

Remedial Investigation Report

Volume II of II - Appendices

Peter Cooper Markhams Site
Dayton, New York

RECEIVED
JUL 21 2006
NYSDEC REG 9
REL FOIL
REL UNREL

Prepared by



Geomatrix

Geomatrix Consultants
90B John Muir Drive, Suite 104
Amherst, NY 14228

in association with



BENCHMARK
ENVIRONMENTAL
ENGINEERING &
SCIENCE, PLLC

Benchmark Environmental Engineering & Science PLLC
726 Exchange Street, Suite 624
Buffalo, NY 14210

February 2005
Revised and Submitted
as Final: July 2006

APPENDIX A

Historic Information/Analytical Data

APPENDIX A-1

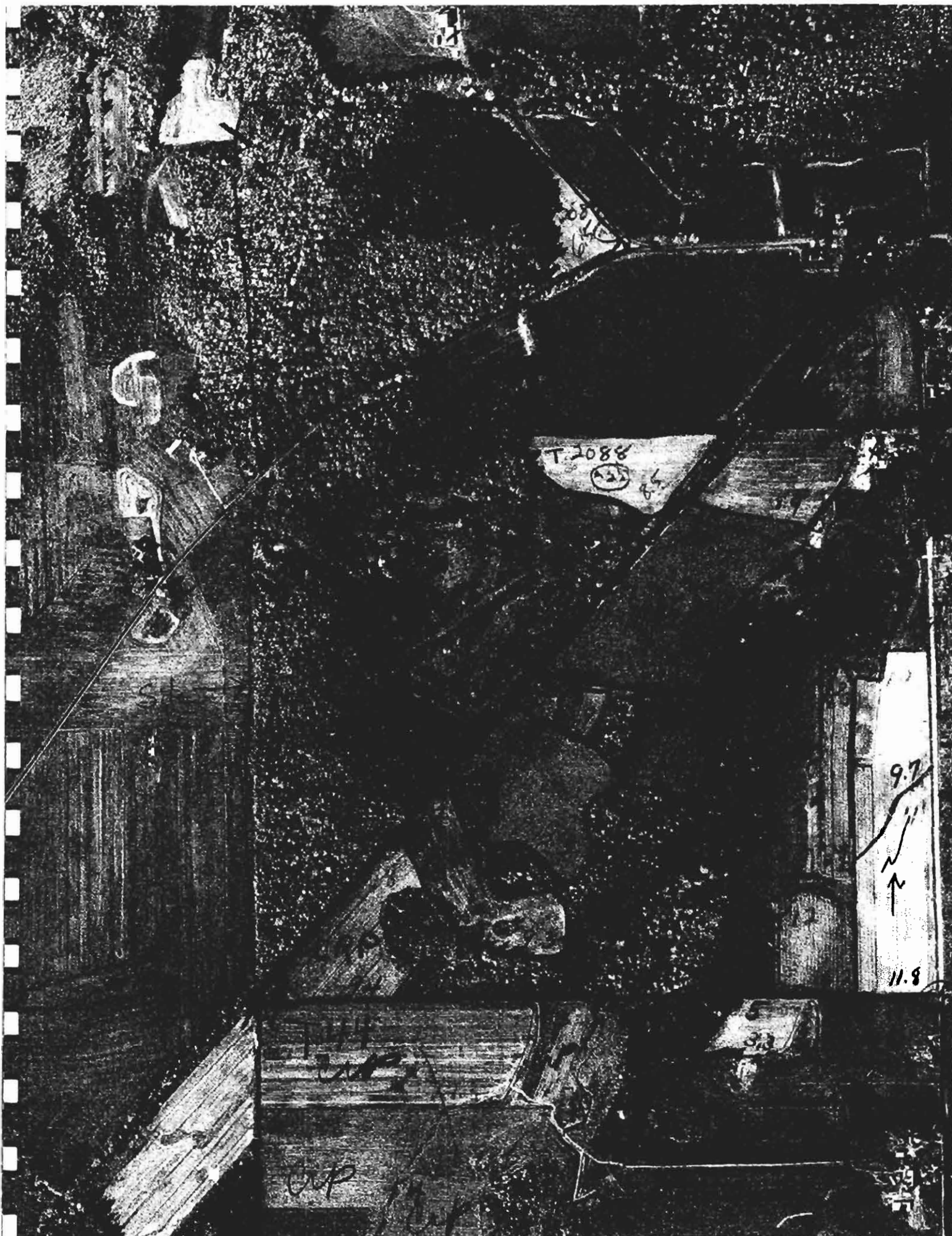
Historic Aerial Photographs







1966



T 2088

9.7

11.8

CP



APPENDIX A-2

1999 USEPA HRR Documentation Package Information



**HAZARD RANKING SYSTEM DOCUMENTATION PACKAGE
PETER COOPER CORP (MARKHAMS)
TOWN OF DAYTON, CATTARAUGUS COUNTY, NEW YORK**

CERCLIS ID No.: NYD980592547

VOLUME 1 of 2

**EPA Contract No.: 68-W5-0019
TDD No.: 02-98-08-0149
Document Control No.: START-02-F-03376**

MARCH 1999

**Prepared for:
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region II
290 Broadway, 18th Floor
New York, NY 10007**

**Prepared by:
Region II Superfund Technical Assessment and Response Team
Roy F. Weston, Inc.
Federal Programs Division
Edison, NJ 08837**

SOURCE DESCRIPTION

2.2 Source Characterization

Number of the source: 3

Name and description of the source:

Contaminated Soil associated with former drum disposal area

In 1972, PCC buried drums of oil and glue plus miscellaneous other refuse in an area east of the wetland (Ref. 13, pp. 5, 6, 7; 30, pp. 103 through 106). During an investigation in 1984, RECRA Environmental, Inc. observed drums and barrels at the site (Ref. 9, p. 181). Magnetometer surveys conducted in 1984, 1988, and 1989 indicated the presence of the buried containers in an area devoid of waste piles (Ref. 8, p. 33; 9, pp. 19, 182; 30, pp. 5, 6, 7). OBG completed a Site Operations Plan in April 1989 for removal of the buried drums (Ref. 30), and the plan was executed in the spring, summer, and fall of 1989 (Ref. 9, p. 181).

The buried containers, primarily 55-gallon steel drums, were excavated, inventoried, and brought to a staging area for characterization (Ref. 9, pp. 183, 184). There were a total of 276 containers, some of which were unsound and most of which were removed from a 24- by 60-foot excavation (Ref. 9, pp. 183, 184; 31, p. 1; 32, p. 1). Upon excavation, the contents of unsound liquid containers were transferred to new containers (Ref. 9, p. 184).

There were four types of material present in the buried drums: animal glue, dextrin, polyvinyl (PV) emulsion, and waste oil (Ref. 9, p. 184; 32, p. 1). Composite samples of each type of waste were collected for laboratory analysis in June/July 1989 (Ref. 9, pp. 184, 192; 33, p. 1; 34, p. 3). NYSDEC observed the sampling and collected split samples (Ref. 9, p. 184; 35, pp. 25, 26, 53, 80, 105, 106). The laboratory identified the oil composite sample as #2 fuel oil, which was confirmed by analysis of the NYSDEC split sample (Ref. 34, p. 3; 35, p. 63; 36, p. 1).

Chromium was detected at concentrations of 220 and 120 mg/kg in the animal glue and its NYSDEC split sample, respectively (Ref. 9, p. 192; 33, p. 1; 35, p. 8). The animal glue sample also showed an EP Toxicity level of 9.5 mg/L for chromium (Ref. 9, p. 192). In addition, several organic compounds were detected in the waste composite samples. The animal glue, PV emulsion, and waste oil samples showed the presence of trichloroethene (TCE), at concentrations ranging from 1.7 mg/kg in the animal glue to 130 mg/kg in the oil. Benzene, dichloroethene (DCE), and vinyl chloride were detected in the PV emulsion sample, while xylene and 2-methylnaphthalene were detected in the waste oil sample (Ref. 9, p. 192). The results for the NYSDEC split samples confirmed the presence of the organic compounds (Ref. 35, pp. 4, 58, 59, 60, 86). NYSDEC considered the split sample data usable and comparable within limits to the original sample data (Ref. 37, pp. 1 through 4).

In May 1989, PCC consented to an Order by NYSDEC to implement an interim remedial program of removing and properly disposing of the drummed wastes (Ref. 38, p. 1, 2, 11). To prepare the drums for transport and disposal, compatible materials were consolidated to reduce the number of drums for disposal. Free liquids except oil were solidified with sawdust (Ref. 9, p. 185). Based on the waste characterization data, only the drum of animal glue that exhibited 9.5 mg/L of chromium in the EP Toxicity test was transported and disposed of as hazardous waste (Ref. 9, p. 185, 192). The waste oil was considered to be nonhazardous and was pumped from its drums for reprocessing (Ref. 9, p. 185; 36, p. 1). The empty oil drums and the remainder of the glue and adhesives drums were transported to a landfill for disposal as nonhazardous waste (Ref. 9, p. 185).

Soils that had been excavated during the drum removal were classified as contaminated or noncontaminated, based primarily on visual observation of color and texture. Visually noncontaminated soils were stockpiled on site for later use as backfill. Contaminated soils were placed in roll-off boxes or staged in the excavation. Based on composite sample analytical data from each roll-off box, the contaminated soils were transported to a landfill for disposal as nonhazardous waste (Ref. 9, p. 186, 193).

OBG collected three composite samples from the base of the excavation in October 1989. The analytical data indicated the presence of chromium, TCE, 1,2-DCE (total), total xylenes, 2-methylnaphthalene, and 4-methylphenol (Ref. 9, pp. 187, 194; 39, pp. 6, 8, 10, 12, 14, 16, 18, 24, 27). NYSDEC collected one split sample that showed comparable results (Ref. 37, p. 4; 40, pp. 1, 2; 41, pp. 5, 6, 9). OBG recommended backfilling the excavation with the visually noncontaminated soil (Ref. 9, p. 189). There is no direct documentation of such an activity, however, MPI did not observe a trench in the former drum disposal area during their reconnaissance and SSI in 1993 (Ref. 19, pp. 6, 11). MPI collected surface soil sample S7 from the edge of the former drum disposal area (Ref. 19, p. 11). Chromium was detected in the sample at 122 mg/kg, significantly above the background concentrations of 19.8 and 15.7 mg/kg (Ref. 20, p. 5; 21, pp. 216, 217, 218). Organic compounds were not detected in sample S7 (Ref. 21, pp. 96, 137, 138, 157).

Location of the source, with reference to a map of the site:

The former drum disposal area is located adjacent to the on-site wetland, in the northeastern portion of the site (Ref. 20, p. 7). The location of Source 3 and soil sample S7 are shown in Figure 2.

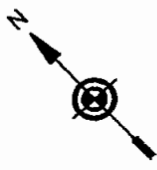
Containment

Release via overland migration and/or flood:

There is no evidence of hazardous substance migration from Source 3, the contaminated soil associated with the former drum disposal area. However, as evidenced by contamination in surface soil sample S7, there is not a maintained engineered cover (Ref. 21, p. 216). There is also no evidence of a maintained run-on control system and runoff management system at the site (Ref. 8, p. 47; 19, p. 7). Therefore, the containment factor value for this source in the surface water migration pathway is 10 (Ref. 1, p. 5).

2.4.1 Hazardous Substances

<u>Hazardous substance</u>	<u>Evidence</u>	<u>Reference</u>
Chromium, total (max. = 260 ppm, East)	Post-excavation soil samples: West, Center, East, RC989-102-004 (NYSDEC split) SSI soil sample S7	39, p. 6; 41, p. 9 20, p. 5; 21, p. 216
Xylene (total) (max. = 2.2 ppm, RC989-102-004)	Post-excavation soil samples: West, Center, RC989-102-004	39, pp. 8, 16; 41, p. 5
1,2-Dichloroethene (max. = 13 ppm, Center)	Post-excavation soil samples: West, Center, East, RC989-102-004	39, pp. 10, 14, 16; 41, p. 5
Trichloroethene (max. = 14 ppm, RC989-102-004)	Post-excavation soil samples: West, Center, East, RC989-102-004	39, pp. 10, 12, 16; 41, p. 5
4-Methylphenol (max. = 5.9 ppm, West)	Post-excavation soil sample: West	39, p. 18
2-Methylnaphthalene (max. = 5.6 ppm, Center)	Post-excavation soil samples: West, Center, RC989-102-004	39, pp. 18, 24, 27; 41, p. 6



LEGEND:

- WASTE PILES (SOURCE 1)
- CONTAMINATED SOIL ASSOCIATED W/ WASTE PILES (SOURCE 2)
- CONTAMINATED SOIL ASSOCIATED W/ FORMER DRAIN BURNAL AREA (SOURCE 3)
- ACCESS ROADS
- WETLAND AREAS

SAMPLES COLLECTED BY O&G, 1988-1989:

- WASTE CHARACTERIZATION SAMPLE
 - SEEP SAMPLE LOCATION
 - SOIL SAMPLE LOCATION
 - MONITORING WELL (Soil samples collected at deep wells during installation)
 - SURFACE WATER/SEDIMENT SAMPLE LOCATION
 - SEDIMENT SAMPLE LOCATION
- SAMPLES COLLECTED BY MFL, 1983:
- WASTE-PILE SAMPLE
 - SOIL SAMPLE LOCATION
 - SURFACE WATER SAMPLE LOCATION

FIGURE 2 - SITE AND SOURCE MAP
PRITE COOPER CORPORATION (Meridians)
DAYTON, NEW YORK
MARCH 1989

U.S. ENVIRONMENTAL PROTECTION AGENCY
EMERGENCY RESPONSE, RESTORATION AND ENFORCEMENT
OFFICE

DRAWN BY: J. HAMPTON JR.

EPA TASK MONITOR: B. CORSTEN

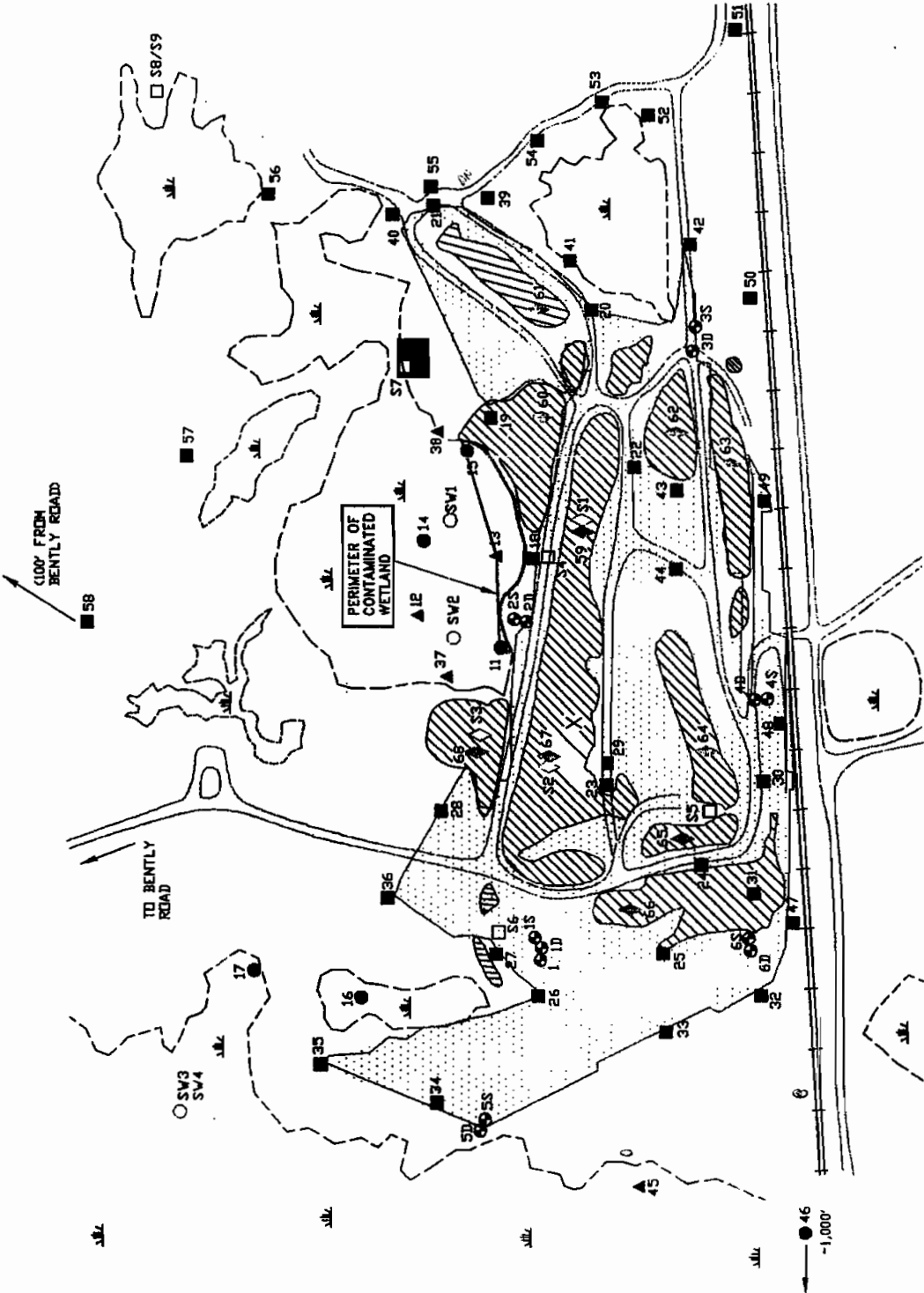
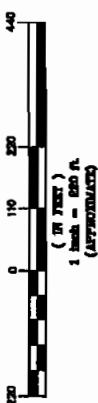
START PROJECT MANAGER: S. SELLAND

6-10000-1075-1172-000

WISCON Roy F. Weston, Inc.
FEDERAL PROGRAMS DIVISION

IN ASSOCIATION WITH PRE ENVIRONMENTAL MANAGEMENT, INC.
P.O. BOX 1000, DAYTON, OH 45401
P.L. SAMPSON ASSOCIATES AND PRE ENVIRONMENTAL SERVICES, INC.

SOURCES:
O'BRIEN & GERE ENGINEERS, INC.,
IN REPORT, 1988
MALCOLM PIERCE, INC., SITE INSPECTION
PRIORITIZATION REPORT, 1983



APPENDIX A-3

Historic Sample Locations

-  WASTE PILES
-  APPROXIMATE PROPERTY LINE
-  ACCESS ROADS
-  WETLAND AREAS (1989)
-  REMEDIATED DRUM BURIAL AREA

SAMPLES COLLECTED BY OB&G (1986-1988)

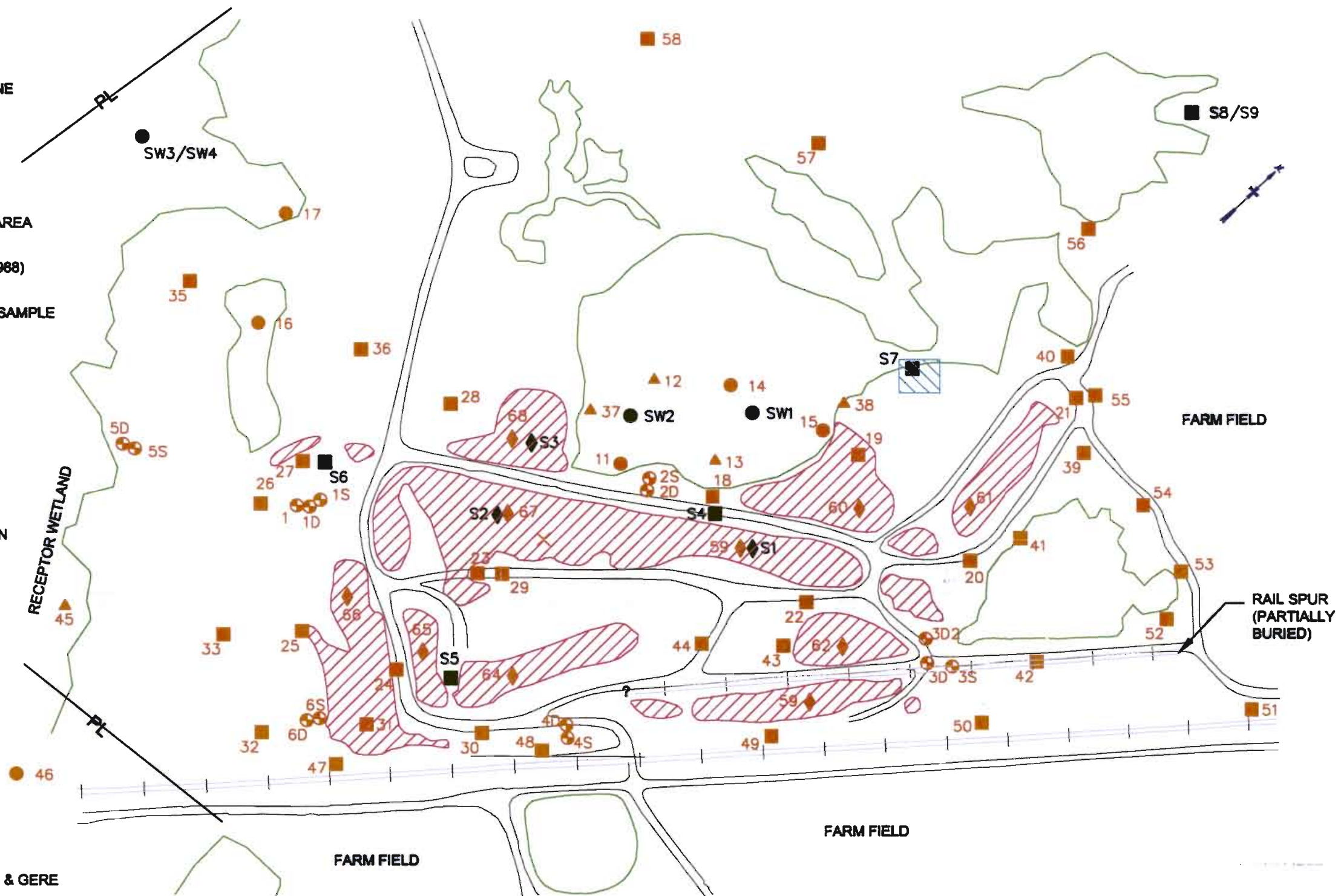
-  WASTE CHARACTERIZATION SAMPLE
-  SEEP SAMPLE LOCATION
-  SOIL SAMPLE LOCATION
-  MONITORING WELL
-  SURFACE WATER/SEDIMENT SAMPLE LOCATION
-  SEDIMENT SAMPLE LOCATION

SAMPLES COLLECTED BY MPI (1993)

-  SURFACE WATER SAMPLE LOCATION
-  WASTE PILE SAMPLE
-  SOIL SAMPLE LOCATION

NOTES:

1. BASE MAP DERIVED FROM O'BRIEN & GERE 1989 RI REPORT



200' 0' 200' 400'
 APPROX. SCALE: 1 INCH = 200 FEET

HISTORIC SAMPLE LOCATIONS
 Markhams Site
 Dayton, New York



Project No.
 7603

Appendix A-3

APPENDIX A-4A

Historical Soil and Sediment Sample Results

Appendix A-4a
Peter Cooper Markhams Site
RI/FS Work Plan
Summary of 1983 Phase I Data
Surface Soil Characterization ⁽¹⁾

Parameter (mg/kg)	Sample Locations ⁽²⁾	
	25' of Shed	100' NE of ROY
Antimony		
Arsenic	49	84
Beryllium		
Cadmium	1.2	2.5
Chromium	66	31000
Copper	140	69
Lead	32	120
Mercury		
Nickel	76	21
Selenium		
Silver	1.4	4.1
Thallium		
Zinc	500	1300

NOTES:

1. Samples were also analyzed for total halogenated organics and total halogenated VOCs. Results were all non-detectable.
2. Collected and analyzed in November 1981 by Recra Research
3. Blank space-compound analyzed for but not detected.

Appendix A-4a
Peter Cooper Markhams Site
RI/FS Work Plan
Summary of 1983 Phase I Data
Sediment Characterization

Parameter (mg/kg)	Sample Locations ⁽¹⁾		
	Swamp -1	Swamp -2	Swamp -3
Antimony			
Arsenic		20	
Beryllium			
Cadmium		0.008	
Chromium	0.336	77.6	0.01
Copper	0.026	3.18	0.018
Lead		0.06	
Mercury			
Nickel		0.23	
Selenium			
Silver	0.008	0.009	0.012
Thallium			
Zinc	0.416	26	0.006

NOTES:

- 1 Collected and analyzed in 1981 by RECRA Environmental
Samples were labeled as 'Swamp Water' however results are
reported in mg/kg.
- 2 Blank space-compound analyzed for but not detected.

Appendix A-4a
Peter Cooper Markhams Site
RI/FS Work Plan
Summary of 1985 Phase II Data
Sediment Characterization

Parameter (mg/kg)	Sample Locations ⁽¹⁾		
	3-C	4-C	5-C
Arsenic	3.9	2.7	3.0
Beryllium			
Total Chromium	27.2	134	100
Copper	55.3	85.2	25.6
Lead	144	5.8	5.3
Mercury			
Silver		6.7	
Zinc	867	161	91.5

NOTES:

1. Collected and analyzed in June 1984 by RECRA Environmental
2. Blank space-compound analyzed for but not detected.

Appendix A-4a
Peter Cooper Markhams Site
RI/FS Work Plan
Summary of 1985 Phase II Data
Surface Soil Characterization

Parameter (mg/kg)	Sample Locations ⁽¹⁾									
	4S	5S	6S	7S	8S	9S	10S			
Arsenic	13.6	15.5	16.2	9.2	9.9	20.2	14.8			
Beryllium										
Total Chromium	437	955	42.7	25400	2340	1850	162			
Copper	34.1	50.1	24.4	124	32.4	43.3	45.1			
Lead	20.4	30.1	9.4	60.8	8.8	11.4	12.4			
Mercury	0.11	0.12		0.91		0.32				
Silver			0.54							
Zinc	156	380	119	991	135	168	467			

NOTES:

1 Collected and analyzed in June 1984 by Recra Research

2 Blank space-compound analyzed for but not detected.

Appendix A-4a
Peter Cooper Markhams Site
RI/FS Work Plan
Summary of 1985 Phase II Data
Surface Soil Characterization

Parameter (mg/kg)	Sample Locations ⁽¹⁾									
	4S	5S	6S	7S	8S	9S	10S			
Halogenated Organic Scan (ECD) ⁽²⁾	ND	ND	ND	ND	ND	ND	ND			
Volatile Halogenated Organic Scan (Coulson's) ⁽³⁾	ND	ND	ND	ND	ND	ND	ND			

- NOTES:
- 1 Collected and analyzed in June 1984 by Recra Research
 - 2 Unit of Measure-ug/l as Chlorine; Lindane Standard
 - 3 Unit of Measure-ug/l as Carbon Tetrachloride Standard
 - 4 ND-Not Detected

Appendix A-4a
Peter Cooper Markhams Site
RI/FS Work Plan
Summary of 1985 Phase II Data
Subsurface Soil Characterization

Parameter (mg/kg)	Sample Locations and Depths ⁽¹⁾							
	B-1 6-8'	B-1 14-16'	B-2 4-6'	B-2 14-16'	B-3 6-8'	B-3 16-18'	B-4 4-6'	B-4 14-16'
Arsenic	7.8	8.2	8.6	7.5	11.5	5.2	9.1	11.7
Beryllium								
Total Chromium	1290	13	56.1	6.4	13.7	4.9	21.9	10.1
Copper	41.7	16.7	31.3	15.3	43.4	14.5	27.9	24.4
Lead	18.8	2.1	6.7	1.6	7.6	4.9	2.2	1.7
Mercury								
Silver	0.63	2.9		0.77				0.66
Zinc	131	104	141	87.2	269	224	83.3	73.4

NOTES:

- 1 Collected and analyzed in June 1984 by Recra Research
- 2 Blank space-compound analyzed for but not detected.

Appendix A-4a
Peter Cooper Markhams Site
RI/FS Work Plan
Summary of 1985 Phase II Data
Subsurface Soil Characterization

Parameter (mg/kg)	Sample Locations and Depths ⁽¹⁾							
	B-1 6-8'	B-1 14-16'	B-2 4-6'	B-2 14-16'	B-3 6-8'	B-3 16-18'	B-4 4-6'	B-4 14-16'
Halogenated Organic Scan (ECD) ⁽²⁾	ND	ND	ND	ND	ND	ND	ND	ND
Volatile Halogenated Organic Scan (Coulson's) ⁽³⁾	ND	ND	ND	ND	ND	ND	ND	ND

- NOTES:
- 1 Collected and analyzed in June 1984 by Recra Research
 - 2 Unit of Measure-ug/l as Chlorine; Lindane Standard
 - 3 Unit of Measure-ug/l as Carbon Tetrachloride Standard
 - 4 ND - Not Detected

Appendix A-4a
Peter Cooper Markhams Site
RI/FS Work Plan
Summary of 1989 RI Data
Soil/Sediment Characterization

Parameter (mg/kg)	Sample Locations and Depth																		
	Well 1D		Well 2D		Well 3D		Well 4D		Well 5D		11 ⁽³⁾	12 ⁽³⁾	13 ⁽³⁾	14 ⁽³⁾	15 ⁽³⁾	16 ⁽³⁾	17 ⁽³⁾	18	19
	0-2'	6-8'	0-2'	4-6'	0-2'	4-6'	0-2'	8-10'	0-2'	2-4'	0-3"	0-3"	0-3"	0-3"	0-3"	0-3"	0-3"	0-3"	0-3"
Total Chromium	46	13	11		90	12	5280	13	13	11	895	54	1270	11	163	139	31	139	56
Hexavalent Chromium	0.45	0.26			1.8		169	1.1			25	2	14	1.1	12	11	2.1	12	1.4
Arsenic	27	17	23	28	8.3	18	18	11	24	18	7	4.1	8.7		5.9	16	25	17	18
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NOTES:

- 1 NA-Not Analyzed
- 2 Blank Space-compound analyzed for but not detected
- 3 Collected from wetland area.

Appendix A-4a
Peter Cooper Markhams Site
RI/FS Work Plan
Summary of 1989 RI Data
Soil/Sediment Characterization

Parameter (mg/kg)	Sample Locations and Depth														
	20 0-3"	21 0-3"	22 0-3"	23 0-3"	23(Dup) 0-3"	24 0-3"	25 0-3"	26 0-3"	27 0-3"	27(Dup) 0-3"	28 0-3"	29 0-3"	30 0-3"	31 0-3"	32 0-3"
Total Chromium	193	401	2710	8560	4070	3230	69300	66	29900	20800	99	10600	890	460	20200
Hexavalent Chromium	3.1	7.3	612	80	212	41	854	2.4	75	87	19	438	22	59	25
Arsenic	16	15	11	12	5.4	13	2	15	8.7	9.1	10	14	9.4	9.3	11
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NOTES:

- 1 NA-Not Analyzed
- 2 Blank Space-compound analyzed for but not detected

Soil/Sediment Characterization

Sample Locations and Depth

2 Blank Space-compound analyzed for but not detected
3 Collected from wetland area.

Appendix A-4a
Peter Cooper Markhams Site
RI/FS Work Plan
Summary of 1989 RI Data
Soil/Sediment Characterization

Parameter (mg/kg)	Sample Locations and Depth																
	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56*	57*	58*
	0-3" 2950	0-3" 8340	0-3" 10050	0-3" 84	0-3" 2080	0-3" 20	0-3" 1100	0-3" 83	0-3" 1200	0-3" 33	0-3" 18	0-3" 46	0-3" 41	0-3" 38	0-3" 420	0-3" 17	0-3" 8.6
Total Chromium	14	55	183	1.14	7.5												9.0
Hexavalent Chromium	7.6	4.7	20	16	17	30	15	15	18	15	4.4	4.7	19	15	16	7.4	1.6
Arsenic	NA	NA	NA	NA	NA	140	100	120	330	160	110	100	110	110	190	99	20
Zinc																	49

- NOTES:
- 1 NA-Not Analyzed
 - 2 *Background Sample locations
 - 3 Blank Space-compound analyzed for but not detected

Appendix A-4a
Peter Cooper Markhams Site
RI/FS Work Plan
Summary of 1993 SSI Data
Surface Soil Characterization

Parameter (mg/kg)	Sample Locations ⁽¹⁾								
	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8*	S-9**
Aluminum	4660 E	291	9610	9000	7530	11200	9790	15700	12500
Antimony	85.2 E	10.3 J	29 E		47.6 E				
Arsenic	25 E	1.1 J	14.3 E	11.6 E	12.9 E	12.7 E	8.3 E	7.7 E	4 E
Barium	226 E	242 E	94.2 E	53.4 E	102 E	71.9 E	89.5 E	105 E	89.2 E
Beryllium	0.45 J			0.27 J	0.35 J	0.66 J	0.54 J	0.36 J	0.27 J
Cadmium									
Calcium	24500 E	65900	65200	3230	79400	4820	1080 J	974 J	751 J
Total Chromium	26800 E	946	11100	389	18100	337	122	19.8	15.7
Cobalt	12.2 J	1.6 J	8.1 J	8.2 J	8.6 J	10.5 J	8.7 J	8.4 J	5.8 J
Copper	467 E	159 E	110 E	43.6 E	139 E	34.6 E	37.8 E	28.6 E	21.3 E
Iron	26700 E	1620	16900	19500	17600	21800	22000	32600	20700
Lead	228 E	243	71.3	18.1	82.5	22.9	26	20.7	14.4
Magnesium	2460 E	43.2 J	3960	2560	3440	3650	2880	3660	2620
Manganese	335 E	4.9	423	658	364	1060	540	183	124
Mercury	3.8 E	4.5	1.4	0.1 J	1.7		0.1 J		
Nickel	25 E		14.6	19.2 E	15.1	26 E	21.8 E	21 E	16.6 E
Potassium	544 J	163 J	448 J	539 J	432 J	979 J	788 J	762 J	634 J
Selenium									
Silver	2.5 J	126	1.7 J	1.2 J			1.2 J		1.4 J
Sodium	96.5 J	40.8 J	163 J	52.9 J	320 J	54.9 J	48.2 J	66 J	36.7 J
Thallium				0.32 J	0.42 J	0.46 J	0.3 J		
Vanadium	37.1 E	3.6 J	24.2 E	15.6 E	26.2 E	19.1 E	18 E	29.2 E	21.5 E
Zinc	2270 E	80.9	645	200	1210	300	160	117	90.7

- NOTES:
- 1 Collected and analyzed in June 1993
 - 2 * Background Sample
 - 3 ** Duplicate of S-8
 - 4 Blank space-compound analyzed for but not detected.
 - 5 E-Estimated Value
 - 6 J-estimated value, compound present below CDRL but >IDL

Appendix A-4a
Peter Cooper Markhams Site
RI/FS Work Plan
Summary of 1993 SSI Data
Surface Soil Characterization

Parameter (ug/kg)	Sample Locations ⁽¹⁾								
	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8*	S-9**
Phenol	730 J								
1,4-Dichlorobenzene	370 J		180 J						
1,2-Dichlorobenzene	2100 E		280 J						
4-Methylphenol	2300 E	3300 J							
1,2,4-Trichlorobenzene	210 J								
Naphthalene	320 J	2600 J	120 J						
2-Methylnaphthalene			57 J						
Acenaphthene	290 J								
Dibenzofuran	220 J								
Fluorene	360 J								
Hexachlorobenzene			120 J						
Pentachlorophenol	120 J	1400 J							
Phenanthrene	4000 E	850 J		52 J	140 J				
Anthracene	790 J								
Carbazole	380 J								
Fluoranthene	5900 E	2000 J		88 J	330 J				
Pyrene	6700 E	2400 J		74 J	240 J				
Benzo(a)anthracene	2900 E	1200 J			190 J				
Chrysene	3600 E	2500 J			260 J				
Benzo(b)fluoranthene	3000 E								
Benzo(k)fluoranthene	2600 E								
Benzo(a)pyrene	2500 E								
Indeno(1,2,3-cd)pyrene	2100 E								

NOTES:

- 1 Collected and analyzed in June 1993
- 2 * Background Sample
- 3 ** Duplicate of S-8
- 4 Blank space-compound analyzed for but not detected.
- 5 E-Estimated Value
- 6 J-estimated value, compound present below CDRL but >IDL

Appendix A-4a
Peter Cooper Markhams Site
RI/FS Work Plan
Summary of 1993 SSI Data
Surface Soil Characterization

Parameter (ug/kg)	Sample Locations ⁽¹⁾								
	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8*	S-9**
Dieldrin			7.2 E						
4,4'-DDE	76 E	610 E	94 E		30 E				
Endrin aldehyde					13 EN				
alpha-Chlordane			31 EN		6.8 EN				
gamma-Chlordane			27 EN						
Arochlor-1254	85 J	150 J			58 EN				
Arochlor-1260			93 EN						

NOTES:

- 1 Collected and analyzed in June 1993
- 2 * Background Sample
- 3 ** Duplicate of S-8
- 4 Blank space-compound analyzed for but not detected.
- 5 E-Estimated Value
- 6 J-estimated value, compound present below CDRL but >IDL
- 7 N-Presumptive evidence of the presence of the material

APPENDIX A-4B

Historical Waste Fill and Seep Sample Results

Appendix A-4b
Peter Cooper Markhams Site
RI/FS Work Plan
Summary of 1989 RI Data
Seep Quality

Parameter (mg/l)	Unit	Seep Composite Concentration
Total Chromium	mg/l	3.8
Hexavalent Chromium	mg/l	1.7
Arsenic	mg/l	0.022
Zinc	mg/l	0.67
Ammonia	mg NH ₃ -N/l	300
BOD (5)	mg/l	100
Nitrate	mg NH ₂ -N/l	0.21
Nitrite	mg NO ₂ -N/l	Not Detected
TKN	mg/l	400

NOTES:

1. Sampling Date 4/21/87

Appendix A-4b
Peter Cooper Markhams Site
RI/FS Work Plan
Summary of 1989 RI Data
Waste/Fill Characterization

Parameter (mg/kg)	Sample Locations ⁽¹⁾				
	M-59	M-60 ⁽²⁾	M-64 ⁽²⁾	M-66	M-68
Total Chromium	4600			20000	46000
Arsenic	7.1			7.2	10
Zinc	680			850	900

NOTES:

- 1 Samples collected in 1988
- 2 See Composite Waste Analyses (Table 3b)

Appendix A-4b
Peter Cooper Markhams Site
RI/FS Work Plan
Summary of 1989 RI Data
Waste/Fill Characterization (EP)

Parameter (mg/l)	Sample Location ⁽¹⁾				
	M-59	M-60	M-64	M-66	M-68
Total Chromium		0.11	0.08		2.4
Arsenic					
Zinc	0.4	3.9	0.61	0.31	5.7
					0.3

NOTES:

- 1 Samples collected in 1988
- 2 Expressed in milligrams/liter in leachate per 40 CFR 261
- 3 Blank Space-compound analyzed for but not detected

Appendix A-4b
Peter Cooper Markhams Site
RI/FS Work Plan
Summary of 1989 RI Data
Waste/Fill Characterization ⁽¹⁾⁽³⁾

Parameter (mg/kg)	Waste Composite ⁽²⁾
Aluminum	7910
Antimony	<8.78
Arsenic	10.5
Barium	98.6
Beryllium	<0.732
Cadmium	<0.732
Calcium	69900
Chromium	8780
Cobalt	<0.732
Copper	81.8
Cyanide	0.879
Iron	14300
Lead	61.2
Magnesium	2290
Manganese	211
Nickel	12.4
Potassium	<732
Selenium	<7.32
Silver	<1.46
Sodium	<732
Thallium	<1.46
Vanadium	16.1
Zinc	408
Mercury	0.735
Percent Total Solids	68.3

NOTES:

- 1 Samples collected in 1988
- 2 Composite Sample of M-60, M-64 and M-67.
- 3 HSL organics all non detect.

APPENDIX A-4C

Historical Surface Water Sample Results

Appendix A-4c
Peter Cooper Markhams Site
RI/FS Work Plan
Summary of 1985 Phase II Data
Surface Water Characterization

Parameter (mg/l)	Sample Locations ⁽¹⁾		
	3-W	4-W	5-W
Arsenic	0.006	0.006	
Beryllium			
Chloride	1.6	2.4	4.2
Total Chromium	0.092	0.118	0.637
Copper	0.017	0.022	0.018
Lead			
Mercury			
Silver			
Zinc	0.054	0.07	0.114

NOTES:

1. Collected & analyzed June 1984 by Recra Research
2. Blank Space-Compound analyzed for but not detected

Appendix A-4c
Peter Cooper Markhams Site
RI/FS Work Plan
Summary of 1985 Phase II Data
Surface Water Characterization

Parameter (ug/l)	Sample Locations ⁽¹⁾		
	3-W	4-W	5-W
Halogenated Organic Scan (ECD) ⁽²⁾			
Volatile Halogenated Organic Scan (Coulson's) ⁽³⁾	30	58	10

NOTES:

- 1 Collected & analyzed June 1984 by Recra Research
- 2 Unit of Measure-ug/l as Chlorine; Lindane Standard
- 3 Unit of Measure-ug/l as Carbon Tetrachloride Standard
- 4 Blank Space-Compound analyzed for but not detected

Appendix A-4c
Peter Cooper Markhams Site
RI/FS Work Plan
Summary of 1989 RI Data
Surface Water Characterization

Parameter (mg/L)	Sample Locations ⁽¹⁾							(2)	
	11	14	15	16	17	17(Dup)	46	46*	
Total Chromium	2.84	0.02	0.548	0.055	0.196	0.085	NA	NA	
Hexavalent Chromium		0.007							
Arsenic	0.104		0.018	0.005	0.061	0.052			
Zinc	NA	NA	NA	NA	NA	NA			0.006

NOTES:

- 1 Samples collected in Sept. 1986
- 2 Samples collected in July 1988
- 3 NA-Not Analyzed
- 4 *Acid Soluble Results
- 5 Blank space-compound analyzed for but not detected

Appendix A-4c
Peter Cooper Markhams Site
RI/FS Work Plan
Summary of 1993 SSI Data
Surface Water Characterization

Parameter (mg/l)	Sample Locations ⁽¹⁾			
	SW-1	SW-2	SW-3	SW-3 Dupe
Aluminum	0.412	0.448	1.8	2.38
Arsenic		0.0046 J	0.0088 J	0.0098 J
Barium	0.0253 J	0.0499 J	0.189 J	0.2 J
Beryllium	0.00057 J		0.00037 J	0.00037 J
Cadmium			0.0021 J	0.0014 J
Calcium	6.16	23.2	23.7	24
Total Chromium	0.0044 J	0.0223		
Cobalt			0.0054 J	0.0054 J
Copper	0.008 J	0.0107 J	0.0149 J	0.0133 J
Iron	0.853	3.57	11	13.1
Lead	0.0171	0.0186	0.0206	0.0243
Magnesium	1.16 J	3.43 J	3.75 J	3.87 J
Manganese	0.066	0.358	1.67	2.04
Nickel		0.0043 J	0.0048 J	
Potassium	0.395 J	0.717 J	1.14 J	1.05 J
Sodium	1.61 J	1.46 J	1.39 J	1.39 J
Vanadium		0.0021 J	0.012 J	0.012 J
Zinc	0.0806	0.0821	0.0793	0.0624

NOTES:

1 Collected and analyzed in June 1993 for TAL Metals using EPA CLP SOW.

2 Blank Space-Compound analyzed for but not detected

3 J-estimated value, compound present below CDRL but >IDI

Appendix A-4c
Peter Cooper Markhams Site
RI/FS Work Plan
Summary of 1993 SSI Data
Surface Water Characterization

Parameter (ug/l)	Sample Location		
	SW-1	SW-2	SW-3 Dupe
Carbon Disulfide		100	

Notes:

- 1 Collected and analyzed in June 1993
- 2 Analyzed samples for full TCL organic list using EPA CLP SOW. Carbon Disulfide was the only organic compound detected above the detection limit.
- 3 Blank space-compound analyzed for but not detected.

APPENDIX A-4D

Historical Groundwater Sample Results

Appendix A-4d
Peter Cooper Markhams Site
RI/FS Work Plan
Summary of 1985 Phase II Data
Shallow Groundwater Characterization

Parameter (mg/l)	Sample Locations and Collection Date ⁽¹⁾			
	B-1(1S)	B-2(2S)	B-3(3S)	B-4(4S)
	6/6/1984	6/4/1984	6/1/1984	6/1/1984
Total Chromium	0.026	ND	ND	0.023
Arsenic	ND	ND	ND	ND
Zinc	58.3	0.791	0.315	5.0
Chloride	39	1.8	6.8	5.4
Beryllium	ND	ND	ND	ND
Copper	ND	ND	ND	0.013
Lead	ND	ND	ND	ND
Mercury	ND	ND	ND	ND
Silver	ND	0.015	ND	ND

NOTES:

1 Collected and analyzed by Recra Research

2 ND-Not Detected

Appendix A-4d
Peter Cooper Markhams Site
RI/FS Work Plan
Summary of 1985 Phase II Data
Shallow Groundwater Characterization

Parameter (ug/l)	Sample Locations and Collection Date ⁽¹⁾			
	B-1(1S)	B-2(2S)	B-3(3S)	B-4(4S)
Halogenated Organic Scan (ECD) ⁽²⁾	6/6/1984	6/4/1984	6/1/1984	6/1/1984
Volatle Halogenated Organic Scan (Coulson's) ⁽³⁾	ND	ND	ND	0.023
	ND	62	18	27

NOTES:

- 1 Collected and analyzed by Recra Research
- 2 Unit of Measure-ug/l as Chlorine;Lindane Standard
- 3 Unit of Measure-ug/l as Carbon Tetrachloride Standard
- 4 ND-Not Detected

Appendix A-4d
Peter Cooper Markhams Site
RI/FS Work Plan
Summary of 1989 RI Data
Groundwater Characterization⁽¹⁾⁽³⁾ - Unfiltered Samples

Parameter (mg/L)	Sample Locations and Collection Date											
	1-Shallow				1-Deep				2-Shallow			
	9/9/1986	4/15/1987	7/13/1988	9/9/1986	4/15/1987	4/15/1987	4/15/1987	4/15/1987	9/10/1986	4/15/1987	7/13/1988	9/10/1986
Total Chromium	NA	0.083	0.008	NA	0.027	0.027	0.027	0.033	NA	NA	0.03	NA
Hexavalent Chromium	NA	0.008		NA					NA	NA	NA	NA
Arsenic	NA	0.033	0.08	NA					NA	NA	NA	NA
Zinc	NA	NA	0.49	NA	NA	NA	NA	NA	NA	NA	3.9	NA
Chloride	NA	9.2	NA	NA	82	NA	NA	NA	NA	NA	NA	NA
Sulfate	NA	840	NA	NA	140	NA	NA	NA	NA	NA	NA	NA

Organic Parameter (ug/L)	Sample Location & Collection Date		
	1-Shallow		
	9/10/1986	4/21/1987	7/13/1988
Bis (2-ethylhexyl)phthalate	NA	3.0	NA
N-nitrosodiphenylamine	NA	2.7	NA
Delta-BHC	NA	0.013	NA

NOTES: 1 Sample from Well 1S was also analyzed for HSL organics.

2 NA- Not Analyzed

3 Only those parameters/locations exhibiting detectable concentrations are presented.

4 Blank space-compound analyzed for but not detected.

Appendix A-4d
Peter Cooper Markhams Site
RI/FS Work Plan
Summary of 1989 RI Data
Groundwater Characterization ⁽¹⁾ - Unfiltered Samples

Parameter (mg/L)	Sample Locations and Collection Date											
	3-Shallow				3-Deep				4-Shallow			
	9/17/1986	4/15/1987	7/13/1988	4/15/1988	9/10/1987	7/13/1988	4/15/1988	9/10/1988	9/10/1986	4/15/1987	7/13/1988	8/31/1988
Total Chromium	NA	0.006		0.01	0.006		0.01	0.01	NA	NA	0.17	NA
Hexavalent Chromium	NA								NA		NA	0.05
Arsenic	NA	0.008		0.006					NA	0.005	NA	
Zinc	NA	NA		0.94	NA		0.01	80	NA	NA	NA	0.042
Chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.08
Sulfate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	8.7	NA
									NA	NA	81	NA

- NOTES:
- 1 Groundwater also collected and analyzed for HSL organics from Well 3S, Well 3D, Well 6S, and Well 6D. Results were less than the detection limit.
 - 2 NA-Not Analyzed
 - 3 Only those parameters/locations exhibiting detectable concentrations are presented.
 - 4 Blank space-compound analyzed for but not detected.

Appendix A-4d
Peter Cooper Markhams Site
RI/FS Work Plan
Summary of 1989 RI Data
Groundwater Characterization⁽¹⁾ - Unfiltered Samples

Parameter (mg/L)	Sample Locations and Collection Date											
	5-Shallow				5-Deep				6-Shallow			
	9/10/1986	4/15/1987	7/13/1988	9/10/1986	4/15/1987	7/13/1988	7/13/1988	7/13/1988	7/13/1988	8/31/1988	7/13/1988	7/13/1988
Total Chromium	NA	0.054	0.02	NA	0.007	0.02	0.02	0.05	0.04			
Hexavalent Chromium	NA			NA								
Arsenic	NA	0.059		NA						0.011		
Zinc	NA	NA	NA	NA	NA	0.02	0.02	0.03	0.02	0.08	0.02	0.01
Chloride	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

NOTES:

- 1 Groundwater also collected and analyzed for HSL organics from Well 3S, Well 3D, Well 6S, and Well 6D. Results were less than the detection limit.
- 2 NA-Not Analyzed
- 3 Only those parameters/locations exhibiting detectable concentrations are presented.
- 4 Blank space-compound analyzed for but not detected.

Appendix A-4d
Peter Cooper Markhams Site
RI/FS Work Plan
Summary of 1989 RI Data
Groundwater Characterization - Filtered Samples

Parameter (mg/L)	Sample Locations and Collection Date											
	1-Shallow				1-Deep				2-Shallow			
	9/9/1986	4/15/1987	7/13/1988	9/9/1986	4/15/1987	4/15/1987	7/13/1988	9/10/1986	9/10/1986	7/13/1988	9/10/1986	2-Deep Dup
Total Chromium	0.055	0.035	0.05	0.017	0.021	0.016	0.03	0.009	0.009	0.01	0.009	NA
Hexavalent Chromium	0.017	NA			NA	NA			0.009	NA	0.009	NA
Arsenic	0.025	NA	0.025		NA	NA			0.02	NA	0.021	NA
Zinc	0.038	NA	0.02	0.045	NA	NA	0.01	8.86	0.021	0.04	0.02	0.02
Calcium	NA	290	NA	NA	220	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	62	NA	NA	57	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	13	NA	NA	44	NA	NA	NA	NA	NA	NA	NA

- NOTES:
- 1 NA-Not Analyzed
 - 2 Only those parameters/locations exhibiting detectable concentrations are presented.
 - 3 Blank space-compound analyzed for but not detected.

