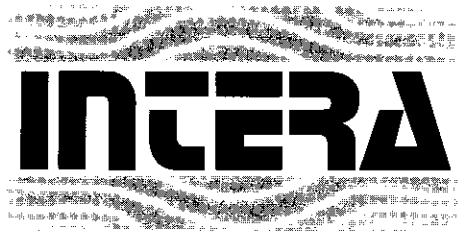
932036

Execution of the Interim Remedial Measure Addendum For the Former Carborundum Company - Electric Products Division, Hyde Park Facility Town of Niagara, Niagara County, New York Site No. 932036

FINAL DOCUMENT

Prepared For:
BP
4850 East 49th Street, MBC#-149
Cuyahoga Heights, Ohio 44125

Prepared By:



INTERA Inc.
Austin, Texas

Project No.: 01-220-7
January, 2004

EXECUTIVE SUMMARY

The former Carborundum Company's Hyde Park facility ("site" or "facility") in Niagara Falls is listed on the New York State Department of Environmental Conservation's (NYSDEC's) list of Inactive Hazardous Waste Disposal Sites. The facility is listed as a Class 2 site, No. 932036. A Class 2 site is defined as a site that poses a significant threat to the public health or the environment and one that requires mitigative action.

NYSDEC has prepared a Record of Decision (ROD) for the site. The ROD divides the site into three operable units (OU1, OU2, and OU3). OU1 is on-site soil, which was addressed through execution of the Interim Remedial Measure (IRM) in 1999. Over 90% of the contaminated soil was removed from within the site boundaries. Remaining contaminated soil in OU1 was located at depths of greater than 10 feet below ground surface (ft BGS) and did not pose a threat to the health of site employees or nearby residents. Therefore, NYSDEC had proposed no further action for OU1. OU2 is groundwater beneath the site that is being addressed through an on-going long-term groundwater monitoring program. OU3 is off-site soil east of the property boundary. A work plan for investigating the nature and extent of contamination in OU3 was prepared and results of the OU3 Investigation indicated that approximately 175 cubic yards (yd^3) of soil contaminated with volatile organic compounds (VOCs) was present in OU3 at concentrations that exceeded NYSDEC Soil Clean-up Objectives.

The OU3 Investigation report recommended that the IRM program be continued to address the soil contamination identified in OU3. The NYSDEC Division of Environmental Remediation confirmed that the IRM program could be continued and indicated that an addendum to the IRM Work Plan should be prepared to address the soil contamination. A work plan addendum was prepared for the removal of contaminated soils identified in OU3 as well as the contaminated soil remaining along the eastern property boundary of the site that could not be removed during the IRM in 1999.

The specific objectives of the OU3 IRM included:

1. Excavation of contaminated soils both on and off site and testing to determine appropriate disposal options, and

2. Disposal of soil at an appropriate facility.

NYSDEC's "Contained-In" Policy was successfully employed at the site during the IRM to manage excavated soils contaminated with VOCs. The OU3 Investigation demonstrated that soil in OU3 meets the conditions for use of the "Contained-In" policy; therefore, the "Contained-In" criteria were applied to soils excavated from the site during the OU3 IRM.

Soils were segregated based on the analytical results of soil samples collected during the IRM and OU3 Investigation from measured sampling locations and depths. Soil excavated from the site was segregated into three categories for disposal purposes. These categories included:

1. Clean Soils: Soil with contaminant concentrations below the NYSDEC Soil Clean-up Objectives for VOCs.

2. Non-Hazardous Soils: Soil with contaminant concentrations above the NYSDEC Soil Clean-up Objectives for VOCs, but below the NYSDEC Soil Action Level concentrations for VOCs.

3. Action Level Soils: Soil with contaminant concentrations above NYSDEC Action Levels for VOCs.

When field conditions and photo ionization detector (PID) readings suggested that soils containing contaminant of concern (COC) concentrations above NYSDEC Soil Clean-up Objectives were removed, INTERA field personnel conducted verification sampling of the floor and walls of the excavation. Verification samples document the condition of soils left on-site on the walls and floors of the excavations. Verification samples were collected based on the following sampling rationale:

- Samples were collected in areas suspected to have the highest COC concentrations based on visual or olfactory evidence of contamination, or on PID readings; or,
- If no evidence of contamination was observed, samples were collected from material types believed to be most heavily impacted based on site conditions and grain size.

All verification samples collected from OU3, off-site property, had VOC concentrations below clean-up criteria. Two verification samples, collected from the excavation floor on site, contained COC's above clean-up objectives. The contaminated verification samples were collected from the maximum attainable depth of 21 ft BGS. NYSDEC was consulted and it was determined that contaminated soil below 21 ft BGS would not pose a health risk to employees or nearby residents. Therefore, no further excavation was conducted.

A total of 2612 tons, or approximately 1451 yd^3, of soil were excavated during the OU3 IRM. The soil excavated included 695 tons (386 yd^3) of clean soils, 1710 tons (950 yd^3) of non-hazardous soils, and 208 tons (116 yd^3) of Action Level soils.

After excavation and soil removal was completed, the site was restored to pre-excavation conditions. The excavation was backfilled with clean stockpiled soil and clean imported clay fill. Surface treatment included crushed stone backfill followed by asphalt paving. The portion of the east perimeter fence which had to be removed during the excavation was also repaired.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

LIST OF ACRONYMS

CL	Clay – Unified Soil Classification System designation
COC	Contaminant of concern
CWM	Chemical Services, LLC; a Waste Management Company
DCE	1, 2-Dichloroethene
DE&S	Duke Engineering & Services
FS	Feasibility study
ft	Feet
ft BGS	Feet below ground surface
ft^2	Square feet
HSL	Hazardous substance list
IRM	Interim Remedial Measure
LDR	Land disposal restriction
LEL	Lower explosive limit
NYCRR	New York Codes, Rules and Regulations
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OU1	Operable unit one
OU2	Operable unit two
OU3	Operable unit three
PAH	Polycyclic aromatic hydrocarbon
PID	Photoionization detector
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
RPD	Relative Percent Difference
SLC	SLC Environmental Services
STEL	Short-term exposure limit
STL	Severn Trent Laboratories
SVOC	Semi-volatile organic compound
TAGM	Technical Administrative Guidance Memorandum
TAL/TCL	Target analyte list/target compound list
TCE	Trichloroethylene
TOC	Total organic carbon
TSS	Total suspended solids
USCS	Unified Soil Classification System
USEPA	United States Environmental Protection Agency
VC	Vinyl Chloride
VOC	Volatile organic compound
yd^3	Cubic yards

1. INTRODUCTION

The former Carborundum Company's Hyde Park facility ("site" or "facility") in Niagara Falls is listed on the New York State Department of Environmental Conservation's (NYSDEC's) list of Inactive Hazardous Waste Disposal Sites. The facility is listed as a Class 2 site, No. 932036. A Class 2 site is defined as a site that poses a significant threat to the public health or the environment and one that requires mitigative action. A site location map is provided in Appendix A, Figure 1.

1.1 Background

A Remedial Investigation (RI), Phase II RI, Feasibility Study (FS) and Interim Remedial Measure (IRM) have been completed at the site by INTERA Inc. (INTERA, formerly Duke Engineering & Services [DE&S]) for BP. Results of the RI and Phase II RI indicated that soils existed on the property that contained volatile organic compounds (VOCs) and/or polynuclear aromatic hydrocarbons (PAHs) at concentrations that exceeded NYSDEC Soil Clean-up Objectives. An IRM was executed at the site in 1999 to delineate the extent of soil contamination and to remove contaminated soil. A total of 35,606 tons of contaminated soil were removed from the site. Excavation during the IRM was conducted up to but not beyond property boundaries. Some soils containing VOCs above NYSDEC Soil Clean-up Objectives were identified along the eastern property boundary, but were not removed during the IRM.

NYSDEC has prepared a Record of Decision (ROD) for the site. The ROD divides the site into three operable units (OU1, OU2, and OU3). OU1 is on-site soil, which was addressed through execution of the IRM. Over 90% of contaminated soil was removed from within the site boundaries. Remaining contaminated soil in OU1 is located at depths of greater than 10 feet below ground surface (ft BGS) and does not pose a threat to the health of site employees or nearby residents. Therefore, NYSDEC has proposed no further action for OU1. OU2 is groundwater beneath the site that is being addressed through an on-going long-term groundwater monitoring program. OU3 is off-site soil east of the site. A work plan to investigate the nature and extent of contamination in OU3 was prepared by INTERA (DE&S, 2001a), and approved by NYSDEC in May 2001. The results of the OU3 investigation that was conducted in August 2001 were documented in a report prepared by INTERA (INTERA, 2002a), and approved by NYSDEC in April 2002. Results of the OU3 Investigation indicated that approximately 175 yd^3 of soil contaminated with VOCs was present in OU3 at concentrations that exceeded NYSDEC Soil Clean-up Objectives.

The OU3 Investigation report recommended that the IRM program be continued to address the soil contamination identified in OU3. The NYSDEC Division of Environmental Remediation confirmed that the IRM program could be continued and indicated that an addendum to the IRM work plan (DE&S, 1999a) should be prepared to address the soil contamination. The IRM work plan addendum was prepared by INTERA (INTERA, 2002c) in August 2002 and approved by NYSDEC on August 26, 2002.

Contaminants of concern (COCs) were identified in the OU3 IRM work area on the basis of analytical results from soil samples collected during the 1999 IRM and the OU3 Investigation. Identified COCs in the OU3 IRM work area include the following VOCs:

1,2-dichloroethene (DCE)	trichloroethylene (TCE)	vinyl chloride (VC)
toluene	xylenes	ethylbenzene
acetone	methylene chloride	

The NYSDEC Soil Clean-up Objectives and Action Level concentrations for COCs are listed in Table 1, Appendix A.

This document provides details on the execution and results of the IRM addendum. The remainder of this section describes the purpose and objectives of the IRM addendum program and the NYSDEC "Contained-In" Policy that was invoked during site cleanup. Section 2 provides details on the methodology and procedures used during the completion of the IRM addendum. Section 3 provides the results of soil excavation and disposal and soil conditions at the site following the IRM. Section 4 describes site restoration.

1.2 Purpose and Objectives of OU3 IRM Program Addendum

An IRM is a planned action(s) that can be conducted without extensive investigation and is designed to be a permanent part of the final remedy for a site. The purpose of the IRM addendum was to remove contaminated soils from OU3 and the eastern portion of the site.

The specific objectives of the OU3 IRM included:

1. Excavation of contaminated soils and testing to determine appropriate disposal options, and

2. Disposal of soil at an appropriate facility.

1.3 NYSDEC "Contained-In" Policy

The NYSDEC Division of Hazardous Substances Regulation, Bureau of Technical Support has developed a guidance document for managing listed hazardous waste. The document, Technical Administrative Guidance Memorandum #3028, dated November 30, 1992, is entitled "Contained-In" Criteria for Environmental Media (NYSDEC, 1992). The "Contained-In" policy applies to soil, sediment and groundwater contaminated by listed hazardous waste and removed pursuant to a corrective action plan. NYSDEC stated that environmental media containing hazardous constituents from listed hazardous waste can be managed as non-hazardous waste under the "Contained-In" Policy if the media meets all of the following three conditions:

1. The soil does not exhibit the characteristics of hazardous waste as defined in 6 New York Codes, Rules and Regulations (NYCRR) Part 371 - Identification of Hazardous Waste.

2. The average total concentration of each contaminant in soils does not exceed its respective soil ingestion level (Action Level Concentrations specified in the contained-in policy).

3. The average total concentration of each contaminant in soil does not exceed 10 times its respective land disposal restriction (LDR) level as promulgated by the United States Environmental Protection Agency (USEPA) August 24, 1998.

The "Contained-In" policy was successfully employed at the site during the IRM to manage excavated soils contaminated with VOCs. Soil clean-up objectives were calculated during the IRM based on a technical memorandum titled "Determination of Soil Cleanup Objectives and Cleanup Levels" (NYSDEC, 1994, revised March 1998). Soil Clean-up Objectives and Action Level concentrations for COCs are provided in Appendix A, Table 1.

The OU3 Investigation demonstrated that VOC concentrations in OU3 soil did not exceed NYSDEC's Action Levels. Two composite soil samples were submitted for laboratory analysis of waste characterization parameters during the OU3 Investigation. The samples were collected from test pits excavated along the fence line located along the eastern property boundary of the Kanthal-Globar site. Laboratory analytical results indicated that the material in these samples can be considered non-hazardous according to 6 NYCRR Part 371 - Identification and Listing of Hazardous Wastes. The OU3 Investigation demonstrated that soil in OU3 met the above stated conditions for use of the "Contained-In" policy; therefore, the "Contained-In" criteria were applied to soils excavated from the site during the OU3 IRM.

Excavated soils that met the conditions for use of the "Contained-In" policy were handled and disposed as a non-hazardous industrial solid waste material at a permitted Resource Conservation and Recovery Act (RCRA) Part 360 landfill. Contaminated soil remaining along the eastern property boundary of the site that was not removed during the IRM included a small quantity of soil below a depth of 10 feet that exceeded NYSDEC's Soil Action Levels. Soil that did not meet the requirements of the "Contained-In" policy was handled and disposed as a hazardous waste at a permitted RCRA Part 373 landfill.

2. METHODOLOGY

2.1 On-site Screening and Segregation of Soils

Soils were excavated using a tracked excavator and either placed directly at, or trucked to, a staging area on site for testing prior to off-site disposal. Soils were segregated based on the analytical results of soil samples collected during the IRM and OU3 Investigation from measured sampling locations and depths. Soil excavated from the site was segregated into three categories for disposal purposes. These categories included:

1. Clean Soils: Soil with contaminant concentrations below the NYSDEC Soil Clean-up Objectives for VOCs.

2. Non-Hazardous Soils: Soil with contaminant concentrations above the NYSDEC Soil Clean-up Objectives for VOCs, but below the NYSDEC Soil Action Level concentrations for VOCs.

3. Action Level Soils: Soil with contaminant concentrations above NYSDEC Action Levels for VOCs.

An exclusion zone was established around the work area with temporary fencing to restrict the access of unauthorized individuals. Soils were excavated and stockpiled on plastic sheeting at a staging area on the site. The staging area was located as far from potential downwind receptors as possible. Stockpiled soil was covered with plastic sheeting to reduce fugitive emissions and dust. The work area is shown in Appendix A, Figure 2 in relation to the property boundary and the former IRM excavation.

Verification samples (discussed below) were collected to confirm that soils remaining in the excavation did not contain COCs above Soil Clean-up Objectives.

2.2 Soil Disposal and Hauling

Action Level soils excavated from the site were disposed at CWM Chemical Services, a RCRA Part 373 registered landfill. Non-hazardous soils were disposed at MODERN landfill, a RCRA Part 360 municipal waste landfill. Both landfills are located in Model City, New York.

2.3 Air Monitoring

Continuous work area and community air monitoring was conducted by INTERA personnel during excavation activities according to the approved IRM Health and Safety Plan. The Health and Safety Plan was in compliance with the New York State Department of Health (NYSDOH) Community Air Monitoring Plan and the NYSDEC Technical Administrative Guidance Memorandum (TAGM) 4031 Dust Control.

Community air monitoring was conducted by continuously monitoring VOC vapor and dust concentrations in ambient air upwind and downwind of the work area during all excavation and soil removal activities. Two air monitoring stations were set up daily, if possible; one downwind of excavation activities and one upwind. In general, wind direction was not consistent throughout the day, or from day to day during the IRM so monitoring stations were adjusted accordingly. During wet weather, the air monitoring stations were dismantled because the instruments could be damaged and because dust and VOCs in air are minimized when excavations and truck routes are wet.

Each station included one dust monitor (MIE Personal Dataram Monitor) and one PID monitor (RAE MultiRAE O2-LEL-H2S-CO-PID Detector). The monitors had data logging capabilities and recorded dust or total VOCs concentrations, short-term exposure limits (STEL) and the maximum and minimum one minute averages. PID readings and dust concentrations noted during excavation and soil removal activities did not reach action levels and vapor and/or dust control measures were not required at any time.

Work area air monitoring was conducted by continuously monitoring the breathing zone of work zone personnel with a PID. PID readings noted in the breathing zone during excavation did not reach action levels and personnel were not required to upgrade the level of health and safety equipment at any time.

2.4 Excavation Water Disposal

Due to rainfall and snowmelt, surface water accumulated in the excavation and required pumping prior to backfilling the excavation. On December 23, 2002 approximately 15,000 gallons of water were pumped from the excavation into a portable storage tank provided by SLC Environmental Services, remediation contractor to INTERA. Water samples were collected and submitted to the laboratory for analysis of total suspended solids (TSS), total organic carbon (TOC), and VOCs as requested by the City of Niagara Falls. Laboratory analytical results for water discharge to the sewer are provided in Appendix A, Table 4. A one-time sewer discharge permit was acquired from the City of Niagara Falls to dispose of the excavation water into the municipal sewer. The water was discharged to the sewer on January 9, 2003 by SLC Environmental Services.

