01	mg/L
				GW-9867-08-03-PK-014	0.00252 J	ND 0.01	mg/L
				GW-9867-08-03-PK-008	0.00254 J	ND 0.01	mg/L
				GW-9867-08-03-PK-011	0.00283 J	ND 0.01	mg/L
GW-9867-08-03-PK-015	0.00217 J	ND 0.01	mg/L				
Gen Chem	08/28/03	Cyanide	0.00613	GW-19867-08-03-PK-025	0.00211 J	ND 0.01	mg/L
				GW-19867-08-03-PK-027	0.00195 J	ND 0.01	mg/L
				GW-19867-08-03-PK-026	0.00219 J	ND 0.01	mg/L
				GW-19867-08-03-PK-024	0.00331 J	ND 0.01	mg/L

Notes:

J Estimated.

ND Non-detect at associated value.

ANALYTICAL DATA ASSESSMENT AND VALIDATION
SURFACE WATER AND GROUNDWATER SAMPLING EVENT
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK
OCTOBER 2003

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1.0 INTRODUCTION

The following document details an assessment and validation of analytical results reported by Ecology and Environment, Inc. (E&E), located in Lancaster, New York, for samples collected at the Vanadium Site (Site) located in Niagara Falls, New York. Groundwater and surface water samples were collected during October 2003. For sample identification, a sampling and analysis summary is presented in Table 1.

The quality assurance/quality control (QA/QC) criteria by which these data have been assessed are outlined in the analytical methods and the document entitled "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review," February 1994, EPA-540/R-94-013.

The data quality assessment and validation presented in the following subsections were performed based on information from data sheets including matrix spike (MS) recoveries, duplicate results, laboratory control sample (LCS) recoveries, and blank results for all parameters.

2.0 SAMPLE HOLDING TIMES

The method-specified holding time criteria for this program were as follows:

<i>Parameter</i>	<i>Matrix</i>	<i>Holding Time</i>
TAL Metals (except Mercury)	Water	180 days from collection to analysis
Mercury	Water	28 days from collection to analysis
Chromium VI	Water	24 hours from collection to analysis
Cyanide	Water	14 days from collection to analysis

All sample analyses were performed within the required holding times. All samples were properly preserved and cooled at 4°C (±2°C) after collection, and all samples were received by the laboratory in good condition.

3.0 LABORATORY BLANK ANALYSES

The purpose of assessing the results of laboratory blank analyses is to determine the existence and magnitude of sample contamination introduced during analysis. Laboratory blanks are prepared from deionized water and analyzed as samples.

Most blank results were non-detect for the analytes of interest with the exception of metals and cyanide present at low concentrations. All associated sample results with concentrations similar to the blank concentrations were qualified as non-detect (see Table 2).

For this study, laboratory blanks were analyzed at a minimum frequency of one per analytical batch.

4.0 LABORATORY CONTROL SAMPLE ANALYSES

The LCS serves as a monitor of the overall performance of all steps in the analysis, including the sample preparation. LCSs were analyzed using the same sample preparation, analytical methods, and QA/QC procedures employed for the investigative samples.

LCSs were reported for all inorganic analyses. All LCS samples yielded recoveries within the established control limits, indicating acceptable overall analytical accuracy.

5.0 MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) ANALYSES

The recoveries of MS/MSD analyses are used to assess the analytical accuracy achieved on individual sample matrices. The relative percent difference (RPD) between the MS and MSD is used to assess analytical precision.

An MS/MSD was analyzed at the required frequency for all parameters.

Most recoveries were acceptable indicating adequate analytical accuracy and precision with the exception of one low cyanide recovery for sample GW-19867-10-03-PK-013. All associated cyanide results were qualified as estimated to reflect the implied low bias (see Table 3).

6.0 DUPLICATE ANALYSES

To assess analytical precision, samples were analyzed in duplicate for chromium VI. The results were compared and must agree within 35 percent difference to be acceptable.

All results were acceptable indicating adequate analytical precision.