Appendix A-4d
Peter Cooper Markhams Site
RI/FS Work Plan
Summary of 1989 RI Data
Groundwater Characterization - Filtered Samples

Parameter	Sample Locations and Collection Date												
	3-Shallow			3-Deep			4-Shallow			4-Deep			
	9/17/1986	4/15/1987	7/13/1988	4/15/1987	7/13/1988	4/15/1987	7/13/1988	9/10/1986	4/15/1987	9/10/1986	4/15/1987	7/13/1988	8/31/1988
Total Chromium		NA	0.01	NA	NA	0.01					0.007	0.01	
Hexavalent Chromium		NA		NA	NA				NA		NA	0.082	
Arsenic		NA		NA	NA				NA		NA		
Zinc	0.338	NA	0.39	NA	NA			10.5	NA	0.049	NA	0.08	0.02
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	58	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	11	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	26	NA	NA

NOTES:

- 1 NA-Not Analyzed
- 2 Only those parameters/locations exhibiting detectable concentrations are presented.
- 3 Blank space-compound analyzed for but not detected.

Appendix A-4d
Peter Cooper Markhams Site
RI/FS Work Plan
Summary of 1989 RI Data
Groundwater Characterization - Filtered Samples

Inorganic Parameter (mg/L)	Sample Locations and Collection Date										
	5-Shallow			5-Deep			6-Shallow			6-Deep	
	9/10/1986	4/15/1987	7/13/1988	9/10/1986	4/15/1987	7/13/1988	7/13/1988	8/31/1988	7/13/1988	7/13/1988	8/31/1988
Total Chromium		NA	0.02		NA	0.02		0.07	0.04	0.04	0.03
Hexavalent Chromium					NA			0.014			
Arsenic		NA			NA						
Zinc	0.032	NA		0.022	NA	0.01		0.02	0.03	0.02	
Calcium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

- NOTES:
- 1 NA-Not Analyzed
 - 2 Only those parameters/locations exhibiting detectable concentrations are presented.
 - 3 Blank space-compound analyzed for but not detected.

APPENDIX B-1

RI Laboratory Analytical Data Validation Reports

Data Validation Services

120 Cobble Creek Road P. O. Box 208

North Creek, N. Y. 12853

Phone 518-251-4429

Facsimile 518-251-4428

March 29, 2002

**Jennifer Hagen
Geomatrix Consultants
336 Harris Hill Rd.
Williamsville, NY 14221**

**RE: Validation of Peter Cooper Markham Site Data Packages—Aqueous samples
STI-Buffalo SDG Nos. A01-B908, and 100114**

Dear Ms. Hagen:

Review has been completed for the data packages generated by Severn Trent Laboratories which pertain to aqueous samples collected at the Peter Cooper Markham site. Seventeen groundwater samples were analyzed for TCL volatiles, TCL semivolatiles, TAL metals, hexavalent chromium, and eight geochemical parameters. The filtrate of one of the samples was also processed for soluble metals, hexavalent chromium, and organic carbon, and one sample was also processed for ferrous iron. Four surface water samples were analyzed for total arsenic and chromium, hexavalent chromium, and eight geochemical parameters. Additionally, field duplicates of each matrix were processed. Three equipment blanks were processed for all except the geochemical parameters, and trip blanks were processed for volatile analytes. Matrix spikes/duplicates were also processed. Methodologies used were those of the USEPA SW846.

Data validation was performed with guidance from the most current editions of the USEPA CLP National Functional Guidelines for Organic and Inorganic Data Review and the USEPA Region 2 SOPs HW-2 and HW-6. The following items were reviewed:

- * Data Completeness
- * Custody Documentation
- * Holding Times
- * Surrogate and Internal Standard Recoveries
- * Matrix Spike Recoveries/Duplicate Correlations
- * Field Duplicate Correlation
- * Preparation/Calibration Blanks
- * Control Spike/Laboratory Control Samples
- * Instrumental Tunes
- * Calibration Standards
- * Instrument IDLs
- * Method Compliance
- * Sample Result Verification

Those items showing deficiencies are discussed in the following sections of this report. All others were found to be acceptable as outlined in the above-mentioned validation procedures, and as applicable for the methodology. Unless noted specifically in the following text, reported results are substantiated by the raw data, and generated in compliance with protocol requirements.

In summary, most results are usable as reported, or with minor edits to nondetection or qualification as estimated. However, due to apparent matrix effect, some of the hexavalent chromium results reporting nondetection are rejected, and detected values are edited to nondetection. These issues are discussed in the following analytical sections.

Attached to this narrative are summaries of sample identification/requirements, and copies of laboratory case narratives. Also included in this submission are red-ink edited client results tables, reflecting validation qualifiers.

General

The metals digestates of samples 110701170 and 110701172 were incorrectly cross-labeled and results were reported with the other's identification. This was evident during validation because 110701172 is an equipment blank, and showed very high metals target analyte concentrations, and the field sample reported only calcium detection. The reversal was confirmed by the digestion log notations. Please see resubmission communications, and the edited sample report forms.

Equipment blanks were clean, with the exception of detection of calcium and sodium (discussed below).

Accuracy and precision determinations were acceptable for all fractions, with the exception of those for hexavalent chromium, most of which showed no spike recovery, and for mercury, which showed low recovery.

Blind field duplicates were processed as 120301184 and 120301185, 110801178 and 110801179, and 110601165 and 110601166, and involved evaluation of all analytes. All correlations were acceptable.

Data Completeness

Several items were requested for resubmission, including corrected results forms, QC summary forms, and raw data. These have been provided under separate cover to the client, and have also been incorporated with the validated data packages. Request communications and some revised report forms are attached to this report.

Some previously omitted metals and wet chemistry QC summary forms are still pending. The raw data have been reviewed for acceptability of those parameters, and validation completed.

Volatile Analyses by EPA 8260

Surrogate standard recoveries, internal standard responses, instrumental tunes, and blank responses were within required limits.

Calibration standard responses were within action guidelines, with the exception of low responses (37%D and 34%D) for dichlorodifluoromethane in calibration standards of 11/19/01 and 11/21/01. Results for that analyte in all groundwater samples except 110501157, 110501158, 110501159, and 110501160 are therefore qualified estimated ("UJ"), with a possible low bias. Reported nondetection results for analytes showing elevated standard responses are not affected.

Matrix spikes of sample 010801177 showed acceptable accuracy and precision. Laboratory Control Sample (LCS) recoveries were also acceptable.

Semivolatile Analyses by EPA 8270C

Holding times, surrogate standard recoveries, internal standard responses, and instrumental tunes were within required limits. Blanks showed no contamination.

Calibration standard responses were within action guidelines, with the exception of low responses (38%D) for 2,4-dinitrophenol. Results for that analyte in 110501157 through 110601167 are therefore qualified estimated ("UJ"), with a possible low bias. Reported nondetection results for analytes showing elevated standard responses are not affected.

Matrix spikes of samples 110501157 and 110801177 showed acceptable accuracy and precision. Laboratory Control Sample (LCS) recoveries were also acceptable.

Metals Analyses

Matrix spike and matrix spike duplicate accuracy and precision evaluations were performed for TAL metals on 110601163 (soluble) and 110801177, and for arsenic and chromium on 120301183, and showed acceptable recoveries and spiked duplicate correlations, with the exception of the mercury recoveries in 110801177 (73% and 60%). Results for mercury in the project samples are therefore qualified estimated ("J" and "UJ"). Mercury also showed low recovery (60%) in a low concentration CRA standard. No corrective action was required of the laboratory.

Due to presence in the associated equipment blank, detections of calcium and sodium in samples 110501157, 110501158, and 110501160 are considered contamination, and edited to nondetection at the elevated reporting limits corresponding to the originally reported values.

Sample results were reported to the project CRDLs, rather than IDLs. The ICP serial evaluation was performed only to the reported project CRDLs, with the initially provided IDL values only reflecting CRDLs. Actual IDLs were provided by the laboratory upon request, and the serial dilution results provided on the Forms 9 were reevaluated during validation for those analytes reporting detection above

CRDL. The recommended qualifications below include IDL evaluation where possible, but a more strict evaluation of matrix effect at low concentrations is not available for analytes.

ICP serial dilution evaluations of 110501160, 110601163 (soluble), 110601167, and 010801177 showed consistent outliers above 10%D, ranging to 25%D, for calcium, iron, and manganese. This can indicate matrix suppression. Detected results for these three analytes are therefore qualified estimated ("J"). Sample 110701170 was also evaluated for serial dilution, and showed outlying correlations for most elements evaluated. Results for the detected metals in that sample are to be qualified as estimated ("J"), and a strong matrix effect is suspected.

Due to low recoveries of the low level standard (CRI), results for lead in 110501157, 110501158, 110501159, and 110501160 are therefore qualified estimated ("UJ" and "J"), with a possible low bias.

Total and dissolved fraction results of 110601163 correlated well, with the exception of the values for selenium (total was below the reporting limit of 5 ppb, dissolved showed 11 ppb). Results for selenium in both fractions of that sample are therefore considered estimated ("J" and "UJ"), and used with caution.

Hexavalent Chromium, TOC, and other Wet Chemistry Analyses

Review was conducted for method compliance, holding times, transcription, calculations, standard and blank acceptability, accuracy and precision, etc., as applicable to each procedure. All were acceptable unless noted below.

Hexavalent chromium reporting limits were revised (from 10,000 ug/L to 10 ug/L) to reflect those utilized during sample analysis, and supported by the instrument QC. Sample results were also revised to reflect detected values above the corrected CRDL. This included a value for an equipment blank of 7.4 ug/L, and therefore, all detected values below 37 ug/L are edited back to nondetection ("U").

Some of the project samples exhibited interference in the hexavalent chromium analysis, and those sample results required correction for "turbidity." That matrix interference absorbances prohibit evaluation of the hexachrome content in some of the samples, as reflected by associated matrix spike recoveries. The spikes conducted (at 50 ppb) on sample 110601167, which produced a large turbidity blank absorbance, showed no recovery, and the result for that sample is not usable ("R"). Samples 110501157, 110601163 (total), and 110701169 also showed very large interferences, and the reported results are therefore also not usable ("R").

Matrix spikes of 110801177, a sample which also exhibited matrix interference, recovered at 22% and 20%. The spikes on sample 110501160, which showed a small amount of interference, recovered at 108%. Sample 110701173, which showed a similar amount of interference, showed recoveries of 13% and 11%). Sample 110801178 showed interference absorbance similar to those two, and the other groundwater samples in the project showed little or no interference, and nondetected results are not rejected, but qualified estimated ("UJ").

The single sample that was processed for soluble hexavalent chromium, 110601163, showed large interference in the unfiltered fraction, and none in the filtered fraction.

In many cases multiple turbidity blanks on a given sample were not consistent, with the variances exceeding the response contribution of the matrix spike. The inherent variance observed in the interference also affects the integrity of the reported low level detections of hexavalent chromium, as the calculated concentration is not very significant relative to the interference. All but one reported detections are edited to nondetection due to the equipment blank response. Additionally, it is noted that the surface water samples reported hexavalent chromium detections just above the reporting limit, although no total chromium was detected in the metals analysis at the same limit. Therefore results for both chromium and hexavalent chromium in those samples are qualified as estimated ("J" or "UJ").

Hexachrome absorbance in sample 110701169 exceeded the linear range of the instrument by almost sixfold, and should have been diluted. The turbidity blank of the sample showed absorbance fivefold higher. The calculated result for the sample showed "detection" at 321 ug/L, but the value/detection is to be considered suspect due to lack of established linearity of the system, and the matrix interference in the sample. The result has been qualified as tentative in identification and estimated in value ("NJ"; qualifier normally used for organic analyte results).

Hexavalent chromium matrix spikes of surface water 120301183 showed low recoveries (52% and 56%, below the 57% limit). Results for the surface water samples are therefore qualified estimated ("J" and "UJ").

Accuracy and precision for the geochemical parameters in 120301183 were acceptable. The TOC recoveries should have been reported on the summary sheet as 90% and 96%, not 90% and 0%.

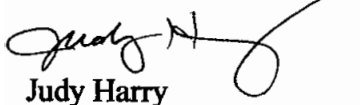
Accuracy and precision determinations for sulfate (110601161), nitrite (110501158), sulfide (110701173) were acceptable. The bicarbonate alkalinity recovery on 110601161 was low (68%), and the result for that analyte in the sample is qualified estimated ("J"). Batch QC determinations for the other analytes were acceptable.

Total and dissolved fraction results correlated well for 110601163, with the exception of that for TOC/SOC, where the filtered fraction showed higher concentrations than the unfiltered (5.6 ppm and 14 ppm). Results for TOC/SOC in this sample are therefore qualified estimated ("J").

With the exception of hexavalent chromium, no sample matrix spike/duplicate QC summaries were provided in SDG 110114. These are to be provided separately. The raw data were reviewed and project accuracy and precision are discussed above. Numerous method blank summaries were provided in SDG 110114, but there are no form entries to specify the applicable analysis or instrument.

Please do not hesitate to contact me if questions or comments arise during your review of this report.

Very truly yours,


Judy Harry

Data Validation Services

120 Cobble Creek Road P. O. Box 208

North Creek, NY 12853

Phone (518) 251-4429

Facsimile (518) 251-4428

March 7, 2002

Jeff Rohe
Severn Trent Laboratories
10 Hazlewood Dr.
Suite 106
Amherst, NY 14228

RE: Geomatrix Consultants-- Peter Cooper Markham site
SDG Nos. A01-A110, A01-A112, A01-9713, A01-B908, A01-9878, A01-9885, 100101,
100105, 100106, 100108, 100109, 100110, 100113, and 100114

Dear Mr. Rohe:

Review of the data packages noted above is in progress. The following items are needed to complete the validation review:

1. Sample client ID 101001028 was received with the samples in SDG 100108 for processing for As, Cr, and Cr+6. It is listed in the lab narrative, and appears to have undergone the preparation for metals and hexachrome (not totally evident due to no correlation between client ID and digestate ID available for that sample). However, no results were reported in the package or in the client tables. Please verify that the sample was processed, and submit report forms for both fractions.
2. Sample 110701172 (SDG 110114) is an equipment blank, but showed very high concentrations of metals. Actual field sample 110701170 showed only low calcium content. It therefore seems that a reversal may have occurred. Review of the descriptions on the ICP digestion log shows -170 to be colorless (although that sample was black in the field), and -172 was described as black (although submitted as an equipment blank). In an attempt to have usable data for the metals in all associated samples, we are trying to verify the series of events prior to analysis of these two samples. Please review these data, provide any additional input/documentation available, and provide a written statement regarding this situation.

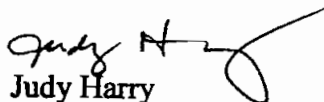
3. It is noted that the reporting limit used for hexavalent chromium in aqueous samples (i.e. SDGs 100114 and A01-B908) is one thousand fold above that evaluated in the lab (which showed detection limit of 10 ppb). Although, upon request the lab resubmitted sample detections below 10,000ppb and above 10 ppb, it is not evident whether the associated method blanks were also reviewed for values between those two concentrations. Please state whether any of the associated method blanks showed concentrations above 10 ppb. This is an important in that blanks should be evaluated to the same level as the samples to determine potential contamination.

Also please discuss whether there is any technical reason that a reporting limit of 10 ug/L could not be considered for this project. The matrix spikes are evaluated at levels (50 ppb) well below the reporting limit (10,000 ppb), and many failed (recoveries <10%), mandating rejection of associated nondetect data. As reported, that would be rejection of most project sample data, which report nondetection at 10,000 ug/L. However, failure of spikes to recover at 50 ppb does not imply an inability to detect **any** Cr+6 in the sample if it were present at 10,000 ppb, and rejection does not seem appropriate. Additionally, risk assessment evaluation involves assumption of sample consistency at the reported RL, and this level seems unnecessarily high.

4. Please complete and submit the required Forms 6 for precision of the metals matrix spikes for this project. Those for the aqueous samples are of greater urgency (see below).
5. Please provide the required IDL summaries for volatiles and semivolatile for the instruments used for this project.
6. The result for hexavalent chromium in soil sample 101001040 (SDG 100108) was reported as nondetection at 0.5 ppb. The raw data shows detection at 0.65 ppb. Please confirm, and provide a corrected report form for that sample if verified.

Thank you in advance for an expedited reply to this request. Item numbers 2., 3., and numbers 4. and 5. as they apply to aqueous samples, are of an urgent nature. Item numbers 1., 6., and numbers 4. and 5. as they apply to soils, are also urgent, although less so. Please provide copies of all communications to Jennifer Smith at Geomatrix.

Very truly yours,


Judy Harry

Data Validation Services

120 Cobble Creek Road P. O. Box 208

North Creek, NY 12853

Phone (518) 251 4420

Facsimile (518) 2

Facsimile Trans

Post-It® Fax Note	7671	Date	3-10-11	# of pages	1
To	Jennifer Hagen	From	Judy Harry		
Co./Dept.	Geomatrix	Co.	DVS		
Phone #	716	Phone #			
Fax #	716 565 0625	Fax #			

TO: Jeff Yohe

COMPANY: STL-Buffalo

FAX NUMBER: 716 691 7991

FROM: Judy Harry

DATE: 03-10-02

No. of pages (including cover): 1

COMMENTS: RE: Geomatrix Consultants
Peter Cooper Markham site

In addition to the resubmissions requested in my letter Friday, the following two items required of the deliverables are also needed for validation:

1. The TDS raw data for sample A01-B908-04 were not located.
2. The metals IDL summary Forms seem to list CRDL values for IDLs. The IDL values from your most recent study are required, and are needed for validation review. — for entire project.

Please forward at your earliest convenience to the fax number above, and send copies of responses to this and Friday's request to Jennifer Hagen at Geomatrix. Thank you.

Resolution to metals data validation issue.

<u>Client ID</u>	<u>Laboratory ID</u>	<u>Description</u>
110701172	A1B07206	Equipment Blank
110701170	A1B07205	Field Sample

After reviewing the hexavalent chromium analysis of these two samples it is apparent that an error occurred during the metals digestion process. Sample A1B07206 shows an absorbance of 0.000 indicating a clear sample volume consistent with the field blank. These two sample volumes were incorrectly labeled during the metals digestion process resulting in inconsistent metal results. Attached is a copy of the relevant page from the hexavalent chromium analysis logbook.

000005

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION
AND
ANALYTICAL REQUEST SUMMARY

LAB NAME: SEVERN TRENT LABORATORIES, INC.

CUSTOMER SAMPLE ID	LABORATORY SAMPLE ID	ANALYTICAL REQUIREMENTS					
		VOA GC/MS	BNA GC/MS	VOA GC	PEST PCB	METALS	WATER QUALITY
110501157	A1A93801	SW8463	SW8463	-	-	SW8463	CFR136
110501158	A1A93802	SW8463	SW8463	-	-	SW8463	CFR136
110501159	A1A93803	SW8463	SW8463	-	-	SW8463	SW8463
110501160	A1A93804	SW8463	SW8463	-	-	SW8463	CFR136
110601161	A1A98401	SW8463	SW8463	-	-	SW8463	CFR136
110601162	A1A98402	SW8463	SW8463	-	-	SW8463	CFR136
110601163	A1A98403	SW8463	SW8463	-	-	SW8463	CFR136
110601164	A1A98404	SW8463	SW8463	-	-	SW8463	CFR136
110601165	A1A98405	SW8463	SW8463	-	-	SW8463	CFR136
110601166	A1A98406	SW8463	SW8463	-	-	SW8463	CFR136
110601167	A1A98407	SW8463	SW8463	-	-	SW8463	CFR136
110701168	A1B07201	SW8463	SW8463	-	-	SW8463	CFR136
110701169	A1B07202	SW8463	SW8463	-	-	SW8463	CFR136
110701170	A1B07205	-	-	-	-	SW8463	CFR136
110701171	A1B07203	SW8463	SW8463	-	-	SW8463	CFR136
110701172	A1B07206	SW8463	SW8463	-	-	SW8463	CFR136
110701173	A1B07204	SW8463	SW8463	-	-	SW8463	CFR136
110801177 <i>CE 11/30/11</i>	A1B13901	SW8463	SW8463	-	-	SW8463	CFR136
110801178	A1B13902	SW8463	SW8463	-	-	SW8463	CFR136
110801179	A1B13903	-	-	-	-	-	CFR136

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION
AND
ANALYTICAL REQUEST SUMMARY

110801180	A1B13904	SW8463	SW8463	-	-	SW8463	CFR136
110801181	A1B13905	SW8463	SW8463	-	-	SW8463	CFR136
110801182	A1B13906	SW8463	SW8463	-	-	SW8463	CFR136

NYSDEC-1

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

000004

SAMPLE IDENTIFICATION
AND
ANALYTICAL REQUEST SUMMARY

LAB NAME: SEVERN TRENT LABORATORIES, INC.

CUSTOMER SAMPLE ID	LABORATORY SAMPLE ID	ANALYTICAL REQUIREMENTS					
		VOA GC/MS	BNA GC/MS	VOA GC	PEST PCB	METALS	WATER QUALITY
120301183	A1B90801	-	-	-	-	SW8463	CFR136
120301184	A1B90802	-	-	-	-	SW8463	CFR136
120301185	A1B90803	-	-	-	-	SW8463	CFR136
120301186	A1B90804	-	-	-	-	SW8463	CFR136

NYSDEC-1

000002

SDG NARRATIVE

Laboratory Name: STL Buffalo

Laboratory Code: STL Buffalo

Contract Number: NY00-433

Sample Identifications: 110501157
110501158
110501159
110501160
110601161
110601162
110601163
110601164
110601165
110601166
110601167
110701168
110701169
110701170
110701171
110701172
110701173
110801177
110801178
110801179
110801180
110801181
110801182

METHODOLOGY

The specific methodologies employed in obtaining the enclosed analytical results are indicated on the specific data tables. The method numbers presented refer to the following U.S. Environmental Protection Agency references:

- "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846), Third Edition, Update III, December 1996, U.S. Environmental Protection Agency Office of Solid Waste.
- 40 CFR Part 136 "Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act" October 26, 1984 (Federal Register) United States Environmental Protection Agency.
- "Standard Methods for the Examination of Water and Wastewater", 19th ed., 1995.

000003

COMMENTS

The enclosed data has been reported utilizing data qualifiers (Q) as defined on the Data Comment Page.

The following STL Buffalo jobs are included in this report: A01-A938, A01-A984, A01-B072 and A01-B139.

Sample dilutions were performed for Wet Chemistry as indicated on the attached Dilution Log. The rationale for dilution is specified by the 3-digit code and definition.

Four coolers were received at a temperature of 4°C.

During sample log in, client sample 110801177 was incorrectly logged in as 11080117. The hardcopy of the report has been manually corrected, the electronic deliverable data diskette also reflects this correction.

Deviations from protocol were encountered for the following:

VOLATILE DATA

All samples were preserved to a pH less than 2.

SEMIVOLATILE DATA

The initial calibration standard curve analyzed on 09/26/2001 exhibited a %RSD for several compounds as greater than 15%. However, the mean RSD for all compounds is 8.65%.

The initial calibration standard curve analyzed on 10/31/2001 exhibited a %RSD for Atrazine and Caprolactam as greater than 15%. Linear regression was used to calculate the concentration of these compounds when detected, however, these compounds were not detected in the associated samples.

METALS DATA

Sample 110701172 was analyzed at a dilution factor of 100 for Iron and Zinc due to the original results exceeding the linear range of the curve. Sample 110701172 was also analyzed on ICP/MS for Thallium due to strong interference on the ICP. As a result, the sample was confirmed, therefore, the ICP data was reported from the diluted run.

Sample 110601163 MS exhibited spike recovery results above quality control limits for Potassium and Sodium. However, the Laboratory Fortified Blank (LFB) was compliant.

Samples 110601163 MS and 110601163 SD exhibited spike recovery results above quality control limits for Potassium and below quality control limits for Mercury. However, the LFB was compliant.

000064

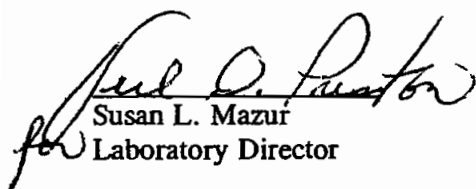
WET CHEMISTRY DATA

There was insufficient volume of samples 11080117, 110801178, 110801179, 110801180, 110801181 and 110801182 for duplicate analyses of Iron.

Samples 110701169 and 110701171 contained a high amount of settleable material for Total Dissolved Solids (TDS).

Samples 11080117 MS and 11080117 SD exhibited spike recovery results below quality control limits for Hexavalent Chromium due to matrix interference. However, the Laboratory Control Sample (LCS) was compliant.

"I certify that this data package is in compliance with the terms and conditions of the contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Director or her designee, as verified by the following signature."


Susan L. Mazur
for Laboratory Director

12/05/01
Date

The results presented in this report relate only to the analytical testing and condition of the sample at receipt. This report pertains to only those samples actually tested. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

CASE NARRATIVE

Laboratory Name: STL Buffalo

000002

Laboratory Code: STL Buffalo

Contract Number: NY00-433

Sample Identifications: 120301183
120301183 MS
120301183 SD
120301184
120301185
120301186

METHODOLOGY

The specific methodologies employed in obtaining the enclosed analytical results are indicated on the specific data tables. The method numbers presented refer to the following U.S. Environmental Protection Agency references:

- "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846), Third Edition, Update III, December 1996, U.S. Environmental Protection Agency Office of Solid Waste.
- 40 CFR Part 136 "Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act" October 26, 1984 (Federal Register) United States Environmental Protection Agency.

COMMENTS

The enclosed data has been reported utilizing data qualifiers (Q) as defined on the Data Comment Page.

Sample dilutions were performed for Wet Chemistry as indicated on the attached Dilution Log. The rationale for dilution is specified by the 3-digit code and definition.

The cooler was received at a temperature of 8°C.

No deviations from protocol were encountered for Metals Data analyses.

Deviations from protocol were encountered for the following:

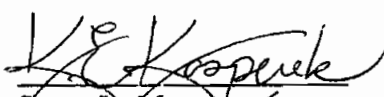
WET CHEMISTRY DATA

Due to Matrix interference, samples 120301183 MS and 120301183 SD exhibited spike recovery results below quality control limits for Hexavalent Chromium. Sample 120301183 SD exhibited spike recovery results below quality control limits for Total Organic Carbon. The relative percent difference (RPD) for spike recovery between the samples was outside quality control limits for Total Organic Carbon. Both samples were reanalyzed to confirm original results.

000003

QA/QC STATEMENT

"I certify that this data package is in compliance with the terms and conditions of the contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Director or her designee, as verified by the following signature."


Susan L. Mazur
Laboratory Director

12/20/2001
Date

The results presented in this report relate only to the analytical testing and condition of the sample at receipt. This report pertains to only those samples actually tested. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

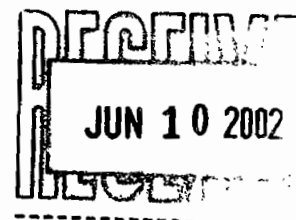
Data Validation Services

120 Cobble Creek Road P. O. Box 208

North Creek, N. Y. 12853

Phone 518-251-4429

Facsimile 518-251-4428



May 15, 2002; Revised June 5, 2002

Jennifer Hagen
Geomatrix Consultants
336 Harris Hill Rd.
Williamsville, NY 14221

RE: Validation of Peter Cooper Markham Site Data Packages Soil, Sediment, and SPLP samples
STI-Buffalo SDG Nos. A01-A110, A01-A112, A01-9713, A01-B078, A01-9878, A01-9885,
100101, 100103, 100105, 100106, 100108, 100109, 100110, and 100113

Dear Ms. Hagen:

Review has been completed for the data packages generated by Severn Trent Laboratories that pertain to soil/solid samples collected 10/01/01 through 10/15/01 at the Peter Cooper Markham site. Samples were analyzed for various combinations of the following analytes: CLP TCL volatiles by EPA 8260B, CLP TCL semivolatiles by EPA 8270C, arsenic, chromium, hexavalent chromium, Total Organic Carbon (TOC), manganese only, and cation exchange capacity. Several leachates were processed for arsenic, chromium, and hexavalent chromium. Sample matrix spikes/duplicates and blind field duplicates were also processed. TOC analyses were subcontracted to STL-Corpus Christi.

Data validation was performed with guidance from the most current editions of the USEPA CLP National Functional Guidelines for Organic and Inorganic Data Review, the USEPA Region 2 SOPs HW-2 and HW-6, and the analysis protocols. The following items were reviewed:

- * Data Completeness
- * Custody Documentation
- * Holding Times
- * Surrogate and Internal Standard Recoveries
- * Matrix Spike Recoveries/Duplicate Correlations
- * Field Duplicate Correlation
- * Preparation/Calibration Blanks
- * Control Spike/Laboratory Control Samples
- * Instrumental Tunes
- * Calibration Standards
- * Instrument IDLs
- * Method Compliance
- * Sample Result Verification

Those items showing deficiencies are discussed in the following sections of this report. All others were found to be acceptable as outlined in the above-mentioned validation procedures, and as applicable for the methodology. Unless noted specifically in the following text, reported results are substantiated by the raw data, and generated in compliance with protocol requirements.

In summary, most results are usable as reported, or with minor edits to nondetection or qualification as estimated. However, due to an apparent matrix effect, most of the hexavalent chromium results are not usable. These issues are discussed in the following analytical sections.

Attached to this narrative are summaries of sample identification/requirements, copies of the laboratory case narratives, and resubmission communications. Also included in this submission are red-ink edited client results tables, reflecting validation qualifiers.

The unique numerical suffixes of the client ID are referenced within this report.

General

Sample 101001028 was processed and reported in the data package as 101001098. The corrected laboratory report forms are attached.

Accuracy and precision matrix spike evaluations were acceptable for semivolatile analytes. Those for volatiles were submitted, but not processed. Most of those analyzed for hexavalent chromium showed no spike recovery. Arsenic and chromium showed minor outlying recoveries in several samples. Duplicate correlations were acceptable. The metals Forms 6 summarizing laboratory duplicates were provided as a resubmission upon request.

Blind field duplicates evaluating precision of volatile and semivolatile analytes were processed as -106 and -107. Field duplicates for arsenic, chromium, and hexavalent chromium were processed as -011/-012, -031/-032, -052/-053, -073/-074, and -094/-095. Arsenic and chromium were also evaluated with -137/-138, and those evaluating manganese were processed as -015/-016. All correlations were acceptable, although the arsenic and chromium variances in -031/-032 were just below the validation action level (and are about threefold different), and those for the leachate showed detections above and below CRDL for hexavalent chromium. Please see the discussion later regarding that analyte.

Samples -055, -056, -058, -126, -127, -128, and -129 had solids content below 30%; all were above 10%. This can prohibit homogenous sampling at collection or during processing. There may be an inherent bias to the reported results for these samples.

Data Completeness

Many items were requested for resubmission, including corrected results forms, QC summary forms, and raw data. They are attached to this report.

The laboratory receipt date and time were not present on some of the external custodies.

Volatile Analyses by EPA 8260

Surrogate standard recoveries, internal standard responses, instrumental tunes, and blank responses were within required limits.

Due to presence in the method blank, all detected results for methylene chloride, all but one for 2-butanone, and four of those for acetone, in the samples are considered external contamination, and are edited to reflect nondetection.

Calibration standard responses were within action guidelines, with the exception of low responses (31%D) for bromomethane. Results for that analyte in the samples are qualified estimated, with a possible low bias. Reported nondetection results for analytes showing elevated standard responses are not affected.

Sample -102 was submitted for matrix spike processing, but this was not performed. There is no notation in the laboratory case narrative regarding this issue. Although the matrix is therefore not evaluated for volatile analyte recovery, the surrogate and internal standard responses showed that there is little matrix effect, and the field duplicate precision was good. Laboratory Control Samples were spiked with all analytes, and showed good recoveries.

Tentatively Identified Compounds (TICs) reported as septa bleed or hexane are external contamination, and should be rejected from consideration as sample components.

Semivolatile Analyses by EPA 8270C

Holding times, surrogate standard recoveries, internal standard responses, and instrumental tunes were within required limits.

Detections of diethylphthalate are considered external contamination, and edited to nondetection, as indicated by presence in the associated method blank.

Calibration standard responses were within validation action guidelines. Reported nondetection results for analytes showing elevated standard responses are not affected.

Matrix spikes of sample -102 showed acceptable accuracy and precision. Laboratory Control Sample (LCS) recoveries were also acceptable.

Total and SPLP Arsenic and Chromium Analyses

The soil matrix spikes of -054, -055, -093, -096, -118, and -139 were acceptable. Those for -022 showed elevated recovery for arsenic (216% and 157%), and the matrix spikes of -075 produced low recovery for arsenic (68% and 72%). Results for arsenic in the samples in SDG 100106 and in the first twenty of SDG 100110 are qualified estimated. Those for -133 showed elevated recoveries for chromium (128% and 172%), and results for chromium in the fourteen samples in SDG 100113 are qualified estimated.

The matrix spikes on the SPLP leachate of -022 were acceptable. Those performed on the leachate of -012 showed outlying chromium recoveries, likely due in part to the relatively high sample concentration (just within the action level of four times the spike amount). The chromium result in that leachate is qualified as estimated. Post-digest spikes of the SPLP leachate of -026 were acceptable.

Manganese matrix spikes of -008 and -016 could not be evaluated due to high sample concentrations. Duplicate correlations were acceptable.

Sample results were reported to the project CRDLs, rather than IDLs. The ICP serial evaluation was performed only to the reported project CRDLs, with the initially provided IDL values only reflecting CRDLs. Actual IDLs were provided by the laboratory upon request, and the serial dilution results provided on the Forms 9 were reevaluated during validation for those analytes reporting detection above CRDL. The recommended qualifications below include IDL evaluation where possible, but a more strict evaluation of matrix effect at low concentrations is not available for analytes.

The ICP serial dilution evaluations of soil samples -008, -016, -054, -055, -096, -097, -012, and -018 were acceptable, as were the evaluations on the leachates of the latter two. The serial dilutions of -075, and -145 showed elevated correlation for chromium of 12%D and 19%D, and chromium detections in twenty samples reported in SDG 100110 and six in SDG A01-A110 are qualified as estimated. The chromium result for -093 is also qualified estimated due to elevated serial dilution in the sample (84%D).

Hexavalent Chromium, CEC, and TOC

Review was conducted for method compliance, holding times, transcription, calculations, standard and blank acceptability, accuracy and precision, etc., as applicable to each procedure. All were acceptable unless noted below.

TOC results for samples collected 10/10/01 and 10/11/01 are qualified estimated, with a possible low bias due to elevated temperatures at sample receipt.

The majority of the samples showed interferences in the hexavalent chromium analysis that are well above ten times the reporting limit, and required "turbidity" blank subtraction. In some cases, the absorbance exceeded the linear range, by up to a factor of four. Those samples should have been diluted and reanalyzed (per protocol, and as shown by the loss of interference shown with the 1:100 dilutions of sample insoluble spikes). The interference readings in the sample turbidity blanks often exceeded those of the reacted samples themselves, and the final determining response value for most samples was either net negative, or a response that is insignificant relative to the magnitude and deviation of the interference. Review of the individual cases of samples reporting detection shows in each case that the response cannot be reliably considered as having resulted from hexavalent chromium. They should therefore be edited to nondetection at the originally reported concentration. However, these nondetections are also not reliable data due to the matrix spike failures, as discussed below.

Hexavalent chromium matrix spikes were performed on samples -018, -075, -093, -118, and -120. In all cases except one (-075), the soluble chromium matrix spikes performed at a concentration one hundred times the reporting limit did not recover. In two of these (-018 and -118), the insoluble

chromium spikes that were performed at a concentration about 2000 times the reporting limit also did not recover. In some cases, the lack of recoveries are due to the fact that the sample interference was high enough to mask response from the spike (see paragraph above). However, sample -120 did not show high interference absorbance, and the soluble spikes still failed to recover, possibly indicating that the matrix reduces hexavalent chromium to trivalent. No evidence is found of the lab processing post-digestion matrix spikes, which would have helped in the evaluation. As reported, and with the information available, the majority of the reported nondetections and detections of hexachrome are to be rejected. The samples in SDGs 100101 and 100110 (subsurface perimeter soils) seem to have consistently low interference, and the matrix spikes of -075 recovered, although low at 25%. Therefore results for these samples have been qualified only as estimated, but those results should be used with great caution.

It can be said that the concentration of hexavalent chromium in the project samples will not exceed the total value determined in the metals analysis. Elevated reporting limits based on those values can be used.

An aqueous hexachrome batch QC matrix spike associated with the SPLP of -026 showed only 26% recovery. The project leachate showed high interference absorbance. No leachate blank was processed with the SPLP hexavalent chromium analyses, and it is not known whether the interference is related to the sample or the leaching procedure, or both. The sample result is qualified as estimated.

Lab narratives/noncompliance summaries should have discussed the poor recoveries observed with the hexachrome matrix spikes. Some of quality control criteria discussed in the analysis protocols were not followed (i.e. dilution of samples exhibiting interference, level of insoluble spikes, LCS recovery acceptance range, post-digestion spikes, etc.).

The QC summary form reported no recovery for the aqueous hexavalent chromium LCS associated with the equipment blank of 10/09/01. Raw data show acceptable recovery (95%) for that LCS.

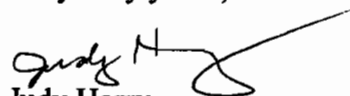
TOC duplicate evaluations of -064 are acceptable.

TOC results initially reported as "mg/L" were corrected to reflect the units of "%".

Several errors in reported values and matrix spike results for hexavalent chromium were observed and addressed during review (see attached communications).

Please do not hesitate to contact me if questions or comments arise during your review of this report.

Very truly yours,


Judy Harry

Sample ID Summaries and Laboratory Case Narratives

000004

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION
AND
ANALYTICAL REQUEST SUMMARY

LAB NAME: SEVERN TRENT LABORATORIES, INC.

CUSTOMER SAMPLE ID	LABORATORY SAMPLE ID	ANALYTICAL REQUIREMENTS					
		VOA GC/MS	BN-A GC/MS	VOA GC	PEST PCB	METALS	WATER QUALITY
100201003	A1958901	-	-	-	-	SW8463	SW8463
100201004	A1958902	-	-	-	-	SW8463	SW8463
100201005	A1958903	-	-	-	-	SW8463	SW8463
10051009	A1971401	-	-	-	-	SW8463	SW8463
10051010	A1971402	-	-	-	-	SW8463	SW8463
10051013	A1971403	-	-	-	-	SW8463	SW8463
100901019	A1988701	-	-	-	-	SW8463	SW8463
100901020	A1988702	-	-	-	-	SW8463	SW8463
100901021	A1988703	-	-	-	-	SW8463	SW8463
100901023	A1988704	-	-	-	-	SW8463	SW8463
100901024	A1988705	-	-	-	-	SW8463	SW8463
100901025	A1988706	-	-	-	-	SW8463	SW8463

NYSDEC-1

000002

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATIONSAMPLE IDENTIFICATION
AND
ANALYTICAL REQUEST SUMMARY

.B NAME: SEVERN TRENT LABORATORIES, INC.

CUSTOMER SAMPLE ID	LABORATORY SAMPLE ID	ANALYTICAL REQUIREMENTS					
		VOA GC/MS	BNA GC/MS	VOA GC	PEST PCB	METALS	WATER QUALITY
100101001	A1963701	-	-	-	-	SW8463	OTHER
100101002	A1963702	-	-	-	-	SW8463	OTHER
100401006	A1971501	-	-	-	-	SW8463	OTHER
100401008	A1971502	-	-	-	-	SW8463	OTHER
100801014	A1981501	-	-	-	-	SW8463	OTHER
100801015	A1981502	-	-	-	-	SW8463	OTHER
100901027	A1988901	-	-	-	-	SW8463	OTHER

NYSDEC-1

000000\$

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATIONSAMPLE IDENTIFICATION
AND
ANALYTICAL REQUEST SUMMARY

LAB NAME: SEVERN TRENT LABORATORIES, INC.

CUSTOMER SAMPLE ID	LABORATORY SAMPLE ID	ANALYTICAL REQUIREMENTS					
		VOA GC/MS	BNA GC/MS	VOA GC	PEST PCB	METALS	WATER QUALITY
100401006	A1971101	-	-	-	-	SW8463	SW8463
100401008	A1971102	-	-	-	-	SW8463	SW8463
100801014	A1976301	-	-	-	-	SW8463	SW8463
100801015	A1976302	-	-	-	-	SW8463	SW8463
100801016	A1976303	-	-	-	-	SW8463	SW8463

NYSDEC-1

000004

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION
AND
ANALYTICAL REQUEST SUMMARY

LAB NAME: SEVERN TRENT LABORATORIES, INC.

CUSTOMER SAMPLE ID	LABORATORY SAMPLE ID	ANALYTICAL REQUIREMENTS					
		VOA GC/MS	BNA GC/MS	VOA GC	PEST PCB	METALS	WATER QUALITY
100401007	A1971301	-	-	-	-	SW8463	SW8463

NYSDEC-1

000004

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION
AND
ANALYTICAL REQUEST SUMMARY

AB NAME: SEVERN TRENT LABORATORIES, INC.

CUSTOMER SAMPLE ID	LABORATORY SAMPLE ID	ANALYTICAL REQUIREMENTS					
		VOA GC/MS	BNA GC/MS	VOA GC	PEST PCB	METALS	WATER QUALITY
100901017	A1987801	-	-	-	-	SW8463	SW8463

NYSDEC-1

000004

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATIONSAMPLE IDENTIFICATION
AND
ANALYTICAL REQUEST SUMMARY

LAB NAME: SEVERN TRENT LABORATORIES, INC.

CUSTOMER SAMPLE ID	LABORATORY SAMPLE ID	ANALYTICAL REQUIREMENTS					
		VOA GC/MS	BNA GC/MS	VOA GC	PEST PCB	METALS	WATER QUALITY
100901026	A1988501	-	-	-	-	SW8463	SW8463

NYSDEC-1

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

000004

SAMPLE IDENTIFICATION
AND
ANALYTICAL REQUEST SUMMARY

LAB NAME: SEVERN TRENT LABORATORIES, INC.

CUSTOMER SAMPLE ID	LABORATORY SAMPLE ID	ANALYTICAL REQUIREMENTS					
		VOA GC/MS	BNA GC/MS	VOA GC	PEST PCB	METALS	WATER QUALITY
101501134	A1A11001	-	-	-	-	SW8463	-
101501141	A1A11002	-	-	-	-	SW8463	-
101501142	A1A11003	-	-	-	-	SW8463	-
101501143	A1A11004	-	-	-	-	SW8463	-
101501144	A1A11005	-	-	-	-	SW8463	-
101501145	A1A11006	-	-	-	-	SW8463	-

NYSDEC-1

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

000004

SAMPLE IDENTIFICATION
AND
ANALYTICAL REQUEST SUMMARY

LAB NAME: SEVERN TRENT LABORATORIES, INC.

CUSTOMER SAMPLE ID	LABORATORY SAMPLE ID	ANALYTICAL REQUIREMENTS					
		VOA GC/MS	BNA GC/MS	VOA GC	PEST PCB	METALS	WATER QUALITY
101501135	A1A11201	-	-	-	-	SW8463	-
101501136	A1A11202	-	-	-	-	SW8463	-
101501137	A1A11203	-	-	-	-	SW8463	-
101501138	A1A11204	-	-	-	-	SW8463	-
101501139	A1A11205	-	-	-	-	SW8463	-
101501140	A1A11206	-	-	-	-	SW8463	-
101501146	A1A11208	-	-	-	-	SW8463	-
101501147	A1A11207	-	-	-	-	SW8463	-
101501148	A1A11209	-	-	-	-	SW8463	-
101501149	A1A11210	-	-	-	-	SW8463	-

NYSDEC-1

000003A

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION
AND
ANALYTICAL REQUEST SUMMARY

LAB NAME: SEVERN TRENT LABORATORIES, INC.

CUSTOMER SAMPLE ID	LABORATORY SAMPLE ID	ANALYTICAL REQUIREMENTS					
		VOA GC/MS	BNA GC/MS	VOA GC	PEST PCB	METALS	WATER QUALITY
100501011	A1972301	-	-	-	-	SW8463	SW8463
100501012	A1972302	-	-	-	-	SW8463	SW8463
100901018	A1988201	-	-	-	-	SW8463	SW8463
100901022	A1988202	-	-	-	-	SW8463	SW8463

NYSDEC-1

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION
AND
ANALYTICAL REQUEST SUMMARY

LAB NAME: SEVERN TRENT LABORATORIES, INC.

CUSTOMER SAMPLE ID	LABORATORY SAMPLE ID	ANALYTICAL REQUIREMENTS					
		VOA GC/MS	BNA GC/MS	VOA GC	PEST PCB	METALS	WATER QUALITY
101001030	A1A03403	-	-	-	-	SW8463	SW8463
101001031	A1A03404	-	-	-	-	SW8463	SW8463
101001032	A1A03405	-	-	-	-	SW8463	SW8463
101001033	A1A03406	-	-	-	-	SW8463	SW8463
101001034	A1A03407	-	-	-	-	SW8463	SW8463
101001035	A1A03408	-	-	-	-	SW8463	SW8463
101001037	A1A03701	-	-	-	-	SW8463	OTHER
101001038	A1A03409	-	-	-	-	SW8463	SW8463
101001040	A1A03410	-	-	-	-	SW8463	SW8463
101001041	A1A03411	-	-	-	-	SW8463	SW8463
101001042	A1A03412	-	-	-	-	SW8463	SW8463
101001043	A1A03413	-	-	-	-	SW8463	SW8463
101001044	A1A03414	-	-	-	-	SW8463	SW8463
101001046	A1A03415	-	-	-	-	SW8463	SW8463
101001048	A1A03416	-	-	-	-	SW8463	SW8463
101001050	A1A03417	-	-	-	-	SW8463	SW8463
101001052	A1A03418	-	-	-	-	SW8463	SW8463
101001053	A1A03419	-	-	-	-	SW8463	SW8463
101001054	A1A03420	-	-	-	-	SW8463	SW8463
101001055	A1A03421	-	-	-	-	SW8463	SW8463

000007

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION
AND
ANALYTICAL REQUEST SUMMARY

101001057	A1A03422	-	-	-	-	SW8463	SW8463
101001058	A1A03423	-	-	-	-	SW8463	SW8463
101001059	A1A03424	-	-	-	-	SW8463	SW8463
101001060	A1A03425	-	-	-	-	SW8463	SW8463
101001062	A1A03426	-	-	-	-	SW8463	SW8463
101001064	A1A03702	-	-	-	-	SW8463	OTHER
101001065	A1A03703	-	-	-	-	SW8463	OTHER
101001066	A1A03704	-	-	-	-	SW8463	OTHER
101001067	A1A03705	-	-	-	-	SW8463	OTHER
101001068	A1A03706	-	-	-	-	SW8463	OTHER
101001069	A1A03427	-	-	-	-	SW8463	SW8463
101001071	A1A03428	-	-	-	-	SW8463	SW8463
101001073	A1A03429	-	-	-	-	SW8463	SW8463
101001074	A1A03430	-	-	-	-	SW8463	SW8463
101001076	A1A03431	-	-	-	-	SW8463	SW8463
101001078	A1A03432	-	-	-	-	SW8463	SW8463
101001080	A1A03433	-	-	-	-	SW8463	SW8463
101001082	A1A03434	-	-	-	-	SW8463	SW8463
101001083	A1A03435	-	-	-	-	SW8463	SW8463
101001084	A1A03436	-	-	-	-	SW8463	SW8463
101001085	A1A03437	-	-	-	-	SW8463	SW8463
101001086	A1A03438	-	-	-	-	SW8463	SW8463
101001087	A1A03439	-	-	-	-	SW8463	SW8463
101001088	A1A03440	-	-	-	-	SW8463	SW8463
101001090	A1A03441	-	-	-	-	SW8463	SW8463
101001092	A1A03707	-	-	-	-	SW8463	OTHER

000008

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION
AND
ANALYTICAL REQUEST SUMMARY

101001093	A1A03442	-	-	-	-	SW8463	SW8463
101001096	A1A03708	-	-	-	-	SW8463	OTHER
101001098	A1A03401	-	-	-	-	SW8463	SW8463
101201097	A1A04301	-	-	-	-	SW8463	SW8463
10120197	A1A55501	-	-	-	-	-	OTHER

NYSDEC-1

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION
AND
ANALYTICAL REQUEST SUMMARY

AB NAME: SEVERN TRENT LABORATORIES, INC.

CUSTOMER SAMPLE ID	LABORATORY SAMPLE ID	ANALYTICAL REQUIREMENTS					
		VOA GC/MS	BNA GC/MS	VOA GC	PEST PCB	METALS	WATER QUALITY
101201098	A1A03201	SW8463	SW8463	-	-	SW8463	CFR136
101201100	A1A03202	SW8463	SW8463	-	-	SW8463	CFR136
101201102	A1A03203	SW8463	SW8463	-	-	SW8463	CFR136
101201104	A1A03204	SW8463	SW8463	-	-	SW8463	CFR136
101201106	A1A03205	SW8463	SW8463	-	-	SW8463	CFR136
101201107	A1A03206	SW8463	SW8463	-	-		CFR136
101201109	A1A03207	SW8463	SW8463	-	-	SW8463	CFR136
101201111	A1A03208	SW8463	SW8463	-	-	SW8463	CFR136
101201113	A1A03209	SW8463	SW8463	-	-	SW8463	CFR136
101201115	A1A03210	SW8463	SW8463	-	-	SW8463	CFR136
101201118	A1A03211	SW8463	SW8463	-	-	SW8463	CFR136
101501151	A1A50501			-	-	-	OTHER
101501154	A1A50502			-	-	-	OTHER
101501155	A1A50503			-	-	-	OTHER
101501156	A1A50504			-	-	-	OTHER

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION
AND
ANALYTICAL REQUEST SUMMARY

LAB NAME: SEVERN TRENT LABORATORIES, INC.