2.5 Verification Sampling and Quality Assurance/Quality Control

Once soils identified to contain COC concentrations above NYSDEC Soil Cleanup Guidelines had been removed from the excavation, verification sampling of the bottom and sides of the excavation was performed. Discrete grab samples were collected using a corner of the backhoe bucket and scraping a vertical section of the excavation over a distance of approximately two feet. Grab samples were collected from the bucket and transferred to clean sample containers. Verification samples were collected based on the following sampling rationale:

- Collect samples in areas suspected to have the highest COC concentrations based on visual evidence of contamination, or on PID readings; or,

- If no evidence of contamination is observed, collect samples from material types believed to be most heavily impacted based on site conditions or grain size.

Each soil sample was collected in two resealable plastic bags. One bag was sealed with maximum headspace and allowed to reach ambient temperature for headspace gas measurement with a PID; the other bag was sealed with minimum headspace and stored on ice for possible selection for laboratory analysis. Headspace gas readings for VOCs were measured using the PGM-50 Multi Gas Monitor manufactured by RAE Systems Inc. Headspace gas concentrations were measured by inserting the instrument probe in the plastic bag and simultaneously manipulating the sample. The results of headspace screen were used to determine whether samples should be submitted to the laboratory, or if additional excavation should be conducted.

Verification samples were submitted to the laboratory for rush turnaround time. If laboratory analytical results indicated COC concentrations above NYSDEC Soil Clean-up Guidelines, additional excavation was carried out and another verification sample was collected. The verification samples that exceeded clean-up criteria were excavated, making them interim soil samples as they are no longer representative samples of soil remaining on-site and cannot be classified as verification samples.

INTERA collected duplicate samples at a frequency of approximately one for every 15 samples to check the precision of the analytical laboratory and sampling procedures. When filling duplicate or split samples, the verification sample jar and the duplicate/split sample jar were filled simultaneously to maximize homogeneity between samples. Sample jars were filled leaving the smallest amount of headspace possible. A trip blank was submitted for VOCs analysis with each shipment of VOC samples.

As a minimum, the approved Interim Remedial Measure Work Plan Addendum prescribed that verification samples were to be collected based on excavation size in accordance with the following:

Excavation Floor Area (ft^2)	No. of Floor Samples	No. of Sidewall Samples
300	2	2
550	2	3
1,075	3	4
2,700	3	5
5,400	4	6
8,070	4	7
10,800	5	8

This minimum sampling guideline was based on an excavation that did not exceed 13 ft deep. For excavations that significantly exceed this depth, additional sidewall samples were prescribed at a rate of four additional samples for every additional 5 ft of depth.

The OU3 IRM excavation had a total floor area of approximately 2320 ft^2 and an average depth of approximately 17 ft. To satisfy the minimum verification sample requirements three floor samples and nine sidewall samples should have been collected. A total of seven floor samples and eight sidewall verification samples were collected. No sidewall samples were collected along the west wall of the excavation as this wall is made up of clean backfill material from the previous excavation activities of the IRM in 1999. Verification sample locations are shown in Appendix A, Figure 3.

2.6 Data Validation

Validation of the data was completed for both field and laboratory aspects of the sampling program. Data validation consisted of:

- Assessment of the field sampling protocols and Quality Assurance/Quality Control (QA/QC) procedures, and
- Assessment of the laboratory analytical methodology and QA/QC procedures.

2.6.1 Field Sampling QA/QC

To ensure that representative samples were collected in the field and were delivered to the laboratory without degradation or contamination of the sample, the following field QA/QC measures were taken:

- Stainless steel sampling equipment including sampling spatulas or trowels were rinsed in detergent solution and distilled water after each sample.
- Samples collected directly from the excavator bucket were collected from soil that had not come in contact with the bucket itself in an effort to prevent cross-contamination.
- Field staff used new latex gloves for each sample.
- Soil samples were immediately split and sealed in two plastic bags, one bag to be screened for organic vapors using a PID and the other put on ice for potential laboratory submission.
- Samples were delivered to the laboratory in sealed, iced coolers under chain-of-custody within acceptable holding times.

During sampling, duplicate samples and travel blanks were collected to assess analytical precision and to identify potential sample contamination during sampling or transportation. The additional samples, all analyzed for VOCs, included the following:

- Duplicate soil samples were collected at a rate of one for every 15 samples submitted for laboratory analysis. A total of two duplicate samples were collected from a total of 25 interim or verification soil samples.
- Travel/trip blanks were shipped to the laboratory at a rate of one per sample shipment that contained samples for VOCs analysis. A total of three trip blanks were submitted to the laboratory.

The relative percent difference (RPD) between sets of duplicate samples was calculated as follows:

$$RPD = \frac{X_1 - X_2}{\overline{X}}$$

where X_1 = concentration of first duplicate
X_2 = concentration of second duplicate
$\overline{X}$ = mean concentration

Duplicate samples showed good correlation, with RPDs of less than 30% between samples for all parameters except trichloroethylene in one duplicate set. Of the two duplicate samples analyzed for the eight COCs, 13 sets of analytical results are non-detect, the other three sets had RPDs of 61.4%, 28.6%, and 2.2%. The overall sample quality is considered to be acceptable. RPDs of all field duplicate samples are provided in Appendix A, Table 2.

All travel blank samples were analyzed for VOCs. VOCs were not detected in the blank samples.

2.6.2 Laboratory QA/QC

Severn Trent Laboratories (STL) provided Category B deliverables for all the samples analyzed. Soil samples were analyzed for VOCs using EPA SW-846 Method 8260B.

Analytical data were validated by Intera Inc. of Austin, Texas. QA/QC was generally acceptable; however, field duplicates for Job Number A02-C580 had a RPD for trichloroethylene of 61%. All trichloroethylene data in this job number were qualified as estimates.

All of the data generated during the December 2002 sampling event at the BP Carborundum facility are deemed acceptable and were generated using established and agreed upon analytical protocols. Some of the data results should be considered estimates (J/UJ) due to a few minor problems encountered during lab analysis, but all of the data can be used to make project decisions. The Data Usability Summary Report is included in Appendix C.

2.7 Site Restoration

2.7.1 Imported Backfill

Imported backfill consisted of clean fill classified as clay (CL) by the Unified Soil Classification System (USCS). Imported backfill came from an approved clay pit operated by Mr. Roger Mawhiney, in the Town of Wilson New York. A sample of soil from this source was analyzed for Semi-volatile organic compounds (SVOCs) from the TCL, VOCs from the TCL, and total hazardous substance list (HSL) metals. The backfill laboratory analysis showed that the backfill material did not contain contaminant concentrations above regulatory guidelines. The acceptance letter and laboratory reports for the imported backfill source are provided in Appendix D.

Backfill was placed and compacted with a bulldozer in approximately two to three inch lifts. On the adjacent property, soil was placed up to ground surface and restored to pre-excavation conditions. On-site, soil backfill was placed up to 1 ft BGS, above which approximately 6 inches of imported stone was placed as a base for surface treatment. Surface treatment including paving could not be completed at the time of excavation due to temperature constraints. Final grading and paving was completed in September 2003.

2.7.2 On-site Backfill

In addition to imported fill, stockpiled soils excavated from above the contaminated zone and determined to be clean from analytical testing during the OU3 Investigation, were used as backfill on site.

2.7.3 Fencing

Fencing along the eastern property boundary which was removed to conduct the excavation was repaired.

2.7.4 Paving

Resurfacing of on-site areas which were previously paved could not be completed at the time of the excavation work due to temperature constraints. Due to unfavorable (wet) conditions experienced through spring and early summer of 2003 final site grading and paving could not be completed until September 2003.

3. OU3 IRM SOIL EXCAVATION RESULTS

This section describes the removal of contaminated soil and the condition of soils remaining following excavation. Summaries of the total volumes, tonnage and lateral areas of excavation are presented in Appendix A, Table 3. The lateral extents of the excavation and excavation floor depths are shown in Appendix A, Figure 3. Sampling results and soil disposal are described in the following sections. On-site and off-site soils are discussed separately even though they were removed as one excavation. Photographs are provided in Appendix E. Laboratory analytical reports are provided on compact disc in Appendix B. Total tonnage reports from MODERN Landfill and CWM Landfill are provided in Appendix F.

3.1 Off-site Soil Excavation and Disposal

The OU3 Investigation identified off-site soils contaminated with VOCs east of the eastern property boundary. Off-site contamination was identified in soil from 10 to 16 ft BGS. Soil excavated from this area was non-hazardous and disposed at MODERN Landfill. Soil from 0 to 8 ft BGS was excavated and stockpiled on-site for use as clean backfill.

Initial excavation and disposal was conducted on December 16 and 17, 2002. Seven verification samples were collected and submitted to STL for VOCs analysis. Two of the verification samples (OU3IRMVS10 and OU3IRMVS12) had VOC concentrations above clean-up criteria. Additional excavation to remove the remaining contaminated soil took place on December 20, 2002. One new verification sample and a duplicate sample were submitted for laboratory analysis. The verification samples had VOC concentrations below the clean-up objectives; therefore, additional excavation was not required. A summary of interim and verification sampling results is provided in Tables 5 and 6, respectively.

A total of 238 tons or approximately 132 yd^3 of non-hazardous material was excavated and disposed from off site. The total volume of clean and non-hazardous material excavated from off site was 352 yd^3. Appendix A, Figure 3 shows the locations of verification samples, the extents of excavation, and the excavation floor depths in feet BGS.

3.2 On-site Soil Excavation and Disposal

During the 1999 IRM on-site soils along the eastern property boundary, below 10 ft BGS, were identified as being contaminated with VOCs. The contaminated soils along the eastern property boundary could not be removed without disrupting the neighboring property. The contaminated soils identified were below 10 ft BGS and did not pose a threat to the health of employees or nearby residents. Therefore, NYSDEC proposed no further soil removal. When contaminated soils were identified off-site, adjacent to the eastern property boundary, it was recommended that additional on-site soil also be removed.

Both Action Level and non-hazardous soils were excavated from on site and disposed at CWM Chemical Services and MODERN Landfill, respectfully. Excavation and disposal was conducted from December 16 to 23, 2002. Soils were segregated based on the analytical results of soil samples collected during the 1999 IRM. Soil thought to be non-hazardous but excavated near Action Level soil was stockpiled and sampled to confirm the appropriate disposal method. Three stockpile samples were collected and analyzed for VOCs. None of the stockpile samples exceeded Action Levels so the soil was disposed as non-hazardous at MODERN Landfill. A summary of stockpile sample results is presented in Appendix A, Table 7.

Thirteen verification samples were collected and submitted to STL for VOC analysis. Three of the verification samples (OU3IRMVS05, OU3IRMVS15 and OU3IRMVS16) had VOC concentrations above clean-up criteria. Additional excavation was conducted to remove the remaining contaminated soil. At a maximum achievable depth of 21 ft, two verification samples (OU3IRMVS18 and OU3IRMVS21) still had VOC concentrations above clean-up criteria. NYSDEC was consulted and it was determined that contaminated soil below 21 ft BGS would not pose a health risk to employees or nearby residents. Therefore, no further excavation was conducted. A summary of interim and verification sampling results is provided in Tables 5 and 6, respectively.

A total of 208.03 tons, or approximately 116 yd^3, of Action Level soil and approximately 1472 tons, or 818 yd^3, of non-hazardous soil were excavated and disposed from the on-site area. Figure 3, Appendix A shows the locations of verification samples, the extents of excavation, and the excavation floor depths in feet BGS. Figure 4, Appendix A shows areas of potentially contaminated soil remaining on-site below 21 ft BGS. An approximate area of 54 yd^2 contains soil potentially contaminated with VOCs above clean-up criteria.

4. SITE RESTORATION

Restoration of surfaces, both on and off site, was completed as outlined in the IRM Work Plan Addendum. The excavation was backfilled with stockpiled soil from above the contaminated zone and imported clay from an approved source. The surface, other than the asphalt pavement, was restored to pre-excavation conditions. Site restoration activities were conducted on December 23 and 24, 2002.

Due to unfavorable weather conditions experienced from December 2002 and through the spring and early summer of 2003, asphalt paving was delayed until September 2003. The fence which had to be removed during excavation activities was also repaired.

5. REFERENCES

DE&S (2001a) Final OU3 Investigation Work Plan for the Former Carborundum Company - Electric Products Division, Hyde Park Facility, Town of Niagara, Niagara County, New York, Site No. 932036. Duke Engineering & Services, March 2001.

DE&S (2001b) Summary Report for the First Year of the Groundwater Monitoring Program at the Former Carborundum Company – Electric Products Division, Hyde Park Facility, Town Of Niagara, Niagara County, New York Site No. 932036. Duke Engineering & Services, March 2001.

DE&S (2001c) Interim Report for Second Year of the Groundwater Monitoring Program - Former Carborundum Company – Electric Products Division, Hyde Park Facility, Town of Niagara, Niagara County, New York, Site No. 932036. Letter report prepared by Duke Engineering & Services, August 20, 2001.

DE&S (2000a) Post IRM Groundwater Sampling at the Former Carborundum Company – Electric Products Division, Hyde Park Facility, Town of Niagara, Niagara County, New York, Site No. 932036, Final Document. Duke Engineering & Services, January 2000

DE&S (2000b) Feasibility Study for the Remediation of the Former Carborundum Company – Electric Products Division, Hyde Park Facility, Town of Niagara, Niagara County, New York, Site No. 932036, Final Document. Duke Engineering & Services, January 2000.

DE&S (1999a) Interim Remedial Measure Work Plan for the Former Carborundum Company – Electric Products Division, Hyde Park Facility, Town of Niagara, Niagara County, New York Site No. 932036, Final Document. Duke Engineering & Services, January 25, 1999.

DE&S (1999b) Test Pit Sampling Results, Former Carborundum Globar Facility, Site No. 932036, Town of Niagara, NY. Letter report prepared by Duke Engineering & Services, May 4, 1999.

DE&S (1999c) Execution of the Interim Remedial Measure for the Former Carborundum Company – Electric Products Division, Hyde Park Facility, Town of Niagara, Niagara County, New York, Site No. 932036, Final Document. Duke Engineering & Services, December 1999.

DE&S (1998) Phase II Remedial Investigation of the Former Carborundum Company Electric Products Division, Hyde Park Facility Town of Niagara, Niagara County, New York Site No. 932036, Final Report. Duke Engineering & Services, May 1998.

Earth Dimensions Inc. (1985) Soils Report Preliminary Site Assessment Hyde Park Facility, Carborundum Globar Manufacturing, Niagara Falls, New York. Earth Dimension Inc., 1985.

Ecology and Environment (1991) Preliminary Site Assessment: Union Carbide Corp; Carbon Products Division Site. Site Number 932035, Town of Niagara, Niagara County. Prepared for: New York State Department of Environmental Conservation. Ecology and Environment Engineering, P.C., June 1991.

INTERA (2002a) OU3 Investigation at the Former Carborundum Company - Electric Products Division, Hyde Park Facility, Town of Niagara, Niagara County, New York. Site No. 932036. Final Report. INTERA Inc., February 2002.

INTERA (2002b) Summary Report for the Second Year of the Groundwater Monitoring Program at the Former Carborundum Company – Electric Products Division, Hyde Park Facility, Town Of Niagara, Niagara County, New York Site No. 932036. INTERA Inc., March 2002.

INTERA (2002c) Interim Remedial Measure Work Plan Addendum for the Former Carborundum Company – Electric Products Division, Hyde Park Facility, Town Of Niagara, Niagara County, New York Site No. 932036. INTERA Inc., August 2002.

INTERA (1997) Remedial Investigation of the Former Carborundum Company Electric Products Division, Hyde Park Facility, Town of Niagara, Niagara County, New York. Final Report. Site No. 932036. INTERA Inc., August 1997.

INTERA (1995) Quality Assurance Project Plan for Remedial Investigation/Feasibility Study of the Former Carborundum Company - Electric Products Division, Hyde Park Facility, Town of Niagara, Niagara County, New York, Site No. 932036. INTERA Inc., August 1995.