7.0 FIELD QA/QC-FIELD DUPLICATES

To assess the analytical and sampling protocol precision, field duplicates (as identified in Table 1) were collected and submitted "blind" to the laboratory. All data outside of estimated regions of detection demonstrated acceptable agreement indicating adequate sampling and analytical procedures with the exception of variability observed between the iron results for sample GW-19867-10-03-PK-012 and its duplicate. The results were qualified as estimated to reflect the implied variability (see Table 4).

8.0 CONCLUSION

Based on the assessment detailed in the foregoing, the data produced by E&E are acceptable with the noted qualifications.

TABLES

TABLE 1

COLLECTION AND ANALYSIS SUMMARY
 REMEDIAL INVESTIGATION
 VANADIUM CORPORATION OF AMERICA
 NIAGARA FALLS, NEW YORK
 OCTOBER 2003

Sample I.D.	Location I.D.	Matrix	Collection Date (mm/dd/yy)	Collection Time (hr:min)	Analysis/Parameters	Comment
GW-19867-1003-PK-001	MW-19	Groundwater	10/01/03	14:20	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-1003-PK-003	MW-22	Groundwater	10/01/03	14:50	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-1003-PK-004	MW-22	Groundwater	10/01/03	14:55	TAL Metals, Cyanide, Hex. Chromium	Field Filtered
GW-19867-1003-PK-005	MW-20	Groundwater	10/01/03	15:20	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-1003-PK-006	MW-20	Groundwater	10/01/03	15:30	TAL Metals, Cyanide, Hex. Chromium	Field Filtered
GW-19867-1003-PK-RB1	Runsate Blank	-	10/01/03	16:50	Chromium VI	
GW-19867-1003-PK-002	MW-25	Groundwater	10/03/03	12:30	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-1003-PK-007	MW-25	Groundwater	10/03/03	12:45	TAL Metals, Cyanide, Hex. Chromium	Field Filtered
GW-19867-1003-PK-008	MW-27	Groundwater	10/03/03	13:10	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-1003-PK-009	MW-27	Groundwater	10/03/03	13:20	TAL Metals, Cyanide, Hex. Chromium	Field Filtered
GW-19867-1003-PK-010	MW-104A	Groundwater	10/03/03	13:40	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-1003-PK-011	MW-104A	Groundwater	10/03/03	14:00	TAL Metals, Cyanide, Hex. Chromium	Field Filtered
GW-19867-1003-PK-012	MW-103A	Groundwater	10/06/03	14:25	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-1003-PK-014	MW-103A	Groundwater	10/06/03	15:00	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-1003-PK-013	MW-103A	Groundwater	10/06/03	14:35	TAL Metals, Cyanide, Hex. Chromium	Duplicate of -012
GW-19867-1003-PK-015	MW-17	Groundwater	10/06/03	15:50	TAL Metals, Cyanide, Hex. Chromium	MS/MSD
GW-19867-1003-PK-016	MW-28	Groundwater	10/06/03	16:15	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-1003-PK-017	MW-21	Groundwater	10/06/03	16:40	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-1003-PK-018	MW-18	Groundwater	10/06/03	17:00	TAL Metals, Cyanide, Hex. Chromium	
SW-19867-08-03-011	SW-11	Surface Water	10/07/03	12:45	TAL Metals, Cyanide, Hex. Chromium	
SW-19867-08-03-013	SW-13	Surface Water	10/07/03	14:00	TAL Metals, Cyanide, Hex. Chromium	
SW-19867-08-03-014	SW-14	Surface Water	10/07/03	14:05	TAL Metals, Cyanide, Hex. Chromium	
SW-19867-08-03-015	SW-15	Surface Water	10/07/03	14:15	TAL Metals, Cyanide, Hex. Chromium	
SW-19867-08-03-019	SW-19	Surface Water	10/07/03	14:20	TAL Metals, Cyanide, Hex. Chromium	
SW-19867-08-03-020	SW-20	Surface Water	10/07/03	13:50	TAL Metals, Cyanide, Hex. Chromium	
SW-19867-08-03-021	SW-21	Surface Water	10/07/03	13:40	TAL Metals, Cyanide, Hex. Chromium	
SW-19867-08-03-023	SW-23	Surface Water	10/07/03	13:05	TAL Metals, Cyanide, Hex. Chromium	MS/MSD
SW-19867-08-03-024	SW-24	Surface Water	10/07/03	13:15	TAL Metals, Cyanide, Hex. Chromium	
SW-19867-08-03-025	SW-25	Surface Water	10/07/03	13:30	TAL Metals, Cyanide, Hex. Chromium	Duplicate of -023
GW-19867-1003-PK-019	MW-26	Groundwater	10/22/2003	14:30	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-1003-PK-020	MW-105A	Groundwater	10/22/2003	13:50	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-1003-PK-021	MW-23	Groundwater	10/22/2003	14:15	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-1003-PK-022	MW-24	Groundwater	10/22/2003	14:35	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-1003-PK-023	MW-106A	Groundwater	10/22/2003	15:10	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-1003-PK-024	MW-15	Groundwater	10/22/2003	15:30	TAL Metals, Cyanide, Hex. Chromium	
GW-19867-0803-PK-025	MW-16	Groundwater	10/22/2003	16:00	TAL Metals, Cyanide, Hex. Chromium	