CUSTOMER SAMPLE ID	LABORATORY SAMPLE ID	ANALYTICAL REQUIREMENTS					
		VOA GC/MS	BNA GC/MS	VOA GC	PEST PCB	METALS	WATER QUALITY
101001029	A1A03301	-	-	-	-	SW8463	SW8463
101001036	A1A03302	-	-	-	-	SW8463	SW8463
101001039	A1A03303	-	-	-	-	SW8463	SW8463
101001045	A1A03304	-	-	-	-	SW8463	SW8463
101001047	A1A03305	-	-	-	-	SW8463	SW8463
101001049	A1A03306	-	-	-	-	SW8463	SW8463
101001051	A1A03307	-	-	-	-	SW8463	SW8463
101001056	A1A03308	-	-	-	-	SW8463	SW8463
101001061	A1A03309	-	-	-	-	SW8463	SW8463
101001063	A1A03310	-	-	-	-	SW8463	SW8463
101001070	A1A03311	-	-	-	-	SW8463	SW8463
101001072	A1A03312	-	-	-	-	SW8463	SW8463
101001075	A1A03313	-	-	-	-	SW8463	SW8463
101001077	A1A03314	-	-	-	-	SW8463	SW8463
101001079	A1A03315	-	-	-	-	SW8463	SW8463
101001081	A1A03316	-	-	-	-	SW8463	SW8463
101001089	A1A03317	-	-	-	-	SW8463	SW8463
101001091	A1A03318	-	-	-	-	SW8463	SW8463
101001094	A1A03319	-	-	-	-	SW8463	SW8463
101001095	A1A03320	-	-	-	-	SW8463	SW8463

000006

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION
AND
ANALYTICAL REQUEST SUMMARY

101201099	A1A04201	-	-	-	-	SW8463	SW8463
101201101	A1A04202	-	-	-	-	SW8463	SW8463
101201103	A1A04203	-	-	-	-	SW8463	SW8463
101201105	A1A04204	-	-	-	-	SW8463	SW8463
101201108	A1A04205	-	-	-	-	SW8463	SW8463
101201110	A1A04206	-	-	-	-	SW8463	SW8463
101201112	A1A04207	-	-	-	-	SW8463	SW8463
101201114	A1A04208	-	-	-	-	SW8463	SW8463
101201116	A1A04209	-	-	-	-	SW8463	SW8463
101201117	A1A04210	-	-	-	-	SW8463	SW8463
101201119	A1A04211	-	-	-	-	SW8463	SW8463

NYSDEC-1

000004

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION
AND
ANALYTICAL REQUEST SUMMARY

LAB NAME: SEVERN TRENT LABORATORIES, INC.

CUSTOMER SAMPLE ID	LABORATORY SAMPLE ID	ANALYTICAL REQUIREMENTS					
		VOA GC/MS	BNA GC/MS	VOA GC	PEST PCB	METALS	WATER QUALITY
101501120	A1A11401	-	-	-	-	SW8463	SW8463
101501121	A1A11402	-	-	-	-	SW8463	SW8463
101501122	A1A11403	-	-	-	-	SW8463	SW8463
101501123	A1A11404	-	-	-	-	SW8463	SW8463
101501124	A1A11405	-	-	-	-	SW8463	SW8463
101501125	A1A11406	-	-	-	-	SW8463	SW8463
101501126	A1A11407	-	-	-	-	SW8463	SW8463
101501127	A1A11408	-	-	-	-	SW8463	SW8463
101501128	A1A11409	-	-	-	-	SW8463	SW8463
101501129	A1A11410	-	-	-	-	SW8463	SW8463
101501130	A1A11411	-	-	-	-	SW8463	SW8463
101501131	A1A11412	-	-	-	-	SW8463	SW8463
101501132	A1A11413	-	-	-	-	SW8463	SW8463
101501133	A1A11414	-	-	-	-	SW8463	SW8463
101501150	A1A50201	-	-	-	-	-	OTHER
101501152	A1A50202	-	-	-	-	-	OTHER
101501153	A1A50203	-	-	-	-	-	OTHER

SDG NARRATIVE

Laboratory Name: STL Buffalo

Laboratory Code: STL Buffalo

Contract Number: NY00-433

Sample Identifications: 100101001
100101002
100401006
100401008
100801014
100801015
100901027

METHODOLOGY

The specific methodology employed in obtaining the enclosed analytical results is indicated on the specific data tables. The method number presented refers to the following U.S. Environmental Protection Agency reference:

- "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846), Third Edition, Update III, December 1996, U.S. Environmental Protection Agency Office of Solid Waste.

COMMENTS

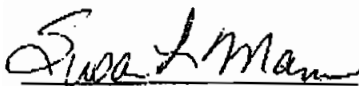
The enclosed data has been reported utilizing data qualifiers (Q) as defined on the Data Comment Page.

Three coolers were received at temperatures of 2°, 4° and 4°C.

Cation Exchange Capacity analyses were performed by STL Corpus Christi. All subcontracted data is included in this report as Appendix A.

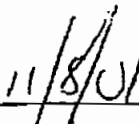
No deviations from protocol were encountered for Metals Data or Wet Chemistry Data analyses.

"I certify that this data package is in compliance with the terms and conditions of the contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Director or her designee, as verified by the following signature."



Susan L. Mazur
Laboratory Director

Date



The results presented in this report relate only to the analytical testing and condition of the sample at receipt. This report pertains to only those samples actually tested. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

000002

SEVERN

TRENT

SERVICES

STL Buffalo

SDG NARRATIVE

Laboratory Name: STL Buffalo

Laboratory Code: STL Buffalo

Contract Number: NY00-433

Sample Identifications:

100201003 ✓
100201004 ✓
100201005 ✓
100510009 ✓
100510010 ✓
100510013 ✓
100901019 ✓
100901020 ✓
100901021 ✓
100901023 ✓
100901024 ✓
100901025 ✓

total
Analyzed
Change
Wet Chemistry

METHODOLOGY

The specific methodology employed in obtaining the enclosed analytical results is indicated on the specific data tables. The method number presented refers to the following U.S. Environmental Protection Agency reference:

- "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846), Third Edition, Update III, December 1996, U.S. Environmental Protection Agency Office of Solid Waste.

COMMENTS

The enclosed data has been reported utilizing data qualifiers (Q) as defined on the Data Comment Page.

Three coolers were received at temperatures of 2°, 4° and 4°C.

No deviations from protocol were encountered for Wet Chemistry Data analyses.

Deviations from protocol were encountered for the following:

METALS DATA

The results of soil samples have been corrected for percent solids and are reported on a dry weight basis.

000003

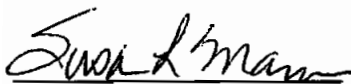
SEVERN
TRENT
SERVICES

STL Buffalo

METALS DATA CON'T.

Sample 100901024 was analyzed at a dilution factor of 10 for Chromium due to the original results exceeding the linear range of the curve.

"I certify that this data package is in compliance with the terms and conditions of the contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Director or her designee, as verified by the following signature."



Susan L. Mazur
Laboratory Director

10/29/87

Date

The results presented in this report relate only to the analytical testing and condition of the sample at receipt. This report pertains to only those samples actually tested. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

SDG NARRATIVE

STL Buffalo

Laboratory Name: STL Buffalo

Laboratory Code: STL Buffalo

Contract Number: NY00-433

Sample Identifications: 100401006
100401008
100801014
100801015
100801016

METHODOLOGY

The specific methodology employed in obtaining the enclosed analytical results is indicated on the specific data tables. The method number presented refers to the following U.S. Environmental Protection Agency reference:

- "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846), Third Edition, Update III, December 1996, U.S. Environmental Protection Agency Office of Solid Waste.

COMMENTS

The enclosed data has been reported utilizing data qualifiers (Q) as defined on the Data Comment Page.

Two coolers were received at a temperature of 4°C.

No deviations from protocol were encountered for Wet Chemistry Data analyses.

Deviations from protocol were encountered for the following:

METALS DATA

The results of soil samples have been corrected for percent solids and are reported on a dry weight basis.

000003

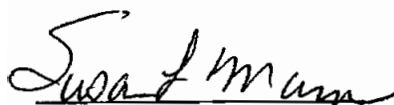
SEVERN

TRENT

SERVICES

STL Buffalo

"I certify that this data package is in compliance with the terms and conditions of the contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Director or her designee, as verified by the following signature."



Susan L. Mazur
Laboratory Director

Date

10/29/01

The results presented in this report relate only to the analytical testing and condition of the sample at receipt. This report pertains to only those samples actually tested. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

SDG NARRATIVE

Laboratory Name: STL Buffalo

Laboratory Code: STL Buffalo

Contract Number: NY00-433

Sample Identifications: 100501011
100501012
100901018
100901022

METHODOLOGY

The specific methodology employed in obtaining the enclosed analytical results is indicated on the specific data tables. The method number presented refers to the following U.S. Environmental Protection Agency reference:

- "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846), Third Edition, Update III, December 1996, U.S. Environmental Protection Agency Office of Solid Waste.

COMMENTS

The enclosed data has been reported utilizing data qualifiers (Q) as defined on the Data Comment Page.

Two coolers were received at temperatures of 2° and 4°C.

Deviations from protocol were encountered for the following:

METALS DATA

The results of soil samples have been corrected for percent solids and are reported on a dry weight basis.

Sample A1988201 MS is actually A1988202 MS, and sample A1988201 SD is actually A1988202 SD. The samples were switched during log in, however, they have been fixed in the report.

Samples 100501012 MS SPLP and 100501012 SD SPLP exhibited spike recovery results below quality control limits for Chromium. However, the Laboratory Fortified Blank (LFB) was compliant.

METALS DATA CON'T.

Sample 100901022 MS SPLP exhibited spike recovery results below quality control limits for Arsenic, and samples 100901022 MS TOTAL and 100901022 SD TOTAL exhibited spike recovery results above quality control limits for Arsenic. However, the LFB was compliant.

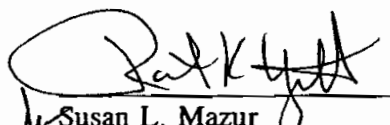
Samples 100501011, 100501012, 100901022 MS and 100901022 SD were analyzed at a dilution factor of 10 for Total Chromium due to the original results exceeding the linear range of the curve.

WET CHEMISTRY

The tumbler temperature range was 24°-26°C, however, the acceptable tumbler temperature range is 21°-25°C.

Samples did not exhibit spike recovery results for Hexavalent Chromium due to matrix interference. However, the Laboratory Control Sample (LCS) was compliant.

"I certify that this data package is in compliance with the terms and conditions of the contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Director or her designee, as verified by the following signature."


Susan L. Mazur
Laboratory Director

11/30/01
Date

The results presented in this report relate only to the analytical testing and condition of the sample at receipt. This report pertains to only those samples actually tested. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

SDG NARRATIVE

Laboratory Name: STL Buffalo

Laboratory Code: STL Buffalo

Contract Number: NY00-433

Sample Identifications:

- 101001028
- 101001030
- 101001031
- 101001032
- 101001033
- 101001034
- 101001035
- 101001038
- 101001040
- 101001041
- 101001042
- 101001043
- 101001044
- 101001046
- 101001048
- 101001050
- 101001052
- 101001053
- 101001054
- 101001055
- 101001057
- 101001058
- 101001059
- 101001060
- 101001062
- 101001069
- 101001071
- 101001073
- 101001074
- 101001076
- 101001078
- 101001080
- 101001082
- 101001083
- 101001084
- 101001085
- 101001086
- 101001087

101001088
101001090
101001093
101001037
101001064
101001065
101001066
101001067
101001068
101001092
101001096
101201097

METHODOLOGY

The specific methodology employed in obtaining the enclosed analytical results is indicated on the specific data tables. The method number presented refers to the following U.S. Environmental Protection Agency reference:

- "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846), Third Edition, Update III, December 1996, U.S. Environmental Protection Agency Office of Solid Waste.

COMMENTS

The enclosed data has been reported utilizing data qualifiers (Q) as defined on the Data Comment Page.

The following STL Buffalo jobs are included in this report: A01-A034, A01-A036, A01-A037, A01-A043 and A01-A555.

The cooler was received at a temperature of 6°C.

Cation Exchange Capacity and Total Organic Carbon analyses were performed by STL Corpus Christi. All subcontracted data is included in this report as Appendix A.

Deviations from protocol were encountered for the following:

METALS DATA

The results of soil samples have been corrected for percent solids and are reported on a dry weight basis.

Samples 101001064, 101001065, 101001066, 101001067, 101001092 and 101201097 were analyzed at a dilution factor of 10 for Chromium due to the original results exceeding the linear range of the curve.

Sample 101001088 was analyzed at a dilution factor of 100 for Chromium due to the original results exceeding the linear range of the curve.

WET CHEMISTRY DATA

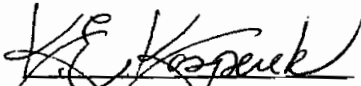
Sample 101201097 was analyzed at a dilution factor of 2 due to the original results exceeding the linear range of the curve.

Samples 101001054 MS and 101001054 SD exhibited spike recovery results below quality control limits for Hexavalent Chromium. The relative percent difference (RPD) for spike recovery between the samples was above quality control limits for Hexavalent Chromium. As a result, the samples were reanalyzed and exhibited compliant spike recovery results. However, the Laboratory Control Sample (LCS) was compliant.

Samples 101001093 MS and 101001093 SD exhibited spike recovery results below quality control limits for Hexavalent Chromium. The RPD for spike recovery between the samples was above quality control limits for Hexavalent Chromium. As a result, the samples were reanalyzed and exhibited similar spike recovery results. However, the LCS was compliant.

Samples 101001096 MS and 101001096 SD exhibited spike recovery results below quality control limits for Hexavalent Chromium. The RPD for spike recovery between the samples was above quality control limits for Hexavalent Chromium. As a result, the samples were reanalyzed and exhibited similar spike recovery results. However, the LCS was compliant.

"I certify that this data package is in compliance with the terms and conditions of the contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Director or her designee, as verified by the following signature."


Susan L. Mazar
Laboratory Director

12/20/2001
Date

The results presented in this report relate only to the analytical testing and condition of the sample at receipt. This report pertains to only those samples actually tested. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

SDG NARRATIVE

Laboratory Name: STL Buffalo

Laboratory Code: STL Buffalo

Contract Number: NY00-433

Sample Identifications: 101201098
101201100
101201102
101201104
101201106
101201107
101201109
101201111
101201113
101201115
101201118
101201118 MS
101501151
101501154
101501155
101501156

METHODOLOGY

The specific methodology employed in obtaining the enclosed analytical results is indicated on the specific data tables. The method number presented refers to the following U.S. Environmental Protection Agency reference:

- "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846), Third Edition, Update III, December 1996, U.S. Environmental Protection Agency Office of Solid Waste.

COMMENTS

The enclosed data has been reported utilizing data qualifiers (Q) as defined on the Data Comment Page.

Sample dilutions were performed for Metals Data as indicated on the attached Dilution Log. The rationale for dilution is specified by the 3-digit code and definition.

The coolers were received at temperatures of 4° and 6°C.

Total Organic Carbon analyses were performed by STL Corpus Christi. All data is included in this report as Appendix A.

Deviations from protocol were encountered for the following:

VOLATILE DATA

Due to a laboratory oversight compounds 1,1,2-Trichloro-1,2,2-Trifluoroethane, Methyl acetate, Cyclohexane, and Methylcyclohexane were not added to the standards. As a result, these compounds were searched for as Tentatively Identified Compounds and were not detected in the associated samples.

The initial calibration standard curve analyzed on 10/22/2001 showed the %RSD of three compounds as greater than 15%. However, the mean RSD of all compounds is 9.66%.

SEMIVOLATILE DATA

The initial calibration standard curve analyzed on 09/26/2001 showed the %RSD of several compounds as greater than 15%. However, the mean RSD of all compounds is 8.65%.

The initial calibration standard curve analyzed on 10/31/2001 showed the %RSD of two compounds as greater than 15%. Linear regression was used to calculate the concentration of these compounds if detected.

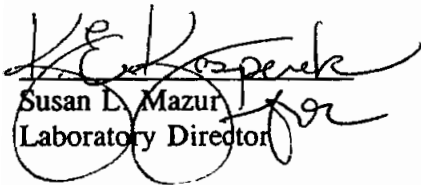
METALS DATA

The results of soil samples have been corrected for percent solids and are reported on a dry weight basis.

WET CHEMISTRY DATA

Samples 101201118 (A1A03211C), 101201118 (A1A03211D), 101201118 MS, and 101201118 SD exhibited spike recovery results below quality control limits for Hexavalent Chromium. However, the Laboratory Control Sample was compliant.

"I certify that this data package is in compliance with the terms and conditions of the contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Director or her designee, as verified by the following signature."


Susan L. Mazur
Laboratory Director

12/20/2001
Date

The results presented in this report relate only to the analytical testing and condition of the sample at receipt. This report pertains to only those samples actually tested. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

SEVERN

TRENT

SERVICES

SDG NARRATIVE

STL Buffalo

Laboratory Name: STL Buffalo

Laboratory Code: STL Buffalo

Contract Number: NY00-433

Sample Identifications:

101001029
101001036
101001039
101001045
101001047
101001049
101001051
101001056
101001061
101001063
101001070
101001072
101001075
101001075 MS
101001077
101001079
101001081
101001089
101001091
101001094
101001095
101201099
101201101
101201103
101201105
101201108
101201110
101201112
101201114
101201116
101201117
101201119

**SEVERN
TRENT
SERVICES****STL Buffalo****METHODOLOGY**

The specific methodology employed in obtaining the enclosed analytical results is indicated on the specific data tables. The method number presented refers to the following U.S. Environmental Protection Agency reference:

- "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846), Third Edition, Update III, December 1996, U.S. Environmental Protection Agency Office of Solid Waste.

COMMENTS

The enclosed data has been reported utilizing data qualifiers (Q) as defined on the Data Comment Page.

Sample dilutions were performed for Metals Data as indicated on the attached Dilution Log. The rationale for dilution is specified by the 3-digit code and definition.

The coolers were received at a temperature of 6°C.

Deviations from protocol were encountered for the following:

METALS DATA

The results of soil samples have been corrected for percent solids and are reported on a dry weight basis.

Samples 101001075 Matrix Spike and Matrix Spike Duplicate exhibited recovery results below quality control limits for Arsenic. However, the Laboratory Control Sample was compliant.

WET CHEMISTRY DATA

Samples 101001075 (A1A03313C) and (A1A03313D) exhibited spike recovery results below quality control limits for Hexavalent Chromium. However, the Laboratory Control Sample was compliant.

000094

SEVERN

TRENT

SERVICES

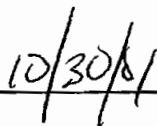
STL Buffalo

"I certify that this data package is in compliance with the terms and conditions of the contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Director or her designee, as verified by the following signature."



Susan L. Mazur
Laboratory Director

Date



The results presented in this report relate only to the analytical testing and condition of the sample at receipt. This report pertains to only those samples actually tested. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

SDG NARRATIVE

Laboratory Name: STL Buffalo

Laboratory Code: STL Buffalo

Contract Number: NY00-433

Sample Identifications:

101501120
101501121
101501122
101501123
101501124
101501125
101501126
101501127
101501128
101501129
101501130
101501131
101501132
101501133
101501150
101501152
101501153

METHODOLOGY

The specific methodology employed in obtaining the enclosed analytical results is indicated on the specific data tables. The method number presented refers to the following U.S. Environmental Protection Agency reference:

- "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846), Third Edition, Update III, December 1996, U.S. Environmental Protection Agency Office of Solid Waste.

COMMENTS

The enclosed data has been reported utilizing data qualifiers (Q) as defined on the Data Comment Page.

The cooler was received at a temperature of 4°C.

Total Organic Carbon analyses were performed by STL Corpus Christi. The subcontracted data is included in this report as Appendix A.

Deviations from protocol were encountered for the following:

METALS DATA

The results of soil samples have been corrected for percent solids and are reported on a dry weight basis.

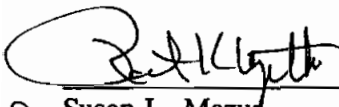
Samples 101501133 MS and 101501133 SD exhibited spike recovery results above quality control limits for Chromium. However, the Laboratory Control Sample (LCS) was compliant.

The continuing calibration verification (CCV#7) on ICP Run A102401 was outside quality control limits for Arsenic and Chromium. However, the samples were bracketed by compliant CCV's.

WET CHEMISTRY DATA

Samples 101501120 MS and 101501120 SD exhibited spike recovery results below quality control limits for Hexavalent Chromium due to matrix interference. The RPD for spike recovery between the samples was above quality control limits for Hexavalent Chromium. As a result, the samples were reanalyzed and exhibited similar spike recovery results. However, the LCS was compliant.

"I certify that this data package is in compliance with the terms and conditions of the contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Director or her designee, as verified by the following signature."


Susan L. Mazur
Laboratory Director

11/30/01
Date

The results presented in this report relate only to the analytical testing and condition of the sample at receipt. This report pertains to only those samples actually tested. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

**SEVERN
TRENT
SERVICES****SDG NARRATIVE****STL Buffalo**

Laboratory Name: STL Buffalo
Laboratory Code: STL Buffalo
Contract Number: NY00-433
Sample Identifications: 100401007

METHODOLOGY

The specific methodology employed in obtaining the enclosed analytical results is indicated on the specific data tables. The method number presented refers to the following U.S. Environmental Protection Agency reference:

- "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846), Third Edition, Update III, December 1996, U.S. Environmental Protection Agency Office of Solid Waste.

COMMENTS

The enclosed data has been reported utilizing data qualifiers (Q) as defined on the Data Comment Page.

The cooler was received at a temperature of 4°C.

No deviations from protocol were encountered for Wet Chemistry Data analyses.

Deviations from protocol were encountered for the following:

METALS DATA

The results of soil samples have been corrected for percent solids and are reported on a dry weight basis.

000003

SEVERN
TRENT
SERVICES

STL Buffalo

"I certify that this data package is in compliance with the terms and conditions of the contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Director or her designee, as verified by the following signature."



Susan L. Mazur
Laboratory Director

Date

10/29/01

The results presented in this report relate only to the analytical testing and condition of the sample at receipt. This report pertains to only those samples actually tested. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

SDG NARRATIVE**STL Buffalo**

Laboratory Name: STL Buffalo

Laboratory Code: STL Buffalo

Contract Number: NY00-433

Sample Identifications: 100901017

METHODOLOGY

The specific methodology employed in obtaining the enclosed analytical results is indicated on the specific data tables. The method number presented refers to the following U.S. Environmental Protection Agency reference:

- "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846), Third Edition, Update III, December 1996, U.S. Environmental Protection Agency Office of Solid Waste.

COMMENTS

The enclosed data has been reported utilizing data qualifiers (Q) as defined on the Data Comment Page.

The cooler was received at a temperature of 2°C.

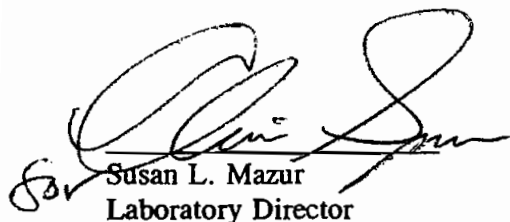
No deviations from protocol were encountered for Metals Data or Wet Chemistry Data analyses.

000003

SEVERN
TRENT
SERVICES

STL Buffalo

"I certify that this data package is in compliance with the terms and conditions of the contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Director or her designee, as verified by the following signature."


Susan L. Mazur
Laboratory Director

10/23/01
Date

The results presented in this report relate only to the analytical testing and condition of the sample at receipt. This report pertains to only those samples actually tested. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

000002

SEVERN
TRENT
SERVICES

SDG NARRATIVE

STL Buffalo

Laboratory Name: STL Buffalo

Laboratory Code: STL Buffalo

Contract Number: NY00-433

Sample Identifications: 100901026

METHODOLOGY

The specific methodology employed in obtaining the enclosed analytical results is indicated on the specific data tables. The method number presented refers to the following U.S. Environmental Protection Agency reference:

- "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846), Third Edition, Update III, December 1996, U.S. Environmental Protection Agency Office of Solid Waste.

COMMENTS

The enclosed data has been reported utilizing data qualifiers (Q) as defined on the Data Comment Page.

The cooler was received at a temperature of 2°C.

No deviations from protocol were encountered for Metals Data analyses.

Deviations from protocol were encountered for the following:

WET CHEMISTRY DATA

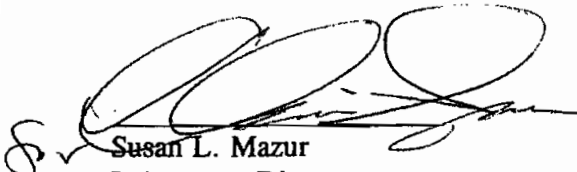
The standard temperature range for the tumbler is 21-25°C, however, the temperature range of the tumbler for these analyses was 24-26°C.

000003

SEVERN
TRENT
SERVICES

STL Buffalo

"I certify that this data package is in compliance with the terms and conditions of the contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Director or her designee, as verified by the following signature."


Susan L. Mazur
Laboratory Director

10/24/01

Date

The results presented in this report relate only to the analytical testing and condition of the sample at receipt. This report pertains to only those samples actually tested. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

SDG NARRATIVE

Laboratory Name: STL Buffalo

Laboratory Code: STL Buffalo

Contract Number: NY00-433

Sample Identifications: 101501134
101501141
101501142
101501143
101501144
101501145

METHODOLOGY

The specific methodology employed in obtaining the enclosed analytical results is indicated on the specific data tables. The method number presented refers to the following U.S. Environmental Protection Agency reference:

- "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846), Third Edition, Update III, December 1996, U.S. Environmental Protection Agency Office of Solid Waste.

COMMENTS

The enclosed data has been reported utilizing data qualifiers (Q) as defined on the Data Comment Page.

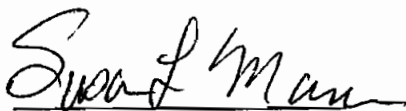
The cooler was received at a temperature of 4°C.

Deviations from protocol were encountered for the following:

METALS DATA

The results of soil samples have been corrected for percent solids and are reported on a dry weight basis.

"I certify that this data package is in compliance with the terms and conditions of the contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Director or her designee, as verified by the following signature."



Susan L. Mazur
Laboratory Director

11/01/01
Date

The results presented in this report relate only to the analytical testing and condition of the sample at receipt. This report pertains to only those samples actually tested. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

000002

SDG NARRATIVE

Laboratory Name: STL Buffalo

Laboratory Code: STL Buffalo

Contract Number: NY00-433

Sample Identifications: 101501135
101501136
101501137
101501138
101501139
101501139 MS
101501140
101501146
101501147
101501148
101501149

METHODOLOGY

The specific methodology employed in obtaining the enclosed analytical results is indicated on the specific data tables. The method number presented refers to the following U.S. Environmental Protection Agency reference:

- "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846), Third Edition, Update III, December 1996, U.S. Environmental Protection Agency Office of Solid Waste.

COMMENTS

The enclosed data has been reported utilizing data qualifiers (Q) as defined on the Data Comment Page.

The cooler was received at a temperature of 4°C.

Deviations from protocol were encountered for the following:

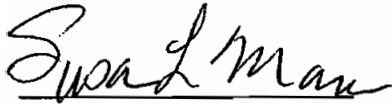
METALS DATA

The results of soil samples have been corrected for percent solids and are reported on a dry weight basis.

Sample 101501139 Matrix Spike Duplicate exhibited recovery results below quality control limits for Chromium. However, the Laboratory Control Sample is compliant.

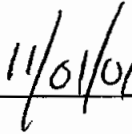
000003

"I certify that this data package is in compliance with the terms and conditions of the contract both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Director or her designee, as verified by the following signature."



Susan L. Mazur
Laboratory Director

Date



The results presented in this report relate only to the analytical testing and condition of the sample at receipt. This report pertains to only those samples actually tested. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

Resubmission Requests and Responses

Data Validation Services

120 Cobble Creek Road P. O. Box 208

North Creek, NY 12853

Phone (518) 251-4429

Facsimile (518) 251-4428

March 7, 2002

Jeff Rohe
Severn Trent Laboratories
10 Hazlewood Dr.
Suite 106
Amherst, NY 14228

RE: Geomatrix Consultants-- Peter Cooper Markham site
SDG Nos. A01-A110, A01-A112, A01-9713, A01-B908, A01-9878, A01-9885, 100101,
100105, 100106, 100108, 100109, 100110, 100113, and 100114

Dear Mr. Rohe:

Review of the data packages noted above is in progress. The following items are needed to complete the validation review:

1. Sample client ID 101001028 was received with the samples in SDG 100108 for processing for As, Cr, and Cr+6. It is listed in the lab narrative, and appears to have undergone the preparation for metals and hexachrome (not totally evident due to no correlation between client ID and digestate ID available for that sample). However, no results were reported in the package or in the client tables. Please verify that the sample was processed, and submit report forms for both fractions.
2. Sample 110701172 (SDG 110114) is an equipment blank, but showed very high concentrations of metals. Actual field sample 110701170 showed only low calcium content. It therefore seems that a reversal may have occurred. Review of the descriptions on the ICP digestion log shows -170 to be colorless (although that sample was black in the field), and -172 was described as black (although submitted as an equipment blank). In an attempt to have usable data for the metals in all associated samples, we are trying to verify the series of events prior to analysis of these two samples. Please review these data, provide any additional input/documentation available, and provide a written statement regarding this situation.

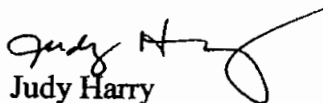
3. It is noted that the reporting limit used for hexavalent chromium in aqueous samples (i.e. SDGs 100114 and A01-B908) is one thousand fold above that evaluated in the lab (which showed detection limit of 10 ppb). Although, upon request the lab resubmitted sample detections below 10,000ppb and above 10 ppb, it is not evident whether the associated method blanks were also reviewed for values between those two concentrations. Please state whether any of the associated method blanks showed concentrations above 10 ppb. This is an important in that blanks should be evaluated to the same level as the samples to determine potential contamination.

Also please discuss whether there is any technical reason that a reporting limit of 10 ug/L could not be considered for this project. The matrix spikes are evaluated at levels (50 ppb) well below the reporting limit (10,000 ppb), and many failed (recoveries <10%), mandating rejection of associated nondetect data. As reported, that would be rejection of most project sample data, which report nondetection at 10,000 ug/L. However, failure of spikes to recover at 50 ppb does not imply an inability to detect any Cr+6 in the sample if it were present at 10,000 ppb, and rejection does not seem appropriate. Additionally, risk assessment evaluation involves assumption of sample consistency at the reported RL, and this level seems unnecessarily high.

4. Please complete and submit the required Forms 6 for precision of the metals matrix spikes for this project. Those for the aqueous samples are of greater urgency (see below).
5. Please provide the required IDL summaries for volatiles and semivolatile for the instruments used for this project.
6. The result for hexavalent chromium in soil sample 101001040 (SDG 100108) was reported as nondetection at 0.5 ppb. The raw data shows detection at 0.65 ppb. Please confirm, and provide a corrected report form for that sample if verified.

Thank you in advance for an expedited reply to this request. Item numbers 2., 3., and numbers 4. and 5. as they apply to aqueous samples, are of an urgent nature. Item numbers 1., 6., and numbers 4. and 5. as they apply to soils, are also urgent, although less so. Please provide copies of all communications to Jennifer Smith at Geomatrix.

Very truly yours,


Judy Harry

Data Validation Services

120 Cobble Creek Road P. O. Box 208

North Creek, NY 12853

Phone (518) 251-4429

Facsimile (518) 251-4428

Facsimile Transmission

TO: Jeff Yohe

COMPANY: STL-Buffalo

FAX NUMBER: 716 691 7991

FROM: Judy Harry 

DATE: 03-10-02

No. of pages (including cover): 1

COMMENTS: RE: Geomatrix Consultants
Peter Cooper Markham site

In addition to the resubmissions requested in my letter Friday, the following two items required of the deliverables are also needed for validation:

1. The TDS raw data for sample A01-B908-04 were not located.
2. The metals IDL summary Forms seem to list CRDL values for IDLs. The IDL values from your most recent study are required, and are needed for validation review. — *for entire project.*

Please forward at your earliest convenience to the fax number above, and send copies of responses to this and Friday's request to Jennifer Hagen at Geomatrix. Thank you.

Data Validation Services

120 Cobble Creek Road P. O. Box 208

North Creek, NY 12853

Phone (518) 251-4429

Facsimile (518) 251-4428

Facsimile Transmission

TO: Jeff Yohe

COMPANY: STL-Buffalo

FAX NUMBER: 716 691 7991

FROM: Judy Harry 

DATE: 03-18-02

No. of pages (including cover): 2

COMMENTS: RE: Geomatrix Consultants
Peter Cooper Markham site

Review of the resubmissions for this project is in progress.

1. As noted in our phone discussion earlier today, the question item 6 in my request of March 7 stands, as I believe that the reported value (per absorbance reading) for hexachrome should have been "0.65", not "0.065" as reported in the raw data.
2. Most of the data packages do not include the preparation/digestion documentation for the hexachrome analysis. Please provide that for all soil project samples.

3. It is noted that, although the method 7196A indicates a maximum holding time for the hexachrome extracts of 24 hours before analysis, those soil samples processed in SDG 100113 were analyzed 6 days later. Please discuss the laboratory holding time protocol for this analysis.

As you know, time is critical in resolving these issues. Thank you again for prompt attention to this request. As always, please send Jennifer copies.

cc: Jennifer Hagen

Data Validation Services

120 Cobble Creek Road P. O. Box 208
North Creek, NY 12853
Phone (518) 251-4429
Facsimile (518) 251-4428

March 18, 2002

Jeff Yohe
Severn Trent Laboratories
10 Hazlewood Dr.
Suite 106
Amherst, NY 14228

RE: Geomatrix Consultants-- Peter Cooper Markham site
SDG Nos. A01-A110, A01-A112, A01-9713, A01-B078, A01-B908, A01-9878, A01-9885,
100101, 100103, 100105, 100106, 100108, 100109, 100110, 100113, and 100114

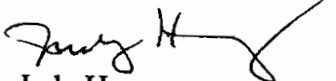
Dear Mr. Yohe:

Review of the data packages noted above has been completed. The following items are needed to complete the validation review:

1. The reported values and recoveries for some of the hexavalent chromium high level matrix spikes appear to be reported tenfold lower than actual. Please review these data for the project matrix spikes (they pertain to samples diluted at 1:100 and spiked at about 700 mg/kg). It is not true in all cases, but examples are lab ID A034-42 (SDG 100108) and A114-01 (SGD 100113). The values and recoveries seem to be calculated using the LCS dilution factor of 1:10, rather than 1:100.
2. Please provide the calibration curve data (raw) which pertain to the hexavalent chromium analyses reported in the project data packages.
3. Please forward the SPLP leaching, metals digestion, and Cr+6 preparation logs for the sample in SDG A01-9885. Also, identify the location of the SPLP blank results for the Cr+6 analyses.
4. Data package SDGs 100109, and 100113 included samples processed for TOC by STL-CC, but no associated raw data were included in the packages. Please provide.

Thank you in advance for an expedited reply to this request. Please provide copies of all communications to Jennifer Hagen at Geomatrix.

Very truly yours,


Judy Harry

Data Validation Services

120 Cobble Creek Road P. O. Box 208

North Creek, NY 12853

Phone (518) 251-4429

Facsimile (518) 251-4428

Facsimile Transmission

TO: Jeff Yohe

COMPANY: STL-Buffalo

FAX NUMBER: 716 691 7991

FROM: Judy Harry 

DATE: 03-29-02

No. of pages (including cover): 1

COMMENTS: RE: Geomatrix Consultants
Peter Cooper Markham site

As indicated in my voice mail this morning, the following items are needed to complete the data package documentation for this project:

1. The resubmitted duplicate Forms 6 for the metals analyses do not include one for sample 110801177 (SDG 110114).
2. With the exception of hexavalent chromium, sample matrix spike/duplicate summary forms were not provided for any of the wet chem analyses. Raw data indicate that they were processed, but the summary forms all report blank spike LCS recoveries/correlations. Please provide the required summaries.

SDG's 110114 and A01-8908

Please copy Jennifer with all communications. Thank you.

cc: Jennifer Hagen

Data Validation Services

120 Cobble Creek Road P. O. Box 208

North Creek, NY 12853

Phone (518) 251-4429

Facsimile (518) 251-4428

Facsimile Transmission

TO: Jeff Yohe
COMPANY: STL-Buffalo
FAX NUMBER: 716 691 7991

FROM: Judy Harry
DATE: 04-02-02

No. of pages (including cover): 1

RE: Geomatrix --Peter Cooper Markham site
Calculation for hexachrome spike recoveries on diluted soil samples

COMMENTS:

Here are two examples of the calculations about which I have inquired.

This variance seems only to have occurred in the very high level (~900 ppm) spikes, not the usual 40 ppm level. In addition to the review of this calculation, please also ask the department if these high level spikes are actual pre-digestion spikes, processed as the low level ones are.

Run	Date	SDG	100113	Curve Conc	Dig Vol	Spl vol	DF	Dry	
1) A1-A034-42	MSB	.098 mg/L	=	98 ug/L	x .1 L	÷ 2.5 g	x 100	x 1.17	≈ 460
2) A1-A114-01	MSB	139	=	139 ug/L	x .1	÷ 2.5	x 100	x 1.17	≈ 650

Recoveries are ~ 10 x higher.

not 46
not 64

Thanks. Again, please copy Jennifer with all findings.

cc: Jennifer Hagen

Fax message



Date: 3/12/02

To: Judy Harey

Company: DVS

Fax: 518-251-4428

From: Jeff Yohe

Subject: DATA VALIDATION ISSUES

Pages: MANY

Severn Trent Laboratories, Inc.
STL Buffalo
10 Hazelwood Drive
Amherst, New York 14228

Tel 716 691 2600
Fax 716 691 7991
www.stl-inc.com

JUDY

PLEASE REVIEW. QUESTIONS OR CONCERNS PLEASE

CONTACT ME AT 716-691-2600 OR JYOH@STL-INC.COM

JEFF

The following is a progress report of the items that you have requested:

1. It appears that after my review of the COC's and sample log in, that ID 101001028 was logged in incorrectly as ID 101001098. In Task 9 sampled on 10/01/01, all samples are accounted for with the exception of sample 28, which was logged in inadvertently as 98.
2. Samples 110701172/110701170-Pending
3. Hexavalent Chromium-Pending
4. Form 6-Completed with the exception of SDG 100108, which will have to be unarchived.
5. IDL/MDL summaries-Completed
6. Hexavalent Chromium-Pending
7. Metal IDL summary-Completed
8. Pending-TDS raw Data

I am currently working to resolve the outstanding issues as soon as possible and will send when available.

Jeff Yohe
STL Buffalo

Limit Check Table : PB

08/23/01 01:40:33 PM

page 1

#	ELEM. NAME	HIGH LIMIT	LOW LIMIT
1	AL*	.025	-.04
2	SB*	.005	-.01
3	AS*	.003	-.005
4	BA*	.0006	-.003
5	BE*	.0007	-.0031
6	CD*	.0007	-.0015
7	CA*	.025	-.05
8	CR*	.001	-.003
9	CO*	.001	-.003
10	FE*	.02	-.04
11	PB*	.002	-.004
12	MG*	.025	-.04
13	MN*	.0008	-.003
14	NI*	.0015	-.003
15	K_*	.075	-.5
16	AG*	.001	-.004
17	NA*	.2	-.5
18	TL*	.004	-.01
19	V_*	.001	-.003
20	ZN*	.001	-.003
21	SE*	.005	-.01
22	CU*	.001	-.004
23	B*	.002	-.008
24	MO*	.002	-.005
25	SN*	.003	-.01
26	TI*	.0008	-.002

↑
~~LINEAR~~ NON-CLP
~~RANGES~~ IDL
ACTIVE → 8-20-2001

TRACE #1

IDL for CLP/Non-CLP		Expiration Date: 12/24/2004	
Effective Date: 9/25/2001			
	IDL		
Ag	0.9		
Al	17.8		
As	3.6		
B	2.8		
Ba	0.1		
Be	0.2		
Ca	13.1		
Cd	0.3		
Co	0.5		
Cr	0.7		
Cu	0.8		
Fe	17.4		
K	28.2		
Mg	7.5		
Mn	0.2		
Mo	1.6		
Na	272.7		
Ni	1.4		
Sb	5.1		
Sn	4.6		
Ti	0.3		
Tl	5.2		
V	0.7		
Zn	1.5		
Pb	2.8		
Se	4.3		

ug/L

Date: 03/12/2002
Time: 13:25:51

SW646 B270C SOIL MOL'S AT 330UG/KG EXTR.METHOD
Study Type: MDL

Rept: AM0751
Page: 1

Instrument: 150Y-A
File Extension: RR
Unit of Measure: UG/KG
Analyst: PH
Analysis Date: 10/09/2001
Expiration Date: 10/09/2002

NO	Compound Name	Y49029	Y49030	Y49031	Y49032	Y49033	Y49034	Y49035	Avg	Std Dev	% RSD	MDL
2	C705 n-nitrosodimethylamine	199.47667	155.94667	305.65333	169.52667	202.20667	250.06333	276.47333	222.76667	55.92450	25.10452	175.77070
3	C550 2-Fluorophenol	178.21000	162.09333	295.66000	169.77333	195.44333	234.19667	271.63000	215.27809	52.70510	24.48233	165.65213
4	C325 bis(2-Chloroethyl)ether	241.94000	205.66333	361.92333	211.46833	233.21333	310.68000	340.33667	272.17713	64.19090	23.59424	201.75500
5	C545 Phenol-d5	255.67667	220.72000	378.19000	222.93333	255.69000	322.02000	378.32333	290.50761	68.62320	23.62103	215.68272
6	C570 2-chlorophenol-d6	212.36000	178.12333	329.21333	195.96333	217.99000	271.94667	310.62000	246.31666	60.41220	24.52623	189.87554
7	C315 Phenol	274.57333	239.64333	397.87667	255.90000	271.95667	341.24667	362.51333	306.26429	60.46600	19.74437	190.04464
8	C330 2-Chlorophenol	232.19000	199.67000	352.65000	214.11000	239.52000	307.40667	333.20667	268.39334	61.42190	22.88503	193.04903
9	C320 aniline	28.80333	10.63000	112.47000	61.33667	8.16667	19.79667	25.74667	38.13573	37.18310	97.50200	116.86448
10	C335 1,3-Dichlorobenzene	218.57000	202.19000	366.06000	211.74000	239.61000	304.10667	339.91000	268.88381	66.87110	24.86989	210.17587
11	C340 1,4-Dichlorobenzene	226.46000	203.47000	368.36333	214.26333	240.16000	317.12000	334.28667	272.01761	66.23050	24.34787	208.16246
12	C375 1,2-dichlorobenzene-d6	232.04333	199.48000	362.63333	215.94333	238.62000	309.63667	349.77000	272.58951	66.81930	24.31279	210.07306
13	C350 1,2-dichlorobenzene	236.48333	213.74667	371.94667	223.66667	254.17667	293.15667	348.42000	280.90716	64.86110	23.08987	203.85844
14	C345 Benzyl alcohol	206.70333	258.39667	407.33000	254.17667	233.66667	348.25667	421.91667	328.56240	69.78540	21.23962	219.33551
15	C360 bis(2-chloroisopropyl)ether	258.30000	220.35333	365.88667	223.87333	244.34000	328.42000	346.44667	283.94571	61.20680	21.55581	192.37297
16	C355 2-Methylphenol	258.32667	220.90333	367.32000	229.58667	244.61667	318.98000	346.59667	283.76144	59.49220	20.98557	186.98398
17	C375 Hexachlorocyclohexane	190.76667	173.91000	316.82667	177.39667	197.06333	276.07333	306.08667	234.01763	63.08080	26.95558	198.26295
18	C370 n-nitroso-di-n-propylamine	266.26333	236.43667	381.60667	232.33667	254.00333	358.83667	377.68667	301.02630	68.33960	22.70235	214.79136
19	C365 4-Methylphenol	269.50667	246.85000	390.41667	247.57667	261.99667	347.59333	383.55667	306.67097	64.70340	21.09864	203.36279
21	C520 Nitrobenzene-d5	247.42000	216.25000	360.46000	223.87667	235.82667	317.05667	360.94667	280.26240	64.06440	21.40708	199.04556
22	C410 Nitrobenzene	260.72333	237.23000	377.17667	225.58667	243.14667	345.50000	361.48667	293.83573	73.46650	22.86872	203.35441
23	C415 Isophorone	322.62000	284.20667	433.77000	268.93667	304.89333	401.63333	445.04667	351.58667	73.46650	20.89570	230.90521
24	C430 benzoic acid	217.18000	151.99667	229.98000	130.76667	187.67333	207.68000	281.98333	201.03429	50.36370	23.05229	158.29311
25	C420 2-Nitrophenol	239.76000	203.84333	344.77333	209.16000	229.99667	296.39667	348.90667	267.54810	62.00130	29.64044	206.49604
26	C425 2,4-Dinitrophenol	182.90000	176.36333	332.49000	182.83333	181.92333	194.46667	300.62667	221.65761	65.70030	21.23456	216.47224
27	C435 bis(2-Chloroethoxy)methane	287.52667	265.80000	410.03667	247.47333	281.97667	376.22000	401.35000	337.08619	64.51690	20.41117	202.77662
28	C440 2,4-Dichlorophenol	284.86000	253.95333	384.00333	254.53333	269.69667	364.20667	415.16000	297.92570	65.31710	21.92396	205.29165
29	C445 1,2,4-Trichlorobenzene	257.40333	233.78000	378.73333	230.54333	266.49667	347.88333	370.64000	297.92570	65.31710	21.92396	205.29165
30	C450 Naphthalene	298.27667	264.64667	424.63333	267.20667	300.54667	393.96667	415.16000	337.77669	67.64820	20.92157	222.11015
31	C455 4-Chloroaniline	134.12000	65.86333	262.72000	174.86000	70.09667	138.30000	165.75000	144.53000	67.54860	46.59835	211.67665
32	C460 Hexachlorobutadiene	228.13667	206.05333	354.21667	199.53667	230.37333	303.16667	342.27667	266.25144	65.44100	24.57865	205.68106
33	C465 4-Chloro-3-methylphenol	387.74000	309.87333	451.48667	288.18333	327.69667	401.69667	476.58000	377.60810	71.89380	19.03926	225.96221
34	C470 2-Methylnaphthalene	314.95333	285.59000	448.57333	276.14667	312.21667	398.26000	434.15000	352.84143	72.28020	20.47951	227.11381
36	C510 Hexachlorocyclopentadiene	134.91000	127.22000	221.79333	119.95667	149.30000	201.62667	243.40333	171.17286	50.09240	29.26422	157.44041
37	C515 2,4,6-Trichlorophenol	336.91000	294.18000	405.14333	273.36667	301.80000	379.09000	455.55667	349.43526	66.47070	19.02232	208.91741
38	C520 2,4,5-Trichlorophenol	374.26667	315.88333	435.78000	307.01667	341.06667	397.25333	469.35667	377.23191	61.00030	16.17050	191.72394
39	C525 2-Fluorobiphenyl	319.66667	298.19000	442.84333	290.90333	313.73333	415.46333	453.27000	342.00999	71.84750	19.84683	225.81669
40	C525 2-Chloronaphthalene	338.38000	294.70667	427.70333	296.09000	317.19667	409.06667	441.65000	360.60477	63.64220	17.64483	200.02143
41	C530 2-Nitroaniline	423.35000	353.50667	433.61667	329.84000	345.73000	402.47667	488.34333	396.98049	57.08010	14.37857	179.40275

Date: 03/12/2002
Time: 13:25:51

SUBS 8270C SOIL MDL'S AT 330UG/KG EXTR. METH 3050A
Study Type: MDL

Report: AN0751
Page: 2

Instrument: 150V-A
File Extensions: RR
Unit of Measure: UG/KG
Analysis Date: 10/09/2001
Expiration Date: 10/09/2002

NO	Compound Name	Y49029	Y49030	Y49031	Y49032	Y49033	Y49034	Y49035	Avg	Std Dev	% RSD	MDL
42	C540 Acenaphthylene	366.40000	318.78333	444.79000	308.82667	336.30000	432.46667	484.53333	384.58571	69.08720	17.96406	217.14107
43	C535 Dimethylphthalate	451.66333	417.58000	516.79333	399.26000	426.29333	463.39000	535.63667	457.23094	53.09340	11.61194	166.87236
44	C542 2,6-Dinitrotoluene	399.43667	383.63667	428.00000	334.49333	376.60000	403.96667	485.25333	401.62667	46.82610	11.65911	147.17443
45	C550 Acenaphthene	382.10000	332.35667	458.71333	322.33667	351.10000	442.25000	492.58333	397.34857	67.17340	16.90541	211.12600
46	C555 3-Nitroaniline	407.10000	355.68333	455.17667	357.95667	344.06667	404.31667	449.26333	396.22334	45.27820	11.42744	142.30938
47	C552 2,4-Dinitrophenol	154.17000	184.83000	199.14667	146.29333	193.87667	162.95000	260.24000	185.92667	30.44860	20.67944	120.84395
48	C565 Dibenzofuran	411.91333	345.67000	474.04000	344.73667	370.53000	432.75000	490.96667	411.10096	60.99880	14.83791	191.71923
49	C570 2,4-Dinitrotoluene	456.29667	438.32333	483.40333	379.47000	415.71000	445.32333	490.96667	444.21333	38.53090	8.63796	121.10262
50	C560 4-Nitrophenol	413.28667	371.71333	430.44000	319.99000	355.46667	372.10333	421.98000	383.56429	40.12000	10.45975	128.09716
51	C590 Fluorene	459.05333	407.47333	522.13333	389.24667	416.46667	474.15000	542.12333	458.94951	58.14960	12.67015	182.76419
52	C585 4-Chlorophenyl-phenylether	436.58667	369.22000	480.94000	349.89000	384.13333	440.24333	515.05333	425.15237	60.59200	14.25185	190.44066
53	C580 Diethylphthalate	506.90667	487.66000	574.26000	449.31000	480.88000	510.83667	558.75333	509.80096	43.84830	8.60499	137.87807
54	C620 1,2-diphenylhydrazine	449.81333	387.39333	490.43667	361.75000	403.32667	443.02000	505.86000	434.31429	53.24730	12.25444	167.35626
55	C595 4-Nitroaniline	423.51667	420.69000	487.43667	387.86000	397.87000	434.15000	478.75000	432.09620	37.79520	8.73078	118.79031
57	C610 4,6-Dinitro-2-methylphenol	304.49667	311.50333	349.24333	289.55000	301.92000	297.30667	379.00667	316.14667	36.36080	11.50124	114.28199
58	C615 n-Nitrosodiphenylamine	457.26000	431.00000	525.13333	406.32667	431.01333	452.42000	514.48333	459.67380	44.40800	9.66076	139.57434
59	C535 2,4,6-Trisubstituted phenol	422.49667	384.44667	441.35333	342.17333	378.41000	403.41333	470.61333	406.12951	42.82340	10.54427	134.59395
60	C625 4-Bis(phenyl)-phenyl ether	441.06333	406.36667	479.05333	374.26333	395.78333	426.39667	505.30333	432.60427	46.54860	10.76009	146.30225
61	C630 Hexachlorobenzene	470.80000	448.19000	528.07667	398.13000	433.04667	461.73667	508.53000	464.07287	44.13420	9.51019	138.71379
62	C635 Pentachlorophenol	370.93333	367.22000	403.58000	305.51667	353.13667	329.03333	423.11000	364.64714	40.57310	11.12667	127.52125
63	C640 Phenanthrene	517.50000	503.92333	602.00333	466.55000	495.28667	520.69667	579.75333	526.53047	47.83530	9.08500	150.34635
64	C645 Anthracene	479.63000	454.11333	570.66333	436.27000	445.06333	475.76000	528.63333	484.01903	48.84340	10.09121	153.51481
65	C647 carbazole	529.28000	515.01000	590.15333	478.96000	493.74000	523.12333	580.32000	532.00809	37.78870	7.09363	118.61273
66	C650 Di-n-butylphthalate	326.80333	327.60667	382.30333	278.78000	305.12000	323.12333	380.32000	332.00809	37.78870	6.90913	120.59848
67	C655 Fluoranthene	546.19333	546.97333	614.44333	508.16000	529.27667	541.43000	601.03667	555.35904	38.37050	7.64931	123.00728
69	C715 Pyrene	510.46333	491.94000	571.66667	457.93667	484.25000	514.12000	551.10000	511.63953	39.13690	7.46957	120.84969
71	C630 Terphenyl-d14	520.63667	500.68333	584.59333	453.36333	481.08333	518.02667	534.53667	513.27476	41.63210	8.11107	130.84969
72	C720 Butylbenzylphthalate	471.63667	461.40000	518.63333	403.48000	448.36333	459.88333	492.72000	465.15951	36.03110	7.74597	113.24575
73	C725 3,3'-Dichlorobenzidine	285.34667	205.69667	390.64667	309.97000	210.27667	270.57333	292.18333	280.67049	62.96290	22.44333	197.89239
74	C730 Benzofuranthracene	504.79333	482.67333	556.57667	440.50667	471.46667	486.22667	534.18000	498.06049	38.80270	7.79076	121.95689
75	C735 Chrysene	508.48667	486.40667	565.99000	449.52000	467.42000	502.48333	538.57000	502.69667	40.13330	7.98360	126.13896
76	C740 bis(2-Ethylhexyl)phthalate	667.95333	501.21333	554.08000	411.92667	469.79667	475.88000	527.90000	515.25000	81.27760	15.77440	235.45550
77	C760 Di-n-octylphthalate	496.79667	469.84667	534.64667	403.37333	449.63667	464.65667	513.95000	476.12383	43.61790	9.17364	137.27964
79	C765 Benzofluoranthene	606.49333	581.11333	660.30333	553.93667	553.89333	582.27667	610.58000	592.65666	37.26390	6.28760	117.12044
80	C770 Benzofluoranthene	551.59000	567.96000	636.84667	504.53667	548.22000	552.22000	605.04000	566.63049	42.86710	7.56879	134.79416
81	C775 Benzofluoranthene	502.98667	486.85333	582.99667	466.86333	453.17333	476.43000	522.41000	499.10190	43.44120	8.70387	136.53569
82	C780 Indeno[1,2,3-cd]pyrene	589.47333	580.94667	657.87000	530.30667	534.91333	534.50333	577.32667	572.19143	45.28960	7.91511	142.34521
83	C785 Dibenz[a,h]anthracene	631.40000	610.62667	680.76667	545.61333	562.14667	572.24333	622.59333	603.62714	46.90720	7.77089	147.42933