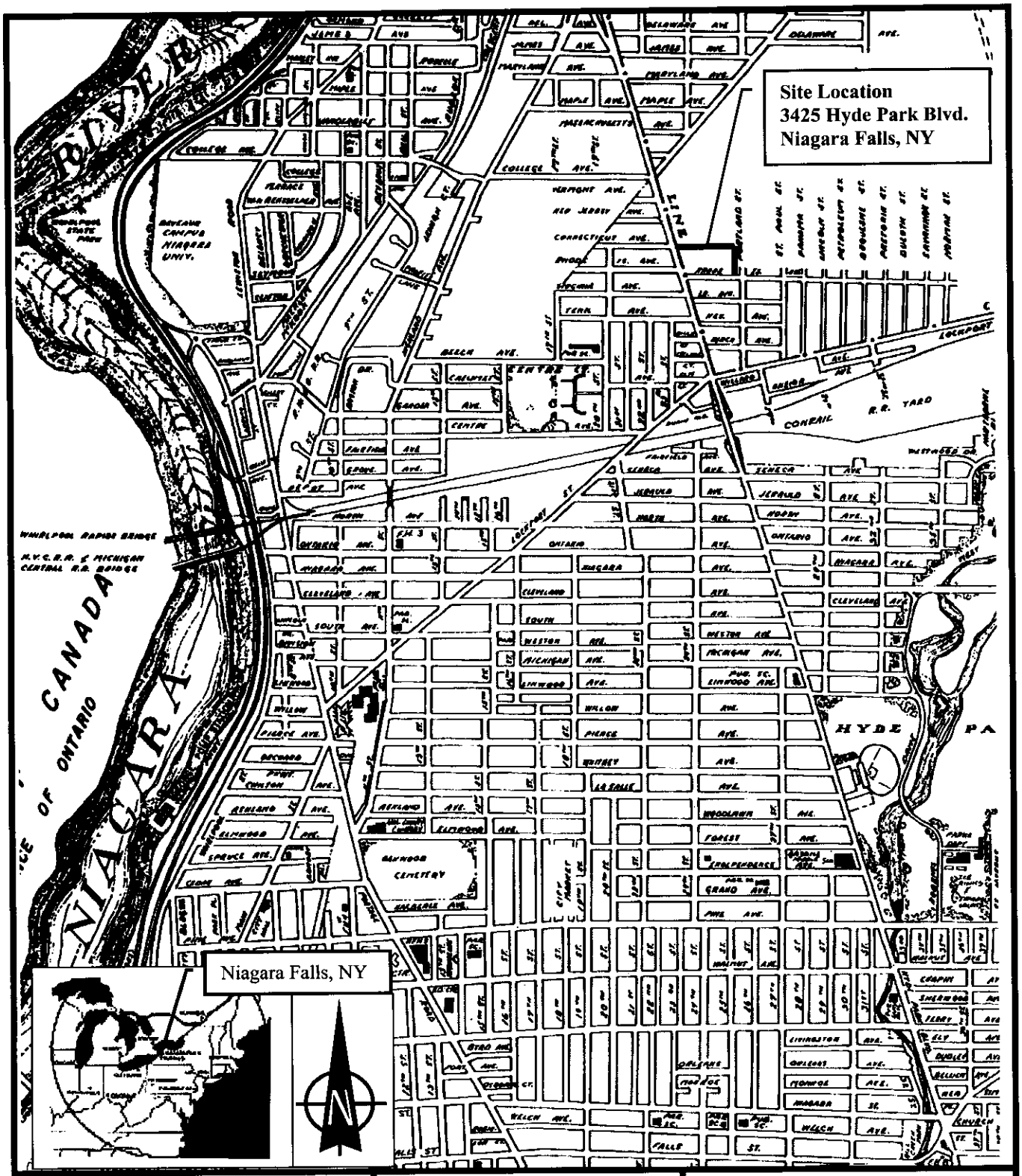
INTERA (1993) Report on the Preliminary Site Assessment of the Carborundum Company - Electric Products Division, Hyde Park Facility, Town of Niagara, Niagara County, New York. INTERA Inc., May 1993.

NYSDEC (1994) Determination of Soil Cleanup Objectives and Cleanup Levels NYSDEC TAGM HWR-94-4046, January 24, 1994, revised March 1998.

NYSDEC (1992) "Contained-In" Criteria for Environmental Media NYSDEC TAGM #3028, November 30, 1992

APPENDIX A

Figures and Tables



INTERA	**Figure 1**	**Site Location Map**

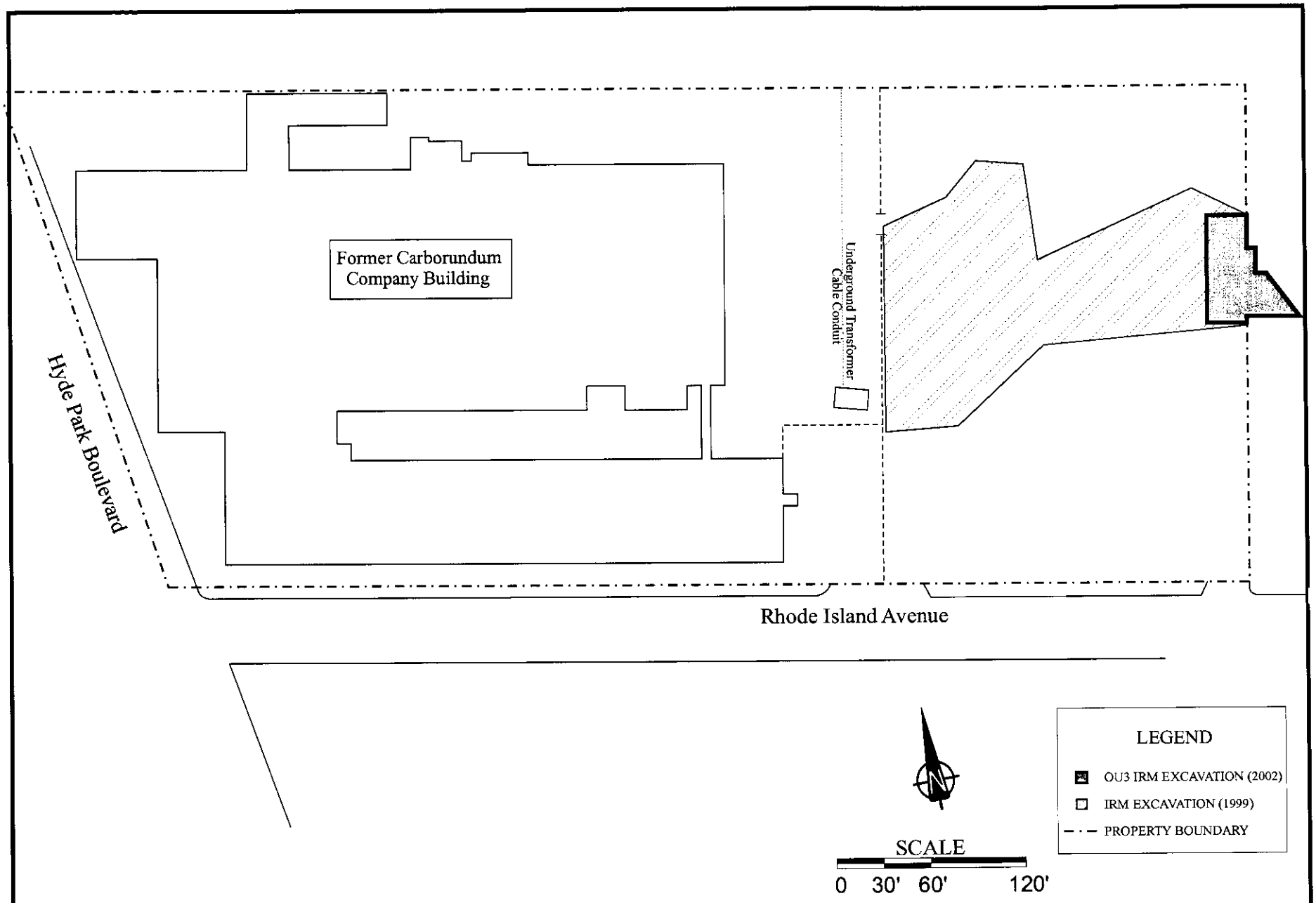
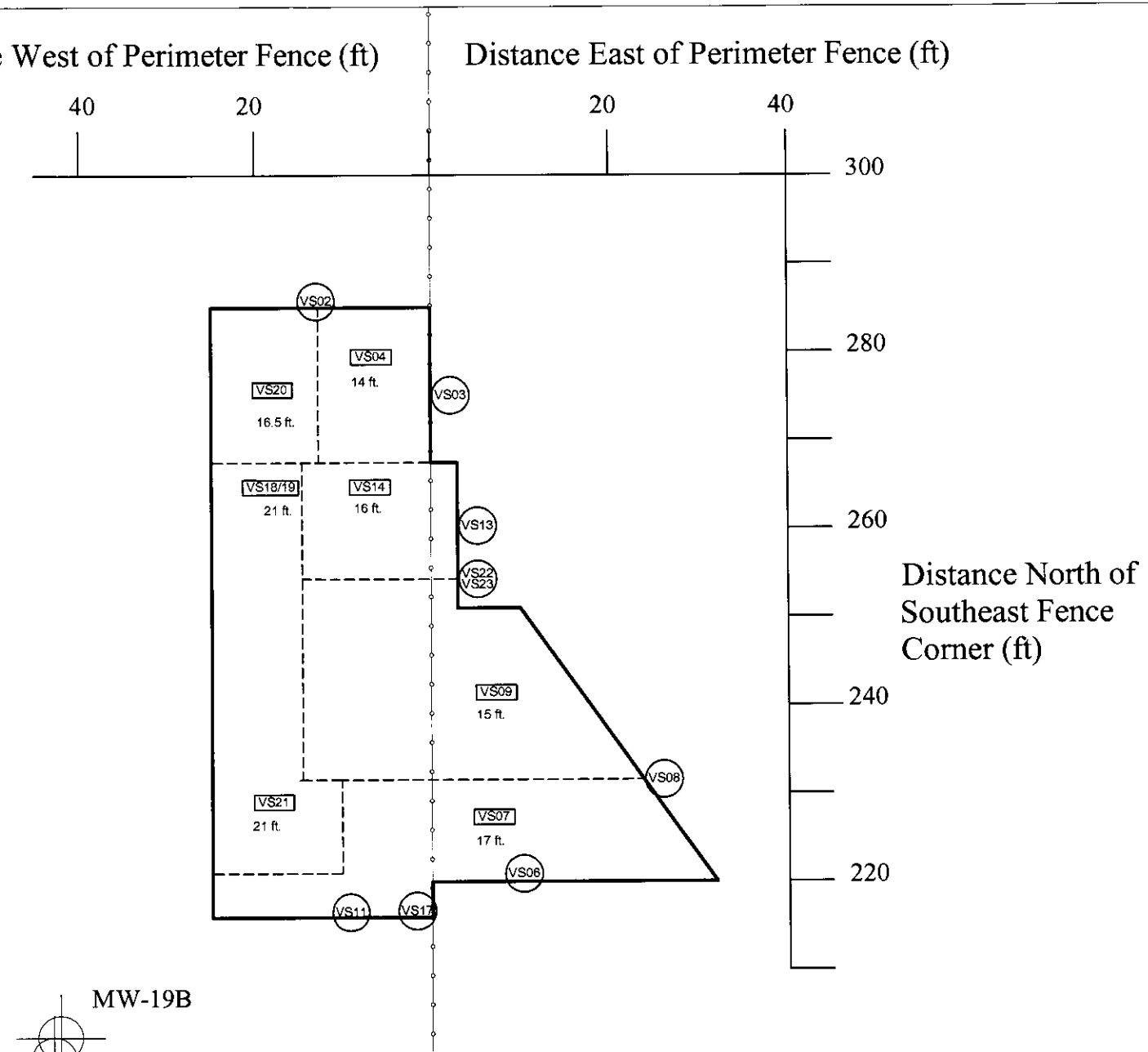


Figure 2	Job #: 01-220-7	Site Layout - OU3 IRM Excavation Limits	
Date: April 2003	Drawn/File Name: Fig2 Site Layout.cdr	Former Carborundum Company - Electric Products Division	



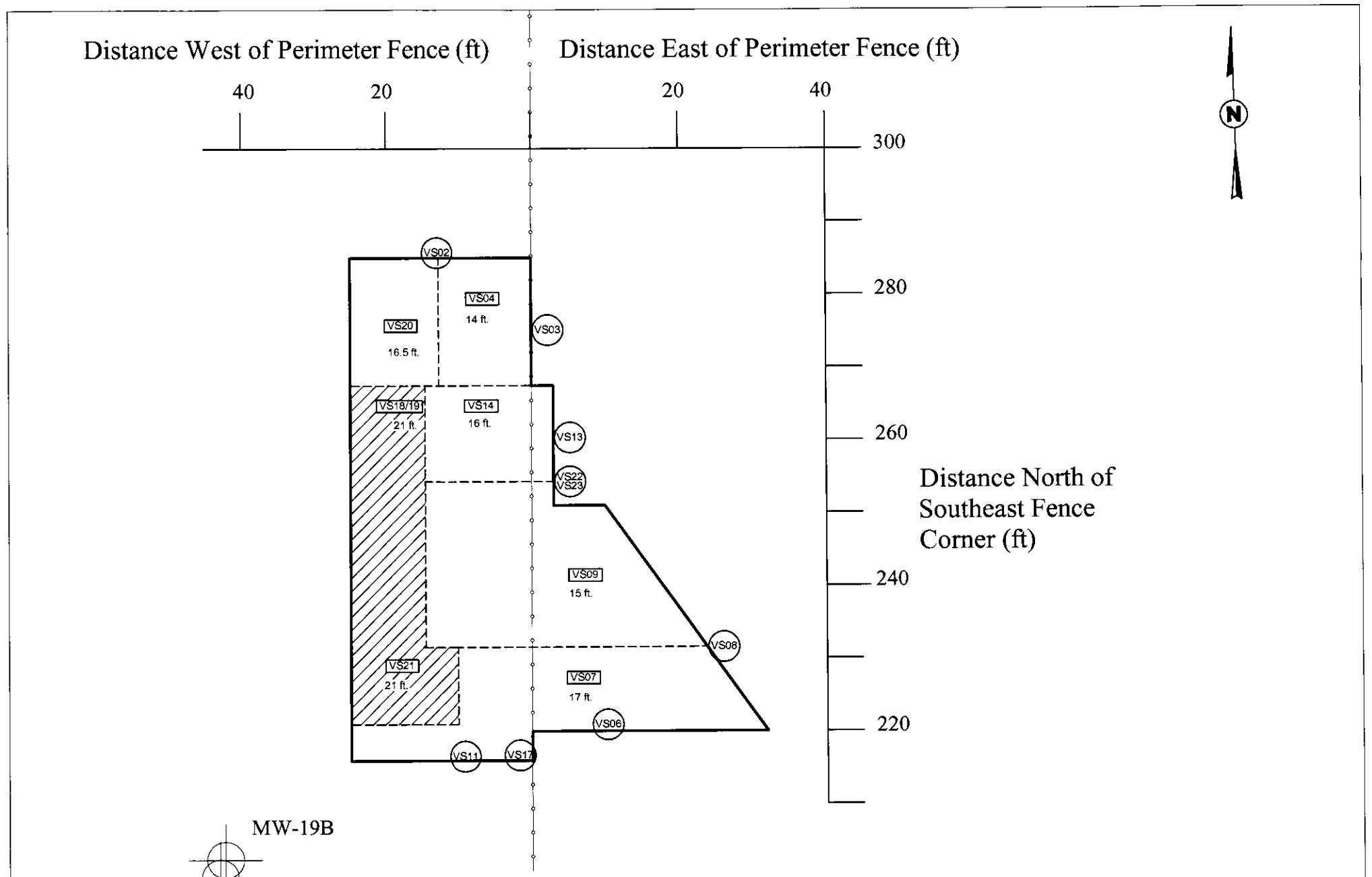
Scale (ft.)

0 10 20

Legend:

- MW-19A — Monitoring Well Location
- VS03 — Wall Verification Sample
- VS03 — Floor Verification Sample
- 16.5 ft. — Excavation Floor Depth
- Perimeter Fence
- Top of Excavation

Project Location: 3425 Hyde Park Blvd., Niagara Falls, NY		Date: December 2002	Figure #: 3
ACAD File: OU3IRM_Excavation.dwg	Drawn By: EW	Project #: 01-220-7	
INTERA		Title: Verification Sample Locations	



Scale (ft.)