Notes:
 MS/MSD Matrix Spike/Matrix Spike Duplicate
 TAL Target Analyte List

TABLE 1

COLLECTION AND ANALYSIS SUMMARY
REMEDIAL INVESTIGATION
VANADIUM CORPORATION OF AMERICA
NIAGARA FALLS, NEW YORK
OCTOBER 2003

QUALIFIED SAMPLE RESULTS DUE TO ANALYTE CONCENTRATIONS IN THE METHOD BLANKS
 REMEDIAL INVESTIGATION
 VANADIUM CORPORATION OF AMERICA
 NIAGARA FALLS, NEW YORK
 OCTOBER 2003

Parameter	Blank ID/Date	Analyte	Blank Result	Sample ID	Sample Result	Qualified Sample Result	Units
Metals	10/14/03	Aluminum	50.25	GW-19867-10-03-PK-013	59.1 J	ND 200	ug/L
				GW-19867-10-03-PK-012	41.0 J	ND 200	ug/L
				GW-19867-10-03-PK-013	59.1 J	ND 200	ug/L
				GW-19867-10-03-PK-012	41.0 J	ND 200	ug/L
Metals	10/07/03	Arsenic	7.768	GW-19867-10-03-PK-011	14.8 J	ND 25.0	ug/L
				GW-19867-10-03-PK-007	14.3 J	ND 25.0	ug/L
				GW-19867-10-03-PK-002	14.7 J	ND 25.0	ug/L
				GW-19867-10-03-PK-010	18.5 J	ND 25.0	ug/L
Metals	10/07/03	Beryllium	0.201	GW-19867-10-03-PK-008	0.196 J	ND 5.00	ug/L
				GW-19867-10-03-PK-007	0.186 J	ND 5.00	ug/L
				GW-19867-10-03-PK-002	0.205 J	ND 5.00	ug/L
Metals	10/09/03	Chromium Total	0.8219	GW-19867-10-03-PK-006	1.17 J	ND 10.0	ug/L
				GW-19867-10-03-PK-016	2.90 J	ND 10.0	ug/L
Metals	10/14/03	Iron	56.95	GW-19867-10-03-PK-017	98.0 J	ND 200	ug/L
				GW-19867-10-03-PK-003	82.3 J	ND 1500	ug/L
Metals	10/14/03	Magnesium	122.1	GW-19867-10-03-PK-017	121 J	ND 1500	ug/L
				GW-19867-10-03-PK-016	3.54 J	ND 20.0	ug/L
Metals	10/14/03	Nickel	2.03	GW-19867-10-03-PK-018	9.45 J	ND 20.0	ug/L
				GW-19867-10-03-PK-016	3.54 J	ND 20.0	ug/L