Date: 03/12/2002
Time: 13:25:31

SW046 8270C SOIL MDL'S AT 350UG/KG EXIR.METH 3050A
Study Type: MDL

Rept: AN0751
Page: 3

Instrument: L50Y-A
File Extension: RR
Unit of Measure: UG/KG
Analyst: PM
Analysis Date: 10/09/2001
Expiration Date: 10/09/2002

No	Compound Name	Y49029	Y49030	Y49031	Y49032	Y49033	Y49034	Y49035	Avg	Std Dev	% RSD	MDL

84	C790 Benzo[a,h,i]perylene	581.87333	568.22333	632.80333	505.06667	536.47333	526.71333	568.52333	559.95379	42.02820	7.50566	132.09463

Date: 03/12/2002
Time: 13:26:17

8270 WATER MDL'S AT 20MG
Study Type: MDL

Rep: AN0751
Page: 1

Instrument: 150Y-A
File Extension: RR
Unit of Measure: UG/L
Analyst: PM
Analysis Date: 03/22/2001
Expiration Date: 03/22/2002

No	Compound Name	Y46577	Y46578	Y46579	Y46580	Y46581	Y46582	Y46583	Avg	Std Dev	% RSD	MDL
2	C705 n-nitrosodimethylamine	0.96470	3.76500	3.53800	2.34150	3.40070	1.87700	2.04860	2.56507	1.03990	40.50182	3.26526
3	C850 2-fluorophenol	0.78890	3.43050	3.96900	1.99560	2.78490	1.92940	2.37680	2.43930	1.12380	46.07059	3.53210
4	C325 bis(2-chloroethyl)ether	6.62050	10.26210	11.45050	7.04660	10.19930	7.54490	9.40380	8.90396	1.90270	21.36914	5.98019
5	C845 Phenol-d5	1.11550	3.14500	3.65360	1.37680	2.95540	2.06700	2.58248	2.44170	0.90420	37.03158	2.84190
6	C570 2-chlorophenol-d4	4.55080	9.36870	10.86530	6.14210	9.55230	6.85500	8.69370	8.00399	2.22240	27.76615	4.98500
7	C315 Phenol	0.97760	3.19600	3.24150	1.43940	2.82130	1.84690	2.73830	2.32329	0.89830	38.66500	2.82336
8	C330 2-chlorophenol	4.02650	8.31060	9.93770	5.65280	7.71920	6.03090	6.89120	6.93841	1.93420	27.87670	6.07919
9	C320 aniline	3.80620	10.12750	9.39930	5.12440	6.87200	5.85630	3.76770	6.42191	2.53930	39.54120	7.98102
10	C335 1,3-dichlorobenzene	3.77020	6.09780	8.08650	5.84040	8.06620	6.64710	8.42210	6.70433	1.65540	24.69151	5.20292
11	C340 1,4-dichlorobenzene	3.83240	6.87240	8.83170	5.82990	8.36410	7.10480	8.57990	7.01984	1.67110	23.80539	5.25227
12	C875 1,2-dichlorobenzene-d4	4.15640	6.87240	8.83170	5.82990	8.36410	6.64710	8.25710	7.00061	1.65570	23.65080	5.20387
13	C350 1,2-dichlorobenzene	4.17160	6.63090	8.91590	5.92250	8.28420	6.63800	8.27330	6.97691	1.65180	23.67524	5.19161
14	C345 Benzyl alcohol	2.81690	6.93630	7.23990	3.42370	5.89770	4.29950	4.71190	5.04656	1.70200	33.72594	5.34939
15	C360 bis(2-chloroisopropyl)ether	6.77560	10.87340	12.50320	8.10610	11.45100	8.00170	10.23940	9.70731	2.10450	21.67909	6.61444
16	C355 2-methylphenol	3.45710	8.16700	9.35310	4.88110	7.75170	5.52930	6.77620	5.63197	1.64920	30.36099	5.18344
17	C370 hexachloroethane	2.55990	4.44740	6.29460	4.92500	7.05660	5.43550	7.29480	5.52445	2.21530	23.25865	6.96289
18	C375 n-nitroso-di-n-propylamine	6.73870	10.81490	12.78460	7.58290	11.23810	7.88910	9.62410	9.51356	2.22260	23.34244	6.98563
19	C365 4-methylphenol	2.78650	7.29330	8.53100	4.36070	7.04590	5.22220	6.09840	9.71939	2.02970	20.88300	6.37935
21	C820 nitrobenzene-d5	6.52680	11.23250	12.63730	7.18440	10.39330	8.38140	10.23900	10.34850	2.22290	25.16150	6.98657
22	C610 nitrobenzene	7.92380	11.21660	12.31960	13.64120	7.45240	11.06330	11.03740	8.03453	1.84980	21.04056	5.81392
23	C615 isophorone	7.92340	12.28570	12.12420	6.65930	9.96770	7.29420	9.07190	8.79159	2.12910	20.58784	5.64074
25	C420 2-nitrophenol	6.00480	10.19350	12.12420	6.65930	9.96770	7.29420	9.07190	8.03453	1.84980	21.04056	5.81392
26	C425 2,4-dimethylphenol	5.92050	10.26930	11.01230	7.06620	10.08170	8.83050	10.86880	10.34153	2.12910	20.58784	5.64074
27	C435 bis(2-chloroethoxy)methane	7.86880	11.59730	12.77380	7.88020	12.57130	10.06790	10.97560	10.34067	1.79470	17.35574	5.64074
28	C440 2,4-dichlorophenol	7.57740	11.46330	12.30070	8.28560	11.71420	10.06790	10.97560	10.34067	1.79470	17.35574	5.64074
29	C445 1,2,4-trichlorobenzene	4.40900	6.72730	8.79790	5.65740	8.31610	7.01940	8.40100	7.04687	1.60740	22.81013	5.05206
30	C450 Naphthalene	6.71990	10.31250	11.88190	7.96950	11.13110	9.20070	10.77800	9.71251	1.84870	19.03421	5.81046
31	C455 4-chloroaniline	3.44610	9.77110	9.80270	4.74760	7.05460	6.90450	5.06030	6.68384	2.46010	36.80669	7.73209
32	C660 hexachlorobutadiene	2.82510	4.87340	6.47970	5.45900	7.43280	5.96620	7.77190	5.82944	1.67700	28.76777	5.27081
33	C465 4-chloro-3-methylphenol	7.01740	12.61110	11.89800	9.70860	12.72240	10.88240	10.82270	10.80894	1.98690	18.38201	6.24483
34	C470 2-methylnaphthalene	6.76330	9.81690	11.03610	7.60230	10.77360	8.44200	14.13860	9.79643	2.48990	25.41640	7.82576
36	C510 hexachlorocyclopentadiene	2.36160	4.58600	6.53460	4.93980	6.79630	5.44860	7.98850	5.52220	1.82310	33.01402	5.73000
37	C515 2,4,6-trichlorophenol	7.87230	12.33260	12.81250	11.06230	12.08100	10.93860	12.17390	11.32474	1.66630	14.71380	5.23718
38	C520 2,4,5-trichlorophenol	7.26660	11.92290	12.56260	10.72530	12.25430	10.42530	11.98030	11.01961	1.83340	16.63761	5.76238
39	C525 2-fluorobiphenyl	6.67940	10.98890	12.43060	8.96190	11.69890	10.14760	12.52660	10.49401	2.09890	20.00093	6.59684
40	C525 2-chloronaphthalene	6.73280	10.86950	12.41180	8.41590	11.84970	9.74790	12.01740	10.29214	2.11010	20.50205	6.63204
41	C530 2-nitroaniline	8.27240	14.00380	14.71690	12.27060	15.16330	13.25090	13.94480	13.08896	2.32440	17.75846	7.30559
42	C540 Acenaphthylene	9.36590	14.61080	14.72910	11.74460	14.81050	12.96980	15.04540	13.23944	2.20960	16.68953	6.94477

Date: 03/12/2002
Time: 13:26:17

8270 WATER MDL'S AT ZOMS
Study type: MDL

Rept: AN0751
Page: 2

Instrument: 150Y-A
File Extension: RR
Unit of Measure: ug/L
Analysis Date: 03/22/2001
Expiration Date: 03/22/2002

NO	Compound Name	Y46577	Y46578	Y46579	Y46580	Y46581	Y46582	Y46583	Avg	Std Dev	% RSD	MDL
43	C535 Dimethylphthalate	9.53660	13.93520	15.46890	11.96270	15.13390	13.57660	14.77230	13.48374	2.09080	15.56541	6.59653
44	C542 2,6-Dinitrotoluene	7.43370	12.52370	13.38240	10.42900	13.13110	10.36550	12.17750	11.34927	2.10180	18.51925	6.60596
45	C550 Acenaphthene	8.68700	13.06640	14.54230	10.69480	14.77050	11.85430	13.84720	12.49464	2.22600	17.79963	6.99003
46	C545 3-Mitroaniline	3.94680	10.93770	11.16100	7.38900	9.17640	8.67660	7.58920	8.41087	2.45790	29.22290	7.72516
47	C555 2,4-Dinitrophenol	2.39440	14.33690	19.13690	6.84890	11.09740	3.84040	3.34110	8.71371	6.35050	72.87940	19.95962
48	C565 Dibenzofuran	8.73960	13.05880	16.59390	12.06010	14.95670	12.75770	14.69330	12.98001	2.17290	16.74036	6.82942
49	C570 2,4-Dinitrotoluene	8.38980	13.07000	14.07630	12.29850	13.67820	12.23390	12.87380	12.37384	1.88080	15.19981	5.91135
50	C560 4-Mitrophenol	1.01060	7.16920	7.35540	3.52510	6.33480	4.02930	5.36230	4.96953	2.28010	45.08160	7.16635
51	C590 Fluorene	8.79310	13.33200	14.51440	12.54250	15.20040	13.32270	14.57650	13.18280	2.14090	16.24010	6.72885
52	C585 4-Chlorophenyl-phenylether	8.03100	12.31600	13.93870	11.90580	13.91150	12.60020	13.14120	12.26349	2.01870	16.46106	6.34477
53	C580 Diethylphthalate	10.12730	14.29750	15.12280	14.25720	14.82900	13.71550	15.22690	13.93931	1.76340	12.65055	5.54237
54	C620 1,2-diphenylhydrazine	9.24110	13.97100	15.18190	13.46570	15.35830	13.30050	14.79780	13.61376	2.09280	15.37268	6.57767
55	C595 4-Mitroaniline	5.59520	12.73200	12.75060	9.77130	12.11590	10.59010	10.58860	10.59196	2.49010	23.50934	7.82638
57	C610 4,6-Dinitro-2-methylphenol	13.40140	25.33300	31.67470	17.52900	27.76180	19.30720	17.71000	21.81673	6.54790	30.01321	20.58005
58	C615 n-Mitrosodiphenylamine	8.06010	11.89860	13.52850	10.43690	13.65120	11.40130	11.51180	11.46894	1.90940	16.60588	6.00124
59	C635 2,4,6-Trifluorophenol	8.34530	12.09280	13.56560	10.96610	13.65910	12.46790	11.98610	11.86899	1.81370	15.28100	5.70046
60	C625 4-Bromophenyl-phenylether	8.01670	12.32490	14.37630	11.10260	14.64750	13.74010	12.49510	12.41471	2.29750	18.50627	7.22104
61	C630 Hexachlorobenzene	6.57340	11.55160	12.91520	10.16970	12.65480	10.99940	11.52240	10.90964	2.13090	23.46292	6.69742
62	C635 Pentachlorophenol	15.55820	31.57730	34.45790	24.73270	29.78380	26.65130	24.31590	26.43959	6.20350	17.73869	19.49760
63	C640 Phenanthrene	9.56480	14.18500	15.98050	13.52700	15.88160	14.27740	14.45740	13.98196	2.14770	15.36051	6.75022
64	C665 Anthracene	9.25700	14.68150	16.57440	13.34440	16.12640	14.15850	14.65940	14.11454	2.41210	17.08947	7.58123
65	C647 carbazole	10.72570	14.72580	16.31550	13.45820	15.16970	14.73060	14.80060	14.41801	1.89570	13.14014	5.95619
66	C650 bi-n-butylphthalate	9.78070	14.84510	17.28530	13.54620	17.11590	15.49330	15.22470	14.06186	2.00990	14.46794	6.31712
67	C655 Fluoranthene	9.52510	15.61060	15.59210	13.77790	16.36840	15.47280	14.91150	14.53121	2.63630	17.73869	8.28589
69	C715 Pyrene	9.54440	15.36460	15.59210	14.46470	16.36840	15.47280	14.91150	14.53121	2.63630	17.73869	8.28589
70	C710 benzidine	4.82660	15.37100	9.03670	3.94120	6.85030	6.81240	0.31230	6.73579	4.70100	69.79137	14.77524
71	C830 Terphenyl-d14	10.10690	17.24990	15.97860	14.64800	17.34590	15.88700	15.83370	15.29286	2.46550	16.12190	7.74907
72	C720 Butylbenzylphthalate	9.24460	15.14670	14.45160	13.39510	16.51220	14.41530	14.09010	13.89366	2.26980	16.36695	7.13398
73	C725 3,3'-Dichlorobenzidine	7.03660	12.14210	11.52120	10.23870	12.89390	12.27390	11.28270	11.05559	1.96550	17.75025	6.17128
74	C730 Benzofuran	10.77240	17.20170	17.80580	16.17230	19.33250	17.00270	16.20400	16.35591	2.68730	16.43075	8.44618
75	C735 Chrysene	9.92600	16.36760	17.52460	15.71410	18.36010	16.42030	14.24280	14.59041	2.44490	17.39363	8.44618
76	C740 bis(2-Ethylhexyl)phthalate	9.43820	16.49800	15.40060	14.39960	16.55030	15.60340	14.01000	16.93474	2.65480	15.67665	7.58432
78	C760 Di-n-octylphthalate	11.49720	19.32740	18.45890	17.22050	18.85270	17.17650	14.55070	15.81807	2.42590	15.33626	7.62460
79	C765 Benzofluoranthene	10.89550	17.65250	17.67170	16.16030	17.21680	16.59900	14.55070	15.81807	2.42590	15.33626	7.62460
80	C770 Benzofluoranthene	10.51340	18.01790	18.52820	16.68330	18.04130	17.13370	15.20750	16.30361	2.78290	17.06923	8.74665
81	C775 Benzofluoranthene	10.71500	16.30370	16.51100	15.82180	16.79260	15.39530	15.20440	15.24911	2.08150	13.64998	6.54215
82	C780 Indeno[1,2,3-cd]pyrene	10.26670	16.16370	15.39920	15.42670	16.14440	15.37500	17.02780	15.11464	2.22030	14.68973	6.97640
83	C785 Dibenz[a,h]anthracene	11.24150	17.37030	17.49110	15.93280	17.95390	16.16060	14.69220	15.83550	2.31600	14.61274	7.27290

Date: 03/12/2002
Time: 15:26:17

8270 WATER MDL'S AT 20MG
Study Type: MDL

Rept: AW0751
Page: 3

Instrument: 150Y-A
File Extension: RR
Unit of Measure: UG/L
Analyst: PM
Analysis Date: 03/22/2001
Expiration Date: 03/22/2002

No	Compound Name										MDL
	Y46577	Y46578	Y46579	Y46580	Y46581	Y46582	Y46583	Avg	Std Dev	% RSD	
84 C790 Benzoflg,h,1}perylene	12.57610	18.56530	16.98310	18.45620	21.67670	18.72150	17.95910	18.13666	2.73390	15.07372	8.59265

Instrument: NP597SP
File Extension: RL
Unit of Measure: US/KG
Analysis Date: 02/07/2001
Expiration Date: 12/31/2001

He	Compound Name	P1130	P1131	P1137	P1133	P1134	P1135	P1136	Avg	Std Dev	% RSD	MDL
2 C010	Chloromethane	4.56088	4.79928	5.56382	5.31272	4.83154	4.96142	4.83860	4.98117	0.34210	6.86766	1.07522
3 C015	Bromomethane	3.38760	3.37152	3.61816	2.77142	2.82222	2.42636	2.84742	3.03636	0.42540	14.01020	1.33703
4 C020	Vinyl Chloride	4.46060	4.48816	5.96612	4.47876	4.26324	4.13780	4.33068	4.58921	0.62080	13.52718	1.95117
5 C025	Chloroethane	4.68160	4.78890	6.14082	4.74404	4.87614	4.35936	4.93628	4.93493	0.56260	11.40036	1.76825
6 C030	Methylene Chloride	8.41446	8.43692	10.32108	8.76584	8.74478	8.41900	8.00174	8.72624	0.24560	8.55580	2.34656
7 C035	Acetone	5.54944	4.90942	5.15116	5.44284	5.01324	4.95258	5.23340	5.17886	0.24560	4.74216	0.77192
8 C040	Carbon Disulfide	4.94532	4.49458	5.64856	4.31142	4.13414	4.00248	4.21022	4.54670	0.56720	12.67498	1.78271
9 C045	1,1-Dichloroethene	4.83870	4.52424	5.84308	4.44346	4.38000	4.44120	4.61360	4.72633	0.51550	10.90698	1.62022
10 C050	1,1-Dichloroethane	5.07702	4.81668	5.73218	4.78358	4.71542	4.51154	4.71662	4.90729	0.40070	8.16540	1.25940
11 C057	trans-1,2-dichloroethene	4.96104	4.85630	5.73174	4.86240	4.34626	4.65554	4.44134	4.83636	0.45590	9.42651	1.43289
12 C066	cis-1,2-dichloroethane	5.37020	5.14628	5.58400	4.82582	4.93834	5.17618	4.91180	5.13609	0.27170	5.29002	0.85395
13 C060	Chloroform	5.17520	4.99020	5.66322	5.05202	4.90656	4.63312	4.90528	5.04651	0.31900	6.32120	1.90262
14 C015	1,2-Dichloroethane-d4	49.16580	50.16218	51.31640	52.34232	52.54652	50.13144	50.47378	50.87691	1.24400	2.44512	3.90989
15 C065	1,2-Dichloroethane	5.20946	5.25976	6.09136	5.57476	5.37050	5.39494	5.46058	5.49304	0.28350	5.16198	0.89104
16 C110	2-Butanone	5.65696	5.85026	5.50960	6.31882	6.01148	5.44238	6.00876	5.82834	0.31280	5.16688	0.98313
18 C115	1,1,1-Trichloroethane	4.98812	4.53708	5.56772	4.30294	4.09490	4.29842	4.32336	4.58779	0.51640	11.25596	1.62305
19 C120	Carbon Tetrachloride	4.60994	4.38928	5.39182	3.99630	3.97014	3.93352	4.06134	4.33174	0.52870	12.20526	1.66170
20 C130	Bromochloroethane	4.82276	4.51014	5.27706	4.39284	4.43546	4.54310	4.61132	4.65610	0.38070	6.60424	0.96647
21 C140	1,2-Dichloropropane	5.32252	4.82298	5.60222	4.69610	4.77112	4.86848	4.70672	4.96716	0.35220	7.09057	1.10696
22 C145	cis-1,3-Dichloropropene	4.61320	4.51562	5.19540	4.44982	4.36440	4.46924	4.56360	4.59589	0.27630	6.01189	0.86841
23 C150	Trichloroethene	5.20810	4.93464	5.62666	4.68096	4.39338	4.53474	4.50806	4.84380	0.44340	9.15397	1.39361
24 C165	Benzene	5.42578	4.84874	5.60998	4.48258	4.35244	4.56642	4.68998	4.85370	0.48260	9.94293	1.51681
25 C155	Dibromochloromethane	4.62164	4.43516	5.06168	4.43234	4.34066	4.55644	4.51636	4.54059	0.24890	5.48167	0.78229
26 C170	trans-1,3-Dichloropropene	4.70466	4.51702	5.18950	4.63014	4.54602	4.59424	4.60328	4.68383	0.23100	4.93166	0.72603
27 C160	1,1,2-Trichloroethane	5.27076	5.08432	5.26714	4.97738	4.76374	4.89424	5.05702	5.04493	0.18640	3.69480	0.50586
28 C180	Bromoform	4.56704	4.10248	4.34488	4.02602	4.30642	4.06846	4.40006	4.27077	0.21110	4.94290	0.66349
30 C210	4-Methyl-2-Pentanone	5.26372	4.34994	4.43770	4.57502	4.25178	4.28342	4.49570	4.52274	0.34620	7.65465	1.08811
31 C215	2-Hexanone	5.07144	4.71676	4.24156	4.67740	4.58260	4.27486	4.69030	4.60786	0.20480	6.16338	0.89261
32 C220	Tetrachloroethene	5.27492	4.60850	4.98486	3.93480	3.85948	3.96206	4.02312	4.37826	0.57590	13.15365	1.81005
33 C225	1,1,2,2-Tetrachloroethene	4.78944	4.54002	4.61102	4.33056	4.09802	4.22756	4.39972	4.43090	0.23540	5.31269	0.73986
34 C205	Toluene-d8	48.58666	47.11786	46.21456	46.66876	46.35446	46.57730	45.84318	46.76337	0.89530	1.91452	2.81393
35 C230	Toluene	4.89082	4.16720	4.59868	3.86106	3.72528	3.80520	3.83550	4.12637	0.45230	10.96121	1.42158
36 C235	Chlorobenzene	5.20018	4.54034	5.08754	4.31788	4.26030	4.26174	4.30262	4.56433	0.40920	8.96517	1.26612
37 C240	Ethylbenzene	3.01108	4.40696	4.96914	3.89050	3.83090	3.88226	4.08070	4.28451	0.52390	12.22777	1.64662
38 C246	m,p-Xylene	8.87126	9.64680	8.21878	7.69072	7.90784	8.08772	8.64929	8.64929	0.93370	10.79511	2.93462
39 C247	o-Xylene	5.10198	4.52048	5.00522	4.23306	4.07476	4.05392	4.01474	4.43203	0.45860	10.36740	1.44138
40 C510	p-Bromofluorobenzene	50.45270	51.91620	51.94024	52.15198	51.62402	51.02934	51.58926	51.50053	0.59580	1.15533	1.87009
41 C245	Styrene	4.65430	4.07510	4.40336	4.00120	3.81150	3.71966	3.80018	4.06649	0.34630	8.51594	1.08642

Date: 03/12/2002
Time: 13:14:31

ASP/CLP 5ML IDL AT 5UG/L
Study Type: IDL

Rept: AM0751
Page: 1

Instrument: MP5975F
File Extension: RR
Unit of Measure: UG/L
Analyte: CAS
Analysis Date: 01/25/2001
Expiration Date: 01/25/2002

No	Compound Name	F1008	F1009	F1010	F1011	F1012	F1013	F1014	Avg	Std Dev	% RSD	IDL
2	C290 Dichlorodifluoromethane	4.76228	5.44586	4.84896	4.66952	4.72214	4.21624	4.27408	4.69987	0.40800	8.68109	1.22400
3	C010 Chloromethane	5.89584	8.11208	6.55408	6.72438	6.65650	6.38014	6.54094	6.69484	0.68220	10.18594	2.04660
4	C015 Bromomethane	6.16802	7.81466	5.81558	5.34600	5.72460	4.95606	5.93168	5.96524	0.90780	15.21816	2.72340
5	C020 Vinyl Chloride	5.54116	7.55564	6.01780	5.90948	5.85040	5.90886	5.69320	6.06809	0.67470	11.11862	2.02410
6	C025 Chloroethane	4.98058	7.34288	5.81092	5.83082	6.29894	5.01918	5.65672	5.84857	0.80780	13.81192	2.42340
7	C030 Methylene Chloride	5.61500	6.68594	5.53476	5.67306	5.30164	4.91068	5.26010	5.56589	0.55900	10.04332	1.67700
8	C035 Acetone	5.07554	6.51136	6.03306	7.87440	6.63050	7.56560	6.72172	6.63043	0.93660	14.06545	2.79780
9	C040 Carbon Disulfide	4.84914	6.43228	5.00004	4.79056	4.96912	4.59108	4.66922	5.04306	0.63020	12.49638	1.89060
10	C275 Trichlorofluoromethane	5.29972	6.68864	5.48056	5.49306	6.00800	5.40286	5.54020	5.70187	0.68940	8.58315	1.66820
11	C045 1,1-dichloroethane	5.00806	7.42176	5.71494	5.96138	5.68396	5.38806	5.68546	5.83771	0.76120	13.03936	2.28360
12	C291 1,1,2-Trichloro-1,2,2-trifluor	5.26148	6.54050	5.59390	5.43928	5.55594	5.20956	5.17560	5.54236	0.47830	8.63331	1.43530
13	C962 T-butyl methyl ether	4.91264	5.62916	5.03866	4.95024	4.66762	4.55094	4.70342	4.92177	0.35700	7.23349	1.07100
14	C050 1,1-dichloroethane	4.66838	6.40254	5.04066	5.13202	5.11054	4.59636	4.68406	5.09066	0.62090	12.19685	1.86270
15	C235 Methyl Acetate	4.58826	6.05630	5.31506	5.40342	5.42222	4.97374	5.12432	5.26904	0.45370	8.61068	1.36110
16	C057 trans-1,2-dichloroethane	4.70612	6.40762	4.95692	4.87010	4.67700	4.54510	4.83894	5.00024	0.63560	12.71139	1.90680
17	C056 cis-1,2-dichloroethane	4.70232	6.46548	4.85206	4.93558	4.93124	4.44886	4.67580	4.97306	0.68810	13.83655	2.06430
18	C060 Chloroform	4.85444	6.43966	5.01766	5.04574	4.96662	4.58150	4.76196	5.09537	0.61450	12.05997	1.84330
19	C315 1,2-dichloroethane-d4	53.97812	54.32604	54.82970	55.44014	53.87460	54.85320	54.96442	54.60919	0.58920	1.04232	1.70760
20	C065 1,2-dichloroethane	5.28008	6.61276	5.30766	5.45616	4.96742	4.97144	5.01676	5.36190	0.62730	10.45137	1.80250
21	C110 2-Butanone	5.12458	7.05172	6.47818	6.12800	5.85422	5.83452	5.55682	6.00400	0.62730	7.64558	1.13010
23	C256 Cyclohexane	5.11334	5.60052	4.93992	4.81558	4.99198	4.66388	4.56406	4.92703	0.37670	15.15136	2.20080
24	C012 Methylcyclohexane	5.94224	5.76214	4.70790	4.12830	4.74666	4.46656	4.13890	4.84181	0.73360	15.00319	1.84650
25	C115 1,1,1-Trichloroethane	4.11876	5.87312	4.46862	4.29620	4.47368	4.31016	4.18024	4.53154	0.61550	12.83318	1.80450
26	C120 Carbon Tetrachloride	3.89284	5.47012	4.05770	3.84312	3.90574	3.77908	3.68840	4.10246	0.60150	14.07315	2.09520
27	C130 Bromodichloromethane	4.51298	6.02022	4.72076	4.42998	4.40238	4.40524	4.63388	4.96264	0.55320	13.27918	1.96560
28	C140 1,2-dichloropropane	4.59450	6.49916	4.98932	4.68726	4.85778	3.86488	4.16266	4.54061	0.54730	13.49702	1.64190
29	C145 cis-1,3-Dichloropropene	4.56914	6.06462	4.58042	4.30252	4.24010	4.18036	4.72982	4.05497	0.59750	13.40699	1.79250
30	C150 Trichloroethene	4.32330	5.67528	4.35922	4.24130	4.24572	4.50876	4.77982	4.45663	0.62750	13.38829	1.88250
31	C145 Benzene	4.65548	6.40392	4.66686	4.76638	4.80500	4.50876	4.72982	4.93404	0.55320	13.27918	1.96560
32	C155 Dibromochloromethane	4.27982	5.19898	3.82478	3.88162	3.82240	3.56092	3.81634	4.05497	0.59750	13.40699	1.79250
33	C170 trans-1,3-Dichloropropene	4.39560	5.76662	4.37278	4.37570	4.19600	4.01472	4.07502	4.45663	0.62750	13.38829	1.88250
34	C160 1,1,2-Trichloroethane	4.62302	6.06190	4.55964	4.58804	4.48240	4.32606	4.16762	4.68693	0.54710	15.63742	1.64130
35	C160 Bromoform	3.45332	4.66414	3.33720	3.37062	3.54622	3.11180	3.00742	3.49866	0.41830	8.85627	1.25490
37	C163 1,2-dibromoethane	5.11632	5.40852	4.73030	4.52938	4.98850	4.24606	4.33278	4.71584	0.45890	9.75103	1.37670
38	C210 4-Methyl-2-Pentanone	4.67014	5.60602	4.52938	4.98850	4.65800	4.24606	4.33278	4.71584	0.45890	9.75103	1.37670
39	C215 2-Hexanone	6.15792	6.19390	5.50110	5.06004	5.20452	4.88340	4.48548	5.35519	0.64000	11.95102	1.92000
40	C220 Tetrachloroethene	4.93970	5.57776	4.22162	3.99148	4.20202	3.45292	3.59784	4.28333	0.74850	17.47472	2.24550
41	C225 1,1,2,2-Tetrachloroethane	5.28246	6.31502	4.97116	4.71676	4.82346	4.34328	4.22862	4.95441	0.69920	14.11268	2.09760

Date: 03/12/2002
Time: 13:14:31

ASP/CLP 5ML IDL AT 5UG/L
Study Type: IDL

Rept: AN0751
Page: 2

Instrument: HP5973F
File Extension: RR
Unit of Measure: UG/L
Analysis Date: 01/25/2001
Expiration Date: 01/25/2002

NO	Compound Name	F1008										Avg	Std Dev	% RSD	IDL
		F1008	F1009	F1010	F1011	F1012	F1013	F1014	F1015	F1016	F1017				
42	CS05 Toluene-d8	52.81932	50.79732	51.51574	52.57458	51.07768	52.57688	52.35570	51.95960	0.81460	1.56776	2.44380			
43	CS30 Toluene	4.89660	5.84890	4.65558	4.57902	4.68884	4.36558	4.17286	4.74391	0.54030	11.36934	1.62090			
44	CS35 Chlorobenzene	5.25662	6.11290	4.89770	4.82460	4.81870	4.51736	4.33776	4.96367	0.58180	11.72117	1.74540			
45	CS40 Ethylbenzene	4.90042	5.81986	4.64516	4.52874	4.54674	4.23342	3.86598	4.64861	0.61170	13.15877	1.83510			
46	CS46 m,p-Xylene	9.72672	11.27986	9.12780	9.05492	8.82230	8.13962	7.96256	9.15911	1.11180	12.13873	3.35540			
47	CS47 o-Xylene	4.72030	5.72496	4.52566	4.66034	4.57396	3.97872	3.89262	4.58237	0.60200	13.13731	1.80620			
48	CS10 p-Bromofluorobenzene	49.63062	47.95338	48.60174	49.11588	49.46520	48.38432	47.85884	48.71571	0.70680	1.45087	2.12040			
49	CS45 Styrene	4.38260	5.35542	4.14864	4.22032	4.30494	3.79872	3.78892	4.28563	0.52620	12.27824	1.57860			
50	CS66 Isopropylbenzene	5.06294	5.38866	4.53326	4.56806	4.53180	4.15320	3.94790	4.56941	0.50290	11.00580	1.50870			
51	CS60 1,3-Dichlorobenzene	5.33832	5.57896	4.48114	4.33488	4.49262	4.19550	3.93514	4.61950	0.60050	12.99924	1.80150			
52	CS67 1,4-Dichlorobenzene	5.36656	5.31390	4.43374	4.48964	4.60788	4.28646	4.13640	4.66209	0.48710	10.44610	1.46130			
53	CS49 1,2-Dichlorobenzene	5.24062	5.39230	4.48474	4.52908	4.49364	4.18776	4.22830	4.65091	0.47570	10.22811	1.42710			
54	CS86 1,2-Dibromo-3-chloropropane	7.09236	8.14780	7.04348	5.60170	5.97956	5.01326	5.04668	6.27500	1.18370	18.86375	3.55110			
55	CS13 1,2,4-Trichlorobenzene	6.69382	6.36868	5.44772	5.08854	5.12836	4.94514	4.91212	5.51204	0.72370	13.12944	2.17110			

STL BUFFALO

GEO MATRIX CONSULTANTS

-6-
DUPLICATES

SAMPLE NO.

120301183 SD

Contract: NY00-433

Lab Code: STL BFLO

Case No.:

SAS No.:

SDG NO.: A01-B908

Matrix (soil/water): WATER

Level (low/med): LOW

% Solids for Sample: 0.0

% Solids for Duplicate: 0.0

Concentration Units (ug/L or mg/kg dry weight):

UG/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Arsenic		173.5200		201.5400		14.9		P
Chromium		176.8400		204.1100		14.3		P

STL BUFFALO**GEO MATRIX CONSULTANTS**-6-
DUPLICATES

SAMPLE NO.

101501139 SD

Contract: NY00-433

Lab Code: STLBFLO

Case No.: _____

SAS No.: _____

SDG NO.: A01-A112

Matrix (soil/water): SOIL

Level (low/med): LOW

% Solids for Sample: 88.8

% Solids for Duplicate: 88.8

Concentration Units (ug/L or mg/kg dry weight):

MG/KG

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Arsenic		28.9790		28.8793		0.3		P
Chromium		46.8022		39.4188		17.1		P

STL BUFFALO**GEO MATRIX CONSULTANTS**

-6-
DUPLICATES

SAMPLE NO.

101501133 SD

Contract: NY00-433

Lab Code: STLBFL0

Case No.: _____

SAS No.: _____

SDG NO.: 100113Matrix (soil/water): SOILLevel (low/med): LOW% Solids for Sample: 30.6% Solids for Duplicate: 30.6

Concentration Units (ug/L or mg/kg dry weight):

MG/KG

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Arsenic		64.9290		63.6794		1.9		P
Chromium		300.6123		327.6004		8.6		P

GEO MATRIX CONSULTANTS

-6-
DUPLICATES

SAMPLE NO.

1106011638DSOL

Contract: NY00-433

Lab Code: STLBFLO

Case No.: 00014

SAS No.:

SDG NO.: 110114

Matrix (soil/water): WATER

Level (low/med): LOW

% Solids for Sample: 0.0

% Solids for Duplicate: 0.0

Concentration Units (ug/L or ng/kg dry weight):

UG/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RFD	Q	M
Aluminum		200.0000	U	9414.4297		200.0	*	P
Antimony		60.0000	U	185.5600		200.0	*	P
Arsenic		10.0000	U	199.1500		200.0	*	P
Barium		442.8200		632.3100		35.2	*	P
Beryllium		5.0000	U	193.5900		200.0	*	P
Cadmium		5.0000	U	199.0900		200.0	*	P
Calcium		45759.1719		55368.6211		19.0		P
Chromium		10.0000	U	197.0200		200.0	*	P
Cobalt		50.0000	U	202.6500		200.0	*	P
Copper		25.0000	U	199.2100		200.0	*	P
Iron		351.1000		750.3600		72.5	*	P
Lead		3.0000	U	197.1700		200.0	*	P
Magnesium		8041.5801		17771.6699		75.4	*	P
Manganese		160.6900		357.8400		76.0	*	P
Nickel		40.0000	U	198.1800		200.0	*	P
Potassium		5000.0000	U	13627.6299		200.0	*	P
Selenium		10.5500		224.9800		182.1	*	P
Silver		10.0000	U	44.7700		200.0	*	P
Sodium		5000.0000	U	13048.0703		200.0	*	P
Thallium		10.0000	U	197.0900		200.0	*	P
Vanadium		50.0000	U	197.2000		200.0	*	P
Zinc		20.0000	U	213.9800		200.0	*	P

STL BUFFALO**GEO MATRIX CONSULTANTS**

-6-

DUPLICATES

SAMPLE NO.

11080117 SD

Contract: NY00-433

Lab Code: STLBFL0

Case No.: 00014

SAS No.:

SDG NO.: 110114

Matrix (soil/water): WATER

Level (low/med): LOW

% Solids for Sample: 0.0

% Solids for Duplicate: 0.0

Concentration Units (ug/L or mg/kg dry weight):

UG/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RED	Q	M
Aluminum		10890.1201		10498.8398		3.7		P
Antimony		195.5100		189.1600		3.3		P
Arsenic		195.4600		190.7600		2.4		P
Barium		233.0300		226.5300		2.8		P
Beryllium		192.8600		189.1800		1.9		P
Cadmium		190.6500		187.7600		1.5		P
Calcium		293871.0000		287590.4063		2.2		P
Chromium		204.8800		201.4300		1.7		P
Cobalt		195.3100		191.7400		1.8		P
Copper		207.7600		202.9000		2.4		P
Iron		10200.0000		9660.2998		4.3		P
Lead		189.8200		188.4800		0.7		P
Magnesium		85690.5469		83640.7813		2.4		P
Manganese		527.0200		515.9800		2.1		P
Nickel		195.5700		192.8500		1.4		P
Potassium		13700.1602		13326.8096		2.8		P
Selenium		184.7700		181.5800		1.7		P
Silver		50.4200		48.6000		3.7		P
Mercury		4.8833		4.0167		19.5		CV
Sodium		31328.4297		30597.8906		2.4		P
Thallium		187.6300		186.9000		0.4		P
Vanadium		199.7900		195.8200		2.0		P
Zinc		23.1000		203.8400		1.7		P

STL BUFFALO**GEO MATRIX CONSULTANTS****-6-
DUPLICATES**

SAMPLE NO.

101001075 SD

Contract: NY00-433

Lab Code: STLBFL0

Case No.: _____

SAS No.: _____

SDC NO.: 100110Matrix (soil/water): SOILLevel (low/med): LOW* Solids for Sample: 88.8* Solids for Duplicate: 88.8

Concentration Units (ug/L or mg/kg dry weight):

MG/KG

Analyte	Control Limit	Sample (S) C	Duplicate (D) C	RPD	Q	M
Arsenic		32.6286	33.3963	2.3		P
Chromium		34.4623	34.8302	1.1		P

STL BUFFALO

GEO MATRIX CONSULTANTS

-6-
DUPLICATES

SAMPLE NO.

100501012SD SPLP

Contract: NY00-433

Lab Code: STL BFLO

Case No.: _____

SAS No.: _____

SDG NO.: 100106

Matrix (soil/water): WATER

Level (low/med): LOW

% Solids for Sample: 0.0

% Solids for Duplicate: 0.0

Concentration Units (ug/L or mg/kg dry weight):

UG/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Arsenic		186.9300		202.1700		7.8		P
Chromium		720.6800		795.5600		9.9		P

STL BUFFALO

GEO MATRIX CONSULTANTS

6
DUPLICATES

SAMPLE NO.

100901022SD SPLP

Contract: NY00-433

Lab Code: STL BFLO

Case No.:

SAS No.:

SDC NO.: 100106

Matrix (soil/water): WATER

Level (low/med): LOW

% Solids for Sample: 0.0

% Solids for Duplicate: 0.0

Concentration Units (ug/L or mg/kg dry weight):

UG/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Arsenic		163.1600		175.9400		7.5		P
Chromium		265.9200		287.4700		7.8		P

STL BUFFALO

GEO MATRIX CONSULTANTS

-6-

DUPLICATES

SAMPLE NO.

100901022SD TOTAL

Contract: NY00-433

Lab Code: STL BFLO

Case No.: _____

SAS No.: _____

SDG NO.: 100106

Matrix (soil/water): SOIL

Level (low/med): LOW

* Solids for Sample: 59.7

* Solids for Duplicate: 59.7

Concentration Units (ug/L or mg/kg dry weight):

MG/KG

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Arsenic		139.5116		119.3768		15.6	*	P
Chromium		8595.9335		9276.2871		7.6		P

GEO MATRIX CONSULTANTS

-6-

DUPLICATES

SAMPLE NO.

100401008 SD

Contract: NY00-433

Lab Code: STLBFLO

Case No.: _____

SAS No.: _____

SDG NO.: 1G0105

Matrix (soil/water): SOIL

Level (low/med): LOW

* Solids for Sample: 85.2

* Solids for Duplicate: 85.2

Concentration Units (ug/L or mg/kg dry weight):

MG/KG

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Manganese		603.4566		970.5851		46.6	*	P

Data Validation Services

120 Cobble Creek Road P. O. Box 208

North Creek, NY 12853

Phone (518) 251-4429

Facsimile (518) 251-4428

Facsimile Transmission

TO: Jeff Yobe

COMPANY: STL-~~Buffalo~~

FAX NUMBER: 716 691 7991

FROM: Judy Harry *J*

DATE: 03-10-02

No. of pages (including cover): 1

COMMENTS: RE: Geomatrix Consultants
Peter Cooper Markham site

In addition to the resubmissions requested in my letter Friday, the following two items required of the deliverables are also needed for validation:

1. The TDS raw data for sample A01-B908-04 were not located.
2. The metals IDL summary Forms seem to list CRDL values for IDLs. The IDL values from your most recent study are required; and are needed for validation review. — *for entire project.*

Please forward at your earliest convenience to the fax number above, and send copies of responses to this and Friday's request to Jennifer Hagen at Geomatrix. Thank you.

SEE ATTACHMENT

Analyst /Date/Time Set Up:

Analyst /Date/Time Removed:

Initial Oven Temp.				Final Oven Temp				Thermometer #				Comments	
Job #	Sample I.D.	Type	Dish #	Vol (ml)	Pre-Wt. (g)	#1 Post Wt. (g)	#2 Post Wt. (g)	#3 Post Wt. (g)	Post Wt. - Pre Wt. Of Final Residue (g)	Final Conc. at Constant Wt. (mg/L)			
B823	A1B82301	TDS	SUNNY	100	110.0645	110.4235	110.4224			3579	4060		
B827	A1B82701		OWC		113.7044	114.0100	114.0101			9057	9240		
B830	A1B83001		SHAN		115.9715	115.1130	110.1135			1420	249	✓ Root	
B839	A1B83901		PH		113.3011	113.3054	113.3050			585	698		
	02		PUPPY		108.9501	109.0704	119.0704			1263	1350		
	03		SUNNY		109.5573	109.6011	109.6008			535	573		
CCV	50011650		PUNK		115.4989	115.5408	115.5408			479	906		
CCB	BCANUK		PPET	100	114.2532	114.8500	114.8558			30	1390		
B844	A1B84401		FILE	100	119.2124	119.3404	119.3404			1270	1390		
	02		DOC		110.6508	110.7194	110.7193			1085	881	✓ Root	
B853	A1B85301		SHAW		115.7915	115.8008	115.8008			930	215	✓ Root	
	02		BASE		112.4962	112.4954	112.4955			930	980		
B864	A1B86401		MM		102.7705	102.8124	102.8119	102.8116		351	507		
B869	A1B86901		WERD		114.1518	114.2040	114.2043			1125	ND	✓	
	0100P		BUM		115.0003	115.1179	115.1182			1179			
B808	A1B80801		DEAF		113.2791	113.2906	113.2902			111	-		
	02		DS		120.3485	120.3922	120.3917			432	-		
	03		BOB		114.9950	115.0338	115.0330			386	-		

Standard Comments:

1. Sample contained alot of suspended particles
2. Sample contained alot of settleable sediment
3. Sample is cloudy
4. Sample is colored

 Reviewed By _____
 Reviewed Date _____
 Solutions _____

 TDS Temperature criteria = 180 +/-2 °C
 TSS /TS Temperature criteria = 103 +/-1 °C

000155

Logbook # A02-06-11

SOLIDS LOG (SS, TS, TSS, TDS)

Analyst/Date/Time Set Up:

Analyst/Date/Time Removed:

[illegible]

Standard Comments:

1. Sample contained alot of suspended particles
2. Sample contained alot of settleable sediment
3. Sample is cloudy
4. Sample is colored

Reviewed By _____
Reviewed Date _____
Solutions _____

TDS Temperature criteria = $180 \pm 2^\circ\text{C}$
TSS /TS Temperature criteria = $103 \pm 1^\circ\text{C}$

000153

Fax message

Date: 03-13-02

To: JUOY HARRY

Company: DUS

Fax: 518-251-4428

From: JEFF YOINE

Subject: VALIDATION ISSUE

Pages: 3 w/COVER



Severn Trent Laboratories, Inc.
STL Buffalo
10 Hazelwood Drive
Amherst, New York 14228

Tel 716 691 2600
Fax 716 691 7991
www.stl-inc.com

JUOY

THIS FAX SHOULD RESOLVE ISSUE #6. PLEASE
CONTACT ME WITH QUESTIONS OR CONCERNS.

JEFF

pg. 2/2

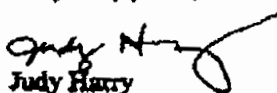
3. It is noted that the reporting limit used for hexavalent chromium in aqueous samples (i.e. SDGs 100114 and A01-B908) is one thousand fold above that evaluated in the lab (which showed detection limit of 10 ppb). Although, upon request the lab resubmitted sample detections below 10,000ppb and above 10 ppb, it is not evident whether the associated method blanks were also reviewed for values between those two concentrations. Please state whether any of the associated method blanks showed concentrations above 10 ppb. This is an important in that blanks should be evaluated to the same level as the samples to determine potential contamination.

Also please discuss whether there is any technical reason that a reporting limit of 10 ug/L could not be considered for this project. The matrix spikes are evaluated at levels (50 ppb) well below the reporting limit (10,000 ppb), and many failed (recoveries <10%), mandating rejection of associated nondetect data. As reported, that would be rejection of most project sample data, which report nondetection at 10,000 ug/L. However, failure of spikes to recover at 50 ppb does not imply an inability to detect any Cr+6 in the sample if it were present at 10,000 ppb, and rejection does not seem appropriate. Additionally, risk assessment evaluation involves assumption of sample constituency at the reported RL, and this level seems unnecessarily high.

4. Please complete and submit the required Forms 6 for provision of the metals matrix spikes for this project. Those for the aqueous samples are of greater urgency (see below).
5. Please provide the required IDL summaries for volatiles and semivolatile for the instruments used for this project.
6. The result for hexavalent chromium in soil sample 101001040 (SDG 100108) was reported as nondetection at 0.5 ppb. The raw data shows detection at 0.65 ppb. Please confirm, and provide a corrected report form for that sample if verified.

Thank you in advance for an expedited reply to this request. Item numbers 2., 3., and numbers 4. and 5. as they apply to aqueous samples, are of an urgent nature. Item numbers 1., 6., and numbers 4. and 5. as they apply to soils, are also urgent, although less so. Please provide copies of all communications to Jennifer Smith at Geomatrix.

Very truly yours,


Judy Harry

SEVERN TRENT LABORATORIES, INC. - BUFFALO
HEXACHROME ANALYSIS-SOILS

Date	Analyst	Job #	Sample I.D.	Vol.	ABS.	ABS. Blank	ABS. Corr.	Curve Conc.	Dilution	Dry Weight Corrected Final Conc.	Dry Weight Corrected EOL	Comments
10-22-01	GR	AD341	AIAD34102	25	0.585	0.3403	0.222	0.118		1.07	2.24	
			03		1.121	1.159	0.000	<0.01		<0.40	1.43	
			04		1.064	1.370	0.000	<0.01		<0.40	1.45	
			05		0.853	1.018	0.000	<0.01		<0.40	2.28	
			06		1.024	1.083	0.000	<0.01		<0.40	2.28	
			07		0.545	0.451	0.094	0.050		2.78	1.40	100% 100%
			08		0.206	0.230	0.000	<0.01		<0.40	1.30	
			09		0.205	0.186	0.079	0.048		2.18	1.28	
			10		0.104	0.079	0.085	0.013		2.05	1.26	
			11		0.091			0.018		4.80	—	97%
			12		0.000			<0.01		<0.40	—	
			13		0.082	0.009	0.013	<0.01		<0.40	1.21	AIAD341D
			14		0.447	0.351	0.096	0.051		2.67	1.29	0.065
			15		0.135	0.143	0.000	<0.01		<0.40	1.20	NOT
			16		0.246	0.209	0.037	0.019		0.95	1.25	0.66 AS
			17		0.188	0.134	0.000	<0.01		<0.40	1.20	INDICATED
			18		0.111	0.079	0.032	0.017		0.853	1.25	IN YOUR
					0.194	0.188	0.006	<0.01		0.185	1.43	FAX

Test Time: 1515 Reviewed By: Solutions: WXR 13-1, 15-12
 Test Time: 2815 Date: Curve Date: 9-6-01 Spec: H10CH
 000023

STL BUFFALO

GEO MATRIX CONSULTANTS
+
DUPLICATES

SAMPLE NO.