0 10 20

Legend:

- MW-19A — Monitoring Well Location
- VS03 — Wall Verification Sample
- VS03 — Floor Verification Sample
- 16.5 ft. — Excavation Floor Depth
- Perimeter Fence
- Top of Excavation
- Potentially Contaminated Soil

Project Location: 3425 Hyde Park Blvd., Niagara Falls, NY		Date: April 2003	Figure #: 4
ACAD File: OU3IRM_Excavation.dwg	Drawn By: GDB	Project #: 01-220-7	

INTERA

Title: Potentially Contaminated Soil Remaining

Table 1: Selected NYSDEC Soil Clean-up Objectives and Action Level Concentrations

Contaminants of Concern	Clean-up Objective[1] (ug/g)	Action Level[2] (ug/g)
Trichloroethene	0.88	64
1,2-Dichloroethene (total)	0.41	2,800
Acetone	0.2	8,000
Vinyl Chloride	0.2	0.36
Xylenes (total)	1.68	200,000
Ethylbenzene	7.7	8,000
Toluene	2.1	20,000
Methylene Chloride	0.15	93

Notes:

1 - Recommended Soil Cleanup Objectives calculated based on 1.4% TOC in soil (NYSDEC TAGM HWR-94-4046, January 24, 1994)

2 - Soil Action Level (NYSDEC TAGM #3028, November 30, 1992)

Table 2 RPD's for VOCs in Field Duplicate Soil Samples

Sample and Sample Duplicate	Analytical Results (µg/g)							
	Vinyl Chloride	Acetone	Methylene Chloride	cis- and trans-1,2-Dichloroethene	Trichloroethene	Toluene	Ethyl benzene	Total Xylenes
OU3IRMSVS18	nd	nd	nd	4.6	10	nd	nd	nd
OU3IRMSVS19	nd	nd	nd	4.7	5.3	nd	nd	nd
RPD%	--	--	--	2.2%	61.4%	--	--	--
OU3IRMSVS22	nd	nd	nd	nd	0.003	nd	nd	nd
OU3IRMSVS23	nd	nd	nd	nd	0.004	nd	nd	nd
RPD%	--	--	--	--	28.6%	--	--	--

Notes:

nd -- Indicates parameter not detected above laboratory detection limits

RPD – Relative Percent Difference

Table 3: Excavation Volume, Mass, and Area Summaries

Area of Excavation	On-site Soils	Off-site Soils
Total volume excavated (yd^3)	1099	352
Tonnage disposed as action level (tons)	208.03	0
Tonnage disposed as non-haz (tons)	1472	238
Volume stockpiled and used as clean backfill (yd^3)	166	220
Lateral excavation area (ft^2)	1725	594

Table 4: Laboratory Analytical Results for Water Discharge to Sewer

Sample Number >>	Units	OU3IRMWS1 23-Dec-02	OU3IRMWS2 23-Dec-02	OU3IRMWS3 23-Dec-02
Total Organic Carbon	mg/L		5.2	
Total Suspended Solids	mg/L			30
Ethylbenzene	µg/L	1.1 J		
Styrene	µg/L	<5.0		
cis-1,3-Dichloropropene	µg/L	<5.0		
trans-1,3-Dichloropropene	µg/L	<5.0		
1,2-Dichloroethane	µg/L	<5.0		
Vinyl acetate	µg/L	<10		
4-Methyl-2-pentanone	µg/L	<10		
Toluene	µg/L	0.66 J		
Chlorobenzene	µg/L	<5.0		
Dibromochloromethane	µg/L	<5.0		
Tetrachloroethene	µg/L	<5.0		
Total Xylenes	µg/L	1.9 J		
1,2-Dichloroethene (Total)	µg/L	32		
Carbon Tetrachloride	µg/L	<5.0		
2-Hexanone	µg/L	<10		
Acetone	µg/L	<10		
Chloroform	µg/L	<5.0		
Benzene	µg/L	<1		
1,1,1-Trichloroethane	µg/L	<5.0		
Bromomethane	µg/L	<10		
Chloromethane	µg/L	<10		
Chloroethane	µg/L	<5.2		
Vinyl chloride	µg/L	1.1 J		
Methylene chloride	µg/L	<5.0		
Carbon Disulfide	µg/L	<5.0		
Bromoform	µg/L	<5.0		
Bromodichloromethane	µg/L	<5.0		
1,1-Dichloroethane	µg/L	<5.0		
1,1-Dichloroethene	µg/L	<5.0		
1,2-Dichloropropane	µg/L	<5.0		
2-Butanone	µg/L	<10		
1,1,2-Trichloroethane	µg/L	<5.0		
Trichloroethene	µg/L	14		
1,1,2,2-Tetrachloroethane	µg/L	<5.0		

Notes:

J - Indicates an estimated value. Compound meets identification criteria and is less than the specific detection limit but greater than zero.

<5 - Indicates not detected above laboratory detection limit.

Table 5: Laboratory Analytical Results for Verification Soil Samples (ug/g)

	Sample Number >>		OU31RMVS02	OU31RMVS03	OU31RMVS04	OU31RMVS06	OU31RMVS07	OU31RMVS08	OU31RMVS09	OU31RMVS11
	Sample Location >>		wall; 8-10 ft	wall; 8-10 ft	floor; 14 ft	wall; 9-11 ft	floor; 17 ft	wall; 9-11 ft	floor; 15 ft	wall; 14-16 ft
	PID Reading (ppm) >>		4.9	3.1	2.3	0.0	0.0	0.0	10.1	9.7
	Clean up Objective	**Action Level**	16-Dec-02	16-Dec-02	16-Dec-02	16-Dec-02	16-Dec-02	17-Dec-02	17-Dec-02	17-Dec-02
Trichloroethene	0.88	64	0.070	0.062	<0.005	0.026	<0.005	0.002 J	0.230	0.140
1,2-Dichloroethene	0.41	2,800	0.046	0.007	0.03	0.002 J	<0.005	<0.005	0.13	0.021
Acetone	0.2	8,000	0.009 BJ	0.009 BJ	0.026 B	0.007 J	0.019 B	<0.010 UJ	0.022	0.035
Vinyl Chloride	0.2	0.36	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Xylenes (total)	1.68	200,000	<0.005	<0.005	<0.005	<0.005	<0.005	0.002 J	0.016	<0.005
Ethylbenzene	7.7	8,000	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.004 J	<0.005
Toluene	2.1	20,000	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.002 J	<0.005
Methylene Chloride	0.15	93	0.014 BJ	0.012 B	0.010 BJ	0.012 B	0.008 B	0.009 B	0.009 BJ	0.022 BJ

Notes:

All units ug/g

Dupl. - indicates a duplicate sample

UJ - Indicates the analyte was not detected above the reported sample quantitation limit and the quantitation limit is approximate.

J - Indicates an estimated value. Compound meets identification criteria and is less than the specific detection limit but greater than zero

B - Indicates that the analyte was found in both the sample and its associated laboratory blank. Possible probable blank contamination.

D - Indicates compound identified in an analysis at a secondary dilution factor.

U - Indicates the analyte was not detected above the reported sample quantitation limit.

<5 - Indicates not detected above laboratory detection limit.

580D Indicates that parameter exceeds Clean-up Objective

Table 5: Laboratory Analytical Results for Verification Soil Samples (ug/g)

	Sample Number >>		OU31RMVS13	OU31RMVS14	OU31RMSVS17	OU31RMSVS18	OU31RMSVS19	OU31RMSVS20	OU31RMVS21	OU31RMVS22	OU31RMVS23
	Sample Location >>		wall; 14.5-16.5 ft	floor; 16 ft	wall; 5-7 ft	floor; 21 ft	21 ft (dup)	floor; 16.5 ft	floor; 21 ft	wall; 13-15 ft	13-15 ft (dup)
	PID Reading (ppm) >>		0.5	0.0	0.0	59.9	59.9	0.0	13.0	0.0	0.0
	Clean up Objective	**Action Level**	17-Dec-02	17-Dec-02	18-Dec-02	18-Dec-02	18-Dec-02	18-Dec-02	20-Dec-02	20-Dec-02	20-Dec-02
Trichloroethene	0.88	64	0.022	0.002 J	0.005 J	**10 J**	**5.3 J**	<0.005 UJ	**7.9 D**	0.003 J	0.004 J
1,2-Dichloroethene	0.41	2,800	0.003 J	0.002 J	0.002 J	**4.6**	**4.7**	<0.005 UJ	**0.640 D**	<0.005	<0.005
Acetone	0.2	8,000	0.013 J	0.016 J	0.01	<1.250	<1.250	0.016	<0.010 UJ	<0.010 UJ	<0.010
Vinyl Chloride	0.2	0.36	<0.010	<0.010	<0.010	<1.250	<1.250	<0.010	0.004 J	<0.010	<0.010
Xylenes (total)	1.68	200,000	<0.005	<0.005	<0.005	<0.625	<0.625	<0.005	<0.005	<0.005	<0.005
Ethylbenzene	7.7	8,000	<0.005	<0.005	<0.005	<0.625	<0.625	<0.005	<0.005	<0.005	<0.005
Toluene	2.1	20,000	<0.005	<0.005	<0.005	0.450 J	<0.625	<0.005	<0.005	<0.005	<0.005
Methylene Chloride	0.15	93	0.006 B	0.008 B	0.010 B	<0.625	<0.625	0.005 BJ	0.004 BJ	0.005 B	0.007 B

Notes:

All units ug/g

Dupl. - indicates a duplicate sample

UJ - Indicates the analyte was not detected above the reported sample quantitation limit and the quantitation limit is approximate.

J - Indicates an estimated value. Compound meets identification criteria and is less than the specific detection limit but greater than zero.

B - Indicates that the analyte was found in both the sample and its associated laboratory blank. Possible/probable blank contamination.

D - Indicates compound identified in an analysis at a secondary dilution factor.

U - Indicates the analyte was not detected above the reported sample quantitation limit.

<5 - Indicates not detected above laboratory detection limit.

580D Indicates that parameter exceeds Clean-up Objective

Table 6: Laboratory Analytical Results for Interim Soil Samples (ug/g)

	Sample Number >>		OU31RMVS05	OU31RMVS10	OU31RMVS12	OU31RMVS15	OU31RMSVS16
	Sample Location >>		floor; 14.5 ft	wall; 13-15 ft	wall; 6-8 ft	floor; 15 ft	floor; 16 ft
	PID Reading (ppm) >>		1.7	37.0	27.0	4.2	13.0
	Clean up Objective	**Action Level**	16-Dec-02	17-Dec-02	17-Dec-02	17-Dec-02	18-Dec-02
Trichloroethene	0.88	64	0.040	0.220	**2.4 D**	0.110	**6.6 J**
1,2-Dichloroethene	0.41	2,800	**0.92**	**0.98 D**	0.32 DJ	**1.4 D**	**5.3**
Acetone	0.2	8,000	0.046 J	0.012 J	0.01 J	0.012	<1.250
Vinyl Chloride	0.2	0.36	<0.010	0.035	0.005 J	<0.010	<1.250
Xylenes (total)	1.68	200,000	<0.005	0.006	0.002 J	<0.005	<0.625
Ethylbenzene	7.7	8,000	<0.005	0.041	0.002 J	<0.005	<0.625
Toluene	2.1	20,000	<0.005	<0.005	<0.005	<0.005	0.180 J
Methylene Chloride	0.15	93	0.110 B	0.008 B	0.009 B	0.008 BJ	<0.625

Notes:

All units ug/g

Dupl. - indicates a duplicate sample

UJ - Indicates the analyte was not detected above the reported sample quantitation limit and the quantitation limit is approximate.

J - Indicates an estimated value. Compound meets identification criteria and is less than the specific detection limit but greater than zero.

B - Indicates that the analyte was found in both the sample and its associated laboratory blank. Possible/probable blank contamination.

D - Indicates compound identified in an analysis at a secondary dilution factor.

U - Indicates the analyte was not detected above the reported sample quantitation limit.

<5 - Indicates not detected above laboratory detection limit.

580D Indicates that parameter exceeds Clean-up Objective

Table 7: Laboratory Analytical Results for Stockpiled Soil Samples (ug/g)

	Sample Location >>		Stockpile Sample	Stockpile Sample	Stockpile Sample
	Sample Number >>		OU31RMVS01	OU3IRMSP1	OU3IRMSP2
	Clean up Objective	**Action Level**	16-Dec-02	17-Dec-02	17-Dec-02
Trichloroethene	0.88	64	<0.005	0.27	**4.0 D**
1,2-Dichloroethene	0.41	2,800	<0.005	**1.200**	0.170
Acetone	0.2	8,000	0.008 BJ	0.051 J	0.010
Vinyl Chloride	0.2	0.36	<0.010	<0.010	<0.010
Xylenes (total)	1.68	200,000	<0.005	**3.800**	0.001 J
Ethylbenzene	7.7	8,000	<0.005	0.520	<0.005
Toluene	2.1	20,000	<0.005	0.600	0.005
Methylene Chloride	0.15	93	0.009 B	.019 B	0.006 BJ

Notes:

All units ug/g

(dup) - indicates a duplicate sample

UJ - Indicates the analyte was not detected above the reported sample quantitation limit and the quantitation limit is approximate.

J - Indicates an estimated value. Compound meets identification criteria and is less than the specific detection limit but greater than zero.

B - Indicates that the analyte was found in both the sample and its associated laboratory blank. Possible/probable blank contamination.

D - Indicates compound identified in an analysis at a secondary dilution factor.

U - Indicates the analyte was not detected above the reported sample quantitation limit.

<5 - Indicates not detected above laboratory detection limit.

580D Indicates that parameter exceeds Clean-up Objective

APPENIDX B

Laboratory Analytical Reports

APPENDIX C

Data Usability Report

Data Usability Summary Report

Site Name:	BP Amoco Former Carborundum-Niagara Falls, NY	**Matrix:**	Soil and Water
Laboratory:	Severn Trent Services (STL) 10 Hazelwood Drive Suite 106 Amherst, NY 14228		
Reviewer:	INTERA Inc.	**Completion Date:**	January 30, 2003
STL Job #s:	A02-C491 A02-C536 A02-C580 A02-C707		

Part I. History of Data Review and Validation

December 20, 2002	INTERA Inc. completed field sampling.
January 14, 2003	INTERA QA Specialist received data to perform data review.
January 30, 2003	INTERA completed the Data Usability Summary Report for the BP Carborundum project.

Part II. Data Review

Twenty-five soil samples and three trip blanks were collected for the December 2002 BP Carborundum Globar-St. Gobain soils testing (STL Job #s A02-C491, A02-C536, A02-C580, and A02-C707). BP Carborundum samples were analyzed using the following established SW-846 method:

- Target Compound List Volatile Organic Compounds by EPA Method 8260B (25 soil samples and 3 water samples)

All data packages were reviewed for the following items, as applicable: laboratory case narrative, chain-of-custody documentation, sample holding times, Contract Required Quantitation Limits, method/equipment/trip blank data, field duplicates, surrogate recovery data, and matrix/matrix spike duplicates. Additionally, VOC data packages were reviewed for initial and continuing calibrations, GC/MS tunings, internal standard areas, and sample duplicate recovery. Each of these items was compared to review criteria presented in the Region 2 Data Validation Guidelines (SOP HW-24) (EPA 1999) and the NYSDEC Analytical Services Protocol (NYSDEC 2000). A checklist of the review criteria was created for each method in the data

package. By completing the checklist, the data reviewer identified whether or not the laboratory or sampler met, or failed to meet, the review criteria stipulated in the Region 2 data validation guidance and/or the analytical method. A summary of the comments generated during the data review process is presented in Table 1.

Based on the results of the data review, some data were qualified. INTERA added qualifiers to the data sheets in accordance with the guidelines provided in the EPA Region 2 data validation guidance, unless otherwise noted. Qualifiers amended to the lab data packages were also added to the project data tables in Attachment 1. Laboratory supplied qualifiers were not modified by the data reviewer.

Each of the review criteria has been summarized below. Each review parameter has been assessed to determine the overall quality of the laboratory or sampler's performance. An indication of the quality of the data has been provided by using one of the following three terms: acceptable, provisional, or unusable. These terms are defined below:

Acceptable = No results were qualified for any problem associated with this QC parameter.

Provisional = Some results were qualified because of problems associated with this QC parameter.

Unusable = Some results are unusable because of major problems associated with this QC parameter.

Laboratory Case Narrative and Sample Log-In:

- All Analyses: Acceptable. No problems noted.

Data Package Completeness

- All Analyses: Acceptable. All data packages were complete as defined under NYSDEC Analytical Services Protocol Category B deliverables.

Chain-of-Custody Documentation:

- All Analyses: Acceptable. No problems noted.

Sample Storage:

- All Analyses: Acceptable. Samples for Job Number A02-C580 were received at 10°C and no temperature was indicated upon receipt of samples for Job Number A02-C707. Due to the short time between sample collection and delivery to the lab, professional judgment was used to determine sample qualification was not necessary.

Sample Preservation:

- All Analyses: Acceptable. No problems noted.

Sample Holding Times:

- VOC by 8260: Acceptable. No problems were noted with holding times.

Contract Required Quantitation Limits:

Laboratory reporting limits were compared to the Contract Required Quantitation Limits (CRQLs) presented in Exhibit C – Section 1 for Organics of the NYSDEC Analytical Services Protocol (2000).

- VOC by 8260: Provisional. For Job Numbers A02-C536, A02-C580, and A02-C707 reporting levels for medium level soils analysis are slightly above the CRQL for acetone, bromomethane, 2-butanone, chloroethane, chloromethane, 2-hexanone, 4-methyl-2-pentantone, vinyl chloride and vinyl acetate in all samples. For Job Numbers A02-C536, A02-C580, and A02-C707 reporting limits for waters analysis are above CRQL for all analytes except benzene and vinyl chloride. No data were qualified for this QC parameter.