TABLE 2

QUALIFIED SAMPLE RESULTS DUE TO ANALYTE CONCENTRATIONS IN THE METHOD BLANKS
 REMEDIAL INVESTIGATION
 VANADIUM CORPORATION OF AMERICA
 NIAGARA FALLS, NEW YORK
 OCTOBER 2003

Parameter	Blank ID/Date	Analyte	Blank Result	Sample ID	Sample Result	Qualified Sample Result	Units
Metals	10/07/03	Zinc	2.657	GW-19867-10-03-PK-007	6.34 J	ND 10.0	ug/L
				GW-19867-10-03-PK-011	6.44 J	ND 10.0	ug/L
Metals	10/14/03	Zinc	1.908	GW-19867-10-03-PK-013	9.35 J	ND 10.0	ug/L
				GW-19867-10-03-PK-012	6.67 J	ND 10.0	ug/L
				GW-19867-10-03-PK-014	3.30 J	ND 10.0	ug/L
Metals	10/28/03	Aluminum	47.30	GW-19867-10-03-PK-025	92.9 J	ND 200	ug/L
				GW-19867-10-03-PK-020	133 J	ND 200	ug/L
				GW-19867-10-03-PK-019	158 J	ND 200	ug/L
Metals	10/28/03	Iron	79.92	GW-19867-10-03-PK-021	305 J	ND 200	ug/L
				GW-19867-10-03-PK-020	174 J	ND 200	ug/L
Gen Chem	10/15/03	Cyanide (total)	0.0104	SW-19867-10-03-PK-024	0.0107	ND 0.01	mg/L
				SW-19867-10-03-PK-023	0.00805 J	ND 0.01	mg/L
				SW-19867-10-03-PK-021	0.00727 J	ND 0.01	mg/L
				SW-19867-10-03-PK-020	0.0178	ND 0.01	mg/L
				SW-19867-10-03-PK-025	0.0110	ND 0.01	mg/L
				SW-19867-10-03-PK-021	0.00727 J	ND 0.01	mg/L
				SW-19867-10-03-PK-023	0.00805 J	ND 0.01	mg/L

Notes:

J Estimated.

ND Non-detect at associated value.

TABLE 3

QUALIFIED SAMPLED RESULTS DUE TO OUTLYING MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERIES
 REMEDIAL INVESTIGATION
 VANADIUM CORPORATION OF AMERICA
 NIAGARA FALLS, NEW YORK
 OCTOBER 2003

Parameter	Analyte	MS Recovery (percent)	MSD Recovery (percent)	RPD	RPD		Associated Sample ID	Sample Result	Units	Qualifier
					Control Limits (percent)	Control Limits (percent)				
Gen Chem	Cyanide (total)	79	106	29	82-122	20	SW-19867-10-03-PK-019	ND 0.01	mg/L	J
							SW-19867-10-03-PK-014	ND 0.01	mg/L	J
							SW-19867-10-03-PK-013	ND 0.01	mg/L	J
							SW-19867-10-03-PK-011	ND 0.01	mg/L	J
							SW-19867-10-03-PK-015	0.00364 J	mg/L	J

Notes:

- J Estimated.
- MS Matrix spike.
- MSD Matrix spike duplicate.
- ND Non-detect at associated value.
- RPD Relative percent difference.

TABLE 4

QUALIFIED SAMPLE DATA DUE TO VARIABILITY IN FIELD DUPLICATE RESULTS
 REMEDIAL INVESTIGATION
 VANADIUM CORPORATION OF AMERICA
 NIAGARA FALLS, NEW YORK
 OCTOBER 2003

Parameter	Analyte	Original		Duplicate		RPD	Units	Qualifier ⁽¹⁾
		Sample ID	Result	Sample ID	Result			
Metals	Iron	GW-19867-10-03-PK-012	762	GW-19867-10-03-PK-014	544	33	µg/L	J

Notes:

RPD Relative percent difference.

⁽¹⁾ Qualifier is associated with both original and duplicate results.