1106011638D00L

Contract: M300-433

Lab Code: STLBR40

Case No.: 00014

SAS No.:

SDG NO.: 110114

Matrix (soil/water): WATER

Level (low/med): LOW

% Solids for Sample: 0.0

% Solids for Duplicates: 0.0

Concentration Units (ug/L or mg/kg dry weight):

ug/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum		200.0000	U	9414.4297		200.0	*	P
Antimony		60.0000	U	185.3400		200.0	*	P
Arsenic		10.0000	U	199.1500		200.0	*	P
Barium		442.8200		432.3100		35.2	*	P
Beryllium		5.0000	U	193.5900		200.0	*	P
Cadmium		5.0000	U	193.8900		200.0	*	P
Calcium		45759.1719		88369.6211		19.0		P
Chromium		10.0000	U	197.0200		200.0	*	P
Cobalt		50.0000	U	202.6500		200.0	*	P
Copper		25.0000	U	199.2100		200.0	*	P
Iron		251.1000		750.3400		72.5	*	P
Lead		3.0000	U	197.1700		200.0	*	P
Magnesium		8041.5801		17771.6699		75.4	*	P
Manganese		160.6900		387.8400		76.0	*	P
Nickel		40.0000	U	198.1800		200.0	*	P
Potassium		5000.0000	U	13627.6299		200.0	*	P
Selenium		10.8800		224.9800		182.1	*	P
Silver		10.0000	U	44.7700		200.0	*	P
Sodium		8990.0000	U	13048.0763		200.0	*	P
Thallium		10.0000	U	197.8900		200.0	*	P
Vanadium		50.0000	U	197.2000		200.0	*	P
Zinc		20.0000	U	213.9800		200.0	*	P

Post-It® Fax Note	7571	Date	3-18-02	1 of 1
To	Jeff K. Kline	From	Judy Harry	
Co./Dept	STL - Buffalo	Co.	DV-5-	
Phone #		Phone #	518 251 4429	
Fax #	766 991 7991	Fax #		

Form VI - 2H

Jeff
This form
needs revision.
It compares a sample
with a spike.
It was with the
resubmitted set.

STL 46 300 ED

TH.

A938

GEO MATRIX CONSULTANTS

-6-
DUPLICATES

SAMPLE NO.

110601163SDSOL

Contract: NY00-433

Lab Code: STLEFLO

Case No.: 00014

SAS No.:

SDG NO.: 110114

Matrix (soil/water): WATER

Level (low/med): LOW

% Solids for Sample: 0.0

% Solids for Duplicate: 0.0

Concentration Units (ug/L or mg/kg dry weight):

UG/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum		9063.6904		9414.4297		3.8		P
Antimony		181.5100		185.5600		2.2		P
Arsenic		193.1300		199.1500		3.1		P
Barium		608.1300		632.3100		3.9		P
Beryllium		185.8500		193.5900		4.1		P
Cadmium		189.0700		199.0900		5.2		P
Calcium		52765.9609		55368.6211		4.8		P
Chromium		190.1000		197.0200		3.6		P
Cobalt		195.2800		202.6500		3.7		P
Copper		192.4700		199.2100		3.4		P
Iron		724.8600		750.3600		3.5		P
Lead		197.1600		197.1700		0.0		P
Magnesium		17015.9199		17771.6699		4.3		P
Manganese		342.8200		357.8400		4.3		P
Nickel		190.5300		198.1800		3.9		P
Potassium		13251.1904		13627.6299		2.8		P
Selenium		229.0100		224.9800		1.8		P
Silver		42.3600		44.7700		5.5		P
Sodium		12698.3398		13048.0703		2.7		P
Thallium		190.7600		197.0900		3.3		P
Vanadium		189.7300		197.2000		3.9		P
Zinc		204.1200		213.9800		4.7		P

Fax message

Date: 3-22-02

To: Judy Harey

Company: DVS

Fax: 518-251-4428

From: Jeff Yone

Subject: VALIDATION ISSUES

Pages: 3 w/cover



Severn Trent Laboratories, Inc.
STL Buffalo
10 Hazelwood Drive
Amherst, New York 14228

Tel 716 691 2600
Fax 716 691 7991
www.stl-inc.com

JUDY,

I HAD A MEETING TODAY WITH THE QA/QC MANAGER.
AND MANY OF THESE VALIDATION ISSUES WILL BE
RESOLVED QUICKLY.

JEFF YONE

SEVERN TRENT LABORATORIES, INC. BUFFALO
Hexavalent Chromium Digestion Log

Date	Time	Analyst	Job #	Sample Type	Initial wgt (g)	Final (ml)	Color Before/After	Texture
11/16	14:00	LK	9882	02	2.4565	2.561	Brown	Y
			13281	01	2.5614	2.5065		
				02	2.5055	2.4889		
				03	2.4889	2.5758		
				03MSA	2.4359	2.5979		
				03MSB	2.579			
				03SDA	2.5147			
				03SDB	2.4852			
				04	2.5732			
				05	2.5601		GRAY	Coarse
				06	2.5329		GRAY/BLACK	ST
				07	2.5133		BLACK	
			13406	02	2.4585		Brown	
				LCS	2.50		Yellow	Clear
				MBIK	2.50			Clear
Final Volume 100 ml.								
LK 01/11/02								

Ependorf

Batch Additions:

0.501 - MS21719
 Cr⁶⁺ spike - MS21821
 PbCr⁶⁺ - MS21819
 Buffer - MS21710

MS21820 - MS21819

The "B" sample is the PbCrO₄ Insoluble spiked sample-PbCrO₄ wgt added to MS and SD are as follows:

MSB .146
 SDB .130

Hot Block & Temp:

C / 123

Sample Temp:

95

Digestive Cup Lot

C1233

pH Calibration

MS21819 1556

C55/123

000031

Hexavalent Chromium Digestion Log

Date	Time	Analyst	Job #	Sample Type	Initial wgt (g)	Final (ml)	Color Before/After	Texture
10/29	1345	LL	~~9882~~	02	2.5206	100.00	BLACK	Yelw clay
				02MSA	2.4783			
				02MSB	2.4781			
				02SDA	2.5161			
				02SDB	2.5142			
				LC5	2.50		Yellow	
				MB1	2.30			
-988202SDB was lost (spilled) -will be redigested								
LL 01/11/12								

Ependorf: 5 ml M020180402 1.0 ml M020403
 Batch Additions:
 Digestive solution - MSC1710 P6Cnly - M020715
 Phen. phate Buffer - MSC1705 Sal Spike - MSC1521
 Mg Cl₂ · 6 H₂O - M020714

The "B" sample is the pbCrO4 Insoluble spiked sample-PbCrO4 wgt% added to MS and SD are as follows:

MSA = 0.138
SMA = 0.141

Hot Block & Temp: A/125 Sample Temp: 34 Digestive Cup Lot C1176

Ms. A. 9.2. 1556

Scope Pr. 7 10/30/01.

000030

SEVERN TRENT LABORATORIES, INC. BUFFALO
Hexavalent Chromium Digestion Log

Date	Time	Analyst	Job #	Sample Type	Initial wgt (g)	Final (ml)	Color Before/After		Texture
10/19/01	15:30	BO.	A114	01	2.49	100	Brown	Brown	medium
				02	2.52				
				03	2.49				
				04	2.49				
				05	2.50				
				06	2.50				
				07	2.56				
				08	2.52				
				09	2.45				
				10	2.49				
				11	2.50				
				12	2.56				
				13	2.48				
				14	2.48				
				LCS	2.50		Yellow	Colorless	—
				MBIK	2.50		Colorless	↓	—
			A114	01MSA	2.50	100	Brown	Brown	Medium
				01MSB	2.53				
				01SDA	2.51				
				01SOB	2.48				

Ependorf: 5ml MBLDIB0402 1.2ml MBLDIB0423 Sale Sp. Re - MSL1521
 Batch Additions: mycospine solution - MSL1710
phosphate buffer - MSL1729
MgCl₂ 5160 - MBL0914
ph conc. - MBL0915

The "B" sample is the pbCrO4 Insoluble spiked sample-PbCrO4 wgts added to MS and SD are as follows:

HL 5B	0135
50B	0119

Hot Block & Temp: 10/123 Sample Temp: 55 Digestive Cup Lot C1176

pH Calibration 1554

1 & 10/28/07

000029

SEVERN TRENT LABORATORIES, INC. BUFFALO
Hexavalent Chromium Digestion Log

✱

Date	Time	Analyst	Job #	Sample Type	Initial wgt (g)	Final (ml)	Color Before/After		Texture
10/15	LK	1200	A036	01	2.55	100.00	Brown	Yellow	Medium
				02	2.48			Yellow	
				03	2.46			Brown	
				04	2.52				
				05	2.52				
				06	2.54			↓	
				07	2.53			Orange	
				08	2.49			Yellow	
				08MSA	2.58			Orange	
				08MSB	2.50				
				08SDA	2.51				
				08SDB	2.53				
				LCS	2.50		Yellow	—	—
				MBIK	2.50		—	—	—

Ependorf 1.5ml M060180402 1.0ml M060180403
 Batch Additions: Digestive Solution - MSL1710 Sol. Spike - MSL1521
 Pb-tol-Lt Buffer - MSL1703
 $\text{AsCl}_3 \cdot 6\text{H}_2\text{O}$ - M060814
 PbCrO₄ - M060815
 The "B" sample is the PbCrO₄ Insoluble spiked sample - PbCrO₄ wts added to MS and SD are as follows:
 MSL15037
 SDB 0158

Hot Block & Temp: 0/123 Sample Temp: 75 Digestive Cup Lot: C1176

pH Calibration 1558

(14)

000028

SEVERN TRENT LABORATORIES, INC. BUFFALO

Hexavalent Chromium Digestion Log

Date	Time	Analyst	Job #	Sample Type	Initial wgt (g)	Final (ml)	Color Before/After		Texture
10/19	1200	CK	AD342	21	2.50	100.00	Brown	Brown	medium
				22	2.49				
				23	2.56				
				24	2.47				
				25	2.51				
				26	2.48				
				27	2.50				
				28	2.48				
				29	2.54				
				30	2.58				
				31	2.56				
				32	2.47				
				33	2.55				
				34	2.46				
				35	2.56				
				36	2.47				
				37	2.58				
				38	2.47				
				39	2.55				
				40	2.50				
				41	2.54				
				42	2.52				
				42MSA	2.54				
				42MSB	2.46				
				42SBA	2.49				
				42SDB	2.45				
				LC5	2.5		Yellow	Colorless	—
				MBK	2.5				—

Ependorf: 5 ml MBLO102402 1.0 ml MBLO102403
 Batch Additions: Digestive Solution - MSC1210 Sol. Sp. Re. MSC1521
 PbCrO4 Buffer - MSC1205
 PbCrO4 - MSC0904
 PbCrO4 - MBLO102403

The "B" sample is the PbCrO4 Insoluble spiked sample. PbCrO4 wgt added to MS and SD are as follows:

MSB 0.149
 SDB 0.123

Hot Block & Temp: C/123 Sample Temp: 86 Digestive Cup Lot: C1176

pH Calibration: 1558

LA 10/26/01 (38)

000027

SEVERN TRENT LABORATORIES, INC. BUFFALO

Hexavalent Chromium Digestion Log

Date	Time	Analyst	Job #	Sample Type	Initial wgt (g)	Final (ml)	Color Before/After	Texture
10/18	1230	LK	A0344	01	2.48	100	Brown	Medium
				02	2.48		Brown	
				03	2.52			
				04	2.48			
				05	2.46			
				06	2.51			
				07	2.52			
				08	2.55		Orange	
				09	2.47			
				10	2.52			
				11	2.54		Brown	
				12	2.50		Yellow	
				13	2.46		Brown	
				14	2.46		Orange	
				15	2.50			
				16	2.56			
				17	2.49		Yellow	
				18	2.48		Orange	
				19	2.52			
				20	2.49		Yellow	
				20MSA	2.46			
				20MSB	2.48			
				20SDA	2.57			
				20SDB	2.48			
	1230	LK		LCS	2.5		Yellow	
				MBIK	2.5			

Ependorf

Batch Additions: 5 ml MD0180402 1.0 ml MD0180403
 Digestive Solution - MSL1710 Soluble Spike - MSL1521
 Phosphate Buffer - MSL1709
 $\text{MgCl}_2 \cdot 6\text{H}_2\text{O}$ - MD0514
 PCC-04 - MD0514

The "B" sample is the PbCrO_4 Insoluble spiked sample. PbCrO_4 wgt added to MS and SD are as follows:

MSB - 0.164
 SDB - 0.152

Hot Block & Temp:

13/124

Sample Temp:

54

Digestive Cup Lot

C1176

pH Calibration

1556

1.0 ml 10/18 (26)

000026

SEVERN TRENT LABORATORIES, INC. BUFFALO
Hexavalent Chromium Digestion Log

X

Date	Time	Analyst	Job #	Sample Type	Initial wgt (g)	Final (ml)	Color Before/After	Texture
10/18	1345	LK	A033*	01	2.54	100.	Brown	Med
				02	2.53			
				03	2.49			
				04	2.49			
				05	2.54			
				06	2.51			
				07	2.50			
				08	2.51			
				09	2.47			
				10	2.50			
				11	2.56			
				12	2.49		Yellow	
				13	2.56			
				13MSA	2.52			
				13MSB	2.51			
				13SDA	2.58			
				13SDB	2.57			
				14	2.48		Orange	
				15	2.49			
				16	2.48			
				17	2.49			
				18	2.52		Yellow	
				19	2.55			
				20	2.53			
				2CS	2.5		Yellow	
				MBIK	2.5		Clear	

Ependorf 5ml MOD/80402 20ml MOD/80403
 Batch Additions: Digestive solution - MSL/910 Soluble Spike - MSL/ISA1
phosphate Buffer - MSL/707
msl-6132 - msl-0514
ph-cro4 - msl-0515
 The "B" sample is the pbCrO4 insoluble spiked sample. PbCrO4 wgt added to MS and SD are as follows:
MSA .0116
SDB .0119

Hot Block & Temp: A55/125 Sample Temp: 55 Digestive Cup Lot C1126

pH Calibration 1556 (26) 000025

SEVERN TRENT LABORATORIES, INC. BUFFALO
Hexavalent Chromium Digestion Log



Date	Time	Analyst	Job #	Sample Type	Initial wgt (g)	Final (ml)	Color Before/After	Texture
10/18	11:30	LK	A032	01	2.52	100	Brown	Yellow
				02	2.55		Orange	
				03	2.48			
				04	2.49			
				05	2.52		↓	
				07	2.56		Yellow	
				08	2.49		↓	
				09	2.50		↓	
				10	2.52		Yellow	
				11MSA	2.49		Brown	
				11MSB	2.48			
				11SDA	2.48			
				11SDB	2.49		↓	
			A042	01	2.51		Yellow	
				02	2.50		Yellow	
				03	2.50		Orange	
				04	2.48		↓	
				05	2.51		Clear	
				06	2.52		Yellow	
				07	2.54 (2ml)		↓	
				08	2.52		Gray	
				09	2.52		↓	
				10	2.53		↓	
				11	2.49		Orange	
			A043	01	2.50		Brown	↓
			LCS	-			Yellow	-
			MBIK	-			-	-
			A032	11	2.53	10/17/01	Brown	Brown

Ependorf: 5ml M00100402 1.0ml M00180403
 Batch Additions: Digestive Solution - MSL1710 Soluble Spike - MSL1521
 Phosphate Buffer - MSL1709 PbCrO4 - M0L0915
 HgCl2·6H2O - M0L0919

The "B" sample is the PbCrO4 Insoluble spiked sample-PbCrO4 wgt added to MS and SD are as follows:

11MSB - 0.122
 11SDB - 0.122

Hot Block & Temp: B/124 Sample Temp: 54 Digestive Cup Lot: C1126

pH Calibration: 1556

10/23/01

(27)

000024

SEVERN TRENT LABORATORIES, INC. BUFFALO
Hexavalent Chromium Digestion Log



Date	Time	Analyst	Job #	Sample Type	Initial wgt (g)	Final (ml)	Color Before/After	Texture
7/18	1300	LR	~~9713~~	01	2.54	100.	BROWN	Clear
				02	2.53			
			↓	03	2.51			
			9713	01	2.49			
			9714	01	2.54			
				02	2.56			
			↓	03	2.50			
			9723	01	2.49		Yellow	
			↓	02	2.50			
			9882	01	2.56			
				01MSA	2.48		GRAY	
				01MSB	2.57			
				01SDA	2.49			
			↓	01SDB	2.49			
			9887	01	2.58			
				02	2.55		CLEAR	
				03	2.56			
				04	2.46		GRAY	
				05	2.54		ORANGE	
			↓	06	2.46		Yellow	
			LCS	-	2.50		Yellow	Clear
			RLBK	-	2.50		Clear	

Ependorf MDL 0180402 .5 ml MDL 0180403 1.0 ml
 Batch Additions: Digestive Solution - MSL1710 Soluble Spike - MSL1521
Phosphate Buffer - MSL1709
M.C. 6150 - MSL0914
Lead Chromate - MSL0915

The "B" sample is the pbCrO4 Insoluble spiked sample-PbCrO4 wgt added to MS and SD are as follows:

MSB : 0.123
SD : 0.124

Hot Block & Temp: A 95/125 Sample Temp: 95 Digestive Cup Lot C1176

pH Calibration 1556

LR

10/22/01

(22)

000023

Fax message

Date: 3-23-02

To: JUDY HARRY

Company: DVS

Fax: 518-251-4428

From: JEFF YOHE

Subject: DATA VALIDATION ISSUES

Pages: 15 w/COVER

AS PER YOUR REQUEST.

I AM WAITING FOR THE RAW DATA FROM THE
TOL ANALYSIS AT CORPUS CRISTI.

JEFF YOHE



Severn Trent Laboratories, Inc.
STL Buffalo
10 Hazelwood Drive
Amherst, New York 14228

Tel 716 691 2600
Fax 716 691 7991
www.stl-inc.com

SPLP LOGBOOK: A01-9885

TCLP Preparation Logbook for Method 1311

Page 2 of 4

ANALYST: EH

DATE: 10/15/01

BATCH# 11809202

LABORATORY SAMPLE ID	9882	9882	9882	9885	6-BLK
	01	01A5	02	01	J-1542
EXTRACTION TYPE	M	M	M	M	M
1. Sample Preparation for Extraction Procedure (check one)					
a) If sample is 100% solid, add appropriate extraction fluid.					
Record weight of sample (100 grams minimum for Metals and Extractables, 25 grams maximum for Volatiles)	100.40	100.90	100.02	100.21	
Record volume (mL) of extraction fluid added (amount of fluid is 20 X the weight of sample)	2000	2000	2000	2000	2000
b) If sample is $\geq 0.5\%$ solid, determine weight of extraction fluid to add using the following equation:	EH 10/15/01				
Record weight (g) of sample (SP) determined in Step 2					
Record volume (mL) of extraction fluid to add Extraction Fluid added = $20 \times (\text{SP}) \text{ weight}$					
2. Extraction (Solid for 18 $\pm$ 2 hours)					
Record Initial pH of TCLP extract	8.72	8.83	8.89	6.20	4.22
Record Start time	15:00				
Starting pressure	NA				
Record Tumbler rpm (range of 30 ± 2 rpm) YES or NO	30				
Record Stop time	8:00				
Record min/max temperature (range of $23 \pm 2^\circ\text{C}$)	24/26				
Record Filtration Complete Date and Time	10/16/01	10/16/01	10/16/01	10/16/01	10/16/01
Use 0.6 to 0.8 μm acid washed glass fiber filter	10:30	10:30	10:30	10:30	10:30
Record the final Pressure of ZHE. If pressure has been maintained at 10 PSI or greater then proceed. If pressure has not been maintained at 10 PSI then reset there is a leak.	NA				
Record Final pH of TCLP extract	8.45	8.30	8.33	8.02	4.40
8. Final TCLP Extract					
If sample is 100% solids, only c will be used.					
If sample $\geq 0.5\%$ solids, only a will be used.					
If sample is multiphase, both b and c will be used.					
a) Volume (mL) of Liquid Extract from Pressured Filtered Sample (from Step 2) with $<0.5\%$ solids	EH 10/15/01				
Record pH					
b) Volume (mL) of Liquid Extract from Pressured Filtered Sample (from Step 2) with $\geq 0.5\%$ solids (LP)	EH 10/15/01				
Record pH					
c) Volume (mL) of Tumbled Extract Obtained in Step 6 from Solid portion of Pressured Filtered sample	EH 10/15/01				
If volumes from b (not tumbled filtered liquid extract) and c (post tumbled filtered liquid extract) are compatible, add together. If volumes are not miscible, treat as separate extracts.					
Record pH of Combined Volume					
Record Combined Volume mL					
ZHE Leak Test performed (before every extraction) Pass/Fail					

Reviewed By/Date _____

000000

Logbook# A02-06-3

STL BUFFALO

TCLP Preparation Logbook for Method 1311

Page 2 of 4

ANALYST: PH

DATE: 10/5/01

BATCH#

A1809202

LABORATORY SAMPLE ID	9882 01	9882 01M5	9882 02	9885 01	EBLK 5-1542
EXTRACTION TYPE	M	M	M	M	M
EXTRACTION VESSEL NUMBER					
1. Percent Solids Determination - (check a or b)					
a) Sample will obviously yield no liquid when subjected to pressure filtration (is 100% solids). Verified with Spatula Test. Proceed to Step 3.	✓	✓	✓	✓	
b) Sample is liquid or multiphastic, use pressure filtration to determine percent solids. Proceed to Step 2.					
2. Pressure Filtration - use an acid washed (2% HNO ₃) 0.6 to 0.8 mm glass fiber filter					
Weight (g) of Filtrate Container (FC)					
Weight (g) of Subsample (SW) (100 gram minimum)					
Gradually apply vacuum or gentle pressure in increments of 10, 20, 30, 40 and 50 psi. When filtration does not result in additional filtrate within any 2 minute period, the filtration is done.					
Weight (g) of Filtrate Filled Container (FF)					
Determine Weight (g) of Liquid Phase (LP) : (FF) - (FC)					
Determine Weight (g) of Solid Phase (SP) : (SW) - (LP)					
% Solids = $\frac{(SP)}{(SW)} \times 100$					
If % solids are $\geq 0.5\%$, the liquid phase is stored at 4°C and Proceed to Step 3 for the solid phase. Liquid phase (LP) will be used in Step 7. If % solids are $< 0.5\%$, the liquid phase is considered the TCLP extract. Enough of the sample should be filtered. Proceed to Step 7.					
3. Particle Size Reduction (check a or b)					
a) Solid phase passes through a 9.5 mm sieve. YES OR NO. If no prepare solid portion by crushing, cutting, or grinding to a size that would. Proceed to Step 4.	Yes	Yes	Yes	Yes	
4. Extraction Fluid Determination					
Weight of test sample (use 5.0 ± 1.0 grams of solid phase)					
Actual volume of water (add 96.5 ± 1.0 mL)					
After 5 minutes of stirring, record Initial pH					
If Initial pH is < 5 , use Extraction Fluid I					
If Initial pH is > 5 , add 3.5 mL of 1N HCl, heat to and hold at 50°C for ten minutes. Record pH after ten minutes.					
Let cool to room temperature and record Final pH					
If Final pH ≤ 5 use Fluid I If Final pH > 5 use Fluid II					
Extraction Fluid Used:	SRP #1	#1	#1	#1	#1
5. Extraction Fluid Preparation:					
Glacial Acetic Acid	1.0 N NaOH	Final Vol. (mL)	Extraction Fluid #	Analyst:	Date:
Vol (mL)	Lot#	Vol (mL)	Lot#		
60% Sulfuric Acid	Solution added	pH			
H ₂ SO ₄ → 100% 19-11					
HNO ₃ → 100% 17-11					
					000055

Fluids Recipe: On page 1

Corrected Form I

Client Sample ID: 101001040

Laboratory ID: A1A03410

Geomatrix Consultants, Inc.
Wet Chemistry Analysis

Client Sample No.

101001040

Lab Name: STL Buffalo

Contract: _____

Lab Code: RECNYCase No.: 00009

SAS No.: _____

SDG No.: 100109Matrix (soil/water): SOILLab Sample ID: A1A03410% Solids: 79.2Date Samp/Recv: 10/10/2001 10/11/2001

Parameter Name	Units of Measure	Result	C	Q	M	Method Number	Analyzed Date
Hexavalent Chromium - Total	MG/KG	0.65	U		A	7196A	10/22/2001

Comments:

03/20/2002 10:00 AM 101001028

Corrected Form I for Client Sample ID: 101001028
Laboratory ID: A1A0341

After reviewing Chain of Custody documentation from samples received on 10-11-01 Client Sample ID 101001028 was inadvertently logged in as 101001098. The appropriate corrections have been made and these forms are attached.

Geomatrix Consultants, Inc.
Wet Chemistry Analysis

Client Sample No.

101001028

Lab Name: STL Buffalo

Contract: _____

Lab Code: RECNYCase No.: 00009

SAS No.: _____

SDG No.: 100109Matrix (soil/water): SOILLab Sample ID: A1A03401Solids: 85.7Date Samp/Recv: 10/10/2001 10/11/2001

Parameter Name	Units of Measure	Result	C	Q	M	Method Number	Analyzed Date
Hexavalent Chromium - Total	MG/KG	0.47	U		A	7196A	10/22/2001

Comments:

Geomatrix Consultants, Inc.
Metals Analysis

Client Sample No.

101001028

Lab Name: STL Buffalo

Contract: _____

Lab Code: RECNYCase No.: 00002

SAS No.: _____

SDG No.: 100109Matrix (soil/water): SOILLab Sample ID: A1A03401Solids: 85.7Date Samp/Recv: 10/10/2001 10/11/2001

Parameter Name	Units of Measure	Result	C	Q	M	Method Number	Analyzed Date
Arsenic - Total	MG/KG	8.8			P	P	10/18/2001
Chromium - Total	MG/KG	434			P	P	10/18/2001

Comments:

Geometrix Consultants, Inc.
Wet Chemistry AnalysisClient Sample # 40066

101001098

Lab Name: STL Buffalo

Contract: _____

Lab Code: RCNY

Case No.: _____

SAS No.: _____

SOG No.: 100108Matrix (soil/water): SOILLab Sample ID: A1A03401% Solids: 85.7Date Samp/Recv: 10/10/2001 10/11/2001

Parameter Name	Units of Measure	Result	C	Q	M	Method Number	Analyzed Date
Hexavalent Chromium - Total	MG/KG	0.47	U		A	7196A	10/22/2001

Comments:

TL BUFFALO

000064

GEO MATRIX CONSULTANTS
-1-
INORGANIC ANALYSIS DATA SHEET

SAMPLE NO.

101001098

Contract: NY00-433

Lab Code: SILBYLO

Case No.:

SAS No.:

SDG NO.: 100108

Matrix (soil/water): SOIL

Lab Sample ID: AD119614

Level (low/med): LOW

Date Received: 10/11/01

Solids: 95

Concentration Units (mg/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-38-2	Arsenic	5.8			P
7440-47-3	Chromium	434			P

Judy

IF YOU REQUIRE THIS SPECIFIC FORM
PLEASE LET ME KNOW. I AM UNABLE TO
PRINT THIS PARTICULAR FORM AND NOBODY WAS
HERE ON SATURDAY WHO WAS ABLE TO. I HAVE
INCLUDED A FORM 1 FOR THESE RESULTS
BUT IT IS A LITTLE DIFFERENT.

Color Before: BROWN

Clarity Before:

Texture: SILT

Color After: YELLOW

Clarity After: CLOUDY

Artifacts:

Comments:

Hexavalent Chromium Calibration Curve

**SEVERN TRENT LABORATORIES, INC. - BUFFALO
HEXACHROME ANALYSIS - WATERS**

CE 9/26/

Logbook# A02-01-12

Date	Analyt	Job #	Sample I.D.	Volume	ABS	ABS Bk.	ABS Corr.	Curve Conc. (mg/l)	Dil.	Final Conc. (mg/l)	Comments
7/10/98	KL	HDL	1.000 ppm	25	0.000						41680000
			0.01 ppm		0.017						
			0.02 ppm		0.040						
			0.05 ppm		0.092						
			0.10 ppm		0.187						
			0.20 ppm		0.375						
			0.30 ppm		0.569						
			0.40 ppm		0.746						
		*K6	BIOKIT	25	1.000					<0.01	
		QV	0.05 ppm		0.096					<0.01	1072
		RSC7	ind-1-a-2		0.042	0.036	0.006			<0.01	
			dub		0.047		0.011			<0.01	
	*		gal		0.087		0.051			0.087	5% @ 0.05 ppm gal
	EF	RSCe	AIRSCAOL		0.011	0.004	0.007			10.01	
			02		0.833	0.855	0.000			10.01	
			03		1493	1481	0.012			10.01	
			04		0.013	0.008	0.005			10.01	
			05		0.006					10.01	
		(CCU)	0.05 ppm		0.093					0.050	100%
		CES	bioscR		0.000					20.01	

Reviewed By/Date: EF 9-6-01
Spec: HPA4 DC 2000

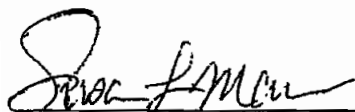
Curve Date 9/10/01

000061

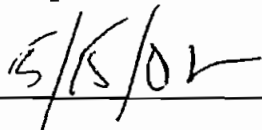
000005

The results presented in this report relate only to the analytical testing and condition of the sample at receipt. This report pertains to only those samples actually tested. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

"I certify that this package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package and electronic deliverable has been authorized by the Laboratory Director or her designee, as verified by the following signature."



Susan L. Mazur
Laboratory Director



Date

000004

NON-CONFORMANCE SUMMARY

Job#: A02-4040, A02-4090

STL Project#: NY1A8789

SDG#: 0417

Site Name: PETER COOPER MARKHAMS SITE

General Comments

The enclosed data have been reported utilizing data qualifiers (Q) as defined on the Data Comment Page.

Soil, sediment and sludge sample results are reported on "dry weight" basis unless otherwise noted in this data package.

According to 40CFR Part 136.3, pH, Chlorine Residual and Dissolved Oxygen analyses are to be performed immediately after aqueous sample collection. When these parameters are not indicated as field (e.g. pH-Field), they were not analyzed immediately, but as soon as possible after laboratory receipt.

Sample dilutions were performed as indicated on the attached Dilution Log. The rationale for dilution is specified by the 3-digit code and definition.

Sample Receipt Comments

A02-4040

Sample Cooler(s) were received at the following temperature(s); 4 °C.

A02-4090

Sample Cooler(s) were received at the following temperature(s); 6 °C.

Metals Data

No deviations from protocol were encountered during the analytical procedures.

Wet Chemistry Data

Sample matrix interference occurred on sample 042502214 for Hexachrome analysis. As a result, sample was spiked in duplicate with results below the QC limits for hexachrome spike recovery.

Sample 042302193 exhibited surrogate recovery results above quality control limits for 2,4,6-Tribromophenol. However, there were no hits for the compounds associated with this surrogate. No corrective action was necessary.

Metals Data

No deviations from protocol were encountered during the analytical procedures.

Wet Chemistry Data

Samples 042202187MS and 042202187SD exhibited spike recovery results below quality control limits for Hexavalent Chromium. However, the Laboratory Control Sample was compliant.

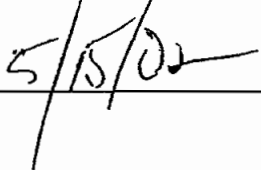
The results presented in this report relate only to the analytical testing and condition of the sample at receipt. This report pertains to only those samples actually tested. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

"I certify that this package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package and electronic deliverable has been authorized by the Laboratory Director or her designee, as verified by the following signature."



Susan L. Mazur
Laboratory Director

Date



NON-CONFORMANCE SUMMARY

Job#: A02-3912,A02-3965,A02-4037,A02-4092STL Project#: NY1A8789SDG#: 0416Site Name: PETER COOPER MARKHAMS SITEGeneral Comments

The enclosed data have been reported utilizing data qualifiers (Q) as defined on the Data Comment Page.

Soil, sediment and sludge sample results are reported on "dry weight" basis unless otherwise noted in this data package.

According to 40CFR Part 136.3, pH, Chlorine Residual and Dissolved Oxygen analyses are to be performed immediately after aqueous sample collection. When these parameters are not indicated as field (e.g. pH-Field), they were not analyzed immediately, but as soon as possible after laboratory receipt.

Sample dilutions were performed as indicated on the attached Dilution Log. The rationale for dilution is specified by the 3-digit code and definition.

Sample Receipt Comments

A02-3912

Sample Cooler(s) were received at the following temperature(s); 2 °C.

Samples were received by sample control on 04/23/02 at 08:00.

A02-3965

Sample Cooler(s) were received at the following temperature(s); 3 °C.

A02-4037

Sample Cooler(s) were received at the following temperature(s); 4°C.

A02-4092

Sample Cooler(s) were received at the following temperature(s); 6°C.

GC/MS Volatile Data

All samples were preserved to a PH less than 2.

Initial calibration standard curve A2I0000304-1 exhibited the %RSD of several compounds as greater than 15%. However, the mean RSD of all compounds is 14.63%.

GC/MS Semivolatile Data

The analyte Naphthalene was detected in the Method Blank A2B0345602 at a level below the project established reporting limit. No corrective action is necessary for any values in Method Blanks that are below the requested reporting limits.

Linear regression was used to calibrate analytes Caprolactam and Atrazine that were greater than 15% RSD in the initial calibration A2I0000324.

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION
AND
ANALYTICAL REQUEST SUMMARY

AB NAME: SEVERN TRENT LABORATORIES, INC.

CUSTOMER SAMPLE ID	LABORATORY SAMPLE ID	ANALYTICAL REQUIREMENTS					
		VOA GC/MS	BNA GC/MS	VOA GC	PEST PCB	METALS	WATER QUALITY
042402206	A2404001	-	-	-	-	SW8463	CFR136
042502212	A2409001	-	-	-	-	SW8463	CFR136
042502213	A2409002	-	-	-	-	SW8463	CFR136
042502214	A2409003	-	-	-	-	SW8463	CFR136
042502215	A2409004	-	-	-	-	SW8463	CFR136

NYSDEC-1



SAMPLE SUMMARY

<u>LAB SAMPLE ID</u>	<u>CLIENT SAMPLE ID</u>	<u>SAMPLED</u>		<u>RECEIVED</u>	
		<u>DATE</u>	<u>TIME</u>	<u>DATE</u>	<u>TIME</u>
A2396502	42302193	04/23/2002	08:45	04/23/2002	20:30

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION
AND
ANALYTICAL REQUEST SUMMARY

042402208	A2403707	SW8463	-	-	-	SW8463	CFR136
042502209	A2409201	SW8463	-	-	-	SW8463	CFR136
042502210	A2409202	SW8463	-	-	-	SW8463	SW8463
042502211	A2409203	SW8463	-	-	-	SW8463	CFR136

NYSDEC-1

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION
AND
ANALYTICAL REQUEST SUMMARY

LAB NAME: SEVERN TRENT LABORATORIES, INC.

CUSTOMER SAMPLE ID	LABORATORY SAMPLE ID	ANALYTICAL REQUIREMENTS					
		VOA GC/MS	BNA GC/MS	VOA GC	PEST PCB	METALS	WATER QUALITY
042202187	A2391201	SW8463	-	-	-	SW8463	CFR136
042202188	A2391202	SW8463	-	-	-	SW8463	CFR136
042202189	A2391203	SW8463	-	-	-	SW8463	CFR136
042202190	A2391204	SW8463	-	-	-	SW8463	CFR136
042202191	A2391205	SW8463	-	-	-	SW8463	CFR136
042302192	A2396501	SW8463	-	-	-	SW8463	CFR136
042302193	A2396502	SW8463	SW8463	-	-	SW8463	CFR136
042302194	A2396503	SW8463	-	-	-	SW8463	CFR136
042302195	A2396504	-	-	-	-	SW8463	SW8463
042302196	A2396505	SW8463	-	-	-	SW8463	CFR136
042302197	A2396506	SW8463	SW8463	-	-	SW8463	SW8463
042302198	A2396507	SW8463	SW8463	-	-	SW8463	CFR136
042302199	A2396508	SW8463	SW8463	-	-	SW8463	CFR136
042302200 ✓	A2396509	SW8463	-	-	-	SW8463	CFR136
042402201	A2403701	SW8463	-	-	-	SW8463	CFR136
042402202 ✓	A2403702	SW8463	-	-	-	SW8463	CFR136
042402203	A2403703	SW8463	-	-	-	SW8463	CFR136
042402204	A2403704	SW8463	-	-	-	SW8463	SW8463
042402205	A2403705	SW8463	-	-	-	SW8463	CFR136
042402207	A2403706	SW8463	-	-	-	SW8463	CFR136

acceptable unless noted below.

Sample 042302193 exhibited significant matrix interference (with a background absorbance about tenfold higher than a detection absorbance). The result for that sample calculated as 56 ug/L, but the laboratory reported it as nondetection at 10 ug/L. Due to the background absorbance, the detection should be regarded as potential matrix interference, but the reporting limit is to be elevated to be 56 ug/L, and qualified estimated due to the uncertainty that sample hexachrome response would be detected above the matrix. The result should be used with caution. However, it is known that the total chromium concentration of the sample, which would include contribution from any hexavalent chromium, is 17 ppb.

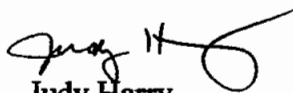
Sample 042302192 also exhibited significant matrix interference (with a background absorbance about tenfold higher than a detection absorbance). The result for that sample is reported as nondetection at 10 ug/L. Due to the background absorbance, the result is qualified estimated due to the uncertainty that sample hexachrome response would be detected above the matrix. There was no total chromium detected in that sample at 10 ug/L.

Matrix spikes of hexavalent chromium in 042202187 and 042502214 showed low recoveries (66% to 76%, below the lab acceptance range limit of 85%). Therefore, all hexachrome results are qualified as estimated ("UJ" or "J"), with a possible low bias.

Accuracy and precision determinations for sulfate, nitrate, and ammonia on 042202187 and 042502214 were acceptable.

Please do not hesitate to contact me if questions or comments arise during your review of this report.

Very truly yours,


Judy Harry

The results for bromomethane and dichlorodifluoromethane in the following samples are to be considered estimated ("UJ"), with a possible low bias due to low responses in the daily calibration standards (52%D and 34%D): 042402201, 042402202, 042402203, 042402204, 042402205, 042402207, 042402208, 042502209, 042502210, 042502211, TB 042302, and TB 042402

Summary Forms 7A incorrectly indicate that xylenes did not respond in the calibration standards. Responses were actually present and acceptable.

Matrix spikes of sample 42202187 showed acceptable accuracy and precision. Laboratory Control Sample (LCS) recoveries were also acceptable.

Semivolatiles Analyses by EPA 8270C

Holding times, surrogate standard recoveries, internal standard responses, and instrumental tunes were within required limits. Blanks showed no contamination.

Due to outlying linearity in the initial calibration standards (35%RSD), the result for caprotactum in all samples is considered estimated ("UJ"), with a possible low bias.

Continuing calibration standard responses were acceptable, with the exception within action guidelines, with the exception of the following (all 26%D to 28%D):

2, 4 Dinitrophenol in 042302197, 042302198, 042302199

2, 4 Dinitrophenol, 4-Nitrophenol, and 4-Nitroaniline in 042302193

Matrix spikes of samples 42302199 showed acceptable accuracy and precision. Laboratory Control Sample (LCS) recoveries were also acceptable for the eleven analytes evaluated.

Metals Analyses

Matrix spike and duplicate accuracy and precision evaluations were performed for arsenic and chromium on 042202187 and 42502214, and showed acceptable recoveries and spiked duplicate correlations. No evaluations for TAL metals was performed with this single sample. Those previously determined for the project groundwater samples were acceptable.

ICP serial dilution evaluations of 042202187, 042502211, 042402206, 042502220, and 042502214 are not applicable due to low sample concentrations. The laboratory should have reported actual IDL values on the Forms 10, not the CRDL values.

Total and dissolved fraction results of 042302192 correlated well.

Hexavalent Chromium, Ammonia, Nitrate, Sulfate, and Turbidity

Review was conducted for method compliance, holding times, transcription, calculations, standard and blank acceptability, accuracy and precision, etc., as applicable to each procedure. All were

Those items showing deficiencies are discussed in the following sections of this report. All others were found to be acceptable as outlined in the above-mentioned validation procedures, and as applicable for the methodology. Unless noted specifically in the following text, reported results are substantiated by the raw data, and generated in compliance with protocol requirements.

In summary, most results are usable as reported, or with minor qualification as estimated. However, due to apparent matrix interferences, some of the hexavalent chromium results reporting detection are edited to nondetection. These issues are discussed in the following analytical sections.

Attached to this narrative are summaries of sample identification/requirements, and copies of laboratory case narratives. Also included in this submission are red-ink edited client results tables, reflecting validation qualifiers.

General

Equipment blanks were clean, with the exception of one reporting detection acetone. None of the associated samples showed acetone detection, but detections in the unassociated samples should be regarded with caution, as possible external contamination.

Accuracy and precision determinations were acceptable for all fractions, with the exception of those for hexavalent chromium, which showed low matrix spike recoveries (discussed below).

Blind field duplicates were processed for groundwaters as 042302198 and 042302199, and for surface waters as 042502212 and 042502213. All correlations were acceptable, with the exception of that for ammonia in the surface waters (variance of well greater than $\pm$ -CRDL). Results for that analyte in 04502212 and 042502213 are therefore qualified as estimated. Additionally, see the discussion below regarding the detections of hexavalent chromium in those two samples.

Some of the custodies (4/22/02 and 4/24/02 sampling) were incomplete as regards laboratory receive dates/times. Samples were hand delivered, and custody was maintained.

Data Completeness

No laboratory resubmissions were required.

Volatile Analyses by EPA 8260

Surrogate standard recoveries, internal standard responses, instrumental tunes, and blank responses were within required limits.

Due to low responses (RRFs) for acetone and 2-butanone, in the calibration standards, results for these two analytes are qualified as estimated ("UJ" or "J"). Due to outlying linearity in the initial calibration standards (35%RSD), the result for 1,2-dibromo-3-chloropropane in all samples is considered estimated ("UJ"), with a possible low bias.

Data Validation Services

120 Cobble Creek Road P. O. Box 208

North Creek, N. Y. 12853

Phone 518-251-4429

Facsimile 518-251-4428

June 10, 2002

Jennifer Hagen
Geomatrix Consultants
336 Harris Hill Rd.
Williamsville, NY 14221

RE: Validation of Peter Cooper Markhams Site Data Packages—Aqueous samples
STI-Buffalo SDG Nos. 0416 and 0417

Dear Ms. Hagen:

Review has been completed for the data packages generated by Severn Trent Laboratories that pertain to aqueous samples collected at the Peter Cooper Markhams site. Five surface water samples, nineteen groundwater samples, and the filtrate of one of them, were analyzed for various combinations TCL volatiles, TCL semivolatiles, arsenic and chromium, hexavalent chromium, nitrate, sulfate, and ammonia. One of the samples was also processed for turbidity, and one sample was also analyzed for TAL metals. Field duplicates and matrix spikes/duplicates of each matrix were processed. Five equipment blanks were processed for all analytes except the geochemical parameters, and trip blanks were processed for volatile analytes. Methodologies used were those of the USEPA SW846.

Data validation was performed with guidance from the most current editions of the USEPA CLP National Functional Guidelines for Organic and Inorganic Data Review and the USEPA Region 2 SOPs HW-2 and HW-6. The following items were reviewed:

- * Data Completeness
- * Custody Documentation
- * Holding Times
- * Surrogate and Internal Standard Recoveries
- * Matrix Spike Recoveries/Duplicate Correlations
- * Field Duplicate Correlation
- * Preparation/Calibration Blanks
- * Control Spike/Laboratory Control Samples
- * Instrumental Tunes
- * Calibration Standards
- * Instrument IDLs
- * Method Compliance
- * Sample Result Verification

SPLP Data Validation Issue A01-9885

The SPLP Method incorporates an extractor blank into the preparation and analysis process; however laboratory personnel utilized an analysis method blank in lieu of the extractor blank. The sample and associated blank was non-detect for Cr+6 and the LCS recoveries were acceptable, therefore there is no impact on data usability.

Geomatrix Consultants, Inc.
Wet Chemistry Analysis

Client Sample No.

100901022

Lab Name: STL Buffalo

Contract: _____

Lab Code: RECONY

Case No.: 00006

SAS No.: _____

SDG No.: 100106

Matrix (soil/water): SOIL

Lab Sample ID: A1988202C

% Solids: 60.2

Date Samp/Recv: 10/09/2001 10/09/2001

Parameter Name	Units of Measure	Result	C	Q	M	Method Number	Analyzed Date
Hexavalent Chromium - Total	MG/KG	0.67	U		A	7196A	10/30/2001

Comments:

Geomatrix Consultants, Inc.
Wet Chemistry Analysis

Client Sample No.

100901022

Lab Name: STL Buffalo

Contract: _____

Lab Code: REONY

Case No.: 00006

SAS No.: _____

SDG No.: 100106

Matrix (soil/water): SOIL

Lab Sample ID: A1988202MS

% Solids: 60.2

Date Samp/Recv: 10/09/2001 10/09/2001

Parameter Name	Units of Measure	Result	C	Q	M	Method Number	Analyzed Date
Hexavalent Chromium - Total	MG/KG	0.67	U		A	7196A	10/30/2001

Comments:

Geomatrix Consultants, Inc.
Wet Chemistry Analysis

Client Sample No.

093

Lab Name: STL Buffalo

Contract: _____

Lab Code: REONY

Case No.: 00009

SAS No.: _____

SDG No.: 100109

Matrix (soil/water): SOIL

Lab Sample ID: A1A03442C

% Solids: 85.3

Date Samp/Recv: 10/11/2001 10/11/2001

Parameter Name	Units of Measure	Result	C	Q	M	Method Number	Analyzed Date
Hexavalent Chromium - Total	MG/KG	0.46	U		A	7196A	10/25/2001

Comments:

Geomatrix Consultants, Inc.
Wet Chemistry Analysis

Client Sample No.

093

Lab Name: STL Buffalo

Contract: _____

Lab Code: RECONY

Case No.: 00009

SAS No.: _____

SDG No.: 100109

Matrix (soil/water): SOIL

Lab Sample ID: A1A03442D

% Solids: 85.3

Date Samp/Recv: 10/11/2001 10/11/2001

Parameter Name	Units of Measure	Result	C	Q	M	Method Number	Analyzed Date
Hexavalent Chromium - Total	MG/KG	0.61			A	7196A	10/25/2001

Comments:

Geomatrix Consultants, Inc.
Wet Chemistry Analysis

Client Sample No.

093

Lab Name: STL Buffalo

Contract: _____

Lab Code: RECONY

Case No.: 00009

SAS No.: _____

SDG No.: 100109

Matrix (soil/water): SOIL

Lab Sample ID: A1A03442MS

% Solids: 85.3

Date Samp/Recv: 10/11/2001 10/11/2001

Parameter Name	Units of Measure	Result	C	Q	M	Method Number	Analyzed Date
Hexavalent Chromium - Total	MG/KG	467			A	7196A	10/25/2001

Comments:

Geomatrix Consultants, Inc.
Wet Chemistry Analysis

Client Sample No.

093

Lab Name: STL Buffalo

Contract: _____

Lab Code: RECONY

Case No.: 00009

SAS No.: _____

SDG No.: 100109

Matrix (soil/water): SOIL

Lab Sample ID: A1A03442SD

% Solids: 85.3

Date Samp/Recv: 10/11/2001 10/11/2001

Parameter Name	Units of Measure	Result	C	Q	M	Method Number	Analyzed Date
Hexavalent Chromium - Total	MG/KG	449			A	7196A	10/25/2001

Comments:

Geomatrix Consultants, Inc.
Wet Chemistry Analysis

Client Sample No.

101501120

Lab Name: STL Buffalo

Contract: _____

Lab Code: RECNY

Case No.: 00013

SAS No.: _____

SDG No.: 100113

Matrix (soil/water): SOIL

Lab Sample ID: A1A11401C

% Solids: 85.4

Date Samp/Recv: 10/15/2001 10/15/2001

Parameter Name	Units of Measure	Result	C	Q	M	Method Number	Analyzed Date
Hexavalent Chromium - Total	MG/KG	0.60			A	7196A	10/25/2001

Comments:

Geomatrix Consultants, Inc.
Wet Chemistry Analysis

Client Sample No.

101501120

Lab Name: STL Buffalo

Contract: _____

Lab Code: RECNY

Case No.: 00013

SAS No.: _____

SDG No.: 100113

Matrix (soil/water): SOIL

Lab Sample ID: A1A11401D

% Solids: 85.4

Date Samp/Recv: 10/15/2001 10/15/2001

Parameter Name	Units of Measure	Result	C	Q	M	Method Number	Analyzed Date
Hexavalent Chromium - Total	MG/KG	0.47	U		A	7196A	10/25/2001

Comments:

Geomatrix Consultants, Inc.
Wet Chemistry Analysis

Client Sample No.

101501120

Lab Name: STL Buffalo

Contract: _____

Lab Code: RBCNY

Case No.: 00013

SAS No.: _____

SDG No.: 100113

Matrix (soil/water): SOIL

Lab Sample ID: A1A11401MS

% Solids: 85.4

Date Samp/Recv: 10/15/2001 10/15/2001

Parameter Name	Units of Measure	Result	C	Q	M	Method Number	Analyzed Date
Hexavalent Chromium - Total	MG/KG	643			A	7196A	10/25/2001

Comments:

Geomatrix Consultants, Inc.
Wet Chemistry Analysis

Client Sample No.

101501120

Lab Name: STL Buffalo

Contract: _____

Lab Code: RECNY

Case No.: 00013

SAS No.: _____

SDG No.: 100113

Matrix (soil/water): SOIL

Lab Sample ID: A1A11401SD

% Solids: 85.4

Date Samp/Recv: 10/15/2001 10/15/2001

Parameter Name	Units of Measure	Result	C	Q	M	Method Number	Analyzed Date
Hexavalent Chromium - Total	MG/KG	624			A	7196A	10/25/2001

Comments:

Judy Harry

From: <jyohe@stl-inc.com>
To: <jhagen@geomatrix.com>
Cc: <narrabst@atecone.net>
Sent: Friday, May 10, 2002 12:22 PM
Attach: Untitled.pdf
Subject: Soil Cr+6 Spike Analysis

The long awaited corrected forms for the Cr+6 soil spike analysis. Please contact me with any questions, hopefully this will resolve this issue.