Method Blank Data:

- All Analyses: Acceptable. No problems noted.

Equipment Blank Data:

- All Analyses: Acceptable. Equipment blanks were not required for this project since dedicated or disposable equipment was used for sampling activities.

Trip Blank Data:

- VOC by 8260: Acceptable. A trip blank was not included in the cooler with Job Number A02-C491. Associated data were not qualified for lack of this QC parameter.

Field Duplicates:

Two field duplicate pairs were collected for groundwater samples. For Job Number A02-C580, soil sample OU31RMSVS19 is a duplicate OU31RMSVS18. For Job Number A02-C707, soil sample OU31RMVS23 is a duplicate of OU31RMVS22. Since Region 2 guidelines do not provide guidance on field duplicates, relative percent difference (RPD) control limits of 20% for water and 30% for soil were used for reviewing all project data.

- VOC by 8260: Provisional. Field duplicates for Job Number A02-C580 had a relative percent difference for trichloroethene of 61%. All trichloroethene data in this job number were qualified as estimates.

Surrogate Recovery Data:

- VOC by 8260: Acceptable. In Job Number A02-C536, the recovery for surrogate toluene-d8 in sample OU31RMVS14 was above control limits. The laboratory reanalyzed the sample and confirmed the analysis. The laboratory suggests matrix interference as the cause for the elevated surrogate recovery. Since only one surrogate was above control limits, qualification of this sample was not necessary per Region 2 guidelines.

Internal Standard:

- VOC by 8260: Acceptable. No problems noted with data package.

Matrix Spike/Matrix Spike Duplicate Recovery Data:

- VOC by 8260: Acceptable. For Job Number A02-C707, a matrix spike was performed on a laboratory water blank per NYSDEC ASP guidelines. However, recovery for carbon disulfide in this analysis was above the upper control limits. Since all associated results were non-detect, qualification was not necessary.

  For Job Numbers A02-C491, A02-C536, A02-C580, and A02-C707, the laboratory did not analyze an MSD sample as required. Associated data were not qualified for lack of this quality control parameter.

Initial Calibrations:

- VOC by 8260: Provisional. For Job Numbers A02-C536 and A02-C580, the initial calibration (A2I0001391-1) percent relative standard deviations (% RSDs) were outside Region 2 guidelines for bromomethane and chloroethane.

  For Job Numbers A02-C536, A02-C491, C02-C707 and A02-C580, the initial calibration (A2I0001293-1) %RSDs were outside control limits for bromomethane, 2-butanone and bromoform.

  For Job Number A02-C707, the initial calibration (A2I0001228-1) %RSDs were outside control limits for carbon tetrachloride and bromoform.

  Per Region 2 guidance, associated samples were qualified as estimates (J/UJ). Refer to Table 2 for a list of associated data.

Continuing Calibration Verifications:

- VOC by 8260: Acceptable. For Job Number A02-C536, CCV (A2C0007161-1) percent differences (% Ds) were outside Region 2 guidelines for acetone, 2-butanone, 4-methyl-2-pentanone and 2-hexanone. CCV (A2C0007220-1) %Ds were outside control limits for methylene chloride and carbon disulfide. CCV (A2C0007194-1) %Ds were outside control limits for chloromethane, bromomethane, chloroethane, carbon disulfide and bromoform.

  For Job Number A02-C491, CCV (A2C0007151-1) %D was outside control limits for carbon disulfide. CCV (A2C0007152-1) %Ds were outside control limits for methylene chloride, carbon disulfide, chloromethane and vinyl acetate. CCV (A2C0007161-1) %Ds were outside control limits for acetone, 2-butanone, 4-methyl-2-pentanone and 2-hexanone.

  For Job Number A02-C707, CCV (A2C0007278-1) %Ds were outside control limits for chloroethane, acetone, carbon disulfide and vinyl acetate. CCV (A2C0007277-1) %Ds were outside control limits for carbon disulfide, vinyl acetate and 1,1,2,2-tetrachloroethane. CCV (A2C0007287-1) %Ds were outside control limits for acetone, vinyl acetate, 4-methyl-2-pentanone and 2-hexanone.

  For Job Number A02-C580, CCV (A2C0007244-1) %Ds were outside control limits for chloromethane, bromomethane, methylene chloride, carbon disulfide, 1,2-dichloroethene, trichloroethene, benzene, tetrachloroethene and 1,1,2,2-tetrachloroethane. CCV (A2C0007245-1) %Ds were outside control limits for carbon disulfide, vinyl acetate and 1,1,2,2-tetrachloroethane. CCV (A2C0007194-1) %Ds were outside control limits for chloromethane, bromomethane, chloroethane, carbon disulfide and bromoform.

  Per Region 2 guidance, associated samples were qualified as estimates (J/UJ). Refer to Table 2 for a list of associated data.

Part III. Data Usability

All of the data generated during the December 2002 sampling event at the BP Carborundum facility are deemed acceptable and were generated using established and agreed upon analytical protocols. Some of the data results should be considered estimates (J/UJ) due to a few minor problems encountered during lab analyses, but all of the data can be used to make project decisions.

Part IV. Suggestions for Next Sampling Event and Laboratory Analysis

Only two lab oversights were identified during the data review process. Severn Trent Laboratories should ensure that calibrations are performed within acceptable Region 2 EPA criteria. Also, the laboratory should analyze a matrix spike duplicate for each batch of data. No additional problems were identified for either the laboratory or the field sampling team.

Part V. References

Environmental Protection Agency (EPA) 1999. USEPA Region 2 Quality Assurance Guidance [Online]. Standard Operating Procedure HW-24. Available: http://www.epa.gov/region2/desa/hsw/sops.htm.

New York State Department of Environmental Conservation (NYSDEC) 2000. Analytical Services Protocol. June.

TABLES

Table 1. Comments Generated During Review of BP Carborundum Data Packages

Severn Trent Job #	Analysis	Lab Sample Numbers	Item	Comments
A02-C491	VOC 8260	All	1	A trip blank was not included in the cooler. Associated data were not qualified for lack of this QC parameter.
		All	2	MSDs were not performed. Associated data were not qualified for lack of this QC parameter.
		All	3	Initial calibration (A2I0001293-1) %RSD > 15% for bromomethane (27.0%), 2-butanone (15.9%) and bromoform (16.6%).
		OU31RMVS01, OU31RMVS03, OU31RMVS07	4	CCV (A2C0007150-1) percent difference greater than 20% for carbon disulfide (52.6%).
		OU31RMVS02, OU31RMVS04	5	CCV (A2C0007152-1) percent difference greater than 20% for methylene chloride (25.2%), carbon disulfide (48.6%), chloromethane (20.1%) and vinyl acetate (22.7%).
		OU31RMVS05, OU31RMVS06	6	CCV (A2C0007161-1) percent difference greater than 20% for acetone (40.5%), 2-butanone (22.2%), 4-methyl-2-pentanone (22.4%) and 2-hexanone (25.5%).
A02-C536	VOC 8260	OU31RMSP1DL, OU31RMSP2DL, OU31RMVS10DL, OU31RMVS12DL, OU31RMVS15DL	1	Reporting limits for medium level soils analysis are slightly above CRQL for acetone, bromomethane, 2-butanone, chloroethane, chloromethane, 2-hexanone, 4-methy-2-pentanone, vinyl chloride and vinyl acetate. Associated data were not qualified due to elevated reporting limits.
		Trip Blank	2	Reporting limits for waters analysis are above CRQL for all analytes except benzene and vinyl chloride. Associated data were not qualified due to elevated reporting limits.
		OU31RMVS14	3	Surrogate toluene-d8 recovery was above control limits. Reanalysis confirmed results and the lab concludes matrix interference. Since only one surrogate was above control limits, qualification was not necessary per Region 2 guidelines.
		All	4	MSDs were not performed. Associated data were not qualified for lack of this QC parameter.
		OU31RMSP1DL, OU31RMSP2DL, OU31RMVS10DL, OU31RMVS12DL, OU31RMVS15DL	5	Initial calibration (A2I0001391-1) %RSD > 15 for bromomethane (51.9%) and chloroethane (45.0%) were above 30%.

Table 1. Comments Generated During Review of BP Carborundum Data Packages

Severn Trent Job #	Analysis	Lab Sample Numbers	Item	Comments
A02-C536 (cont.)	VOC 8260	OU31RMSP1, OU31RMVS08, OU31RMVS10, OU31RMVS12, OU31RMVS13, OU31RMVS14, OU31RMSP2, OU31RMVS09, OU31RMVS11, OU31RMVS14 RI, OU31RMVS15, TB	6	Initial calibration (A2I0001293-1) %RSD > 15 for bromomethane (27.0%), 2-butanone (15.9) and bromoform (16.6%).
		OU31RMSP1, OU31RMVS08, OU31RMVS10, OU31RMVS12, OU31RMVS13, OU31RMVS14	7	CCV (A2C0007161-1) percent difference greater than 20% for acetone (40.5%), 2-butanone (22.2%), 4-methyl-2-pentanone (22.4%) and 2-hexanone (25.5%).
		OU31RMSP2, OU31RMVS09, OU31RMVS11, OU31RMVS14 RI, OU31RMVS15, TB	8	CCV (A2C0007220-1) percent difference was greater than 20% for methylene chloride (36.6%) and carbon disulfide (39.9%).
		OU31RMSP1DL, OU31RMSP2DL, OU31RMVS10DL, OU31RMVS12DL, OU31RMVS15DL	9	CCV (A2C0007194-1) percent difference was greater than 20% for chloromethane (20.1%), bromomethane (31.5%), chloroethane (60.2%), carbon disulfide (46.6%) and bromoform (31.0%).
A02-C580	VOC 8260	All	1	Samples were received at 10°C. Due to short time between sample collection and delivery to the lab, professional judgment was used to determine qualification is not necessary.
		OU31RMSVS16, OU31RMSVS18, OU31RMSVS19	2	Reporting limits for medium level soils analysis are slightly above CRQL for acetone, bromomethane, 2-butanone, chloroethane, chloromethane, 2-hexanone, 4-methy-2-pentanone, vinyl chloride and vinyl acetate. Associated data were not qualified for elevated reporting limits.
		Trip Blank 2	3	Reporting limits for waters analysis are above CRQL for all analytes except benzene and vinyl chloride. Associated data were not qualified due to elevated reporting limits.
		All	4	%RPD for field duplicates OU31RMSVS18 and OU31RMSVS19 was 61% for trichloroethene.
		All	5	MSDs were not performed. Associated data were not qualified for lack of this QC parameter.

Table 1. Comments Generated During Review of BP Carborundum Data Packages

Severn Trent Job #	Analysis	Lab Sample Numbers	Item	Comments
A02-C580 (cont.)	VOC 8260	OU31RMSVS16, OU31RMSVS18, OU31RMSVS19	6	Initial calibration (A2I0001391-1) %RSD for bromomethane (51.9%) and chloroethane (45.0%) were above 15%.
		OU31RMSVS20, OU31RMSVS17, TB 2	7	Initial calibration (A2I0001293-1) %RSD for bromomethane (27.0%), 2-butanone (15.9%) and bromoform (16.6%) were above 15%.
		OU31RMSVS20	8	CCV (A2C0007244-1) percent difference was greater than 20% for chloromethane (21.0%), bromomethane (22.0%), methylene chloride (21.6%), carbon disulfide (20.5%), 1,2-dichloroethene (21.2%), trichloroethene (21.8%), benzene (21.8%), tetrachloroethene (21.4%) and 1,1,2,2-tetrachloroethane (21.2%).
		OU31RMSVS17, TB 2	9	CCV (A2C0007245-1) percent difference was greater than 20% for carbon disulfide (25.6%), vinyl acetate (21.2%) and 1,1,2,2 tetrachloroethane (25.2%).
		OU31RMSVS16, OU31RMSVS18, OU31RMSVS19	10	CCV (A2C0007194-1) percent difference was greater than 20% for chloromethane (20.1%), bromomethane (31.5%), chloroethane (60.2%), carbon disulfide (46.6%) and bromoform (31.0%).
A02-C707	VOC 8260	All	1	Temperature of samples were not indicated upon laboratory check-in. Due to short time between sample collection and delivery to the lab, professional judgment was used to determine qualification is not necessary.
		OU31RMVS21DL	2	Reporting limits for medium level soils analysis are slightly above CRQL for acetone, bromomethane, 2-butanone, chloroethane, chloromethane, 2-hexanone, 4-methy-2-pentanone, vinyl chloride and vinyl acetate. Associated data were not qualified for elevated reporting limits.
		Trip Blank	3	Reporting limits for waters analysis are above CRQL for all analytes except benzene and vinyl chloride. Associated data were not qualified due to elevated reporting limits.
		All	4	MS recovery for waters (trip blank) is 163% for carbon disulfide analysis.
		All	5	MSDs were not performed. Associated data were not qualified for lack of this QC parameter.
		Trip Blank, OU31RMVS21DL	6	Initial calibration (A2I0001228-1) %RSD > 15% for carbon tetrachloride (17.1%) and bromoform (15.7%).
		OU31RMVS21, OU31RMVS22, OU31RMVS23	7	initial calibration (A2I0001293-1) %RSD > 15% for bromomethane (27.0%), 2-butanone (15.9%) and bromoform (16.6%).
		OU31RMVS21, OU31RMVS22	8	CCV (A2C0007278-1) percent difference was greater than 20% for chloroethane (22.3%), acetone (20.1%), carbon disulfide (67%) and vinyl acetate (26.1%).
		OU31RMVS23	9	CCV (A2C0007277-1) percent difference was greater than 20% for carbon disulfide (55%), vinyl acetate (34.4%) and 1,1,2,2-tetrachloroethane (20.8%).
		Trip Blank, OU31RMVS21DL	10	CCV (A2C0007287-1) percent difference was greater than 20% for acetone (24.0%), vinyl acetate (43%), 4-methyl 2-pentanone (25.9%), and 2-hexanone (31.3%).

CCV: Continuing Calibration Verification
CRQL: Contract Required Quantitation Limits
MS/MSD: Matrix Spike/Matrix Spike Duplicate
RPD: Relative Percent Difference
RSD: Relative Standard Deviation
VOC: Volatile Organic Compounds

Table 2. Qualified Data for BP Carborundum Based on Data Review per EPA Region 2 Data Validation Guidelines

Severn Trent Job #	Analysis	Samples	Analyte	Qualifier	Reason Data was Qualified by Region 2 Data Validation Criteria
A02-C491	VOC 8260	All	Bromomethane 2-Butanone Bromoform	J for detects UJ for non-detects	Initial calibration RSD is outside Region 2 control limits (>15%). Associated samples qualified as estimates.
		OU31RMVS01, OU31RMVS03, OU31RMVS07	Carbon Disulfide	J for detects UJ for non-detects	CCV percent difference is outside Region 2 control limits (>20%). Associated samples qualified as estimates.
		OU31RMVS02, OU31RMVS04	Methylene chloride Carbon Disulfide Chloromethane Vinyl acetate	J for detects UJ for non-detects	CCV percent difference is outside Region 2 control limits (>20%). Associated samples qualified as estimates.
		OU31RMVS05, OU31RMVS06	Acetone 2-Butanone 4-Methyl-2-pentanone 2-Hexanone	J for detects UJ for non-detects	CCV percent difference is outside Region 2 control limits (>20%). Associated samples qualified as estimates.
A02-C536	VOC 8260	OU31RMSP1DL, OU31RMSP2DL, OU31RMVS10DL, OU31RMVS12DL, OU31RMVS15DL	Bromomethane Chloroethane	J for detects UJ for non-detects	Initial calibration RSD is outside Region 2 control limits (>15%). Associated samples qualified as estimates.
		OU31RMSP1, OU31RMVS08, OU31RMVS10, OU31RMVS12, OU31RMVS13, OU31RMVS14, OU31RMSP2, OU31RMVS09, OU31RMVS11, OU31RMVS14 RI, OU31RMVS15, TB	Bromomethane 2-Butanone Bromoform	J for detects UJ for non-detects	Initial calibration RSD is outside Region 2 control limits (>15%). Associated samples qualified as estimates.
		OU31RMSP1, OU31RMVS08, OU31RMVS10, OU31RMVS12, OU31RMVS13, OU31RMVS14	Acetone 2-Butanone 4-Methyl-2-pentanone 2-Hexanone	J for detects UJ for non-detects	CCV percent difference is outside Region 2 control limits (>20%). Associated samples qualified as estimates.
		OU31RMSP2, OU31RMVS09, OU31RMVS11, OU31RMVS14 RI, OU31RMVS15, TB	Methylene chloride Carbon Disulfide	J for detects UJ for non-detects	CCV percent difference is outside Region 2 control limits (>20%). Associated samples qualified as estimates.