Jeff
<<Untitled.pdf>>

GEO MATRIX CONSULTANTS

-6-
DUPLICATES

SAMPLE NO.

11080117 SD

Contract: NY00-433

Lab Code: STLBFL0

Case No.: 00014

SAS No.:

SDG NO.: 110114

Matrix (soil/water): WATER

Level (low/med): LOW

% Solids for Sample: 0.0

% Solids for Duplicate: 0.0

Concentration Units (ug/L or mg/kg dry weight):

UG/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum		10890.1201		10498.8398		3.7		P
Antimony		195.5100		189.1600		3.3		P
Arsenic		195.4600		190.7600		2.4		P
Barium		233.0300		226.5300		2.8		P
Beryllium		192.8600		189.1800		1.9		P
Cadmium		190.6500		187.7600		1.5		P
Calcium		293871.0000		287590.4063		2.2		P
Chromium		204.8800		201.4300		1.7		P
Cobalt		195.3100		191.7400		1.8		P
Copper		207.7600		202.9000		2.4		P
Iron		10085.9902		9660.2998		4.3		P
Lead		189.8200		188.4800		0.7		P
Magnesium		85690.5469		83640.7813		2.4		P
Manganese		527.0200		515.9800		2.1		P
Nickel		195.5700		192.8500		1.4		P
Potassium		13700.1602		13326.8096		2.8		P
Selenium		184.7700		181.5800		1.7		P
Silver		50.4200		48.6000		3.7		P
Mercury		4.8833		4.0167		19.5		CV
Sodium		31328.4297		30597.8906		2.4		P
Thallium		187.6300		186.9000		0.4		P
Vanadium		199.7900		195.8200		2.0		P
Zinc		207.3400		203.8400		1.7		P

Data Validation Services

120 Cobble Creek Road P. O. Box 208

North Creek, NY 12853

Phone (518) 251-4429

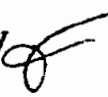
Facsimile (518) 251-4428

Facsimile Transmission

TO: Jeff Yohe

COMPANY: STL-Buffalo

FAX NUMBER: 716 691 7991

FROM: Judy Harry 

DATE: 03-29-02

No. of pages (including cover): 1

COMMENTS: RE: Geomatrix Consultants
Peter Cooper Markham site

As indicated in my voice mail this morning, the following items are needed to complete the data package documentation for this project:

1. The resubmitted duplicate Forms 6 for the metals analyses do not include one for sample 110801177 (SDG 110114).
2. With the exception of hexavalent chromium, sample matrix spike/duplicate summary forms were not provided for any of the wet chem analyses. Raw data indicate that they were processed, but the summary forms all report blank spike LCS recoveries/correlations. Please provide the required summaries.

SDG's 110114 and A01-8908

Please copy Jennifer with all communications. Thank you.

cc: Jennifer Hagen

SEVERN TRENT LABORATORIES, INC. - BUFFALO
 HEXACHROME ANALYSIS - WATERS

Labbook# A02-01-12

June 11/10/01

Date	Analyst	Job #	Sample I.D.	Volume	ABS	ABS Blk.	ABS Corr.	Curve Conc. (mg/l)	DIL	Final Conc. (mg/l)	Comments
4/20/01	ET	118	Blank	25	0.000					<0.10	
		104	0.05 ppm	1	0.041					0.050	100% = 5.0 ug/L
		1072	ALB07301	1	0.008					0.0048	68 = 4.2 ug/L
			02		0.008	0.003	0.005			0.321	69 = 32.1 ug/L
			05		0.001	0.009				0.0047	70 = 4.7 ug/L
			03		0.004					0.0081	71 = 2.1 ug/L
			06		0.000					0.010	72
			04		0.007	0.030	0.007			0.0094	73 = 3.7 ug/L
			04.400		0.032		0.012			0.0064	= 4.4 ug/L
			04.04		0.030		0.010			0.0053	= 5.3 ug/L 0.005 ppm
			04.04		0.104					0.0574	= 56.4 ug/L
			006		0.007					0.010	

Start/End Time 1845-1917
 Reviewed By Date (G) 11/9/01
 Spec #1001 DE 2000
 Solutions A0000013-1, 17-2
 Curve Date 9/10/01

000097
 223323

SEVERN
TRENT
SERVICES

- Corpus Christi, TX

Method/Parameter: Copper Carbon 90.3 Nally, Ltd

Analyst: APD Preservative: Neel H₂SO₄ NaOH ZnAC LCS ID: _____
Start Date/Time: 10/29/01 08:50 AM Other: _____ LCS Conc: 84
End Date/Time: 10/29/01 13:00 Titrant: 0.5 N Spike ID: 8/10/29/01
QA Batch #: 62977 Titrant ID: 1029-22.8 Iron Sulfate Spike Conc: _____

Job/Sx Number	Weight of sample	Initial Buret Reading	Final Buret Reading	Initial ml of Buret Used	org C %	RPD	Comments
Blank I	-	0.000	20.0	20.0	0	-	
Blank II	-	20.0	40.0	20.0	0	-	
Blank III	-	0.00	20.0	20.0	0	-	
209213-1	5.00g	0.00	14.0	14.0	8.2571	-	
209213-1	0.50g	14.0	31.1	17.1	1.1571	-	
-2	0.50g	31.1	45.4	14.3	2.2743	-	
-2d	0.50g	0.00	14.3	14.3	2.2743	0	
-3	0.05g	14.3	31.0	16.7	13.1670	-	
-4	0.05g	31.0	48.2	17.2	11.1720	-	
-5	0.05g	0.00	16.7	16.7	13.1670	-	
-6	0.50g	16.7	26.0	9.3	4.2693	-	
-7	0.50g	26.0	34.5	8.5	4.5885	-	
-8	0.50g	34.5	48.1	13.6	2.5536	-	
209406-1	0.50g	0.00	16.5	16.5	1.3965	-	
-1d	0.50g	16.5	33.0	16.5	1.3965	0	
-2	0.05g	33.0	19	-	10.0000	-	
-3	0.05g	0.00	19.6	19.6	1.5960	-	
209408-1	0.5g	19.6	30.5	10.9	3.6309	-	
-2	0.5g	30.5	46.9	16.4	1.4344	-	
-3	0.5g	0.00	15.3	15.3	1.8753	-	

Corpus Christi, TX

Method/Parameter: Depress Carbon 90.3 Recovery Rate

Analyst: AK
 Start Date/Time: 10/29/01 0815
 End Date/Time: 10/29/01
 QA Batch #: 1129977

Preservative: Neat H₂SO₄ NaOH ZnAc
 Other: 0.5 N
 Titrant: 0.5 N
 Titrant ID: 1129977

LCS ID: 1129977
 LCS Conc: 10/29/01
 Spike Conc: 10/29/01

Job/Sx Number	Wt of Sample	Calculated Result	Blank Result	Unadjusted Result	Corc %	Comments
209408-4	0.05g	15.3	35.0	19.7	1.19%	
209408-1	0.05g	35.0	15.3	19.7	1.19%	
209408-2	0.05g	20.0	35.0	15.3	7.98	
10/29/01 10/29/01 10/29/01 10/29/01 10/29/01 10/29/01 10/29/01 10/29/01 10/29/01 10/29/01						

APPENDIX B-2

Confirmation Hexavalent Chromium Data Validation Report

Data Validation Services

120 Cobble Creek Road P. O. Box 208

North Creek, N. Y. 12853

Phone 518-251-4429

Facsimile 518-251-4428

March 9, 2004

**Rick Frappa
Geomatrix Consultants
336 Harris Hill Rd.
Williamsville, NY 14221**

**RE: Peter Cooper Markhams site
Validation Report for the Soil Total Chromium and Hexavalent Chromium Analyses
STL-Buffalo SDG A03-B765**

Dear Mr. Frappa:

Review has been performed on the data package generated by Severn Trent Laboratories, Inc. that pertains to samples collected at the Peter Cooper Markhams site. Sixteen soil samples were processed for total chromium by EPA Method 6010B and hexavalent chromium (Cr+6) analyses by EPA methods 3060A/7196A, with additional quality requirements of the 2000 NYSDEC ASP.

Data validation was performed with guidance from the most current edition of the USEPA SOP HW-2, and with consideration for the requirements of the project QAPP and the 2000 NYSDEC ASP. The following items were reviewed:

- * Data Completeness**
- * Custody Documentation**
- * Laboratory Narrative Discussion**
- * Holding Times**
- * Matrix Spike Recoveries/Duplicate Correlations**
- * Field Duplicate Correlations**
- * Preparation/Calibration Blanks**
- * Control Spike/Laboratory Control Samples**
- * Calibration/CRI/CRA Standards**
- * ICP Interference Check Standards**
- * ICP Serial Dilution Correlations**
- * Method Compliance**
- * Sample Result Verification**

Those items listed above which show deficiencies are discussed within the text of this narrative. All of the other items were determined to be acceptable.

In summary, sample results are usable, with qualifications of results as estimated applied to two samples due to solids content below 50%.

Total Chromium

Due to low solids content, results for location 85 (36%) and 120 (39%) are qualified as estimated, with an unknown direction of bias.

Chromium sample matrix spike evaluations of location 122 are not applicable due to high sample concentrations of that element. The laboratory duplicate evaluation of that sample shows acceptable precision.

Blind field duplicate evaluation was performed on location 117 and shows acceptable correlation.

The ICP serial dilution evaluation of 122 shows the correlation to be within the validation action limit of 10%D.

Sample processing is compliant, and all reported results are verified as being substantiated by the raw data.

Hexavalent Chromium

Review was conducted for holding times, transcription, calculations, standard and blank acceptability, accuracy and precision, etc., as applicable for the procedure. All were acceptable unless noted below.

Due to low solids content, results for locations 85 (36%) and 120 (39%) are qualified as estimated, with an unknown direction of bias.

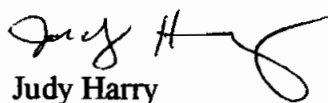
The pre-digestion and post-digestion matrix spikes of location 122 show acceptable accuracy and precision. MSA determinations show good correlations.

Blind field duplicate evaluation was performed on location 117 and shows acceptable correlation.

Transcriptions checks for all sample results and random calculation checks for at least 10% of all data points show no errors. MSA determinations show good correlations.

Please do not hesitate to contact me if you have comments or questions regarding this report.

Very truly yours,


Judy Harry

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION
AND
ANALYTICAL REQUEST SUMMARY

LAB NAME: SEVERN TRENT LABORATORIES, INC.

CUSTOMER SAMPLE ID	LABORATORY SAMPLE ID	ANALYTICAL REQUIREMENTS						
		VOA GC/MS	BNA GC/MS	VOA GC	PEST PCB	METALS	TCLP HERB	WATER QUALITY
107	A3B76512	-	-	-	-	ASP00	-	SW8463
112	A3B76508	-	-	-	-	ASP00	-	SW8463
113	A3B76507	-	-	-	-	ASP00	-	SW8463
115	A3B76501	-	-	-	-	ASP00	-	SW8463
117	A3B76516	-	-	-	-	ASP00	-	SW8463
120	A3B76506	-	-	-	-	ASP00	-	SW8463
121	A3B76509	-	-	-	-	ASP00	-	SW8463
122	A3B76515	-	-	-	-	ASP00	-	SW8463
123	A3B76514	-	-	-	-	ASP00	-	SW8463
127	A3B76511	-	-	-	-	ASP00	-	SW8463
128	A3B76510	-	-	-	-	ASP00	-	SW8463
137	A3B76504	-	-	-	-	ASP00	-	SW8463
85	A3B76503	-	-	-	-	ASP00	-	SW8463
89	A3B76513	-	-	-	-	ASP00	-	SW8463
93	A3B76505	-	-	-	-	ASP00	-	SW8463
BLIND DUPLICATE	A3B76517	-	-	-	-	ASP00	-	SW8463
GPZ-1 1B-4	A3B76502	-	-	-	-	ASP00	-	SW8463

NON-CONFORMANCE SUMMARY

Job#: A03-B765STL Project#: NY1A8789Site Name: PETER COOPER MARKHAMS SITEGeneral Comments

The enclosed data have been reported utilizing data qualifiers (Q) as defined on the Data Comment Page.

Soil, sediment and sludge sample results are reported on "dry weight" basis unless otherwise noted in this data package.

According to 40CFR Part 136.3, pH, Chlorine Residual and Dissolved Oxygen analyses are to be performed immediately after aqueous sample collection. When these parameters are not indicated as field (e.g. pH-Field), they were not analyzed immediately, but as soon as possible after laboratory receipt.

Sample dilutions were performed as indicated on the attached Dilution Log. The rationale for dilution is specified by the 3-digit code and definition.

Sample Receipt Comments

A03-B765

Sample Cooler(s) were received at the following temperature(s); 3.0 °C

All samples were received in good condition.

Metals Data

The recovery of sample 122 Matrix Spike exhibited results below the quality control limits for Chromium. The recovery of sample 122 Matrix Spike Duplicate exhibited results above the quality control limits for Chromium. The RPD between the Matrix Spike and the Matrix Spike Duplicate exceeded quality control limits. The sample result is more than four times greater than the spike added. The LCS is acceptable.

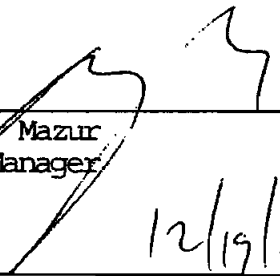
The analyte Chromium was detected in the CCB'S at 05:12 and 06:06 at a level above the project established reporting limit. However, all samples had levels of Chromium greater than ten times that of the Method Blank value, therefore, no corrective action was necessary.

Wet Chemistry Data

No deviations from protocol were encountered during the analytical procedures.

The results presented in this report relate only to the analytical testing and condition of the sample at receipt. This report pertains to only those samples actually tested. All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

"I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or his designee, as verified by the following signature."



Ronald M. Mazur
Project Manager

Date

12/19/03

METHODS SUMMARY

Job#: A03-B765STL Project#: NY1A8789Site Name: PETER COOPER MARKHAMS SITE

<u>PARAMETER</u>	<u>ANALYTICAL METHOD</u>
Chromium - Total	ASP00 6010
Hexavalent Chromium - Total	SW8463 7196A

References:

- ASP00 "Analytical Services Protocol", New York State Department of Conservation, June 2000.
- SW8463 "Test Methods for Evaluating Solid Waste Physical/Chemical Methods (SW846), Third Edition, 9/86; Update I, 7/92; Update IIA, 8/93; Update II, 9/94; Update IIB, 1/95; Update III, 12/96.

[illegible]

Cover Soil	Lathe #113	Lathe #112	Lathe #117	Lathe #115	Lathe #137	Lathe #121	Lathe #120
Constituent ²	10/10/2001	12/3/2003	10/11/2001	12/4/2003	10/11/2001	12/3/2003	10/11/2001 12/3/2003
Total Metals, milligrams per kilogram							
Chromium	4820 J	4760	398 J	1230	35900	20600	18100 13300
Hexavalent Chromium	(1.3U) J	19.8	(0.66U) J	3.8	(-0.93U) R	6.8	(-0.6U) R
							51.8 (-0.51U) R
							5.4 (-0.89U) R
							28000
							29200 E
							18.2 (-20.3U) R
							63.3 U

Wetland Surface Soil	Sample Location, Identification, and Date Collected ¹			
	Lathe #93		Lathe #85	
	Lathe #93	Lathe #85	Lathe #89	Lathe #89
Constituent ²	10/15/2003	12/3/2003	10/15/2003	12/3/2003
Total Metals, milligrams per kilogram				
Chromium	136N J	97.8	87.4N J	14.2 J
Hexavalent Chromium	(-0.52U) R	1.3	(-0.92U) R	4.0U J
				(-1.3U) R
				215N J
				29
				18.3

Boring in Waste	Sample Location, Identification, and Date Collected ¹
	GPZ-1 B-4
Constituent ²	10/5/2001 12/3/2003
Total Metals, milligrams per kilogram	
Chromium	8870 31200
Hexavalent Chromium	(-0.65U) R 4.7

APPENDIX C

Geotechnical Testing Results for Site Fill/Soil/Sediment



580 Olean Road
East Aurora, NY 14052
phone/fax: (716) 655.4933
www.soiltesting.com

Soil • Aggregate • Geosynthetic Testing

Memo

TO: Tom Forbes, Benchmark Environmental

FROM: Jeanne Asquith, 3rd Rock

DATE: January 31, 2002

Re: Transmittal of Hard Copy Report

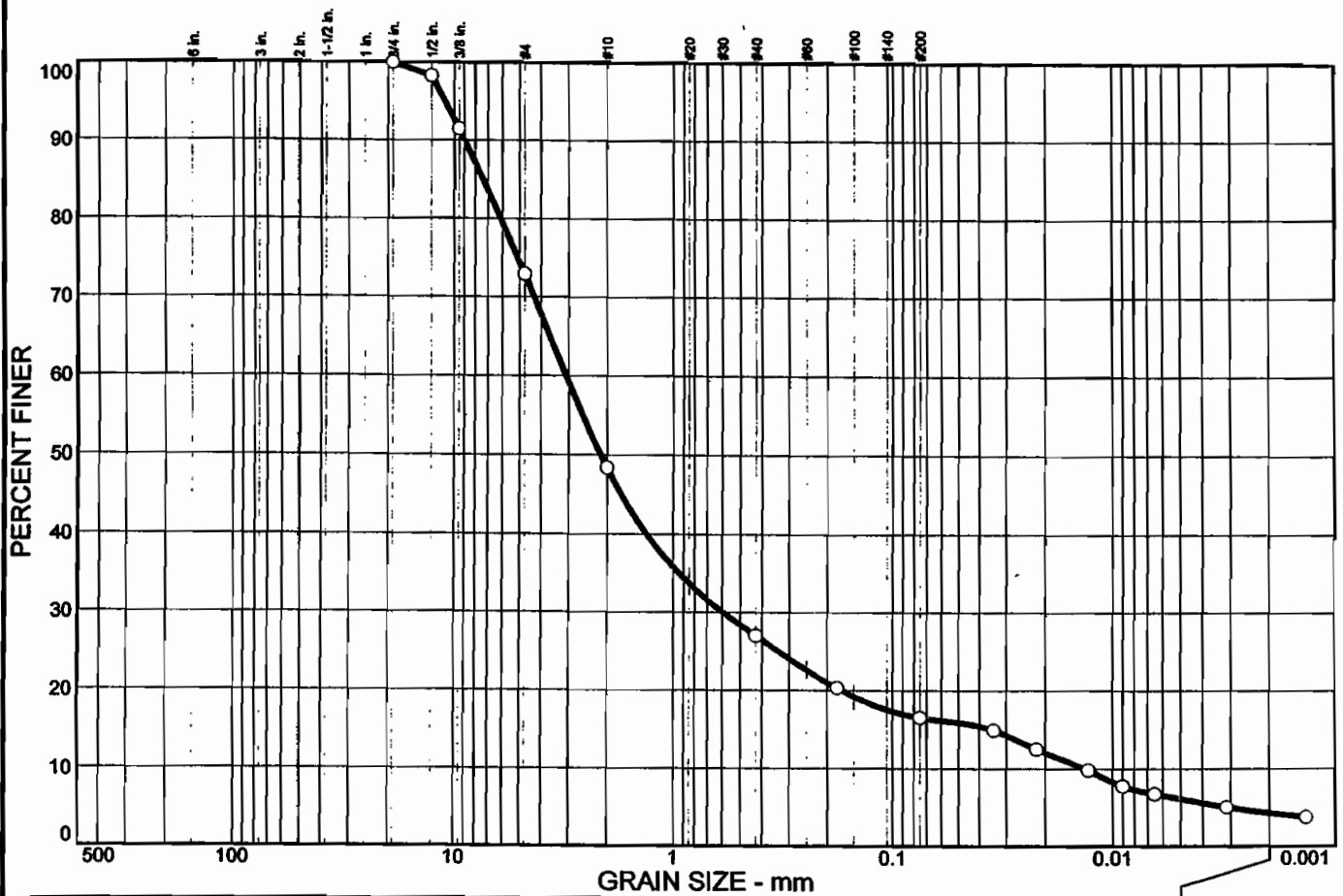
Enclosed is the final report for the Peter Cooper Markhams Site. Also enclosed is the invoice for this testing.

Very truly yours,

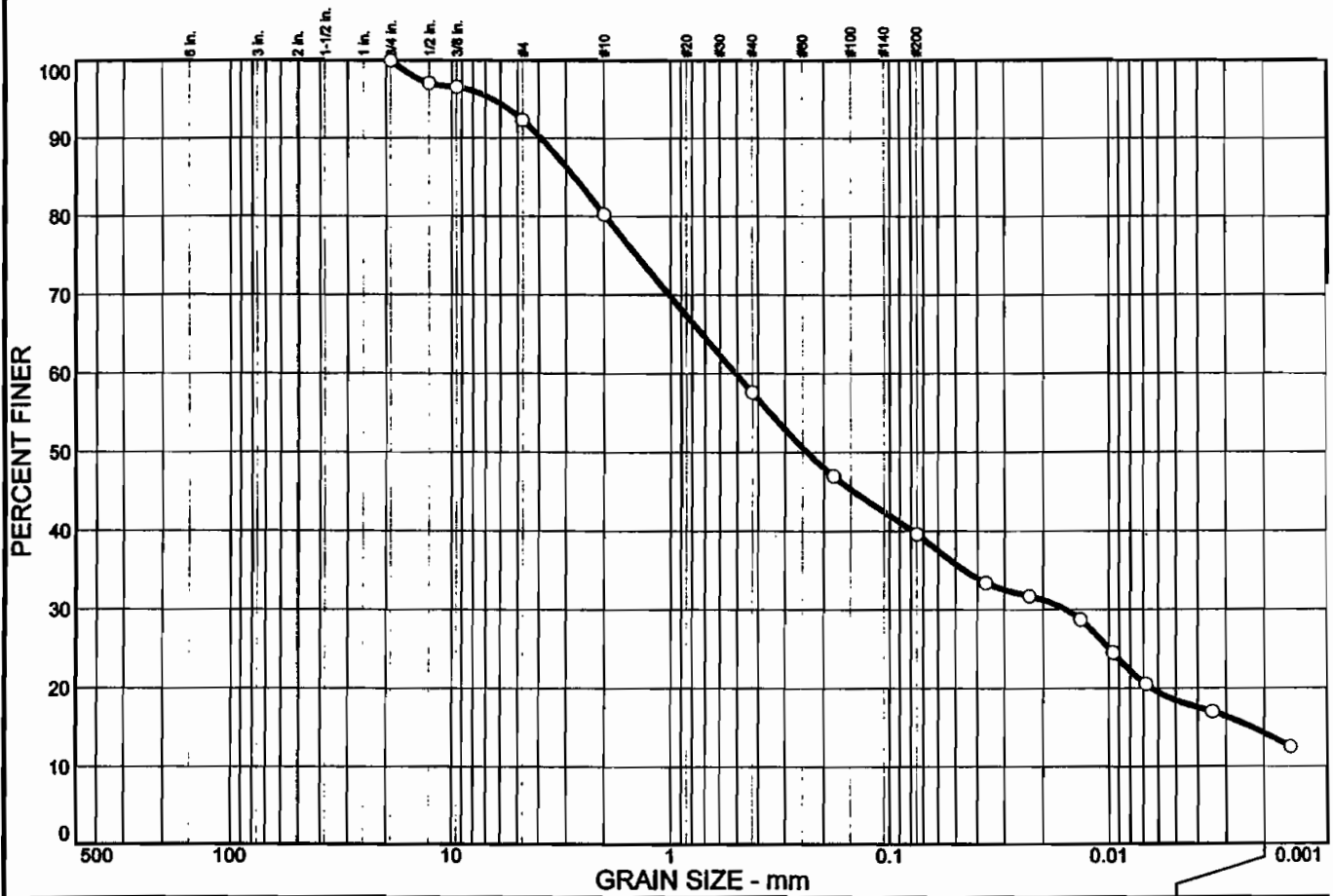
A handwritten signature in cursive script that reads "Jeanne M. Asquith".

Jeanne M. Asquith
Soils Laboratory Manager

Particle Size Distribution Report



Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	7.7	12.1	22.6	18.0	25.4	14.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	97.1		
.375 in.	96.6		
#4	92.3		
#10	80.2		
#40	57.6		
#80	47.0		
#200	39.6		

Soil Description

ID#01-739

PL= **Atterberg Limits** PI=

LL=

Coefficients

D₈₅= 2.73 D₆₀= 0.505 D₅₀= 0.237

D₃₀= 0.0157 D₁₅= 0.0023 D₁₀=

C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Brown

* (no specification provided)

Sample No.: Fill
Location: B-4

Source of Sample: Other Samples

Date: 12/14/01
Elev./Depth:

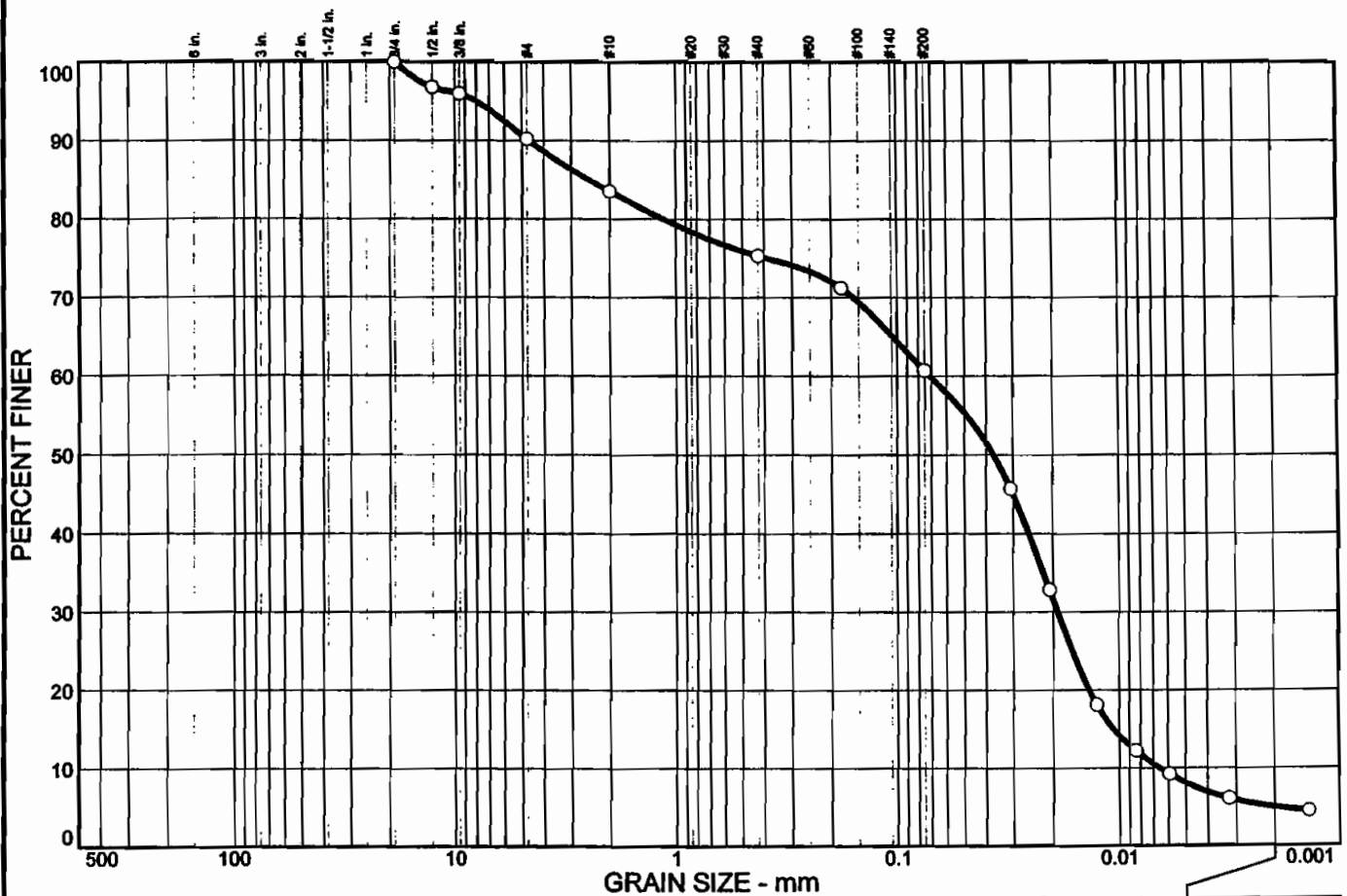
3rd Rock, LLC

Client: Benchmark Environmental Engineering & Science
Project: Peter Cooper Markhams Site

Project No: 01-012

Plate

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	9.8	6.7	8.2	14.6	55.7	5.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	96.8		
.375 in.	96.0		
#4	90.2		
#10	83.5		
#40	75.3		
#80	71.2		
#200	60.7		

* (no specification provided)

Soil Description		
ID#01-740		
Atterberg Limits		
PL=	LL=	PI=
Coefficients		
D ₈₅ = 2.50	D ₆₀ = 0.0709	D ₅₀ = 0.0368
D ₃₀ = 0.0190	D ₁₅ = 0.0106	D ₁₀ = 0.0066
C _u = 10.82	C _c = 0.78	
Classification		
USCS=	AASHTO=	
Remarks		

Sample No.: MW-8S
Location:

Source of Sample:

Date: 12/5/01
Elev./Depth:

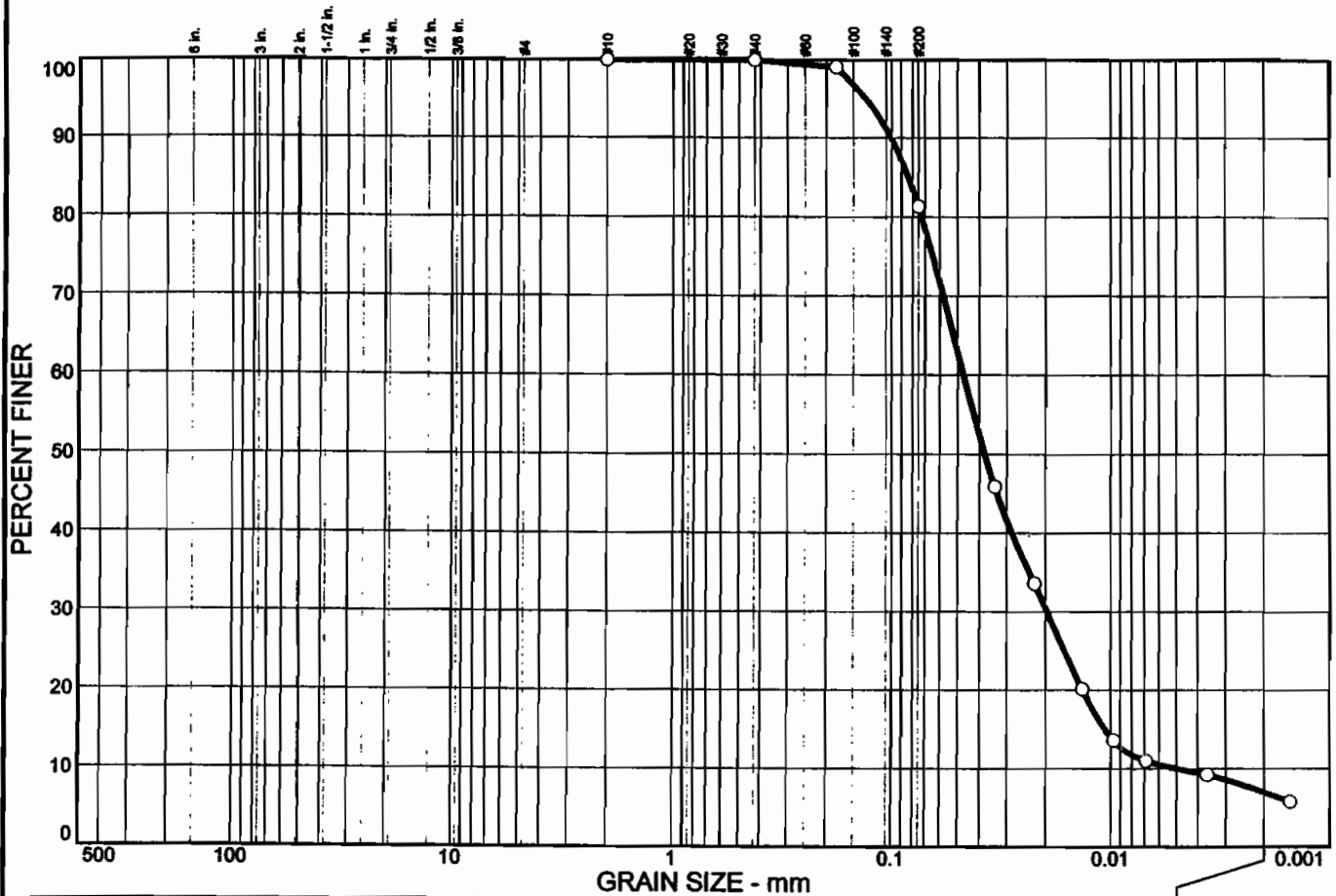
3rd Rock, LLC

Client: Benchmark Environmental Engineering & Science
Project: Peter Cooper Markhams Site

Project No: 01-012

Plate

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.0	18.7	74.3	7.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#40	100.0		
#80	99.1		
#200	81.3		

* (no specification provided)

Soil Description

ID#01-741

Atterberg Limits

PL= LL= PI=

Coefficients

D₈₅= 0.0836 D₆₀= 0.0469 D₅₀= 0.0377
D₃₀= 0.0196 D₁₅= 0.0106 D₁₀= 0.0050
C_u= 9.41 C_c= 1.64

Classification

USCS= AASHTO=

Remarks

Grayish Brown

Sample No.: MW-7D
Location:

Source of Sample: Borehole Samples

Date: 12/14/01
Elev./Depth:

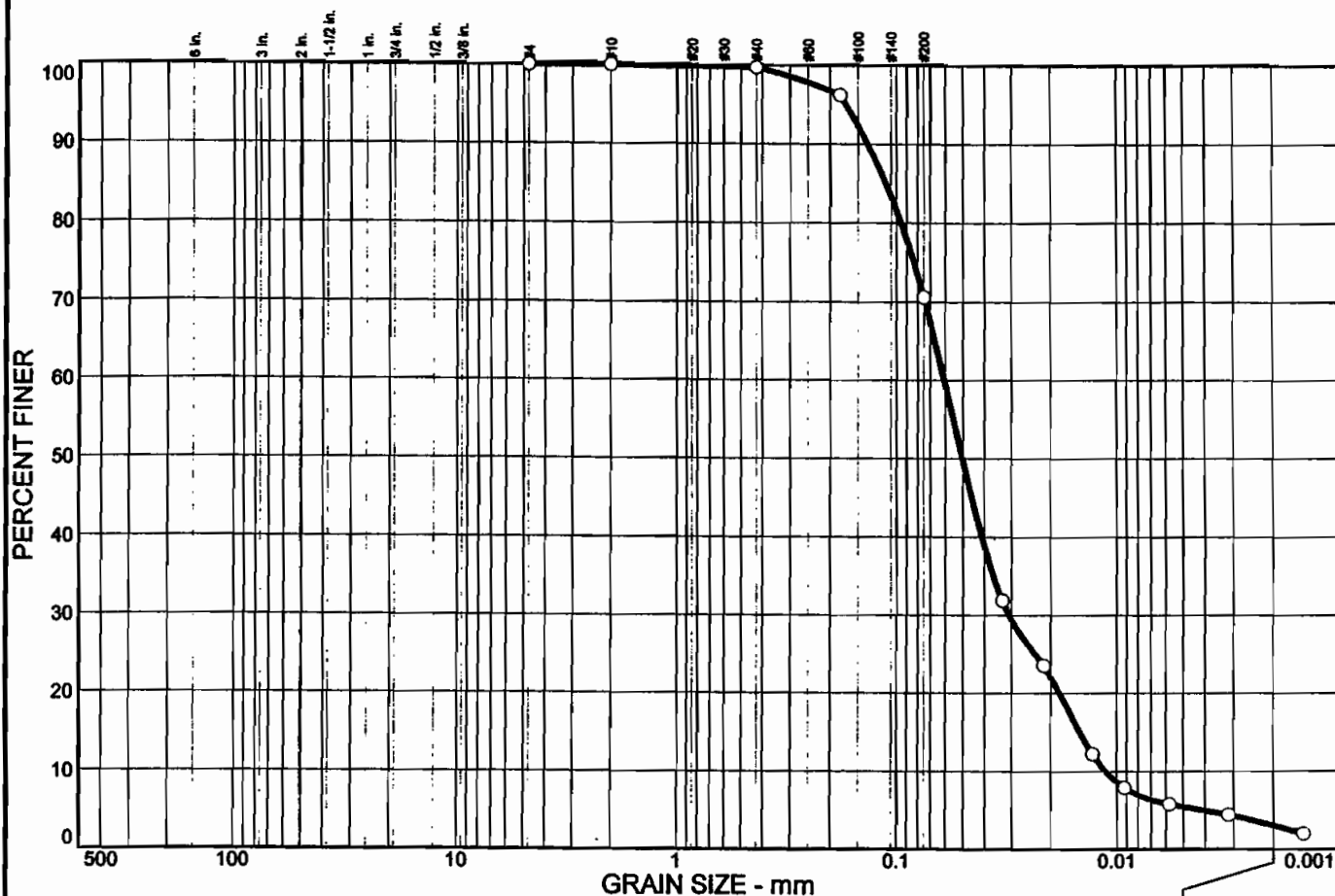
3rd Rock, LLC

Client: Benchmark Environmental Engineering & Science
Project: Peter Cooper Markhams Site

Project No: 01-012

Plate

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.3	29.1	67.6	3.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	100.0		
#40	99.7		
#80	96.2		
#200	70.6		

* (no specification provided)

Soil Description		
ID#01-742		
Atterberg Limits		
PL=	LL=	PI=
Coefficients		
D ₈₅ = 0.112	D ₆₀ = 0.0606	D ₅₀ = 0.0501
D ₃₀ = 0.0308	D ₁₅ = 0.0147	D ₁₀ = 0.0112
C _u = 5.40	C _c = 1.40	
Classification		
USCS=	AASHTO=	
Remarks		
Brown		

Sample No.: MW-8D
Location:

Source of Sample:

Date: 12/5/01
Elev./Depth:

3rd Rock, LLC

Client: Benchmark Environmental Engineering & Science
Project: Peter Cooper Markhams Site

Project No: 01-012

Plate

The graph shows the grain size distribution of a soil sample. The Y-axis represents the percentage of soil finer than a given grain size, ranging from 0 to 100. The X-axis represents the grain size in millimeters on a logarithmic scale, ranging from 500 mm to 0.001 mm. The curve starts at 100% finer for grain sizes down to about 4.75 mm, then drops sharply between 4.75 mm and 0.075 mm, and finally levels off to about 5% finer for grain sizes below 0.075 mm.

Grain Size (mm)	Percent Finer (%)
4.75	100
2.0	98
0.85	98
0.425	97
0.25	90
0.15	78
0.075	56
0.0425	40
0.025	30
0.015	21
0.0075	13
0.00425	11
0.0025	11
0.0015	10
0.00075	8
0.000425	5

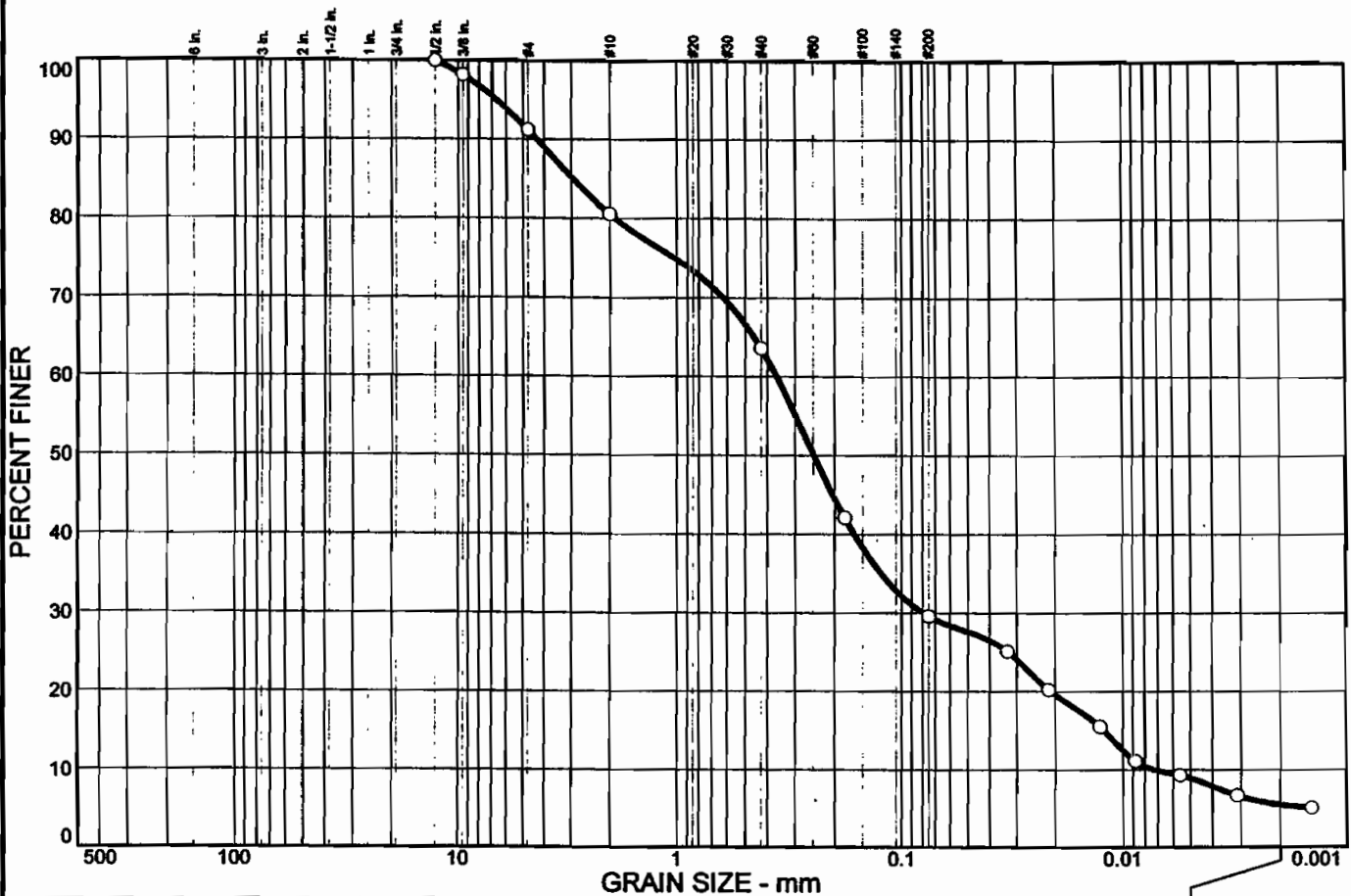
SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
.75 in.	97.0		
.5 in.	97.0		
.375 in.	96.1		
#4	90.0		
#10	78.6		
#40	56.5		
#80	39.8		
#200	30.1		

<u>Soil Description</u>		
ID#01-743		
<u>Atterberg Limits</u>		
PL=	LL=	PI=
<u>Coefficients</u>		
D ₈₅ = 3.21	D ₆₀ = 0.516	D ₅₀ = 0.307
D ₃₀ = 0.0742	D ₁₅ = 0.0260	D ₁₀ = 0.0062
C _u = 83.01	C _c = 1.71	
<u>Classification</u>		
USCS=	AASHTO=	
<u>Remarks</u>		
Brown		

Date: 1/14/02
Elev./Depth:

Plate

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	8.8	10.7	16.9	34.0	24.1	5.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	98.2		
#4	91.2		
#10	80.5		
#40	63.6		
#80	42.1		
#200	29.6		

* (no specification provided)

Soil Description		
ID#01-744		
Atterberg Limits		
PL=	LL=	PI=
Coefficients		
D ₈₅ = 2.94	D ₆₀ = 0.363	D ₅₀ = 0.247
D ₃₀ = 0.0793	D ₁₅ = 0.0121	D ₁₀ = 0.0073
C _u = 49.66	C _c = 2.38	
Classification		
USCS=	AASHTO=	
Remarks		
Brown		

Sample No.: MW-7S
Location:

Source of Sample:

Date: 12/5/01
Elev./Depth:

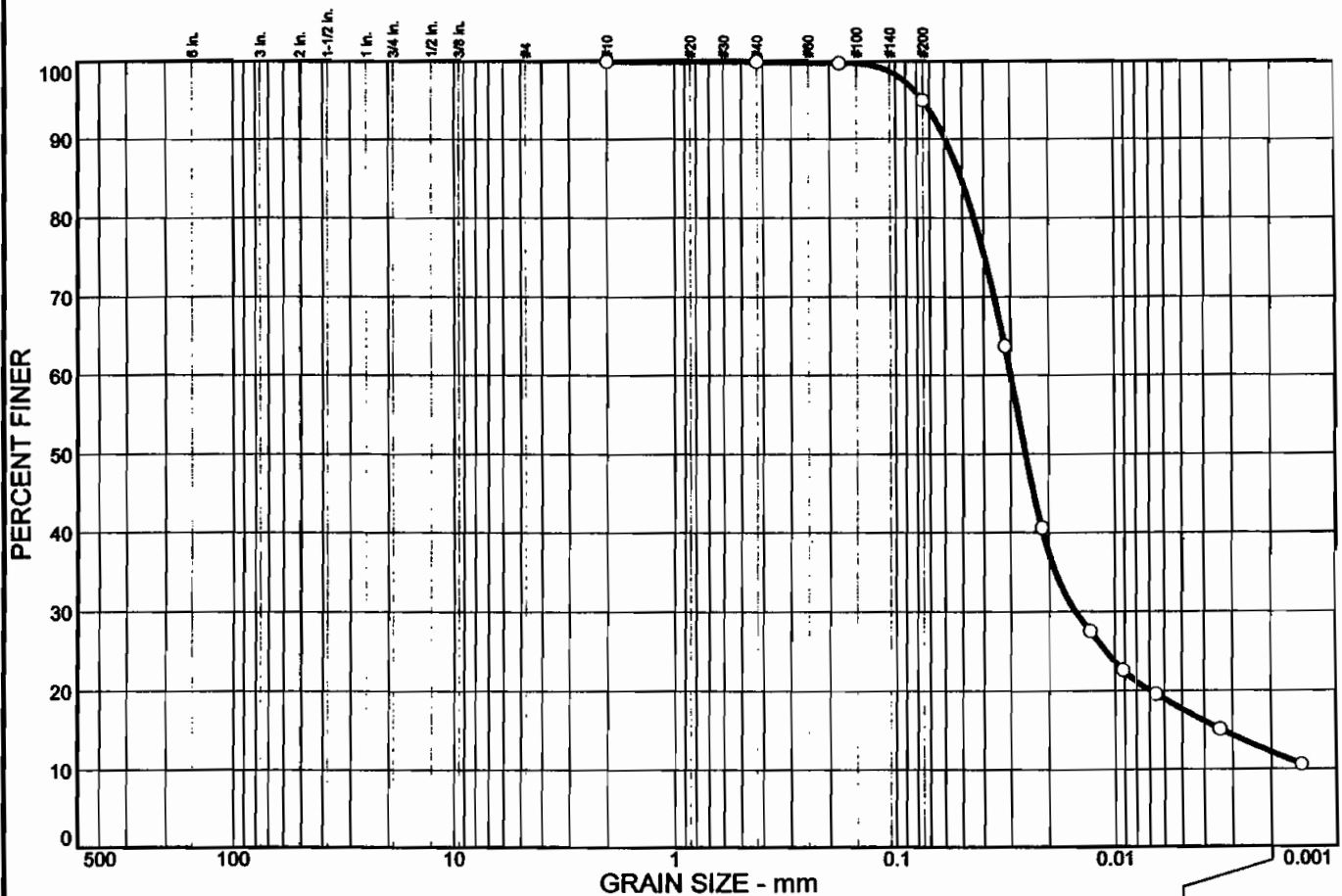
3rd Rock, LLC

Client: Benchmark Environmental Engineering & Science
Project: Peter Cooper Markhams Site

Project No: 01-012

Plate

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	0.0	0.0	0.0	5.0	82.8	12.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#40	100.0		
#80	99.8		
#200	95.0		

* (no specification provided)

Soil Description

ID#01-745

Atterberg Limits

PL= LL= PI=

Coefficients

D₈₅= 0.0504 D₆₀= 0.0300 D₅₀= 0.0256
D₃₀= 0.0151 D₁₅= 0.0033 D₁₀=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Brownish Gray

Sample No.: MW-9D
Location:

Source of Sample:

Date: 11/30/01
Elev./Depth:

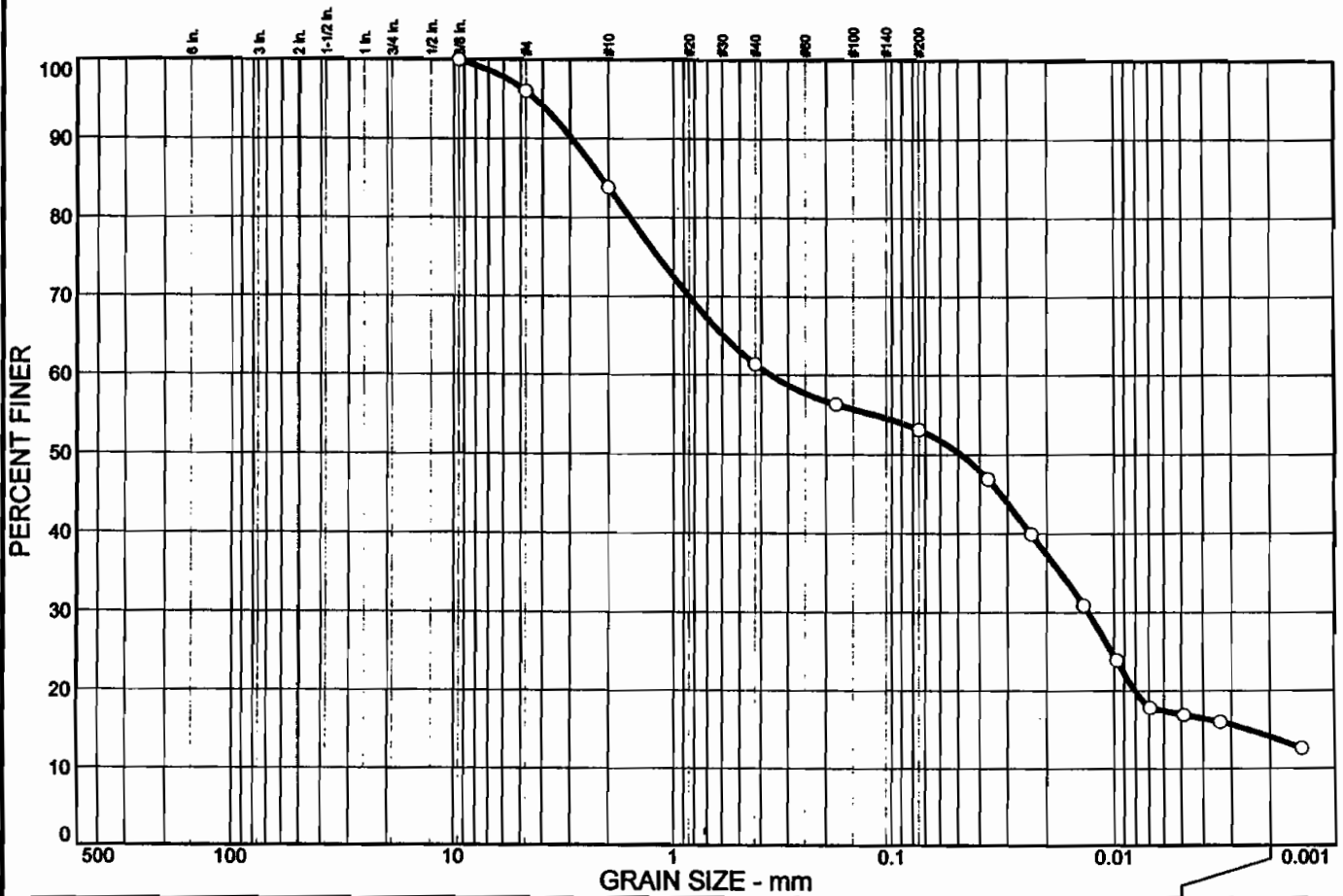
3rd Rock, LLC

Client: Benchmark Environmental Engineering & Science
Project: Peter Cooper Markhams Site

Project No: 01-012

Plate

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	4.0	12.2	22.4	8.3	39.0	14.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	96.0		
#10	83.8		
#40	61.4		
#80	56.3		
#200	53.1		

* (no specification provided)

Soil Description

ID#01-746

Comp 153

0.0483

Sample No.: Loc 85,86,87,88,89,90
Location:

1/14/02

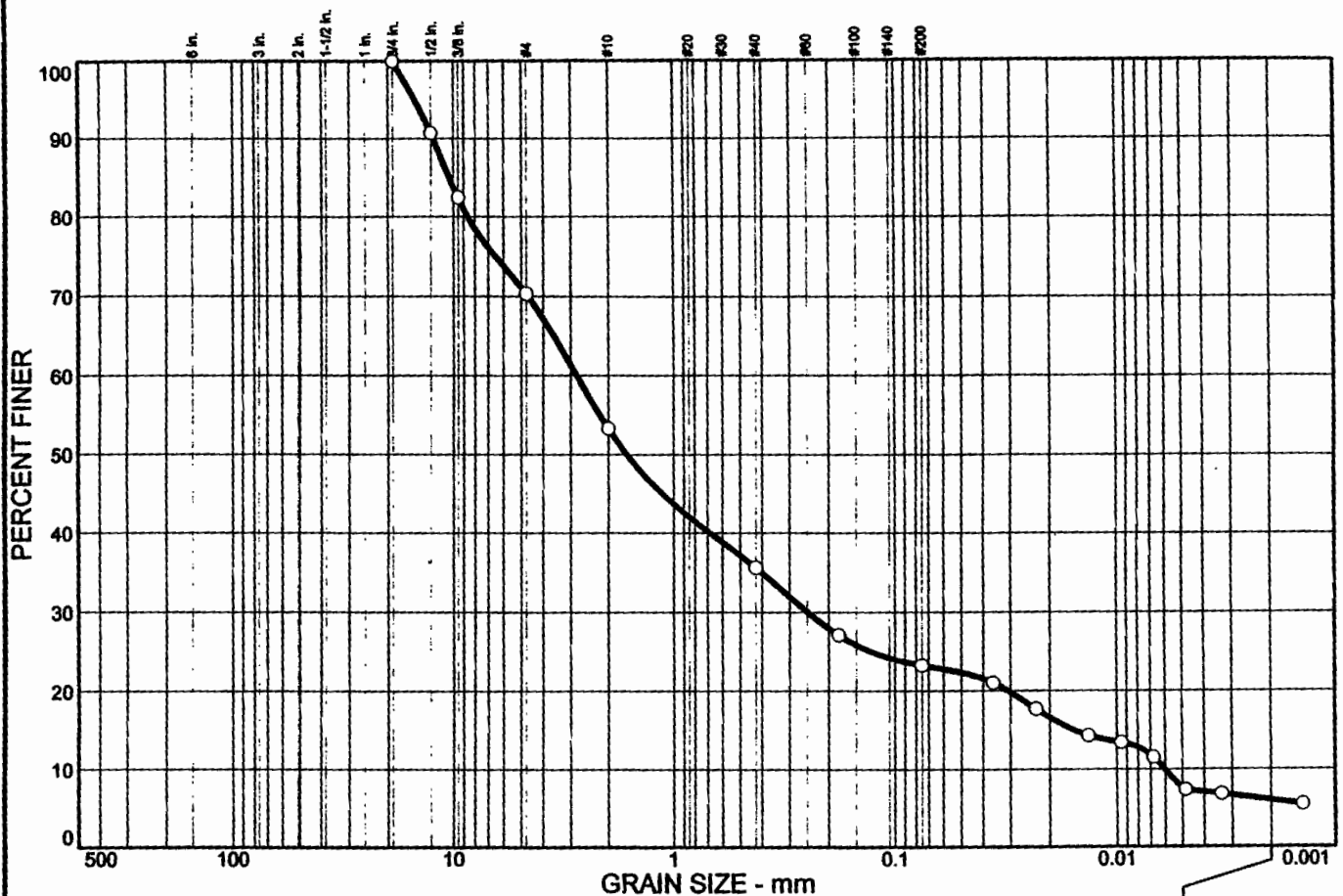
3rd Rock, LLC

Client: Benchmark Environmental Engineering & Science
Project: Peter Cooper Markhams Site

Project No: 01-012

Plate

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	29.7	17.0	17.7	12.4	17.2	6.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	90.7		
.375 in.	82.4		
#4	70.3		
#10	53.3		
#40	35.6		
#80	27.1		
#200	23.2		

* (no specification provided)

Soil Description

ID#01-747

Comp 150

10

Sample No.: Loc 94,86,92
Location:

Source of Sample: Wei

Date: 1/14/02
ev./Depth:

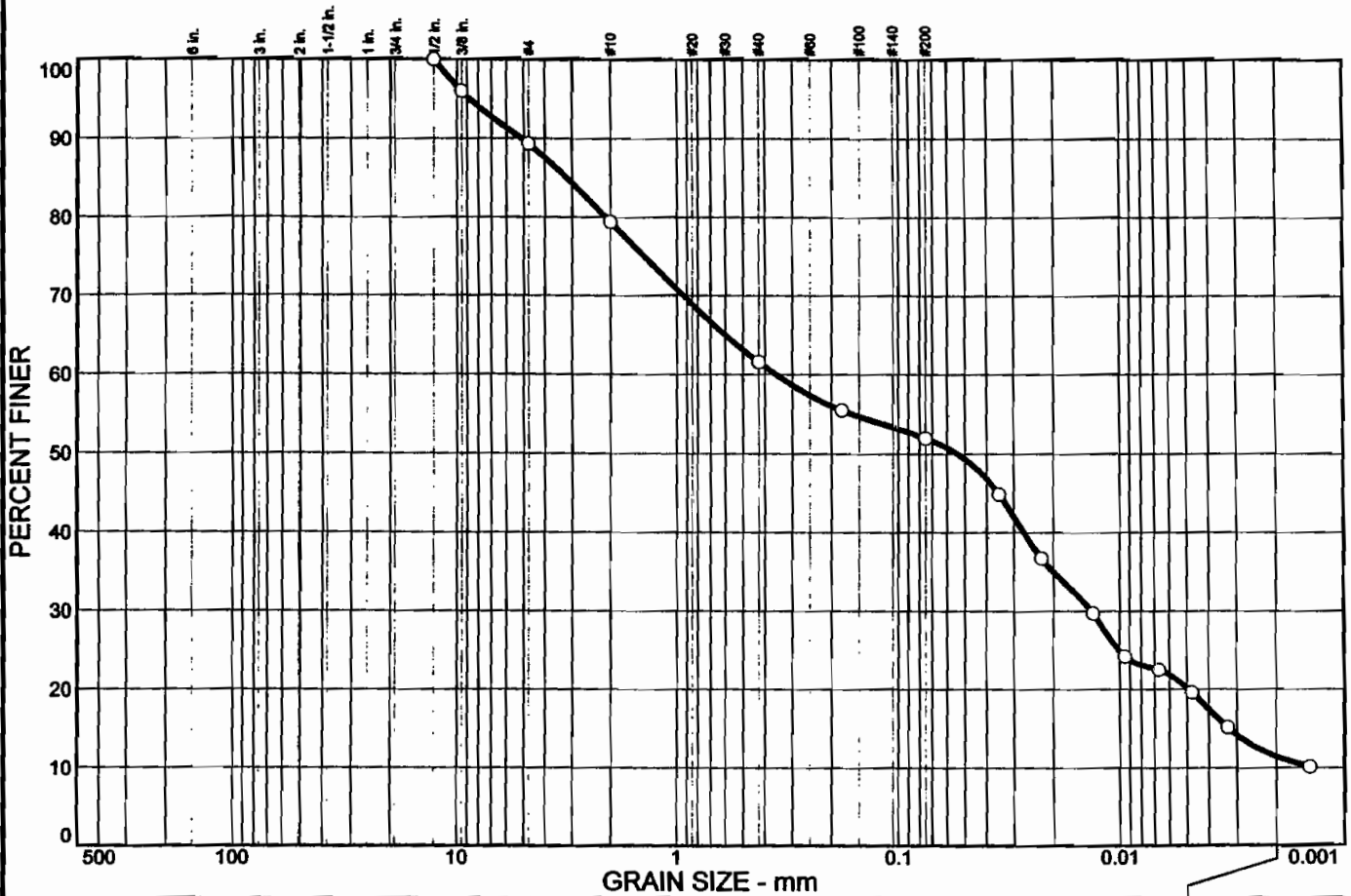
3rd Rock, LLC

Client: Benchmark Environmental Engineering & Science
Project: Peter Cooper Markhams Site

Project No: 01-012

Plate

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	10.7	9.9	17.8	9.6	40.6	11.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.5 in.	100.0		
.375 in.	96.0		
#4	89.3		
#10	79.4		
#40	61.6		
#80	55.5		
#200	52.0		

* (no specification provided)

Soil Description

ID#01-74R

Comp 152

Sample No.:

Source of Sample: We

14/02

Location: Loc 93,84,150,151,152

Elev./Depth:

3rd Rock, LLC

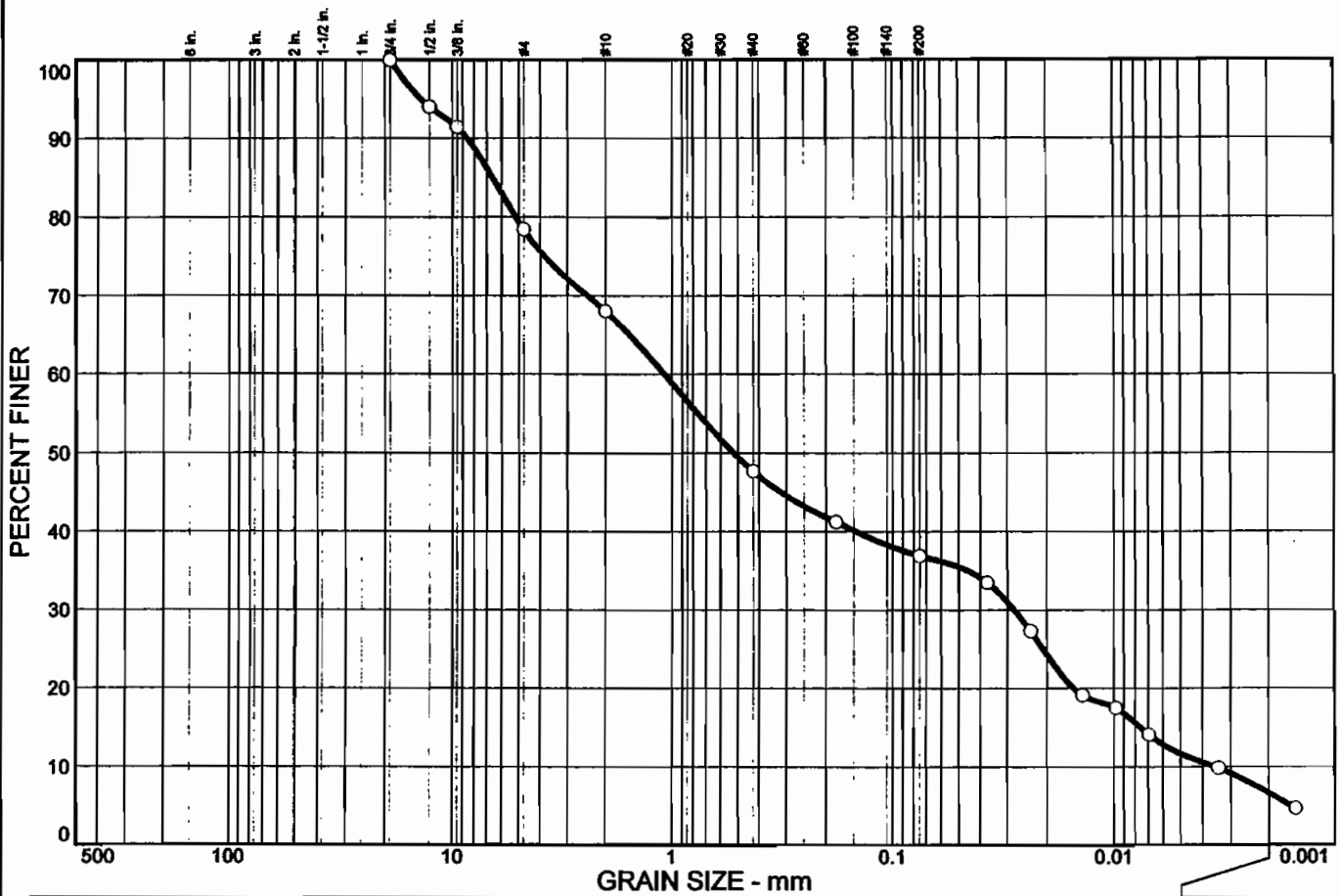
Client: Benchmark Environmental Engineering & Science

Project: Peter Cooper Markhams Site

Project No: 01-012

Plate

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	21.6	10.4	20.3	10.8	30.3	6.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	94.0		
.375 in.	91.4		
#4	78.4		
#10	68.0		
#40	47.7		
#80	41.2		
#200	36.9		

* (no specification provided)

Soil Description		
ID#01-749		
Atterberg Limits		
PL=	LL=	PI=
Coefficients		
D ₈₅ = 6.58	D ₆₀ = 1.08	D ₅₀ = 0.521
D ₃₀ = 0.0279	D ₁₅ = 0.0075	D ₁₀ = 0.0035
C _u = 304.94	C _c = 0.20	
Classification		
USCS=	AASHTO=	
Remarks		
Reddish Brown		

Sample No.: Loc 62,72,111
Location:

Source of Sample: Waste Pile Soil Surf. Perimeter

Date: 1/14/02
Elev./Depth:

3rd Rock, LLC

Client: Benchmark Environmental Engineering & Science
Project: Peter Cooper Markhams Site

Project No: 01-012

Plate

The graph shows the grain size distribution for a soil sample. The y-axis represents the percentage of soil finer than a given grain size, ranging from 0 to 100. The x-axis represents the grain size in millimeters on a logarithmic scale, ranging from 500 mm to 0.001 mm. The curve starts at 100% finer for 4.75 mm and ends at approximately 3% finer for 0.075 mm.

Grain Size (mm)	Percent Finer (%)
4.75	100
3.75	93
2.5	83
1.5	81
1.0	73
0.75	64
0.6	58
0.425	48
0.3	37
0.25	30
0.15	22
0.106	17
0.075	14
0.06	12
0.0425	9
0.03	7
0.025	4
0.015	3

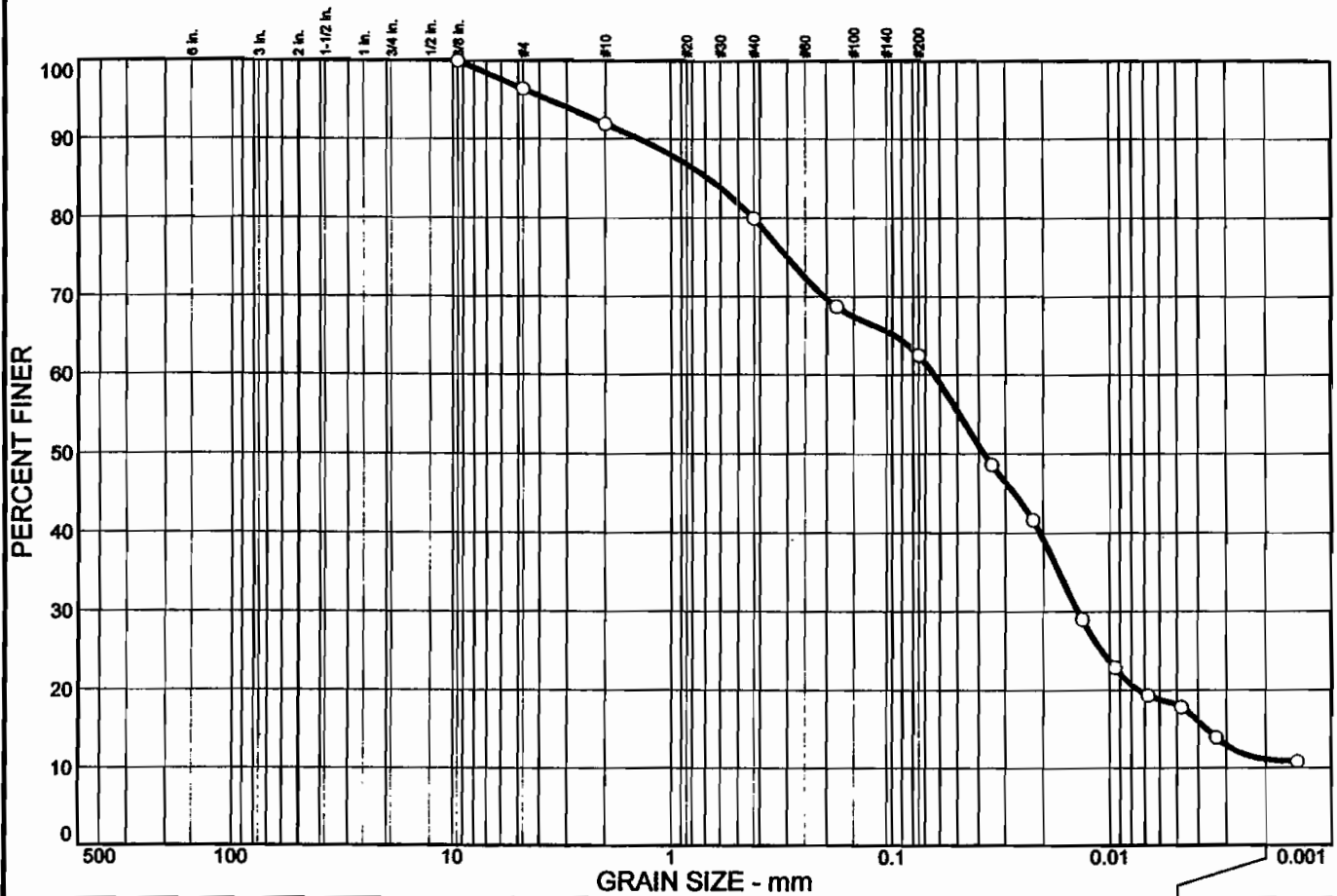
SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1 in.	100.0		
.75 in.	93.0		
.5 in.	82.8		
.375 in.	80.8		
#4	73.7		
#10	64.4		
#40	48.9		
#80	37.1		
#200	28.9		

<u>Soil Description</u>		
ID#01-750		
<u>Atterberg Limits</u>		
PL=	LL=	PI=
<u>Coefficients</u>		
D ₈₅ = 14.2	D ₆₀ = 1.23	D ₅₀ = 0.463
D ₃₀ = 0.0856	D ₁₅ = 0.0145	D ₁₀ = 0.0073
C _u = 168.98	C _c = 0.81	
<u>Classification</u>		
USCS=	AASHTO=	
<u>Remarks</u>		
Dark Brown		

Date: 1/14/02
Elev./Depth:

Plate

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	3.6	4.5	12.0	17.4	51.4	11.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	96.4		
#10	91.9		
#40	79.9		
#80	68.7		
#200	62.5		

* (no specification provided)

Soil Description		
ID#01-751		
PL=	Atterberg Limits LL=	PI=
D ₈₅ = 0.680	Coefficients D ₆₀ = 0.0636	D ₅₀ = 0.0376
D ₃₀ = 0.0138	D ₁₅ = 0.0037	D ₁₀ =
C _u =	C _c =	
USCS=	Classification AASHTO=	
Remarks Very Dk Brown		

Sample No.:
Location: 63,64,65,66,69,71

Source of Sample: Waste Pile Soil Surf. Perimeter

Date: 1/14/02
Elev./Depth:

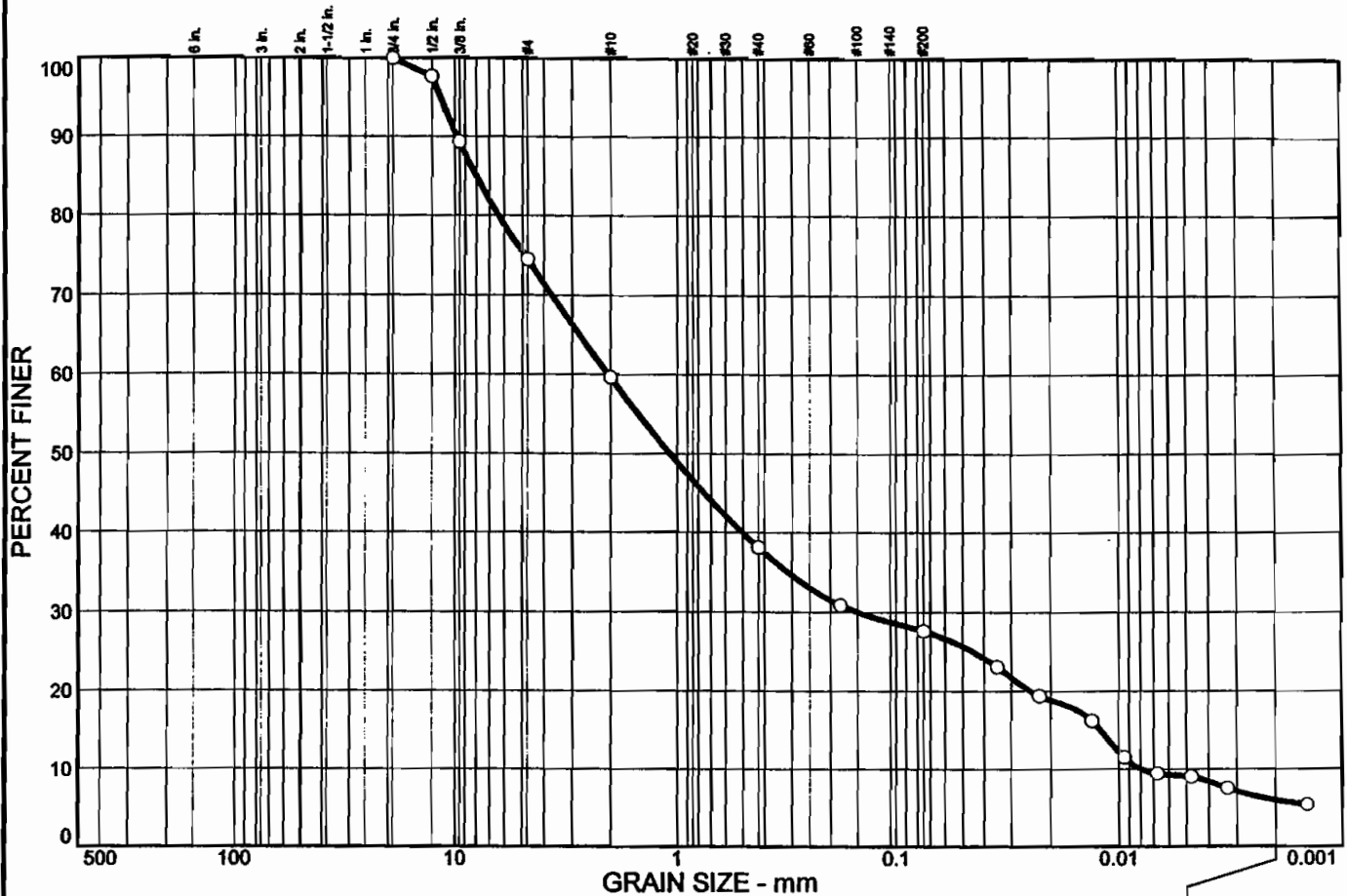
3rd Rock, LLC

Client: Benchmark Environmental Engineering & Science
Project: Peter Cooper Markhams Site

Project No: 01-012

Plate

Particle Size Distribution Report



% + 3"	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
0.0	0.0	25.5	14.9	21.5	10.5	21.6	6.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	97.7		
.375 in.	89.3		
#4	74.5		
#10	59.6		
#40	38.1		
#80	30.9		
#200	27.6		

* (no specification provided)

Soil Description		
ID#01-752		
PL=	Atterberg Limits LL=	PI=
D ₈₅ = 8.02	Coefficients D ₆₀ = 2.05	D ₅₀ = 1.08
D ₃₀ = 0.149	D ₁₅ = 0.0120	D ₁₀ = 0.0079
C _u = 257.92	C _c = 1.37	
USCS=	Classification AASHTO=	
Dark Brown	Remarks	

Sample No.:
Location: 106,104,56,129,126

Source of Sample: Waste Pile Soil Surf. Perimeter

Date: 1/14/02
Elev./Depth:

3rd Rock, LLC

Client: Benchmark Environmental Engineering & Science
Project: Peter Cooper Markhams Site

Project No: 01-012

Plate

The graph shows the grain size distribution for a sample of sand. The y-axis represents the percentage of material finer than a given grain size, ranging from 0 to 100. The x-axis represents the grain size in millimeters, ranging from 500 mm down to 0.001 mm. The curve is a smooth, continuous line connecting data points that show the cumulative percentage of sand finer than each sieve size.

Grain Size (mm)	Percent Finer (%)
4.75	100
2.5	98
1.18	95
0.85	85
0.6	74
0.425	60
0.3	49
0.25	44
0.15	38
0.106	32
0.075	25
0.053	19
0.0425	15
0.03	14
0.025	11
0.015	9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75 in.	100.0		
.5 in.	96.4		
.375 in.	93.6		
#4	84.4		
#10	73.5		
#40	58.8		
#80	48.5		
#200	43.9		

<u>Soil Description</u>	
ID#01-753	
<u>Atterberg Limits</u>	
PL=	LL= PI=
<u>Coefficients</u>	
D ₈₅ = 4.96	D ₆₀ = 0.472
D ₃₀ = 0.0184	D ₁₅ = 0.0070
C _u = 178.24	C _c = 0.27
<u>Classification</u>	
USCS=	AASHTO=
<u>Remarks</u>	
Dk Brown	

Plate

pH Report
Benchmark Environmental Engineering & Science
Peter Cooper Markhams Site

Sample Number	Location	pH* Units
Wetland Sediment	85,86,87,88,89,90,91	4.6
Wetland Sediment	94,86,92	5.1
Wetland Sediment	93,84,150,151,152	5.1

* - Performed using ASTM D4972

3rd Rock, LLC
Hydraulic Conductivity Report Sheet

Project: Peter Cooper Markhams Site
Project No: 01-012

Date of Test: November 30, 2001
Date Sample Received: October 11, 2001

Sample No: ST-2, 01-735
Shelby Tube Sample

Before Test

Wet Density (pcf): 78.2
Moisture Content (%): 67.6
Dry Density (pcf): 46.7

After Test

Wet Density (pcf): 86.3
Moisture Content (%): 84.4
Dry Density (pcf): 46.8

Hydraulic Conductivity Result

Average of Last 4 Readings (cm/s): 2.9×10^{-5}

3rd Rock, LLC
Hydraulic Conductivity Report Sheet

Project: Peter Cooper Markhams Site
Project No: 01-012

Date of Test: December 5, 2001
Date Sample Received: October 11, 2001

Sample No: ST-3, 01-736
Shelby Tube Sample

Before Test

Wet Density (pcf): 82.2
Moisture Content (%): 34.4
Dry Density (pcf): 61.1

After Test

Wet Density (pcf): 88.5
Moisture Content (%): 62.5
Dry Density (pcf): 54.5

Hydraulic Conductivity Result

Average of Last 4 Readings (cm/s): 5.1×10^{-6}

3rd Rock, LLC
Hydraulic Conductivity Report Sheet

Project: Peter Cooper Markhams Site
Project No: 01-012

Date of Test: January 14, 2002
Date Sample Received: October 11, 2001

Sample No: ST-4, 01-737
Shelby Tube Sample

Before Test

Wet Density (pcf): 84.8
Moisture Content (%): 66.5
Dry Density (pcf): 51.0

After Test

Wet Density (pcf): 88.8
Moisture Content (%): 77.1
Dry Density (pcf): 50.2

Hydraulic Conductivity Result

Average of Last 4 Readings (cm/s): 7.8×10^{-5}

APPENDIX D

USEPA Hexavalent Chromium Data Package – Split Sample Results

TAMS

an Earth Tech company

March 22, 2002

Ms. Jennifer Hagen
Geomatrix Consultants, Inc.
338 Harris Hill Road
Williamsville, New York 14221

RE: Hexavalent Chromium Split Sample Analytical Results
Peter Copper Markams Site
Dayton, New York
Job # 6212

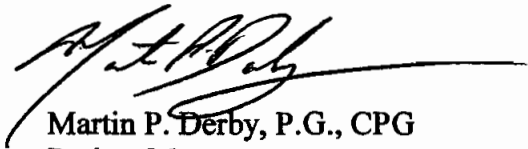
Dear Ms. Hagen:

Ms. Sherrel Henry, the USEPA Remedial Project Manager, has approved the request by Geomatrix to receive copies of the USEPA hexavalent chromium data packages for the Peter Cooper Markhams Landfill project. Attached herein are the requested hexavalent chromium data packages for the split samples collected by TAMS for the USEPA.

Additionally, please find enclosed a telephone conversation log from the original telephone conversation between you (Jennifer Hagen - Geomatrix) and Tamara Hauptfleisch (TAMS). Included with this conversation log is a table summarizing the collected split samples (identifications, matrices, QA/QC) and the analytical results for both the TAMS (EPA) split samples and the Geomatrix samples (split samples only).

If you have further questions regarding the data please contact Scott Kirchner (CDM Federal) at (908)757-9500. If you have any other questions please feel free to contact me or Tamara Hauptfleisch at (716)836-4506.

Very truly yours,
TAMS Consultants, Inc., an Earth Tech company



Martin P. Derby, P.G., CPG
Project Manager
Associate

cc: Sherrel Henry, USEPA
Joe Mayo, CDM Federal (letter only)
Scott Kirchner, CDM Federal

TAMS Consultants, Inc., an Earth Tech company
100 Corporate Parkway, Suite 314, Amherst, NY 14226
(716) 836-4506 Fax (716) 834-8785

Telephone Conversation Log**To:** FILE**From:** Tamara Hauptfleisch**Date:** March 18, 2002**RE:** Hexavalent Chromium Analytical Results at the Peter Cooper Markhams Landfill Site

Date of Phone call: March 18, 2002**Phone call from:** Jennifer Hagen (Geomatrix)**Phone call to:** Tamara Hauptfleisch (TAMS Consultants)*Reviewed by
M. H. O.*

Jennifer Hagen called to inform TAMS that the data validator from Geomatrix may have to reject all hexavalent chromium analytical results (soil, groundwater, and sediment) collected from the Peter Cooper Markhams Landfill Site in Dayton, New York during the Fall 2002 field investigation. The cause for the rejection is poor recoveries and "noisy responses". No further details were provided during the telephone conversation.

Additionally, Geomatrix informed TAMS that the detection limits were "larger" and that during risk assessment calculations this "larger" detection limit would be used where non-detect was reported. Based on this, the calculations could possibly yield higher numbers than actually exist at the site.

Geomatrix inquired about TAMS (EPA) providing the analytical results (data package) for the split samples that were collected and analyzed for hexavalent chromium. In addition, Geomatrix would like the EPA's lab manager to speak with the Geomatrix data validator to compare/discuss Geomatrix results to EPA's.

Attached is a table summarizing EPA split samples that were collected and analyzed for Hexavalent Chromium.



Gascoyne Laboratories, Inc.

Baltimore, MD 21224

(410) 633-1800

FAX NO.
(410) 633-5443

www.gascoyne.com

REPORT OF ANALYSIS

CDM Federal Programs Corporation
107 Corporate Blvd.
South Plainfield, NJ 07080
Attn: Scott Kirchner

Page 1

Report No. 0111097

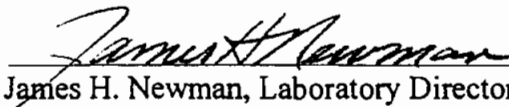
This report of analysis contains test results for samples received at Gascoyne Laboratories, Inc on 11/07/2001 .

This Data Package contains the following:

- This Cover Page
- Sample Summary
- Test Results
- Cooler Receipt Report [Attachment]
- QC Report [Attachment]
- Chain of Custody [Attachment]

This Report of Analysis Contains 4 Pages plus Attachment(s)

Final report reviewed by:


James H. Newman, Laboratory Director

11/28/01
Report issue date

Gascoyne Laboratories, Inc. laboratory accreditations: Maryland 109, Delaware MD015, Virginia 00152, New Jersey 60637, Pennsylvania 68-339, New York 11158, A2LA 410.01, AIHA 100491 and US Army Corps of Engineers.



Gascoyne Laboratories, Inc.

Baltimore, MD 21224

410) 633-1800

FAX NO.
(410) 633-8443

www.gascoyne.com

REPORT OF ANALYSIS

Sample Summary

Page 2

Client: CDM Federal Programs Corporation
Project: Markhams Landfill 6212-501
Report No: 0111097
Date Received: 11/07/2001

Client Sample ID	Lab Sample ID	Collection Date	Collection Time
Rinse Blank; grab	0111097-001	11/06/2001	12:45
MW-2D; grab	0111097-002	11/06/2001	14:30



Gascoyne Laboratories, Inc.

Baltimore, MD 21224

(410) 633-1800

FAX NO.
(410) 633-5443

www.gascoyne.com

REPORT OF ANALYSIS

Test Results

Page 3

Client: CDM Federal Programs Corporation

Client Sample ID: Rinse Blank; grab

Report No: 0111097

Project: Markhams Landfill 6212-501

Lab ID: 0111097-001

Collection Date: 11/06/2001 12:45

Matrix: WATER

Analyses	CAS	Test Results	Reporting Limit	Qualifiers	Units	Date/Time Analyzed
CHROMIUM, HEXAVALENT (CR) (EPA 7196A)						
Prep. Method: <u>NA</u>	Prep. Date: <u>NA</u>		Dilution Factor: 1			Analyst: <u>RED</u> Prep Analyst <u>NA</u>
Chromium, Hexavalent	18540-29-9	< 5.0	5.0	U	µg/L	11/07/2001 10:48



Gascoyne Laboratories, Inc.

Baltimore, MD 21224

(410) 633-1800

FAX NO.
(410) 633-5443

www.gascoyne.com

REPORT OF ANALYSIS

Test Results

Page 4

Client:	CDM Federal Programs Corporation	Client Sample ID:	MW-2D; grab
Report No:	0111097	Lab ID:	0111097-002
Project:	Markhams Landfill 6212-501	Collection Date:	11/06/2001 14:30
Matrix:	GROUNDWATER		

Analyses	CAS	Test Results	Reporting Limit	Qualifiers	Units	Date/Time Analyzed
CHROMIUM, HEXAVALENT (CR) (EPA 7196A)						
Prep. Method: <u>NA</u>		Prep. Date: <u>NA</u>		Dilution Factor: <u>1</u>		Analyst: <u>RED</u> Prep Analyst <u>NA</u>
Chromium, Hexavalent	18540-29-9	< 5.0	5.0	U	µg/L	11/07/2001 10:48

CASE NARRATIVE
GASCOYNE LABORATORIES, INC.

Report Number: 0111097-QC

November 27, 2001

Report To: CDM Federal Programs Corp.
107 Corporate Blvd.
South Plainfield, NJ 07080

Page 1 of 1

Project: Markhams Landfill 6212-501

The samples were collected by the client and were transported to Gascoyne Laboratories via FedEx courier. The courier delivered the samples to Gascoyne personnel in the sample control department for log-in. All sample containers were checked and it was noted that the containers were in satisfactory condition.

The following requested test parameters were performed by Gascoyne Laboratories:

- * Hexavalent Chromium analysis, using EPA Method 7196A

References:

Test Methods for Evaluating Solid Waste, SW-846, Third Edition, USEPA Office of Solid Waste and Emergency Response, Washington, DC November 1986. Also included are Final Update I July 1992, Final Update II September 1994, Update IIA August 1993, and Update IIB January, 1995, Final Update III, December 1996.

All Gascoyne Laboratories, Inc. quality control parameters were met.

NOTES:

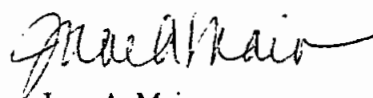
1. Data flags:

The data flag "U" indicates the compound was analyzed for but not detected.

The data flag "B" indicates the compound was detected below the reporting limit but greater than one-half the laboratory reporting limit.

This Quality Control Report contains a 1-page Case Narrative and a total of 007 additional pages. An MDL study is included.

GASCOYNE LABORATORIES, INC.



June A. Main
Quality Assurance Officer

GASCOYNE LABS - QC SUMMARY REPORT

Page 1 of 1

11/27/2001

Report No: 0111097

Company: CDM Federal Programs Corporation

Project: Markhams Landfill 6212-501

	Sample Type	Spike Value	Results	Units	REC (%)	RPD (%)	RPD Limit (%)	Low Limit	High Limit	Sample	
Chromium, Hexavalent	DUP		< 5.0	µg/L		0	20			0111097-002A DUP	R9477
	LCS	100	100.9	µg/L	101			90	114	LCS (0.10 ppm)	R9477
	LCS1	20	20.02	µg/L	100			80	120	Low Chk (0.02 ppm)	R9477
	LCS1	5	5.295	µg/L	106			80	120	MDL1	R9477
	LCS1	5	4.796	µg/L	95.9			80	120	MDL2	R9477
	LCS1	5	5.046	µg/L	101			80	120	MDL3	R9477
	LCS1	5	4.547	µg/L	90.9			80	120	MDL4	R9477
	LCS1	5	4.796	µg/L	95.9			80	120	MDL5	R9477
	LCS1	5	4.796	µg/L	95.9			80	120	MDL6	R9477
	LCS1	5	4.547	µg/L	90.9			80	120	MDL7	R9477
	LCS2	300	301.7	µg/L	101			90	110	High Chk (0.30 ppm)	R9477
	MBLK		< 5.0	µg/L						Method Blank	R9477
	MS	50	50.2	µg/L	100			85	115	0111097-002A MS	R9477
	MSD	50	50.7	µg/L	101	0.989		85	115	0111097-002A MS	R9477

Notes: MBLK: Method Blank
MS: Matrix Spike

PDS: Post Digestion/Distillation Spike
LCS(D): Laboratory Control Sample (Duplicate)

MSD: Matrix Spike Duplicate
RPD: Relative Percent Difference

DUP: Duplicate
REC: Recovery

001

Hexavalent Chromium

SM3500Cr-D and SW846 7196A

Checklist: 50-164
Effective Date: 10/16/00
Page: 1 of 2

Analyst: _____

Date/Time: _____

Calibration Standards:

50ppm Calibration Stock: 01-52083

Expiration Date: 6/2/02

5 ppm Sub-Stock: 01-52329

Expiration Date: 12/17/01

0.5 ppm Sub-Stock: 01-52330

Expiration Date: 12/17/01

Check Standards:

High Check Standard (0.3ppm): 3ml of 5ppm sub-stock to 50ml.

Low Check Standard (0.02ppm): 2ml of 0.5ppm sub-stock to 50ml.

LCS:

50ppm LCS Stock: 01-51524

Expiration Date: 1/17/02

5 ppm LCS Sub-Stock: 01-52331

Expiration Date: 12/17/02

LCS (0.1ppm): 1ml of 5ppm LCS sub-stock to 50ml.

Spike (0.05ppm): 0.5ml of 5ppm sub-stock to 50ml sample.

Reagents:

Sulfuric Acid (102N): 01-52335

Diphenylcarbazide Solution: 01-52260

Spectrophotometer: a) Spectronic Genesis 5 S/N 3V87103008

b) Baush & Lomb 501 S/N 0881075N

Printout #	Sample ID	Dilution			Notes
		ml Sample	ml DI Water	Dilution Factor	
1	Method Blank	50		1	
2	Low Check Standard (0.02 ppm)	50		1	
3	High Check Standard (0.30 ppm)	50		1	
4	LCS (0.10 ppm)	50		1	
5	Det. Lmt. Chk (0.002)				
6	Dup 0111097-0024				
7	Matrix Spike Dup				
8	Matrix Spike Duplicate NLS				
9	NLS				
10	0111097-0024				
11	MDL1				
12	MDL2				
13	MDL3				
14	MDL4				
15	MDL5				
16	MDL6				
17	MDL7				
18	CCV (0.10 ppm)	50		1	
19	CCB	50		1	
20					

Hexavalent Chromium

SM3500Cr-D and SW846 7196A

Checklist: 50-164
Effective Date: 10/16/00
Page: 1 of 2

Printout #	Sample ID	Dilution			Notes
		ml Sample	ml DI Water	Dilution Factor	
21	Dup				
22	Matrix Spike				
23	Matrix Spike Duplicate				
24					
25					
26					
27					
28					
29					
30					
31					
32					
33	CCV (0.1 ppm)	50		1	
34	CCB	50		1	

Tier Review

Tier 1 Analyst: RED

Date: 11/17/01

Tier 2 Analyst: J. J.

Date: 11/17/01

Tier 1 Review:					Tier 2 Review:			
	Yes	No	NA	Notes	Yes	No	NA	Notes
Calibration:								
Was Correlation coefficient >0.995?	☒				☒			
Was curve within expiration date (1 month)?	☒				☒			
Was method blank <0.0025 ppm?	☒				☒			
Were low and high check standards within acceptance limits?	☒				☒			
Analysis:								
Were all chemical/solution # documented?	☒				☒			
Were all chemicals and solutions within expiration dates?	☒				☒			
Were samples analyzed within 24 hours of collection?	☒				☒			
Were all samples within the limits of calibration?	☒				☒			
Was a color correction performed on colored samples?			☒				☒	
Were duplicate analysis performed on 10% of the samples?	☒				☒			
Were RPDs within acceptance limits?	☒				☒			
Were matrix spike/matrix spike duplicates performed on 10% of the samples?	☒				☒			
Were spike recoveries within acceptance limits?	☒				☒			
Was a CCV and CCB analyzed after every 10 samples?	☒				☒			
Was a CCV and CCB analyzed after last sample?	☒				☒			
Were all CCVs and CCBs acceptable?	☒				☒			
Were all samples IDs transcribed correctly?	☒				☒			
Were all absorbencies transcribed correctly?	☒				☒			

```

87 W01 2001 101-1 48
Amplification: 100 W01 2000
Last name:
Wavelength: 633.0
Upper limit: 30000.000
Lower limit: -30000.000

```

RED

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

[illegible][illegible][illegible]

ID: 2.424
 ID: 2.353

INITIAL CALIBRATION WORKSHEET

Input Spec: Wt. Water

Test Code: CR6_GW

Calibration Date: 11/07/2001

Analyst: HED

Prep Date/Time: 11/07/2001 10:40

Analysis Date/Time: 11/07/2001 10:48

Units: mg/L

Analyte: Chromium, Hexavalent

by: SW846 7196A

Measured Response	Actual Concentration	Calculated Value (mg/L)	Recovery (%)
0.000	0.000	0.000	
0.005	0.001	0.001	105.38
0.022	0.005	0.005	105.91
0.042	0.010	0.010	102.85
0.198	0.050	0.049	98.41
0.403	0.100	0.100	100.35
1.212	0.300	0.302	100.73

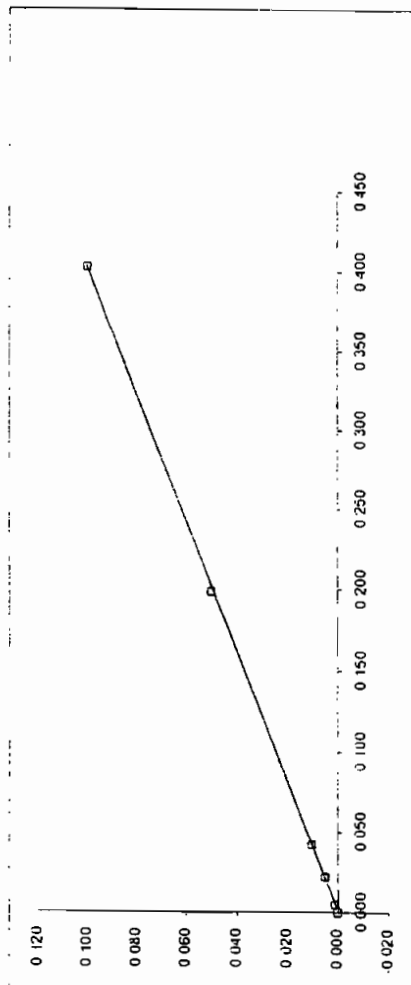
LINEAR EQUATION

$$y = mx + b$$

m^2 0.0007761

b^2 4.0080913

r^2 0.9999401



Omega Batch ID: CR6_W11117-AB

INITIAL ABERRATION WORKSHEET

Initial Calibration Date: 11/07/2001.
 Test Code: CH6_GW
 Prep Date/Time: 11/07/2001
 Analysis Date/Time: 11/07/2001
 Analyst: MEU
 Units: mg/L
 Analyte: Chromium, Hexavalent
 by: SW846 7196A

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Import Spec - WC Water																
Plaintiff #	SampleID	Method Blank	Client ID	SampleType	Response (abs)	DF	PrapDate	AnalyDate	Units	TestCate	Analyte	Spike (ppm)	RawVal	FinalVal	Conc (ppm)	Recovery or RPD
57	1	Method Blank	Method Blank	MBLK	0.000	1	11/07/2001	11/07/2001 10:48	mg/L	CR6_GW	Chromium, Hexavalent		-0.0002	-0.0002	ND	
58	2	Low Clk (0.02 ppm)	Low Clk (0.02 ppm)	LCS1	0.081	1	11/07/2001	11/07/2001 10:48	mg/L	CR6_GW	Chromium, Hexavalent	0.020	0.0200	0.0200	0.0200	100.0%
59	3	High Clk (0.30 ppm)	High Clk (0.30 ppm)	LCS2	1.210	1	11/07/2001	11/07/2001 10:48	mg/L	CR6_GW	Chromium, Hexavalent	0.300	0.3017	0.3017	0.3017	100.57%
60	4	LC-3 (0.10 ppm)	LC-3 (0.10 ppm)	LCS3	0.405	1	11/07/2001	11/07/2001 10:48	mg/L	CR6_GW	Chromium, Hexavalent	0.100	0.1009	0.1009	0.1009	100.85%
61	5	Det Limit Chk(0.002)	Det Limit Chk(0.002)	LCS3	0.008	1	11/07/2001	11/07/2001 10:48	mg/L	CR6_GW	Chromium, Hexavalent	0.002	0.0018	0.0018	ND	90.12%
62	6	0111097-002A		SAMP	0.003	1	11/07/2001	11/07/2001 10:48	mg/L	CR6_GW	Chromium, Hexavalent		0.0006	0.0006	FD	
63	7	0111097-002A DUP	DUP	DUP	0.003	1	11/07/2001	11/07/2001 10:48	mg/L	CR6_GW	Chromium, Hexavalent		0.0006	0.0006	FD	
64	8	U111097-002A MS	MS	MS	0.202	1	11/07/2001	11/07/2001 10:48	mg/L	CR6_GW	Chromium, Hexavalent	0.050	0.0502	0.0502	0.0502	100.41%
65	9	U111097-002A MSU	MSU	MSU	0.404	1	11/07/2001	11/07/2001 10:48	mg/L	CR6_GW	Chromium, Hexavalent	0.050	0.0507	0.0507	0.0507	101.41%
66	10	0111097-001A		SAMP	0.000	1	11/07/2001	11/07/2001 10:48	mg/L	CR6_GW	Chromium, Hexavalent		-0.0002	-0.0002	NA	
67	11	MDL 1		SAMP	0.022	1	11/07/2001	11/07/2001 10:48	mg/L	CR6_GW	Chromium, Hexavalent	0.005	0.0053	0.0053	0.0053	106.00%
68	12	MDL 2		SAMP	0.020	1	11/07/2001	11/07/2001 10:48	mg/L	CR6_GW	Chromium, Hexavalent	0.005	0.0048	0.0048	0.0048	96.00%
69	13	MDL 3		SAMP	0.021	1	11/07/2001	11/07/2001 10:48	mg/L	CR6_GW	Chromium, Hexavalent	0.005	0.0050	0.0050	0.0050	100.00%
70	14	MDL 4		SAMP	0.019	1	11/07/2001	11/07/2001 10:48	mg/L	CR6_GW	Chromium, Hexavalent	0.005	0.0045	0.0045	0.0045	90.00%
71	15	MDL 5		SAMP	0.020	1	11/07/2001	11/07/2001 10:48	mg/L	CR6_GW	Chromium, Hexavalent	0.005	0.0048	0.0048	0.0048	96.00%
72	16	MDL 6		SAMP	0.020	1	11/07/2001	11/07/2001 10:48	mg/L	CR6_GW	Chromium, Hexavalent	0.005	0.0048	0.0048	0.0048	96.00%
73	17	MDL 7		SAMP	0.019	1	11/07/2001	11/07/2001 10:48	mg/L	CR6_GW	Chromium, Hexavalent	0.005	0.0045	0.0045	0.0045	90.00%
74	18	CCV #1 (0.10 ppm)	CCV (0.10 ppm)	CCV	0.404	1	11/07/2001	11/07/2001 10:48	mg/L	CR6_GW	Chromium, Hexavalent	0.100	0.1008	0.1008	0.1008	100.80%
75	19	CCB #1	CCB	CCB	0.000	1	11/07/2001	11/07/2001 10:48	mg/L	CR6_GW	Chromium, Hexavalent		-0.0002	-0.0002	ND	

Inorganics Section MDL Study

Analyst: Richard Davis
Date: 11/07/2001
Analyte: Hexachrome
Matrix: Groundwater
Method: SW846 7196
SOP #: WC-039-00

MDL

Trial #:	1	2	3	4	5	6	7	True Value (ppm)	Average	% Recovery (90-110%)	Standard Deviation	% RSD (<10%)	MDL (ppm)	DL (ppm)
Date:	11/07/2001	11/07/2001	11/07/2001	11/07/2001	11/07/2001	11/07/2001	11/07/2001	0.005	0.00483	96.638	0.000267	5.520	0.00084	0.005
Result:	0.00529525	0.00479626	0.00504576	0.00454677	0.0047963	0.0047963	0.0045468							

Approval: _____

Date: _____



Gascoyne Laboratories, Inc.