Table 2. Qualified Data for BP Carborundum Based on Data Review per EPA Region 2 Data Validation Guidelines

Severn Trent Job #	Analysis	Samples	Analyte	Qualifier	Reason Data was Qualified by Region 2 Data Validation Criteria
A02-0536 (cont.)	VOC 8260	OU31RMSP1DL, OU31RMSP2DL, OU31RMVS10DL, OU31RMVS12DL, OU31RMVS15DL	Chloromethane Bromomethane Chloroethane Carbon Disulfide Bromoform	J for detects UJ for non-detects	CCV percent difference is outside Region 2 control limits (>20%). Associated samples qualified as estimates.
A02-C580	VOC 8260	All	Trichloroethene	J for detects UJ for non-detects	RPD for field duplicate was outside of control limits. Associated data were qualified as estimates.
		OU31RMSVS16, OU31RMSVS18, OU31RMSVS19	Bromomethane Chloroethane	J for detects UJ for non-detects	Initial calibration RSD is outside Region 2 control limits (>15%). Associated samples qualified as estimates.
		OU31RMVSVS20, OU31RMSVS17, TB 2	Bromomethane 2-Butanone Bromoform	J for detects UJ for non-detects	Initial calibration RSD is outside Region 2 control limits (>15%). Associated samples qualified as estimates.
		OU31RMSVS20	Chloromethane Bromomethane Methylene chloride Carbon Disulfide 1,2-Dichloroethene Trichloroethene Benzene Tetrachloroethene 1,1,2,2-Tetrachloroethane	J for detects UJ for non-detects	CCV percent difference is outside Region 2 control limits (>20%). Associated samples qualified as estimates.
		OU31RMSVS17, TB 2	Carbon Disulfide Vinyl acetate 1,1,2,2-Tetrachloroethane	J for detects UJ for non-detects	CCV percent difference is outside Region 2 control limits (>20%). Associated samples qualified as estimates.
		OU31RMSVS16, OU31RMSVS18, OU31RMSVS19	Chloromethane Bromomethane Chloroethane Carbon Disulfide Bromoform	J for detects UJ for non-detects	CCV percent difference is outside Region 2 control limits (>20%). Associated samples qualified as estimates.

Table 2. Qualified Data for BP Carborundum Based on Data Review per EPA Region 2 Data Validation Guidelines

Severn Trent Job #	Analysis	Samples	Analyte	Qualifier	Reason Data was Qualified by Region 2 Data Validation Criteria
A02-C707	VOC 8260	All	Carbon Disulfide	Not Qualified	Matrix spike blank for waters analysis was above control limits. Since all associated results were non-detect, qualification was not necessary.
		Trip Blank, OU31RMVS21DL	Carbon tetrachloride Bromoform	J for detects UJ for non-detects	Initial calibration RSD is outside Region 2 control limits (>15%). Associated samples qualified as estimates.
		OU31RMVS21, OU31RMVS22, OU31RMVS23	Bromomethane 2-Butanone Bromoform	J for detects UJ for non-detects	Initial calibration RSD is outside Region 2 control limits (>15%). Associated samples qualified as estimates.
		OU31RMVS21, OU31RMVS22	Chloroethane Acetone Carbon Disulfide Vinyl acetate	J for detects UJ for non-detects	CCV percent difference is outside Region 2 control limits (>20%). Associated samples qualified as estimates.
		OU31RMVS23	Carbon Disulfide Vinyl acetate 1,1,2,2-Tetrachloroethane	J for detects UJ for non-detects	CCV percent difference is outside Region 2 control limits (>20%). Associated samples qualified as estimates.
		Trip Blank, OU31RMVS21DL	Acetone Vinyl acetate 4-Methyl-2-pentanone 2-Hexanone	J for detects UJ for non-detects	CCV percent difference is outside Region 2 control limits (>20%). Associated samples qualified as estimates.

CCV: Continuing Calibration Verification

RPD: Relative Percent Difference

RSD: Relative Standard Deviation

VOC: Volatile Organic Compounds

ATTACHMENT 1

DATA TABLES WITH QUALIFIERS

Table 5: Laboratory Analytical Results for Verification Soil Samples (ug/g)

	Sample Number >>		OU31RMVS02	OU31RMVS03	OU31RMVS04	OU31RMVS06	OU31RMVS07	OU31RMVS08	OU31RMVS09	OU31RMVS11
	Sample Location >>		wall; 8-10 ft	wall; 8-10 ft	floor; 14 ft	wall; 9-11 ft	floor; 17 ft	wall; 9-11 ft	floor; 15 ft	wall; 14-16 ft
	PID Reading (ppm) >>		4.9	3.1	2.3	0.0	0.0	0.0	10.1	9.7
	Clean up Objective	**Action Level**	16-Dec-02	16-Dec-02	16-Dec-02	16-Dec-02	16-Dec-02	17-Dec-02	17-Dec-02	17-Dec-02
Trichloroethene	0.88	64	0.070	0.062	<0.005	0.026	<0.005	0.002 J	0.230	0.140
1,2-Dichloroethene	0.41	2,800	0.046	0.007	0.03	0.002 J	<0.005	<0.005	0.13	0.021
Acetone	0.2	8,000	0.009 BJ	0.009 BJ	0.026 B	0.007 J	0.019 B	<0.010 UJ	0.022	0.035
Vinyl Chloride	0.2	0.36	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Xylenes (total)	1.68	200,000	<0.005	<0.005	<0.005	<0.005	<0.005	0.002 J	0.016	<0.005
Ethylbenzene	7.7	8,000	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.004 J	<0.005
Toluene	2.1	20,000	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.002 J	<0.005
Methylene Chloride	0.15	93	0.014 BJ	0.012 B	0.010 BJ	0.012 B	0.008 B	0.009 B	0.009 BJ	0.022 BJ

Notes:

All units ug/g

Dupl. - indicates a duplicate sample

UJ - Indicates the analyte was not detected above the reported sample quantitation limit and the quantitation limit is approximate.

J - Indicates an estimated value. Compound meets identification criteria and is less than the specific detection limit but greater than zero.

B - Indicates that the analyte was found in both the sample and its associated laboratory blank. Possible/probable blank contamination.

D - Indicates compound identified in an analysis at a secondary dilution factor.

U - Indicates the analyte was not detected above the reported sample quantitation limit.

<5 - Indicates not detected above laboratory detection limit.

580D Indicates that parameter exceeds Clean-up Objective

Table 5: Laboratory Analytical Results for Verification Soil Samples (ug/g)

	Sample Number >>		OU31RMVS13	OU31RMVS14	OU31RMSVS17	OU31RMSVS18	OU31RMSVS19	OU31RMSVS20	OU31RMVS21	OU31RMVS22	OU31RMVS23
	Sample Location >>		wall; 14.5-16.5 ft	floor; 16 ft	wall; 5-7 ft	floor; 21 ft	21 ft (dup)	floor; 16.5 ft	floor; 21 ft	wall; 13-15 ft	13-15 ft (dup)
	PID Reading (ppm) >>		0.5	0.0	0.0	59.9	59.9	0.0	13.0	0.0	0.0
	Clean up Objective	**Action Level**	17-Dec-02	17-Dec-02	18-Dec-02	18-Dec-02	18-Dec-02	18-Dec-02	20-Dec-02	20-Dec-02	20-Dec-02
Trichloroethene	0.88	64	0.022	0.002 J	0.005 J	**10 J**	**5.3 J**	<0.005 UJ	**7.9 D**	0.003 J	0.004 J
1,2-Dichloroethene	0.41	2,800	0.003 J	0.002 J	0.002 J	**4.6**	**4.7**	<0.005 UJ	**0.640 D**	<0.005	<0.005
Acetone	0.2	8,000	0.013 J	0.016 J	0.01	<1.250	<1.250	0.016	<0.010 UJ	<0.010 UJ	<0.010
Vinyl Chloride	0.2	0.36	<0.010	<0.010	<0.010	<1.250	<1.250	<0.010	0.004 J	<0.010	<0.010
Xylenes (total)	1.68	200,000	<0.005	<0.005	<0.005	<0.625	<0.625	<0.005	<0.005	<0.005	<0.005
Ethylbenzene	7.7	8,000	<0.005	<0.005	<0.005	<0.625	<0.625	<0.005	<0.005	<0.005	<0.005
Toluene	2.1	20,000	<0.005	<0.005	<0.005	0.450 J	<0.625	<0.005	<0.005	<0.005	<0.005
Methylene Chloride	0.15	93	0.006 B	0.008 B	0.010 B	<0.625	<0.625	0.005 BJ	0.004 BJ	0.005 B	0.007 B

Notes:

All units ug/g

Dupl. - indicates a duplicate sample

UJ - Indicates the analyte was not detected above the reported sample quantitation limit and the quantitation limit is approximate.

J - Indicates an estimated value. Compound meets identification criteria and is less than the specific detection limit but greater than zero.

B - Indicates that the analyte was found in both the sample and its associated laboratory blank. Possible/probable blank contamination.

D - Indicates compound identified in an analysis at a secondary dilution factor.

U - Indicates the analyte was not detected above the reported sample quantitation limit.

<5 - Indicates not detected above laboratory detection limit.

580D Indicates that parameter exceeds Clean-up Objective

Table 6: Laboratory Analytical Results for Interim Soil Samples (ug/g)

	Sample Number >>		OU31RMVS05	OU31RMVS10	OU31RMVS12	OU31RMVS15	OU31RMSVS16
	Sample Location >>		floor; 14.5 ft	wall; 13-15 ft	wall; 6-8 ft	floor; 15 ft	floor; 16 ft
	PID Reading (ppm) >>		1.7	37.0	27.0	4.2	13.0
	Clean up Objective	**Action Level**	16-Dec-02	17-Dec-02	17-Dec-02	17-Dec-02	18-Dec-02
Trichloroethene	0.88	64	0.040	0.220	**2.4 D**	0.110	**6.6 J**
1,2-Dichloroethene	0.41	2,800	**0.92**	**0.98 D**	0.32 DJ	**1.4 D**	**5.3**
Acetone	0.2	8,000	0.046 J	0.012 J	0.01 J	0.012	<1.250
Vinyl Chloride	0.2	0.36	<0.010	0.035	0.005 J	<0.010	<1.250
Xylenes (total)	1.68	200,000	<0.005	0.006	0.002 J	<0.005	<0.625
Ethylbenzene	7.7	8,000	<0.005	0.041	0.002 J	<0.005	<0.625
Toluene	2.1	20,000	<0.005	<0.005	<0.005	<0.005	0.180 J
Methylene Chloride	0.15	93	0.110 B	0.008 B	0.009 B	0.008 BJ	<0.625

Notes:

All units ug/g

Dupl. - indicates a duplicate sample

UJ - Indicates the analyte was not detected above the reported sample quantitation limit and the quantitation limit is approximate.

J - Indicates an estimated value. Compound meets identification criteria and is less than the specific detection limit but greater than zero.

B - Indicates that the analyte was found in both the sample and its associated laboratory blank. Possible/probable blank contamination.

D - Indicates compound identified in an analysis at a secondary dilution factor.

U - Indicates the analyte was not detected above the reported sample quantitation limit.

<5 - Indicates not detected above laboratory detection limit.

580D Indicates that parameter exceeds Clean-up Objective

Table 7: Laboratory Analytical Results for Stockpiled Soil Samples (ug/g)

	Sample Location >>		Stockpile Sample	Stockpile Sample	Stockpile Sample
	Sample Number >>		OU31RMVS01	OU3IRMSP1	OU3IRMSP2
	Clean up Objective	**Action Level**	16-Dec-02	17-Dec-02	17-Dec-02
Trichloroethene	0.88	64	<0.005	0.27	**4.0 D**
1,2-Dichloroethene	0.41	2,800	<0.005	**1.200**	0.170
Acetone	0.2	8,000	0.008 BJ	0.051 J	0.010
Vinyl Chloride	0.2	0.36	<0.010	<0.010	<0.010
Xylenes (total)	1.68	200,000	<0.005	**3.800**	0.001 J
Ethylbenzene	7.7	8,000	<0.005	0.520	<0.005
Toluene	2.1	20,000	<0.005	0.600	0.005
Methylene Chloride	0.15	93	0.009 B	.019 B	0.006 BJ

Notes:

All units ug/g

(dup) - indicates a duplicate sample

UJ - Indicates the analyte was not detected above the reported sample quantitation limit and the quantitation limit is approximate.

J - Indicates an estimated value. Compound meets identification criteria and is less than the specific detection limit but greater than zero.

B - Indicates that the analyte was found in both the sample and its associated laboratory blank. Possible/probable blank contamination.

D - Indicates compound identified in an analysis at a secondary dilution factor.

U - Indicates the analyte was not detected above the reported sample quantitation limit.

<5 - Indicates not detected above laboratory detection limit.

580D Indicates that parameter exceeds Clean-up Objective

APPENDIX D

Acceptance Letter and Laboratory Report for Imported Backfill Material

INTERA ENGINEERING LTD.
265 Carling Ave., Suite 208
Ottawa, Ontario K1S 2E1
Phone (613) 232-2525
Fax (613) 232-7149

Ref: 01-220-7

November 28, 2002

SLC Environmental Services
295 Mill Street
Lockport, New York 14094
Attn: Mr. Jerry Jones

RE: Backfill Source for OU3 IRM - Former Carborundum Globar Facility, Niagara Falls, NY

Dear Jerry:

INTERA has reviewed the information that you provided on November 27, 2002 regarding the proposed source of backfill for the Former Carborundum Globar site located on Hyde Park Boulevard in Niagara Falls, New York. The source of the backfill was identified as a clay pit operated by Mr. Roger Mawhiney in the Town of Wilson, New York.

Soils excavated from the borrow pit are proposed for use as backfill from this site. Soils are classified under the USCS as CL. A sample of soil from this source was collected and analyzed for Semi-Volatile Organic Compounds (VOCs) from the TCL, VOCs from the TCL, and total HSL metals. None of the detected concentrations of are concern. This source is therefore approved for use as clean backfill at the Former Carborundum Globar.

INTERA will examine and sample backfill material as it is brought on-site. Please feel free to contact me if you have any questions.

Sincerely,

Eric Wilson, P. Eng.
Project Hydrogeologist

SLC
ENVIRONMENTAL SERVICES

295 Mill Street
Lockport, New York 14094
(716) 433-0776 Fax (716) 433-0802

LETTER OF TRANSMITTAL

DATE: 11/27/02	JOB NO: 02-107
ATTN: ERIC WILSON	
RE: CHEM & GEOTECH DATA	
CLAY BACKFILL FOR	
HYDE PARK SITE	

TO ERIC WILSON
INTERA ENG
265 CARLING AVE SE208
OTTAWA, ONTARIO K1S 2E1
FAX 613-232-7149

WE ARE SENDING YOU ☐ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Copy of letter ☐ Change Order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
1	11/27		CHEM DATA FULL TCL LIST
1	11/27		GEOTECH DATA
			Town of Wilson Clay pit
			Mr. Roger Mawhiney

THESE ARE TRANSMITTED as checked below:

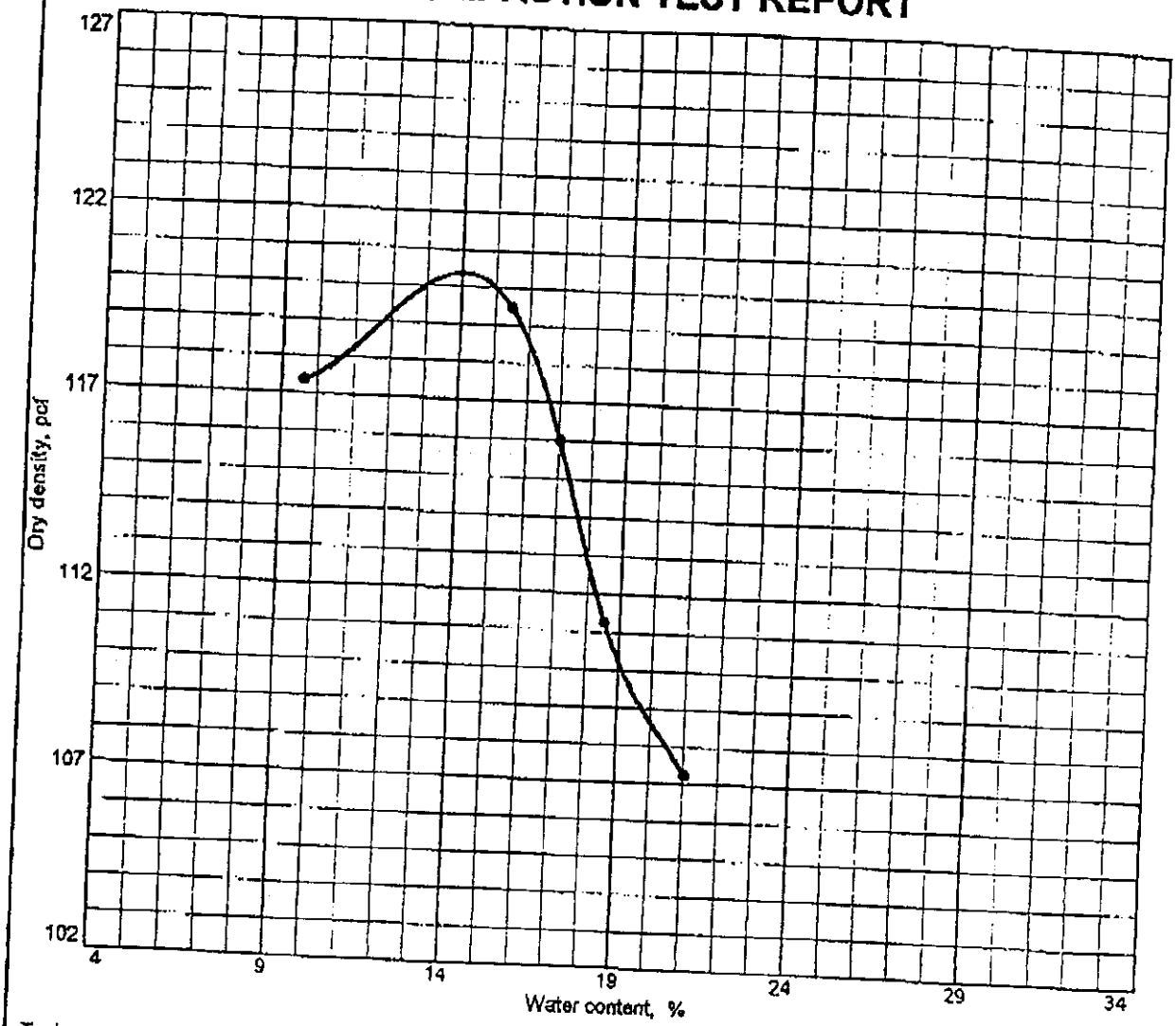
☒ For approval ☐ Approved as submitted ☐ Resubmit_____ copies for approval
☐ For your use ☐ Approved as noted ☐ Submit_____ copied for distribution
☐ As requested ☐ Returned for corrections ☐ Return_____ corrected prints
☐ For review and comment ☐ _____
☐ FOR BIDS DUE_____, 20____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS: MIKE HINTON OF DEC HAS SEEN THESE TEST FOR OTHE WORK (EA LANDFILL COVER) ALSO USED IN CITY OF BUFFALO PARK SITE

COPY TO FILE 02-107

SIGNED: _____

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						
	CL		19.8		42.4	22.3	0.6	93.1

TEST RESULTS

Maximum dry density = 120.4 pcf

Optimum moisture = 14.1 %

MATERIAL DESCRIPTION

Clay
Low Permeability Liner Material

Project No. 00-001 Client: SLC Environmental Services

Project: Witmer Road Landfill

Location: Source 2

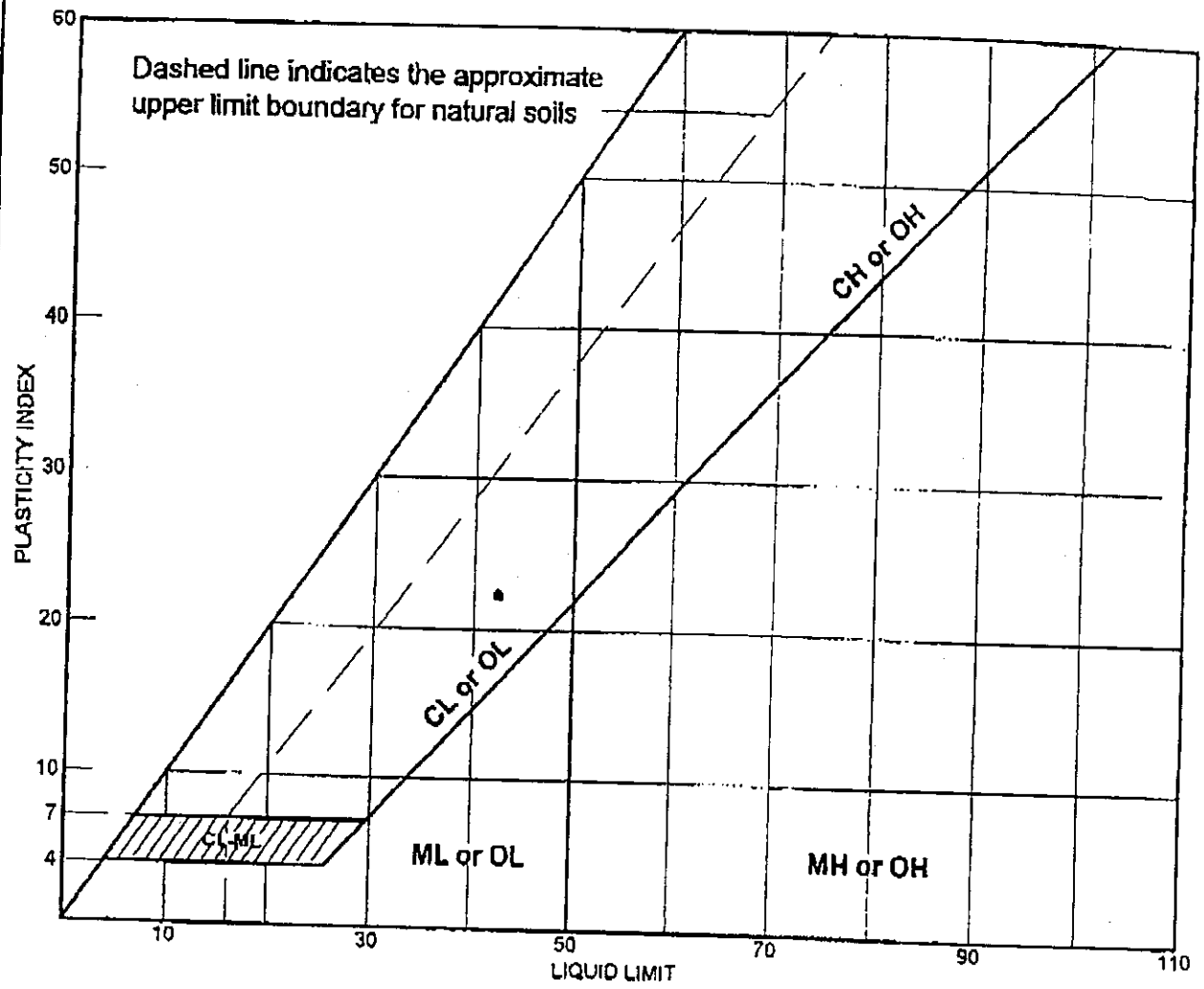
Remarks:

COMPACTION TEST REPORT

3rd Rock, LLC

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	Borrow #2	Clay		19.8	20.1	42.4	22.3	CL

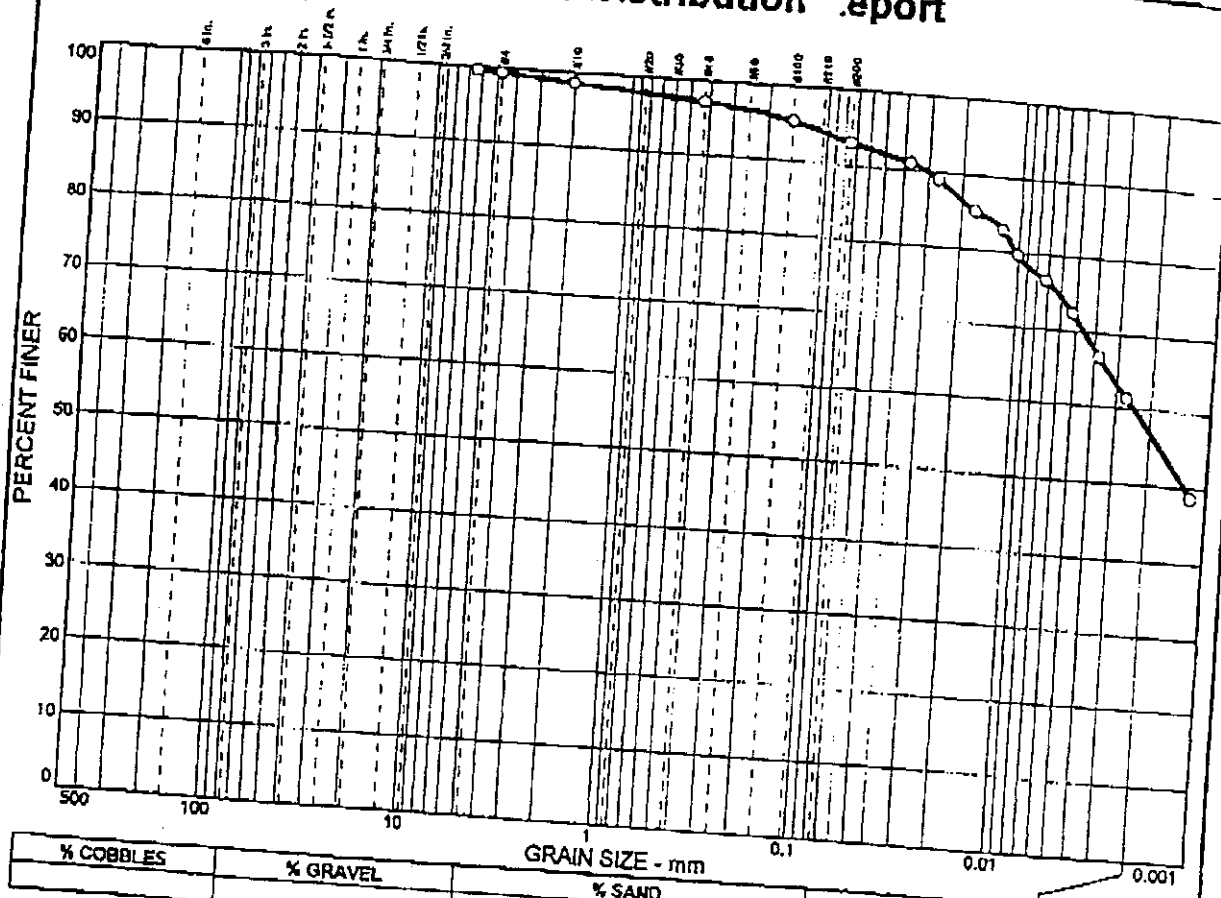
LIQUID AND PLASTIC LIMITS TEST REPORT

3rd Rock, LLC

Client: SLC Environmental Services
Project: Witmer Road Landfill
Project No.: 00-001

Figure

Particle Size Distribution .eport



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
		6.3	36.1	57.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.25 in.	99.6		
#4	99.4		
#10	98.6		
#40	97.2		
#100	95.4		
#200	93.1		

* (no specification provided)

Soil Description

Clay
Low Permeability Liner Material

Atterberg Limits

PL= 20.1 LL= 42.4 PI= 22.3

Coefficients

D_{85}= 0.0168 D_{60}= 0.0024 D_{50}= 0.0013
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= CL AASHTO=

Remarks

Sample No.: Clay Source of Sample: Borrow Source 2
Location: Borrow Source 2 Date: 6/30/00
Elev./Depth:

3rd Rock, LLC

Client: SLC Environmental Services
Project: Witmer Road Landfill
Project No: 00-001

Figure

EA Engineering
Witmer Road Landfill
METHOD 8260 - TCL VOLATILE ORGANICS

Rept: AN0326

Client ID		1AW		2AM		3AM		4AM	
Job No	Lab ID	A00-4443	A0444301	A00-4443	A0444304	A00-4443	A0444307	A00-4443	A0444310
Sample Date		06/23/2000		06/26/2000		06/26/2000		06/26/2000	

Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acetone	UG/KG	ND	25	ND	25	ND	25	ND	25
Benzene	UG/KG	ND	5	ND	5	ND	5	ND	5
Bromodichloromethane	UG/KG	ND	5	ND	5	ND	5	ND	5
Bromoform	UG/KG	ND	5	ND	5	ND	5	ND	5
Bromomethane	UG/KG	ND	10	ND	10	ND	10	ND	10
2-Butanone	UG/KG	ND	25	ND	25	ND	25	ND	25
Carbon Disulfide	UG/KG	ND	5	ND	5	ND	5	ND	5
Carbon Tetrachloride	UG/KG	ND	5	ND	5	ND	5	ND	5
Chlorobenzene	UG/KG	ND	5	ND	5	ND	5	ND	5
Chloroethane	UG/KG	ND	10	ND	10	ND	10	ND	10
Chloroform	UG/KG	ND	5	ND	5	ND	5	ND	5
Chloromethane	UG/KG	ND	10	ND	10	ND	10	ND	10
Dibromochloromethane	UG/KG	ND	5	ND	5	ND	5	ND	5
1,1-Dichloroethane	UG/KG	ND	5	ND	5	ND	5	ND	5
1,2-Dichloroethane	UG/KG	ND	5	ND	5	ND	5	ND	5
1,1-Dichloroethene	UG/KG	ND	5	ND	5	ND	5	ND	5
1,2-Dichloroethene (Total)	UG/KG	ND	10	ND	10	ND	10	ND	10
1,2-Dichloropropane	UG/KG	ND	5	ND	5	ND	5	ND	5
cis-1,3-Dichloropropene	UG/KG	ND	5	ND	5	ND	5	ND	5
trans-1,3-Dichloropropene	UG/KG	ND	5	ND	5	ND	5	ND	5
Ethylbenzene	UG/KG	ND	5	ND	5	ND	5	ND	5
2-Hexanone	UG/KG	ND	10	ND	10	ND	10	ND	10
Methylene chloride	UG/KG	12 B	5	13 B	5	12 B	5	12 B	5
4-Methyl-2-pentanone	UG/KG	ND	25	ND	25	ND	25	ND	25
Styrene	UG/KG	ND	5	ND	5	ND	5	ND	5
1,1,2,2-Tetrachloroethane	UG/KG	ND	5	ND	5	ND	5	ND	5
Tetrachloroethene	UG/KG	ND	5	ND	5	ND	5	ND	5
Toluene	UG/KG	ND	5	ND	5	ND	5	ND	5
1,1,1-Trichloroethane	UG/KG	ND	5	ND	5	ND	5	ND	5
1,1,2-Trichloroethane	UG/KG	ND	5	ND	5	ND	5	ND	5
Trichloroethene	UG/KG	1 J	5	ND	5	ND	5	ND	5
Vinyl acetate	UG/KG	ND	10	ND	10	ND	10	ND	10
Vinyl chloride	UG/KG	ND	10	ND	10	ND	10	ND	10
Total Xylenes	UG/KG	ND	15	ND	15	ND	15	ND	15
IS/SURROGATE(S)									
Chlorobenzene-D5	%	83	50-200	75	50-200	79	50-200	80	50-200
1,4-Difluorobenzene	%	84	50-200	78	50-200	84	50-200	79	50-200
1,4-Dichlorobenzene-D4	%	60	50-200	55	50-200	60	50-200	60	50-200
Toluene-D8	%	109	81-121	107	81-121	107	81-121	107	81-121
p-Bromofluorobenzene	%	100	73-127	96	73-127	99	73-127	94	73-127
1,2-Dichloroethane-D4	%	105	75-136	114	75-136	110	75-136	101	75-136

NA = Not Applicable ND = Not Detected

STL Buffalo

EA Engineering
Witmer Road Landfill
METHOD 8270 - TCL SEMI-VOLATILE ORGANICS

Client ID		1BW		2BM		3BM		4BM	
Job No	Lab ID	A00-4443	A0444302	A00-4443	A0444305	A00-4443	A0444308	A00-4443	A0444311
Sample Date		06/23/2000		06/26/2000		06/26/2000		06/26/2000	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Acenaphthene	UG/KG	ND	330	ND	330	ND	330	ND	330
Acenaphthylene	UG/KG	ND	330	ND	330	ND	330	ND	330
Anthracene	UG/KG	ND	330	ND	330	ND	330	ND	330
Benzo(a)anthracene	UG/KG	ND	330	ND	330	ND	330	ND	330
Benzo(b)fluoranthene	UG/KG	ND	330	ND	330	ND	330	ND	330
Benzo(k)fluoranthene	UG/KG	ND	330	ND	330	ND	330	ND	330
Benzo(ghi)perylene	UG/KG	ND	330	ND	330	ND	330	ND	330
Benzo(a)pyrene	UG/KG	ND	330	ND	330	ND	330	ND	330
Benzoic acid	UG/KG	ND	1600	ND	1600	ND	1600	ND	1600
Benzyl alcohol	UG/KG	ND	330	ND	330	ND	330	ND	330
Bis(2-chloroethoxy) methane	UG/KG	ND	330	ND	330	ND	330	ND	330
Bis(2-chloroethyl) ether	UG/KG	ND	330	ND	330	ND	330	ND	330
2,2'-Oxybis(1-Chloropropane)	UG/KG	ND	330	ND	330	ND	330	ND	330
Bis(2-ethylhexyl) phthalate	UG/KG	ND	330	ND	330	ND	330	ND	330
4-Bromophenyl phenyl ether	UG/KG	ND	330	ND	330	ND	330	ND	330
Butyl benzyl phthalate	UG/KG	ND	330	ND	330	ND	330	ND	330
4-Chloroaniline	UG/KG	ND	330	ND	330	ND	330	ND	330
4-Chloro-3-methylphenol	UG/KG	ND	330	ND	330	ND	330	ND	330
2-Chloronaphthalene	UG/KG	ND	330	ND	330	ND	330	ND	330
2-Chlorophenol	UG/KG	ND	330	ND	330	ND	330	ND	330
4-Chlorophenyl phenyl ether	UG/KG	ND	330	ND	330	ND	330	ND	330
Chrysene	UG/KG	ND	330	ND	330	ND	330	ND	330
Dibenzo(a,h)anthracene	UG/KG	ND	330	ND	330	ND	330	ND	330
Dibenzofuran	UG/KG	ND	330	ND	330	ND	330	ND	330
Di-n-butyl phthalate	UG/KG	ND	330	ND	330	ND	330	ND	330
1,2-Dichlorobenzene	UG/KG	ND	330	ND	330	ND	330	ND	330
1,3-Dichlorobenzene	UG/KG	ND	330	ND	330	ND	330	ND	330
1,4-Dichlorobenzene	UG/KG	ND	330	ND	330	ND	330	ND	330
3,3'-Dichlorobenzidine	UG/KG	ND	660	ND	660	ND	660	ND	660
2,4-Dichlorophenol	UG/KG	ND	330	ND	330	ND	330	ND	330
Diethyl phthalate	UG/KG	ND	330	ND	330	ND	330	ND	330
2,4-Dimethylphenol	UG/KG	ND	330	ND	330	ND	330	ND	330
Dimethyl phthalate	UG/KG	ND	330	ND	330	ND	330	ND	330
4,6-Dinitro-2-methylphenol	UG/KG	ND	1600	ND	1600	ND	1600	ND	1600
2,4-Dinitrophenol	UG/KG	ND	1600	ND	1600	ND	1600	ND	1600
2,4-Dinitrotoluene	UG/KG	ND	330	ND	330	ND	330	ND	330
2,6-Dinitrotoluene	UG/KG	ND	330	ND	330	ND	330	ND	330
Di-n-octyl phthalate	UG/KG	ND	330	ND	330	ND	330	ND	330
Fluoranthene	UG/KG	ND	330	ND	330	ND	330	ND	330
Fluorene	UG/KG	ND	330	ND	330	ND	330	ND	330
Hexachlorobenzene	UG/KG	ND	330	ND	330	ND	330	ND	330
Hexachlorobutadiene	UG/KG	ND	330	ND	330	ND	330	ND	330
Hexachlorocyclopentadiene	UG/KG	ND	330	ND	330	ND	330	ND	330

NA = Not Applicable ND = Not Detected

STL Buffalo

EA Engineering
Witmer Road Landfill
METHOD 8270 - TCL SEMI-VOLATILE ORGANICS

Client ID		18W		28M		38M		48M	
Job No	Lab ID	A00-4443	A0444302	A00-4443	A0444305	A00-4443	A0444308	A00-4443	A0444311
Sample Date		06/23/2000		06/26/2000		06/26/2000		06/26/2000	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Hexachloroethane	UG/KG	ND	330	ND	330	ND	330	ND	330
Indeno(1,2,3-cd)pyrene	UG/KG	ND	330	ND	330	ND	330	ND	330
Isophorone	UG/KG	ND	330	ND	330	ND	330	ND	330
2-Methylnaphthalene	UG/KG	ND	330	ND	330	ND	330	ND	330
2-Methylphenol	UG/KG	ND	330	ND	330	ND	330	ND	330
4-Methylphenol	UG/KG	ND	330	ND	330	ND	330	ND	330
Naphthalene	UG/KG	ND	330	ND	330	ND	330	ND	330
2-Nitroaniline	UG/KG	ND	1600	ND	1600	ND	1600	ND	1600
3-Nitroaniline	UG/KG	ND	1600	ND	1600	ND	1600	ND	1600
4-Nitroaniline	UG/KG	ND	330	ND	330	ND	330	ND	330
Nitrobenzene	UG/KG	ND	330	ND	330	ND	330	ND	330
2-Nitrophenol	UG/KG	ND	1600	ND	1600	ND	1600	ND	1600
4-Nitrophenol	UG/KG	ND	1600	ND	1600	ND	1600	ND	1600
N-nitrosodiphenylamine	UG/KG	ND	330	ND	330	ND	330	ND	330
N-Nitroso-Di-n-propylamine	UG/KG	ND	330	ND	330	ND	330	ND	330
Pentachlorophenol	UG/KG	ND	1600	ND	1600	ND	1600	ND	1600
Phenanthrene	UG/KG	ND	330	ND	330	ND	330	ND	330
Phenol	UG/KG	ND	330	ND	330	ND	330	ND	330
Pyrene	UG/KG	ND	330	ND	330	ND	330	ND	330
1,2,4-Trichlorobenzene	UG/KG	ND	330	ND	330	ND	330	ND	330
2,4,5-Trichlorophenol	UG/KG	ND	330	ND	330	ND	330	ND	330
2,4,6-Trichlorophenol	UG/KG	ND	800	ND	800	ND	800	ND	800
IS/SURROGATE(S)									
1,4-Dichlorobenzene-D4	%	102	50-200	104	50-200	103	50-200	105	50-200
Naphthalene-D8	%	98	50-200	101	50-200	98	50-200	101	50-200
Acenaphthene-D10	%	101	50-200	105	50-200	101	50-200	105	50-200
Phenanthrene-D10	%	100	50-200	102	50-200	99	50-200	101	50-200
Chrysene-D12	%	105	50-200	105	50-200	100	50-200	101	50-200
Perylene-D12	%	101	50-200	103	50-200	96	50-200	97	50-200
Nitrobenzene-D5	%	63	32-120	54	32-120	65	32-120	64	32-120
2-Fluorobiphenyl	%	70	32-120	57	32-120	71	32-120	68	32-120
p-Terphenyl-d14	%	73	40-130	74	40-130	75	40-130	74	40-130
Phenol-D5	%	60	18-120	53	18-120	61	18-120	59	18-120
2-Fluorophenol	%	58	12-120	51	12-120	59	12-120	58	12-120
2,4,6-Tribromophenol	%	75	32-120	74	32-120	74	32-120	69	32-120

NA = Not Applicable ND = Not Detected

[redacted]2000
[redacted]04:41

EA Engineering
Witmer Road Landfill
TOTAL HSL METALS

Rept: AN0326

Client ID		1CW		2CM		3CM		4CM	
Job No	Lab ID	A00-4443	A0444303	A00-4443	A0444306	A00-4443	A0444309	A00-4443	A0444312
Sample Date		06/23/2000		06/26/2000		06/26/2000		06/26/2000	
Analyte	Units	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit	Sample Value	Reporting Limit
Aluminum - Total	MG/KG	9090	2.8	9460	3.1	4760	2.9	2810	2.9
Antimony - Total	MG/KG	ND	0.68	ND	0.74	ND	0.70	0.76	0.69
Arsenic - Total	MG/KG	3.4	0.34	3.3	0.37	1.8	0.35	1.3	0.34
Barium - Total	MG/KG	67.1	0.11	66.6	0.12	25.8	0.12	43.4	0.11
Beryllium - Total	MG/KG	0.79	0.068	0.81	0.074	0.40	0.070	0.21	0.0
Cadmium - Total	MG/KG	0.41	0.080	0.35	0.087	0.26	0.082	0.17	0.0
Calcium - Total	MG/KG	35100	2.8	30000	3.1	22500	2.9	23600	2.9
Chromium - Total	MG/KG	13.5	0.23	13.6	0.25	6.9	0.23	4.1	0.23
Cobalt - Total	MG/KG	7.4	0.17	8.0	0.19	5.0	0.17	3.0	0.17
Copper - Total	MG/KG	15.3	0.17	16.9	0.19	9.4	0.17	6.3	0.17
Iron - Total	MG/KG	18200	2.3	17600	2.5	10700	2.3	6840	2.3
Lead - Total	MG/KG	6.5	0.34	5.4	0.37	2.8	0.35	1.8	0.34
Magnesium - Total	MG/KG	10000	2.8	7380	3.1	4440	2.9	4890	2.9
Manganese - Total	MG/KG	360	0.11	371	0.12	468	0.12	365	0.11
Mercury - Total	MG/KG	ND	0.038	ND	0.040	ND	0.038	ND	0.037
Nickel - Total	MG/KG	17.4	0.17	17.4	0.19	9.8	0.17	5.9	0.17
Potassium - Total	MG/KG	1960	28.6	1780	31.0	686	29.2	436	28.7
Selenium - Total	MG/KG	0.58	0.57	ND	0.62	ND	0.58	ND	0.57
Silver - Total	MG/KG	ND	0.23	ND	0.25	ND	0.23	ND	0.23
Sodium - Total	MG/KG	168	45.7	125	49.6	118	46.6	76.2	46.0
Thallium - Total	MG/KG	ND	0.57	ND	0.62	ND	0.58	ND	0.57
Vanadium - Total	MG/KG	18.6	0.11	19.2	0.12	11.4	0.12	7.2	0.11
Zinc - Total	MG/KG	44.5	0.11	38.9	0.12	24.3	0.12	15.2	0.11

BACKFILL SOURCE

NA = Not Applicable ND = Not Detected

STL Buffalo

APPENDIX E

Photographs

Photo 1: Excavating OU3 soil, clean stockpile visible in background.

Photo 2: Excavating non-hazardous soil from OU3 for disposal.

Photo 3: On-site soil stockpiled on plastic sheeting for sampling prior to disposal.

Photo 4: Action-level soil identified during the IRM has been exposed for excavation.

Photo 5: Action-level soil has been removed from the excavation.

Photo 6: Removing clean backfill from above the plastic sheeting along the 1999 IRM east wall.

Photo 7: Plastic sheeting can be seen sloping down along the extent of former 1999 IRM excavation.

Photo 8: Excavating down to a maximum depth of 21 feet.

Photo 9: Backfilling excavation with clean stockpiled soil.

Photo 10: Surface water is accumulating in excavation and sidewalls have caved. Non-hazardous soil stockpiled on plastic sheeting is visible in the background.

Photo 11: Action-level soil stockpiled on plastic sheeting prior to disposal

Photo 12: Pumping water from excavation into a portable storage tank.

Photo 13: Backfilling excavation with imported clay fill and compacting with bulldozer while dewatering.

Photo 14: Excavation has been completely dewatered.

Photo 15: Excavation nearly completely backfilled, temporary fencing being installed around excavation and equipment.

APPENDIX F

Total Soil Tonnage Reports (CWM and MODERN Landfills)

RECEIVED DATE	PROFILE	NET WEIGHT (LBS)	MANIFEST #	BIF Federal EPA Id
12/20/02	CW2856	393[illegible].00	NYB9691713	NYD097644801
	CW2856	393[illegible].00	NYB9691704	NYD097644801
	TOTAL	787[illegible].00		
12/23/02	CW2856	443[illegible].00	NYB9691749	NYD097644801
	CW2856	396[illegible].00	NYB9691821	NYD097644801
	CW2856	330[illegible].00	NYB9691722	NYD097644801
	TOTAL	1170[illegible].00		
12/26/02	CW2856	389[illegible].00	NYB9691731	NYD097644801
	CW2856	457[illegible].00	NYB9691812	NYD097644801
	TOTAL	8468[illegible].00		
12/27/02	CW2856	4376[illegible].00	NYB9691758	NYD097644801
	CW2856	4432[illegible].00	NYB9691803	NYD097644801
	CW2856	4750[illegible].00	NYB9691794	NYD097644801
	TOTAL	13556[illegible].00		
	TOTAL	41606[illegible].00		

* * * E N D O F R E P O R T * * *

HAZ SOIL

CWM Chemical Services

4116060 LBS → 208.03 Tons

Attn: Larry Jones

483-0802

NON-HAZ
SOIL
MODERN LANDFILL

12/27/02 Time: 13:56:06 Operator: tod Page 1
Commercial Ticket Review by Customer - W/O TAX (rpt027) For: Modern Disposal Services.

Customer Range from : 4378.029 To: 4378.029 Date Range from: 01/01/02 To: 12/27/02

029 SLC CONSTRUCTORS BP AMERICA 3425 HYDE PARK BLVD.
A FALLS

Trans Date	Service Description	Trans.	Quantity	Tonnage
12/16/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	19.04
12/16/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	22.34
12/16/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	35.29
12/16/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	33.81
12/16/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	32.73
12/16/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	20.80
12/16/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	37.70
12/16/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	37.00
12/16/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	40.38
12/16/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	27.35
12/16/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	32.97
12/16/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	31.67
12/16/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	16.20
12/16/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	21.69
12/16/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	34.42
12/16/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	37.20
12/16/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	22.79
12/16/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	23.22
12/16/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	21.98
12/16/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	23.71
12/16/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	23.12
12/16/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	30.15
12/16/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	32.33
12/16/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	24.40
12/16/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	25.03
12/17/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	27.92
12/17/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	33.16
12/17/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	44.53
12/17/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	34.78
12/17/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	27.08
12/17/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	28.65
12/17/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	28.59
12/17/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	42.51
12/17/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	23.82
12/17/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	19.84
12/17/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	26.91
12/17/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	21.22
12/17/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	36.25
12/18/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	31.66
12/18/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	21.23
12/18/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	21.09
12/18/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	21.78
12/20/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	20.71
12/20/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	17.53
12/20/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	22.87
12/20/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	21.83
12/20/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	20.00
12/20/02	TONS (MOZ-1726) CONTAMINATED SOIL (18 TO	432.00	.00	

rcial Ticket Review by Customer - W/O TAX cont'd on next page

DEC. 27. 2002 2:05PM - MODERN DISPOSAL - NO. 7835 P. 2

Customer Range From : 4378.029 To: 4378.029 Date Range from: 01/01/02 To: 12/27/02

029 SLC CONSTRUCTORS EP AMERICA 3425 HYDE PARK BLVD.
A FALLS

Trans Date	Service Description	Trans.	Quantity	Tonnage	Trans. Count
12/20/02	TONS (M02-1726) CONTAMINATED SOIL (18 TO	432.00	.00	24.78	
12/20/02	TONS (M02-1726) CONTAMINATED SOIL (18 TO	432.00	.00	23.31	
12/20/02	TONS (M02-1726) CONTAMINATED SOIL (18 TO	432.00	.00	20.51	
12/20/02	TONS (M02-1726) CONTAMINATED SOIL (18 TO	432.00	.00	20.08	
12/20/02	TONS (M02-1726) CONTAMINATED SOIL (18 TO	432.00	.00	23.65	
12/20/02	TONS (M02-1726) CONTAMINATED SOIL (18 TO	432.00	.00	23.33	
12/20/02	TONS (M02-1726) CONTAMINATED SOIL (18 TO	432.00	.00	27.10	
12/20/02	TONS (M02-1726) CONTAMINATED SOIL (18 TO	432.00	.00	20.81	
12/20/02	TONS (M02-1726) CONTAMINATED SOIL (18 TO	432.00	.00	23.60	
12/20/02	TONS (M02-1726) CONTAMINATED SOIL (18 TO	432.00	.00	21.82	
12/20/02	TONS (M02-1726) CONTAMINATED SOIL (18 TO	432.00	.00	21.41	
12/20/02	TONS (M02-1726) CONTAMINATED SOIL (18 TO	432.00	.00	25.02	
12/20/02	TONS (M02-1726) CONTAMINATED SOIL (18 TO	432.00	.00	24.81	
12/20/02	TONS (M02-1726) CONTAMINATED SOIL (18 TO	432.00	.00	25.52	
12/20/02	TONS (M02-1726) CONTAMINATED SOIL (18 TO	432.00	.00	24.00	
12/20/02	TONS (M02-1726) CONTAMINATED SOIL (18 TO	432.00	.00	25.84	
12/20/02	TONS (M02-1726) CONTAMINATED SOIL (18 TO	432.00	.00	24.81	
		27,648.00	.00	1,709.92	64.

rcial Ticket Review by Customer - W/O TAX cont'd on next page

: 12/27/02 Time: 13:56:07 Operator: tod Page 3

Commercial Ticket Review by Customer - W/O TAX (rpt027) for: Modern Disposal Services.

Customer Range from : 0378.029 To: 0378.029 Date Range from: 01/01/02 To: 12/27/02

al Tonnage: 1,709.92

NON-HAZ
1,709 92