Baltimore, MD 21224

(410) 633-1800

FAX NO.
(410) 633-5443

www.gascoyne.com

REPORT OF ANALYSIS

CDM Federal Programs Corporation
107 Corporate Blvd.
South Plainfield, NJ 07080
Attn: Scott Kirchner

Page 1

Report No. 0111138

This report of analysis contains test results for samples received at Gascoyne Laboratories, Inc on 11/8/01 .

This Data Package contains the following:

- This Cover Page
- Sample Summary
- Test Results
- Cooler Receipt Report [Attachment]
- QC Report [Attachment]
- Chain of Custody [Attachment]

This Report of Analysis Contains 4 Pages plus Attachment(s)

Final report reviewed by: James H. Newman
James H. Newman, Laboratory Director

12/5/01
Report issue date



Gascoyne Laboratories, Inc.

Baltimore, MD 21224

(410) 633- 5443

FAX NO
(410) 633-5443

www.gascoyne.com

REPORT OF ANALYSIS

Sample Summary

Page 2

Client: CDM Federal Programs Corporation
Project: Markhams Landfill 5212-501
Report No: 0111138
Date Received: 11/8/01

Client Sample ID	Lab Sample ID	Collection Date	Collection Time
MW-1S; grab	0111138-001	11/7/01	13:15
MW-1S MS/MSD; grab	0111138-002	11/7/01	13:15



Gascoyne Laboratories, Inc.

Baltimore MD 21224

4101 633-1800

FAX NO
4101 633-5443

www.gascoyne.com

REPORT OF ANALYSIS

Test Results

Page 3

Client:	CDM Federal Programs Corporation	Client Sample ID:	MW-1S; grab
Report No:	0111138	Lab ID:	0111138-001
Project:	Markhams Landfill 5212-501	Collection Date:	11/7/01 13:15
Matrix:	GROUNDWATER		

Analyses	Test Results	Reporting Limit	Qualifiers	Units	Date/Time Analyzed
CHROMIUM, HEXAVALENT (CR) (EPA 7196A)					
Prep. Method: <u>NA</u>	Prep. Date: <u>NA</u>			Prep Analyst <u>NA</u>	Analyst: RED
<i>note: Sample received past maximum recommended holding time.</i>					
Chromium, Hexavalent	< 250	250	U	µg/L	11/9/01 7:44

Qualifiers:

Organic Analysis

- B - Detected in method blank at greater than 1/2 reporting limit
- D - Analyzed at a higher dilution factor
- J - Detected below reporting limit (RL) but greater than 1/2 RL
- U - Analyzed for but not detected

Metals/Inorganic Analysis

- B - Detected below reporting limit (RL) but greater than 1/2 RL
- U - Analyzed for but not detected



Gascoyne Laboratories, Inc.

Baltimore, MD 21224

(410) 633-1800

FAX NO.
(410) 633-5443

www.gascoyne.com

REPORT OF ANALYSIS

Test Results

Page 4

Client: CDM Federal Programs Corporation

Client Sample ID: MW-1S MS/MSD; grab

Report No: 0111138

Project: Markhams Landfill 5212-501

Lab ID: 0111138-002

Collection Date: 11/7/01 13:15

Matrix: GROUNDWATER

Analyses	Test Results	Reporting Limit	Qualifiers	Units	Date/Time Analyzed
CHROMIUM, HEXAVALENT (CR) (EPA 7196A)					
Prep. Method: <u>NA</u>	Prep. Date: <u>NA</u>			Prep Analyst <u>NA</u>	Analyst: RED
note: Sample spiked with 2500 ug/L.					
Chromium, Hexavalent	2,300	250		µg/L	11/9/01 7:44

Qualifiers:

Organic Analysis

- B - Detected in method blank at greater than 1/2 reporting limit
- D - Analyzed at a higher dilution factor
- J - Detected below reporting limit (RL) but greater than 1/2 RL
- U - Analyzed for but not detected

Metals/Inorganic Analysis

- B - Detected below reporting limit (RL) but greater than 1/2 RL
- U - Analyzed for but not detected

CASE NARRATIVE
GASCOYNE LABORATORIES, INC.

Report Number: 0111138-QC

November 30, 2001

Report To: CDM Federal Programs Corp.
107 Corporate Blvd.
South Plainfield, NJ 07080

Page 1 of 1

Project: Markhams Landfill 5212-501

A sample and a sample identified for matrix spiking were collected by the client and were transported to Gascoyne Laboratories via FedEx courier. The courier delivered the samples to Gascoyne personnel in the sample control department for log-in. All sample containers were checked and it was noted that the containers were in satisfactory condition with the following exception:

1. The samples were received past holding time. The client was notified and the laboratory was instructed to analyze the samples and footnote the results on the Report of Analysis.

The following requested test parameters were performed by Gascoyne Laboratories:

- * Hexavalent Chromium analysis, using EPA Method 7196A

References:

Test Methods for Evaluating Solid Waste, SW-846, Third Edition, USEPA Office of Solid Waste and Emergency Response, Washington, DC November 1986. Also included are Final Update I July 1992, Final Update II September 1994, Update IIA August 1993, and Update IIB January, 1995, Final Update III, December 1996.

All Gascoyne Laboratories, Inc. quality control parameters were met.

The sample and the matrix spiked sample were initially analyzed, each in duplicate, without dilution. There was only a trace recovery of the matrix spike due to suspected matrix interferences. The sample and the matrix spiked sample were then analyzed, each in duplicate, at ten-fold and twenty-five-fold dilutions. With each successive dilution the response (absorbance) of the spiked samples improved, however the samples required analysis at a fifty-fold dilution to successfully recover the matrix spikes. The reporting limit has been elevated accordingly, to reflect the dilution factor employed.

The concentration reported for sample 0111138-002 (matrix spike sample) is the actual concentration of the sample spiked with 2500 ug/l hexavalent chromium. The result is footnoted with the spike concentration added. The recoveries of the matrix spike/spike duplicate are shown on the QC summary report page.

NOTES:

1. Data flags:

The data flag "U" indicates the compound was analyzed for but not detected.

The data flag "B" indicates the compound was detected below the reporting limit but greater than one-half the laboratory reporting limit.

This Quality Control Report contains a 1-page Case Narrative and a total of 006 additional pages.

GASCOYNE LABORATORIES, INC.



June A. Main
Quality Assurance Officer
Gascoyne Laboratories, Inc.

GASCOYNE LABS - QC SUMMARY REPORT

Page 1 of 1

11/30/01

Report No: 0111138

Company: CDM Federal Programs Corporatio

Project: Markhams Landfill 5212-501

	Sample Type	Spike Value	Results	Units	REC (%)	RPD (%)	RPD Limit (%)	Low Limit	High Limit	Sample	
Chromium, Hexavalent	DUP		< 250	µg/L		0	20			0111138-001A DUP	R9504
	LCS	0.1	0.1046	mg/L	105			90	114	LCS (0.10 ppm)	R9504
	LCS	0.002	0.002052	mg/L	103			90	114	Low Check (0.002 p	R9504
	LCS1	0.02	0.02076	mg/L	104			80	120	Low Chk (0.02 ppm	R9504
	LCS2	0.3	0.3062	mg/L	102			90	110	High Chk (0.30 ppm	R9504
	MBLK		< 0.0050	mg/L						Method Blank	R9504
	MS	2500	2323	µg/L	92.9			85	115	0111138-002A MS	R9504
	MSD	2500	2311	µg/L	92.4	0.538		85	115	0111138-002A MS	R9504

Notes: MBLK: Method Blank
MS: Matrix Spike

PDS: Post Digestion/Distillation Spike
LCS(D): Laboratory Control Sample (Duplicate)

MSD: Matrix Spike Duplicat
RPD: Relative Percent Difference

DUP: Duplicate
REC: Recovery

 11/30/01

001

Hexavalent Chromium

SM3500Cr-D and SW846 7196A

Checklist: 50-164
Effective Date: 10/16/00
Page: 1 of 2

Analyst: RED

Date/Time: 11/9/01

Calibration Standards:

50ppm Calibration Stock: 01-52083

Expiration Date: 4/2/02

5 ppm Sub-Stock: 01-52329

Expiration Date: 12/12/01

0.5 ppm Sub-Stock: 01-52330

Expiration Date: 12/12/01

Check Standards:

High Check Standard (0.3ppm): 3ml of 5ppm sub-stock to 50ml.

Low Check Standard (0.02ppm): 2ml of 0.5ppm sub-stock to 50ml.

LCS:

50ppm LCS Stock: 01-51524

Expiration Date: 1/17/02

5 ppm LCS Sub-Stock: 01-52331

Expiration Date: 12/17/02

LCS (0.1ppm): 1ml of 5ppm LCS sub-stock to 50ml.

Spike (0.05ppm): 0.5ml of 5ppm sub-stock to 50ml sample.

Reagents:

Sulfuric Acid (102N): 01-52335

Diphenylcarbazide Solution: 01-52260

Spectrophotometer: a) Spectronic Genesis 5 S/N 3V87103008

b) Baush & Lomb 501 S/N 0881075N

Printout #	Sample ID	Dilution			Notes
		ml Sample	ml DI Water	Dilution Factor	
1	Method Blank	50		1	
2	Low Check Standard (0.02 ppm)	50		1	
3	High Check Standard (0.30 ppm)	50		1	
4	LCS (0.10 ppm)	50		1	
5	01-52331-1A	1	49	50	Diluted check to matrix in duplicate
6	Dup				
7	Matrix Spike 01-52331-1A				
8	Matrix Spike Duplicate				
9					
10					
11					
12					
13					
14					
15					
16					
17					
18	CCV (0.10 ppm)	50		1	
19	CCB	50		1	
20					

Hexavalent Chromium

SM3500Cr-D and SW846 7196A

Checklist: 50-164
Effective Date: 10/16/00
Page: 1 of 2

Printout #	Sample ID	Dilution			Notes
		ml Sample	ml DI Water	Dilution Factor	
21	Dup				
22	Matrix Spike				
23	Matrix Spike Duplicate				
24					
25					
26					
27					
28					
29					
30					
31					
32					
33	CCV (0.1 ppm)	50		1	
34	CCB	50		1	

Tier Review

Tier 1 Analyst: RET

Date: 11/9/01

Tier 2 Analyst: JAS

Date: 11/9/01

Tier 1 Review:					Tier 2 Review:				
	Yes	No	NA	Notes		Yes	No	NA	Notes
Calibration:									
Was Correlation coefficient >0.995?	/					/			
Was curve within expiration date (1 month)?	/					/			
Was method blank <0.0025 ppm?	/					/			
Were low and high check standards within acceptance limits?	/					/			
Analysis:									
Were all chemical/solution # documented?	/					/			
Were all chemicals and solutions within expiration dates?	/					/			
Were samples analyzed within 24 hours of collection?	/			Ret out of H.T.		/			
Were all samples within the limits of calibration?	/					/			
Was a color correction performed on colored samples?	/					/			
Were duplicate analysis performed on 10% of the samples?	/					/			
Were RPDs within acceptance limits?	/					/			
Were matrix spike/matrix spike duplicates performed on 10% of the samples?	/					/			
Were spike recoveries within acceptance limits?	/					/			
Was a CCV and CCB analyzed after every 10 samples?	/					/			
Was a CCV and CCB analyzed after last sample?	/					/			
Were all CCVs and CCBs acceptable?	/					/			
Were all samples IDs transcribed correctly?	/					/			
Were all absorbencies transcribed correctly?	/					/			

Hexachrome
GW

20 NOV 2021 27:44:04
Application: ABS/%T/CMC
Test name:
Wavelength: 540.0
High limit: 99999.000
Low limit: -99999.000

HA

ID: 1 0.000 A
ID: 1 0.004 A
ID: 1 1.228 A
ID: 1 0.421 A
ID: 1 0.009 A

ID: 1 0.002 A
ID: 1 0.002 A
ID: 1 0.006 A
ID: 1 0.006 A
ID: 1 0.006 A
ID: 1 0.006 A
ID: 1 0.100 A
ID: 1 0.100 A
ID: 1 0.100 A
ID: 1 -0.000 A
ID: 1 -0.000 A
ID: 1 0.107 A
ID: 1 0.020 A
ID: 1 0.000 A
ID: 1 0.107 A
ID: 1 0.100 A

} 54
} X10
} X25
} X50

ID: 1 0.421 A
ID: 1 0.000 A

INITIAL CALIBRATION WORKSHEET

Initial Calibration Date: 11/02/2001
 Analyst: LLL
 Test Code: CR6_GW
 Prep Date/Time: 11/09/2001
 Analysis Date/Time: 11/09/2001
 Units: mg/L

Analyte: Chromium, Hexavalent
 by: W846 7196A

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Support Spec - WC Water																
Printout	SampleID	Client ID	SampleType	Response (abs)	DF	PrepDate	AnalDate	Units	TestCode	Analyte	Spike (ppm)	RawVal	FinalVal	Conc. (ppm)	Recovery or RPD	
57	1 Method Blank	Method Blank	MBLK	0.000	1	11/09/2001	11/09/2001 7:44	mg/L	CR6_GW	Chromium, Hexavalent		-0.0002	-0.0002	ND		
58	2 Low Chk (0.02 ppm)	Low Chk (0.02 ppm)	LCS1	0.084	1	11/09/2001	11/09/2001 7:44	mg/L	CR6_GW	Chromium, Hexavalent	0.020	0.0208	0.0208	0.0208	103.32%	
59	3 High Chk (0.30 ppm)	High Chk (0.30 ppm)	LCS2	1.228	1	11/09/2001	11/09/2001 7:44	mg/L	CR6_GW	Chromium, Hexavalent	0.300	0.3062	0.3062	0.3062	102.06%	
60	4 LCS (0.10 ppm)	LCS (0.10 ppm)	LCS	0.420	1	11/09/2001	11/09/2001 7:44	mg/L	CR6_GW	Chromium, Hexavalent	0.100	0.1046	0.1046	0.1046	104.59%	
61	5 Det Limit Chk(0.002)	Det Limit Chk(0.002)	LCS3	0.009	1	11/09/2001	11/09/2001 7:44	mg/L	CR6_GW	Chromium, Hexavalent	0.002	0.0021	0.0021	ND	102.59%	
62	6 0111135-001A	DUJ	SAMP	0.000	50	11/09/2001	11/09/2001 7:44	mg/L	CR6_GW	Chromium, Hexavalent		-0.0002	-0.0097	ND		
63	7 0111135-001A	DUJ	DUJ	0.000	50	11/09/2001	11/09/2001 7:44	mg/L	CR6_GW	Chromium, Hexavalent		-0.0002	-0.0097	ND	0.00%	
64	8 0111135-002A MS	MS	MS	0.187	50	11/09/2001	11/09/2001 7:44	mg/L	CR6_GW	Chromium, Hexavalent	2.500	0.0485	2.3231	2.3231	92.92%	
65	9 0111135-002A MSD	MSD	MSD	0.186	50	11/09/2001	11/09/2001 7:44	mg/L	CR6_GW	Chromium, Hexavalent	2.500	0.0462	2.3106	2.3106	92.42%	
66	10 CV #1 (0.10 ppm)	CV #1 (0.10 ppm)	CCV	0.421	1	11/09/2001	11/09/2001 7:44	mg/L	CR6_GW	Chromium, Hexavalent	0.100	0.1048	0.1048	0.1048	104.84%	
67	11 CV #1	CCB	CCB	0.000	1	11/09/2001	11/09/2001 7:44	mg/L	CR6_GW	Chromium, Hexavalent		-0.0002	-0.0002	ND		

006



Gascoyne Laboratories, Inc.

Baltimore, MD 21224

(410) 633-1800

FAX NO.
(410) 633-5443

www.gascoyne.com

REPORT OF ANALYSIS

CDM Federal Programs Corporation
107 Corporate Blvd.
South Plainfield, NJ 07080
Attn: Scott Kirchner

Page 1

Report No. 0112019

This report of analysis contains test results for samples received at Gascoyne Laboratories, Inc on 12/04/2001 .

This Data Package contains the following:

- This Cover Page
- Sample Summary
- Test Results
- Case Narrative [Attachment]
- QC Report [Attachment]
- Chain of Custody [Attachment]

This Report of Analysis Contains 4 Pages plus Attachment(s)

Final report reviewed by: James H. Newman
James H. Newman, Laboratory Director

12/26/01
Report issue date

Gascoyne Laboratories, Inc. laboratory accreditations: Maryland 109, Delaware MD015, Virginia 00152, New Jersey 60637, Pennsylvania 68-339, New York 11158, A2LA 410.01, AIHA 100491 and US Army Corps of Engineers.



Gascoyne Laboratories, Inc.

Baltimore, MD 21224

(410) 633-1300

FAX NO
(410) 633-5443

www.gascoyne.com

REPORT OF ANALYSIS

Sample Summary

Page 2

Client: CDM Federal Programs Corporation
Project: 6212-501 Markhams Landfill
Report No: 0112019
Date Received: 12/04/2001

Client Sample ID	Lab Sample ID	Collection Date	Collection Time
SW Location-1; grab	0112019-001	12/03/2001	11:45
SW Location-1 MS/ MSD; grab	0112019-002	12/03/2001	11:45

NOTE: This was
SW location-3 (not 1)



Gascoyne Laboratories, Inc.

Baltimore, MD 21224

(410) 633-1801

FAX NO
(410) 633-5443

www.gascoyne.com

REPORT OF ANALYSIS

Test Results

Page 3

Client:	CDM Federal Programs Corporation	Client Sample ID:	SW Location-1; grab
Report No:	0112019	Lab ID:	0112019-001
Project:	6212-501 Markhams Landfill	Collection Date:	12/03/2001 11:45
Matrix:	SURFACE WATER		

Analyses	CAS	Test Results	Reporting Limit	Qualifiers	Units	Date/Time Analyzed
CHROMIUM, HEXAVALENT (CR) (SM 3500 CR D)						
Prep. Method: <u>NA</u>	Prep. Date: <u>NA</u>		Dilution Factor: 1			Analyst: <u>RED</u> Prep Analyst <u>NA</u>
Chromium, Hexavalent	18540-29-9	< 5.0	5.0	U	µg/L	12/04/2001 10:34

NOTE:

This was
SW Location -3
(not 1)



Gascoyne Laboratories, Inc.

Baltimore, MD 21224

TEL: 633-1800

FAX: NC
(410) 633-5443

www.gascoyne.com

REPORT OF ANALYSIS

Test Results

Page 4

Client:	CDM Federal Programs Corporation	Client Sample ID:	SW Location-1 MS/ MSD; grab
Report No:	0112019	Lab ID:	0112019-002
Project:	6212-501 Markhams Landfill	Collection Date:	12/03/2001 11:45
Matrix:	SURFACE WATER		

Analyses	CAS	Test Results	Reporting Limit	Qualifiers	Units	Date/Time Analyzed
CHROMIUM, HEXAVALENT (CR) (SM 3500 CR D)						
Prep. Method: <u>NA</u>	Prep. Date: <u>NA</u>		Dilution Factor: 1			Analyst: <u>RED</u> Prep Analyst: <u>NA</u>
note: Sample spiked with 50ug/L hexavalent chromium.						
Chromium, Hexavalent	18540-29-9	43	5.0		µg/L	12/04/2001 10:34
Chromium, Hexavalent	18540-29-9	43	5.0		µg/L	12/04/2001 10:34

NOTE:

This was SW
location-3 (not 1)

CASE NARRATIVE
GASCOYNE LABORATORIES, INC.

Report Number: 0112019-QC

December 21, 2001

Report To: CDM Federal Programs Corp.
107 Corporate Blvd.
South Plainfield, NJ 07080

Page 1 of 1

Project: Markhams Landfill 6212-501

The samples were collected by the client and were transported to Gascoyne Laboratories via FedEx courier. The courier delivered the samples to Gascoyne personnel in the sample control department for log-in. All sample containers were checked and it was noted that the containers were in satisfactory condition.

The following requested test parameters were performed by Gascoyne Laboratories:

- * Hexavalent Chromium analysis, using Standard Methods method SM 3500 Cr D

References:

Standard Methods for the Examination of Water and Wastewater, L.S. Clesceri, et. al, editors, American Public Health Assoc., American Water Works Assoc., Water Pollution Control Federation, 18th Edition, 1992.

All Gascoyne Laboratories, Inc. quality control parameters were met.

The concentrations reported for sample 0112019-002 (matrix spike sample) are the actual concentrations of the sample spiked (in duplicate) with 50 ug/l hexavalent chromium. The results are footnoted with the spike concentration added. The recoveries of the matrix spike/spike duplicate are shown on the QC summary report page.

NOTES:

1. Data flags:

The data flag "U" indicates the compound was analyzed for but not detected.

This Quality Control Report contains a 1-page Case Narrative and a total of 007 additional pages. An MDL study is included.

GASCOYNE LABORATORIES, INC.



June A. Main
Quality Assurance Officer

GASCOYNE LABS - QC SUMMARY REPORT

Page 1 of 1

12/21/01

Report No: 0112019

Company: CDM Federal Programs Corporatio

Project: 6212-501 Markhams Landfill

	Sample Type	Spike Value	Results	Units	REC (%)	RPD (%)	RPD Limit (%)	Low Limit	High Limit	Sample	
Chromium, Hexavalent	DUP		< 5.0	µg/L		0	20			0112019-001A DUP	R10151
	LCS	100	102.7	µg/L	103			90	114	LCS (0.10 ppm)	R10151
	LCS	100	102.7	µg/L	103			90	114	LCS1	R10151
	LCS	100	102.7	µg/L	103			90	114	LCS2	R10151
	LCS	100	103	µg/L	103			90	114	LCS4	R10151
	LCS	100	103.2	µg/L	103			90	114	LCS3	R10151
	LCS1	5	5.02	µg/L	100			80	120	MDL2	R10151
	LCS1	5	5.02	µg/L	100			80	120	MDL1	R10151
	LCS1	5	4.78	µg/L	95.6			80	120	MDL3	R10151
	LCS1	5	5.02	µg/L	100			80	120	MDL4	R10151
	LCS1	20	20.59	µg/L	103			80	120	Low Chk (0.02 ppm)	R10151
	LCS1	5	5.02	µg/L	100			80	120	MDL5	R10151
	LCS1	5	4.541	µg/L	90.8			80	120	MDL6	R10151
	LCS1	5	4.78	µg/L	95.6			80	120	MDL7	R10151
	LCS2	300	298.4	µg/L	99.5			90	110	High Chk (0.30 ppm)	R10151
	MBLK		< 5.0	µg/L						Method Blank	R10151
	MS	50	43.1	µg/L	86.2			85	115	0112019-001A MS	R10151
	MSD	50	42.86	µg/L	85.7	0.557		85	115	0112019-001A MS	R10151

001

Notes: MBLK: Method Blank

MS: Matrix Spike

PDS: Post Digestion/Distillation Spike

LCS(D): Laboratory Control Sample (Duplicate)

MSD: Matrix Spike Duplicate

RPD: Relative Percent Difference

DUP: Duplicate

REC: Recovery

Hexavalent Chromium

SM3500Cr-D and SW846 7196A

Checklist: 50-154
Effective Date: 10/15/00
Page: 1 of 2

Analyst: RED

Date/Time: 12/14/01

Calibration Standards:

50ppm Calibration Stock: 01-52083

Expiration Date: 4/2/02

5 ppm Sub-Stock: 01-52329

Expiration Date: 12/14/01

0.5 ppm Sub-Stock: 01-52330

Expiration Date: 12/14/01

Check Standards:

High Check Standard (0.3ppm): 3ml of 5ppm sub-stock to 50ml.

Low Check Standard (0.02ppm): 2ml of 0.5ppm sub-stock to 50ml.

LCS:

50ppm LCS Stock: 01-51524

Expiration Date: 1/7/02

5 ppm LCS Sub-Stock: 01-52331

Expiration Date: 12/14/01

LCS (0.1ppm): 1ml of 5ppm LCS sub-stock to 50ml.

Spike (0.05ppm): 0.5ml of 5ppm sub-stock to 50ml sample.

Reagents:

Sulfuric Acid (0.2 N): 01-52333

Diphenylcarbazide Solution: 01-52506

Spectrophotometer: a) Spectronic Genesis 5 S/N 3V87103008

b) Baush & Lomb 501 S/N 0881075N

Printout #	Sample ID	Dilution			Notes
		ml Sample	ml DI Water	Dilution Factor	
1	Method Blank	50		1	
2	Low Check Standard (0.02 ppm)	50		1	
3	High Check Standard (0.30 ppm)	50		1	
4	LCS (0.10 ppm)	50		1	
5	(0.052 ppm)				
6	Dup 01/20/01 - 001A				
7	RED Matrix Spike Dup				
8	Matrix Spike Duplicate Matrix Spk				
9	Matrix Spk Dup.				
10	01/20/01 - 002A				
11	01/20/01 - 001B				
12					
13					
14					
15					
16					
17					
18	CCV (0.10 ppm)	50		1	
19	CCB	50		1	
20	LCS				

Checklist: 50-164
Effective Date: 10/16/00
Page: 1 of 2

Printout #	Sample ID	Dilution		Notes
		ml Sample	ml DI Water	
21	Dup- LGS-2			
22	Matrix Spike - LGS3			
23	Matrix Spike Duplicate- LGS-4			
24	MDC-1			
25	MDC-2			
26	MDC-3			
27	MDC-4.			
28	MDC-5			
29	MDC-6			
30	MDC-7			
31				
32				
33	CCV (0.1 ppm)	50		1
34	CCB	50		1

Tier Review

Tier I Analyst: _____

Date: _____

Tier 2 Analyst: [Signature]

Date: 1/11/21

Tier 1 Review:					Tier 2 Review:			
	Yes	No	NA	Notes	Yes	No	NA	Notes
Calibration:								
Was Correlation coefficient >0.995?								
Was curve within expiration date (1month)?								
Was method blank <0.0025 ppm?								
Were low and high check standards within acceptance limits?								
Analysis:								
Were all chemical/solution # documented?								
Were all chemicals and solutions within expiration dates?								
Were samples analyzed within 24 hours of collection?								
Were all samples within the limits of calibration?								
Was a color correction performed on colored samples?								
Were duplicate analysis performed on 10% of the samples?								
Were RPDs within acceptance limits?								
Were matrix spike/matrix spike duplicates performed on 10% of the samples?								
Were spike recoveries within acceptance limits?								
Was a CCV and CCB analyzed after every 10 samples?								
Was a CCV and CCB analyzed after last sample?								
Were all CCVs and CCBs acceptable?								
Were all samples IDs transcribed correctly?								
Were all absorbencies transcribed correctly?								

27

$\left\{ \begin{array}{l} 10 \\ 9 \\ 8 \\ 7 \\ 6 \\ 5 \\ 4 \\ 3 \\ 2 \\ 1 \end{array} \right\}$ 1000

INITIAL CALIBRATION WORKSHEET

Initial Calibration Date: 12/2/01	Input Spec: WC, Water	Test Code: CR6, WW
Analyst: RET	Prep Date/Time: NA	Analyst's Date/Time: 12/4/01 10:34
Analyte: Chromium Hexavalent	Units: mg/L	
by SM3500C-D		

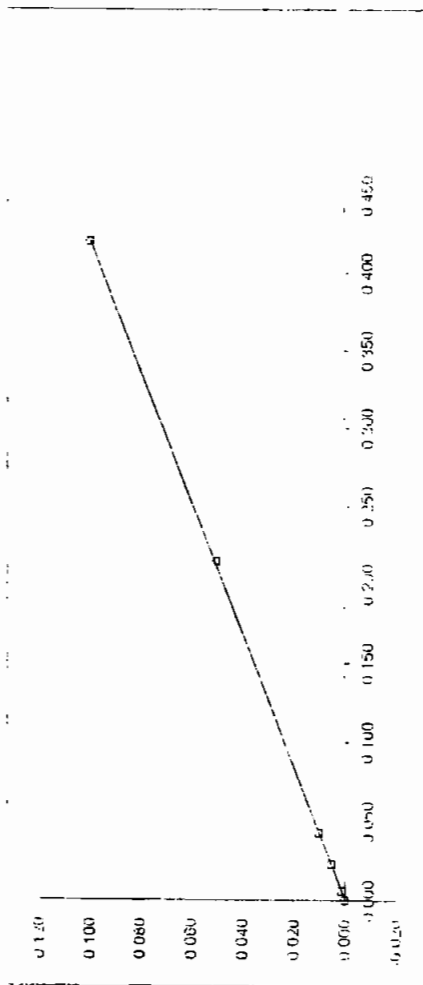
0.000	0.000	0.000	94.83
0.008	0.001	0.001	100.40
0.023	0.005	0.005	98.10
0.043	0.010	0.010	101.53
0.214	0.050	0.051	100.10
0.420	0.100	0.100	99.95
1.254	0.300	0.300	

Omega Batch ID: 64-36-0112-046

LINEAR EQUATION

$$y = ax + b$$

a = 0.0020406
b = 4.1753560
r = 0.9999937



INITIAL CALIBRATION WORKSHEET

Initial Calibration Date: 1/10/01	Test Code: CR6_WW
Analyst: RLJ	Prep Date/Time: N/A
Analyte: Chromium Hexavalent	Analysis Date/Time: 12/01 10:34
by SM3500Cr-D	Units: mg/L

Import Spec. - WetChem_Water																															
Printout		SampleID		Client ID		SampleType		Response (abs)		DF		PrepDate		AnalDate		Units		TestCode		Analyte		Spike (ppm)		RawVal		FinalVal		Conc. (ppm)		Recovery at RPD	
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q															
57	1	Method Blank	Method Blank	Low Ck (0.02 ppm)	MBLK		1	NA	12/4/01 10:34	mg/L	CR6_WW	Chromium, Hexavalent		-0.0007	-0.0007282	ND															
58	2	Low Ck (0.02 ppm)	Low Ck (0.02 ppm)	High Ck (0.30 ppm)	LC51		1	NA	12/4/01 10:34	mg/L	CR6_WW	Chromium, Hexavalent	0.020	0.0206	0.0205873	0.0206	102.94%														
59	3	High Ck (0.30 ppm)	High Ck (0.30 ppm)		LC52		1	NA	12/4/01 10:34	mg/L	CR6_WW	Chromium, Hexavalent	0.300	0.2984	0.2984079	0.2984	99.47%														
60	4	LC5 (0.10 ppm)	LC5 (0.10 ppm)		LC5		1	NA	12/4/01 10:34	mg/L	CR6_WW	Chromium, Hexavalent	0.100	0.1027	0.1027360	0.1027	102.74%														
61	5	Det Lmt Ck (0.002)	Det Lmt Ck (0.002)		LC53		1	NA	12/4/01 10:34	mg/L	CR6_WW	Chromium, Hexavalent	0.002	0.0021	0.0021458	ND	107.29%														
62	6	0112019-001A			SAMP		1	NA	12/4/01 10:34	mg/L	CR6_WW	Chromium, Hexavalent		-0.0002	0.0002492	ND															
63	7	0112019-001A DUP	DUP		DUP		1	NA	12/4/01 10:34	mg/L	CR6_WW	Chromium, Hexavalent		-0.0005	-0.0004887	ND	0.00%														
64	8	0112019-001A MS	MS		MS		1	NA	12/4/01 10:34	mg/L	CR6_WW	Chromium, Hexavalent	0.050	0.0431	0.0431004	0.0431	86.20%														
65	9	0112019-001A MSD	MSD		MSD		1	NA	12/4/01 10:34	mg/L	CR6_WW	Chromium, Hexavalent	0.050	0.0429	0.0428609	0.0429	85.72%														
66	10	0112021-002A			SAMP		1	NA	12/4/01 10:34	mg/L	CR6_WW	Chromium, Hexavalent		0.0002	0.0002298	ND															
67	11	0112029-001C			SAMP		1	NA	12/4/01 10:34	mg/L	CR6_WW	Chromium, Hexavalent		0.0012	0.0011878	ND															
68	12	CCV #110 (0.10 ppm)	CCV		CCV		1	NA	12/4/01 10:34	mg/L	CR6_WW	Chromium, Hexavalent	0.100	0.1032	0.1032150	0.1032	101.22%														
69	13	CCB #1	CCB		CCB		1	NA	12/4/01 10:34	mg/L	CR6_WW	Chromium, Hexavalent		-0.0005	-0.0004867	ND															
70	14	LC51			SAMP		1	NA	12/4/01 10:34	mg/L	CR6_WW	Chromium, Hexavalent	0.100	0.1027	0.1027360	0.1027	102.74%														
71	15	LC52			SAMP		1	NA	12/4/01 10:34	mg/L	CR6_WW	Chromium, Hexavalent	0.100	0.1027	0.1027360	0.1027	102.74%														
72	16	LC53			SAMP		1	NA	12/4/01 10:34	mg/L	CR6_WW	Chromium, Hexavalent	0.100	0.1032	0.1032150	0.1032	103.22%														
73	17	LC54			SAMP		1	NA	12/4/01 10:34	mg/L	CR6_WW	Chromium, Hexavalent	0.100	0.1030	0.1029755	0.1030	102.98%														
74	18	MDL1			SAMP		1	NA	12/4/01 10:34	mg/L	CR6_WW	Chromium, Hexavalent	0.005	0.0050	0.0050198	0.0050	100.40%														
75	19	MDL2			SAMP		1	NA	12/4/01 10:34	mg/L	CR6_WW	Chromium, Hexavalent	0.005	0.0050	0.0050198	0.0050	100.40%														
76	20	MDL3			SAMP		1	NA	12/4/01 10:34	mg/L	CR6_WW	Chromium, Hexavalent	0.005	0.0048	0.0047803	0.0048	95.81%														
77	21	MDL4			SAMP		1	NA	12/4/01 10:34	mg/L	CR6_WW	Chromium, Hexavalent	0.005	0.0050	0.0050198	0.0050	100.40%														
78	22	MDL5			SAMP		1	NA	12/4/01 10:34	mg/L	CR6_WW	Chromium, Hexavalent	0.005	0.0050	0.0050198	0.0050	100.40%														
79	23	MDL6			SAMP		1	NA	12/4/01 10:34	mg/L	CR6_WW	Chromium, Hexavalent	0.005	0.0045	0.0045108	0.0045	90.82%														
80	24	MDL7			SAMP		1	NA	12/4/01 10:34	mg/L	CR6_WW	Chromium, Hexavalent	0.005	0.0048	0.0047803	0.0048	95.61%														

Inorganics Section MDL Study

Analyst: Richard Davis
Date: 12/4/01
Analyte: Hexachrome
Matrix: Wastewater
Method: SM1500-Cr D
SOP #: WC-039-00

MDL

Trial #:	1	2	3	4	5	6	7	True Value (ppm)	Average	% Recovery (90-110%)	Standard Deviation	% RSD (<10%)	MDL (ppm)	DL (ppm)
Date:	12/4/01	12/4/01	12/4/01	12/4/01	12/4/01	12/4/01	12/4/01	0.005	0.0048829	97.659	0.000	3.859	0.000592	0.005
Result:	0.0050198	0.0050198	0.0047803	0.0050198	0.0050198	0.0045408	0.0047803							

Approval: _____

Date: _____

APPENDIX E

Boring Logs and Well Completion Details

D'BRIEN & GERE ENGINEERS, INC.		TEST BORING LOG File Name: PC0088.BL		Report of Boring No. B-15 Sheet 1 of 1 <i>MW-15</i>	
Project Location: Marikams, NY		Type: SPLIT SPOON Hammer: 140 lbs. Fall: 30"		Ground Water Depth 1303.85 Date 12/17/86 Depth 1304.28 Date 4/15/87	
Client: Peter Cooper Corporations		SAMPLER		File No. 1171-005-130	
Boring Co.: Parratt-Wolfe Foreman: Mark Beck DBO Geologist: Peter Bogardus			Boring Location: Near Wooded Area Ground Elevation: 1309.50' Dates: Started:08/27/86 Ended:08/27/86		

Depth	Sample				Sample Description	Stratum Change Depth	Equipment Installed	Field Testing			Remarks
	"N" Value	Penetrm/ Recovery	Depth	Blows /6"				Sal. O/00	So. Cond.	HNU	
0											
5											
10											
15											
20											
25											
30											
35											
40											
45											
50											
55											

NOT SAMPLED
(SEE 1D)

- 5' of screen installed from 14.4' to 9.4'
- 7' of packed sand installed from 14.4' to 6'
- 2' of bentonite pellets installed from 6' to 4'
- 4' of bentonite grout cement installed from 4' to surface
- 4" protective lockable casing

O'DRIS & GERE ENGINEERS, INC.		TEST BORING LOG File Name: PC007B.BL		Report of Boring No. B-1D Sheet 1 of 1	
Project Location: Markham, NY		Type: SPLIT SPOON Sampler Hammer: 140 lbs. Fall: 30"		Ground Water Depth 1303.63 Date 12/17/86 Depth 1303.87 Date 4/13/87	
Client: Peter Cooper Corporations		File No. 1171-005-130			
Boring Co.: Parratt-Wolfe Foreman: Mark Beck Geologist: Peter Bogardus			Boring Location: Near Wooded Area Ground Elevation: 1309.5' Dates: Started: 08/27/86		
			Ended: 08/27/86		

Depth	Sample				Sample Description	Stratum Change Depth	Equipment Installed	Field Testing			R
	"N" Value	Penetration/Recovery	Depth	Blows /6"				Sal. 0/00	Sp. Cond.	HMU	
0	4	10	0-2	3-2 2-2	Moist brown silt, some fine to coarse sand (fill)						0
	10	10	2-4	2-5 3-4	Black moist animal sludge, few cinders (fill)						0
	5	10	4-6	2-2 3-4	Wet black gravel, some fine to coarse sand						0
	8	15	6-8	3-4 4-4							0
10	8	15	10-11.5	2-3 5	Wet black gravel, some fine to coarse sand little silt						0
15	29	15	15-16.5	13-12 17	Wet orange-red silt little fine sand	14'					0
					Wet grey silt	15'					0
20	27	15	20-21.5	11-12 15	Wet grey fine sand little silt	18'					0
25	66	15	25-26.5	18-29 37	Same as above						0
30	52	15	30-31.5	18-25 27	Same as above						0
35	10	NR	35-36.5	5-5 5	Same as above						0
40					Bottom of Hole @ 36.5 ft.						
45											
50											
55											
60											
65											

JP
 6' screen installed from 29.15' to 24.15'
 7' of sand pack installed from 30' to 22'

LOCATION	510' North and 450' East of B-1

[illegible]

CLASSIFICATION ASTM D-2488
METHOD OF INVESTIGATION ASTM D1452-80
D1586-74

D'BRIEN & GERE ENGINEERS, INC.				TEST BORING LOG File Name: PC009B.BL				Report of Boring No. B-20 Sheet 1 of 1			
Project Location: Markham, NY				Type: SPLIT SPOON Hammer: 140 lbs. Fall: 30"				Ground Water Depth 1307.32 Date 12/17/85 Depth 1307.53 Date 4/15/87			
Client: Peter Cooper Corporations								File No. 1171-005-130			
Boring Co.: Parrett-Wolfe Foreman: Mark Beck DBS Geologist: Peter Bogardus						Boring Location: Near Access Road Ground Elevation: 1318.90' Dates: Started: 08/26/85					
						Ended: 08/26/85					
Depth	Sample				Sample Description	Stratum Change Depth	Equipment Installed	Field Testing			
	"N" Value	Penetrn/ Recovery	Depth	Blows /6"				Sal. 0/00	So. Cond.	HMU	
0	21	6"	0-2	11-10 11-7	Dry brown fine to medium sand, some silt, little coarse sand to fine gravel.					0	
	7	12"	2-4	5-3 4-4	Moist grey silty and fine to medium sand, trace of clay	2'					
5	10	12"	4-6	4-4 6-5		4'				0	
					Wet silt and fine to coarse sand, little gravel					0	
10	12	18"	10-11.5	5-5 7	Brown fine to coarse gravel, fine to coarse sand	8'				0	
					Grey fine sand, trace of silt	10'					
15	41	18"	15-16.5	15-17 24	Grey fine sand, little silt					0	
20	40	18"	20-21.5	17-17 23	Grey silt and fine sand					0	
25	49	18"	25-26.5	15-21 28	Grey silt and fine sand					.2	
30	45		30-31.5	14-18 22						0	
					Clay lenses: on spoon						
35	26		35-36.5	10-12 14	Wet grey fine sand					0	
					Bottom of Hole @ 36.5 ft.						
40											
45											
50											
55											

5' of screen installed from 29.07' to 24.07'

8' of sand pack installed from 29.0' to 21.0'

2' of bentonite pellets installed from 21' to 29'

10' of bentonite mud cement installed from 21' to surface

PROJECT: Peter Cooper Markhams R.I. Dayton, New York		Log of Well No. MW-3S(R)	
BORING LOCATION: See Site Plan for MW locations		TOP OF RISER ELEVATION: 1315.27 fmsl	DATUM: NAD 83
DRILLING CONTRACTOR: Nothnagle Drilling, Inc.		DATE STARTED: 10/5/01	DATE FINISHED: 10/5/01
DRILLING METHOD: 4 1/4" dia. Hollow Stem Augers		TOTAL DEPTH: 14.0 fbgs	SCREEN INTERVAL: 9-14 fbgs
DRILLING EQUIPMENT: CME 750 ATV		DEPTH TO WATER: 9 ft	COMPL. CASING: 2" dia. PVC
SAMPLING METHOD: 2" dia. S.S. Split Spoons		LOGGED BY: MAC	
HAMMER WEIGHT: Autohammer	DROP: NA	RESPONSIBLE PROFESSIONAL: Richard H. Frappa	REG. NO.

DEPTH (feet)	SAMPLES				OVM (ppm)	DESCRIPTION NAME (USCS Symbol); color, moist, % by weight, plast., structure, cementation, react. w/HCl, geo. inter.	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
	Sample No.	Sample	Blows/foot				
						Surface Elevation: 1312.05 fmsl	2.5' stickup (approx.)
1	1		19	0		POORLY GRADED SAND with SILT very fine sand (80%) with silt, 10YR 3/2, trace low plasticity fines, trace fine rounded gravel, loose to soft, damp (OUTWASH UNIT) A.A., with 10-20% fine subrounded gravel	schedule 40 PVC riser cement/bentonite grout to surface 3/8" dia. bentonite pellet seal #00N filter sand 0.010" slot schedule 40 PVC well screen
2							
3	2		25	0			
4							
5	3		7	0			
6							
7	4		8	0			
8							
9	5		5	0			
10							
11	6		3	0			
12							
13	7		4	0			
14						End of boring at 14.0 fbgs.	
15							
16							
17							
18							
19							
20							

O'BRIEN & GERE ENGINEERS, INC.					TEST BORING LOG File Name: PC0108.BL		Report of Boring No. B-3D Sheet 1 of 1 mw-3D			
Project Location: Markhams, NY					SAMPLER		Ground Water Depth 1308.07 Date 12/17/86			
Client: Peter Cooper Corporations					Type: SPLIT SPOON Hammer: 140 lbs. Fall: 30"		Depth 1308.71 Date 4/15/87			
Boring Co.: Parratt-Wolfe Foreman: Mark Beck OBG Geologist: Peter Bogardus					Boring Location: Upgradient, Northeast of Site Ground Elevation: 1312.20' Dates: Started: 08/25/86		File No. 1171-005-130			
Depth	Sample				Sample Description	Stratum Change Depth	Equipment Installed	Field Testing		
	"N" Value	Penetrn/ Recovery	Depth	Blows /6"				Sal. 0/00	So. Cond.	HNU SE
0	10	0-12"	0-2	7-5	Black moist cinders some silt					.1
	22	12"	2-4	5-5 7-12 10-9	Brown-red moist silt and fine sand some gravel	1' 5.5'				.2
5	8	6"	4-6	4-4 4-4	Wet fine to coarse sand, trace of silt					.2
10	1	2	10-11.5	1-1 1	Wet fine to coarse sand some silt, stone in shale.					.2
					Orange-red fine sand					
15	47	15	15-16.5	16-21 26	Grey wet fine sand					
20	48	15	20-21.5	19-23 25	Grey wet silt, some fine sand					.2
25	41	15	25-27	16-19 22	Grey wet fine sand and silt					2
30	48	15	30-31.5	14-24 24	Same as above					0
						32'				
35	18	15	35-36.5	4-6 13	Grey moist silt, some clay					0
40	19	15	40-41.5	10-9 10	Grey fine sand					0
45	20	15	45-46	10-12 10	Grey fine sand					0
					Bottom of Hole @ 46 ft.					
50										
55										

5' screen installed from 29.55' to 24.55'
 7' of packed sand installed from 39.55' to 22.55'
 2' of bentonite pellets installed 22.55'
 22' of bentonite grout cement installed from 22' to surface
 4" protective lockable cover installed

Borehole allowed to collapse to 30 ft.

MW-45

DATE STARTED <u>5/29/84</u>	RECRA RESEARCH, INC. SUBSURFACE LOG	HOLE NO. <u>B-4</u>
DATE FINISHED <u>5/29/84</u>		SURFACE ELEV. <u>1307.90</u>
SHEET <u>1</u> OF <u>1</u>		G.W. DEPTH <u>1302.99</u>
		<u>6/20/84</u>

PROJECT	Peter Cooper Markhams	LOCATION	150' West of Railroad
	2EM84001.5000		80' North of B-1

[illegible]

CLASSIFICATION ASTM D-2488

METHOD OF INVESTIGATION ASTM D1452-80

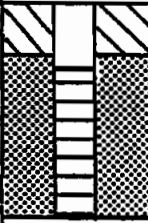
D1586-74

O'BRIEN & GERE ENGINEERS, INC.		TEST BORING LOG File Name: PC011B.BL		Report of Boring No. B-4D Sheet 1 of 1	
Project Location: Markhams, NY		SAMPLER		Ground Water Depth 1306.04 Date 12/17/86	
Client: Peter Cooper Corporations		Type: SPLIT SPOON Hammer: 140 lbs. Fall: 30"		Depth 1305.34 Date 4/15/87	
				File No. 1171-005-130	
Boring Co.: Parratt-Wolfe Foreman: Mark Beck DDO Geologist: Peter Bogardus			Boring Location: Eastern area of site, backroad Ground Elevations: 1312.90' Dates: Started: 08/25/86		
			Ended: 08/25/86		

Depth	Sample				Sample Description	Stratum Change Depth	Equipment Installed	Field Testing			R
	"N" Value	Penetrn/ Recovery	Depth	Blows /6"				Sal. 0/00	So. Cond.	HNU	
0	1	12"	0-2	2-3	Brown moist silty sand, root hairs, piece of wood						0
	6			3-3							
	7	12"	2-4	2-2	Orange-red silt, some fine to medium sand, trace of gravel, rock fragments						0
5	11	12"	4-6	5-5							0
		12"	6-8	5-4							0
	5		8-10	6-4	Wet black fine to medium sand, some fine gravel						0
10				2-3							0
				2-2							0
15	21	12"	15-16.5	8-8	Grey wet fine sand	13'					0
				13	Grey wet fine sand, trace of silt	15'					0
						18'					0
20	44	15	20-21.5	11-18	Grey wet fine to medium sand	21'					0
				26							0
25	37	15	25-26.5	12-18	Grey wet fine sand, trace of silt						0
				19							0
30	34	15	30-31.5	10-10	Grey fine sand and silt, trace of clay xxxx						0
				24							0
35	31	15	35-36	18-17	Grey fine sand and silt						0
				24							0
					Bottom of Hole @ 36.5 ft.						0
40											0
45											0
50											0
55											0

5' screen installed from 30.08' to 25.08'
 8' of packed sand installed from 30.08' to 22.08'
 2' of bentonite pellets installed from 22.08' to 20'
 20' of bentonite grout cement installed from 20' to surface
 4" protective lockable cover installed

O'BRIEN & GERE ENGINEERS, INC.		TEST BORING LOG File Name: PC013B.BL		Report of Boring No. B-5 Sheet 1 of 1 <i>mw-5-</i>	
Project Location: Markham, NY		SAMPLER		Ground Water Depth 1299.43 Date 12/17/86	
Client: Peter Cooper Corporations		Type: SPLIT SPOON Hammer: 140 lbs. Fall: 30"		Depth Date	
				File No. 1171-005-130	
Boring Co.: Parratt-Wolfe Foreman: Mark Beck OBG Geologist: Peter Bogardus			Boring Location: Southwest Area: Wooded Area Ground Elevation: 1300.50' Dates: Started: 08/28/86		
			Ended: 08/28/86		

Depth	Sample				Sample Description	Stratum Change Depth	Equipment Installed	Field Testing			Remarks
	"N" Value	Penetrn/ Recovery	Depth	Blows /6"				Sal. 0/00	So. Cond.	HMU	
0											
5											
10											
15											
20											
25					NOT SAMPLED (SEE 50)						
30											
35											
40											
45											
50											
55											

5' screen installed from 7.85' to 2.85'
 5.85' of packed sand installed from 7.85' to 2'
 2' of bentonite pellets installed from 2' to surface
 4" protective lockable cover installed

O'BRIEN & GERE ENGINEERS, INC.		TEST BORING LOG File Name: PC012B.BL		Report of Boring No. B-5D Sheet 1 of 1 <i>mw-51</i>	
Project Location: Markhams, NY		SAMPLER		Ground Water Depth 1302.42 Date 12/17/86	
Client: Peter Cooper Corporations		Type: SPLIT SPOON Hammer: 140 lbs. Fall: 30"		Depth 1302.59 Date 4/15/87	
				File No. 1171-005-130	

Boring Co.: Parratt-Wolfe Foreman: Mark Beck DBG Geologist: Peter Bogardus		Boring Location: Southwest Area: Wooded Area Ground Elevation: 1300.4' Dates: Started: 08/28/86		Ended: 08/28/86

Depth	Sample				Sample Description	Stratum Change Depth	Equipment Installed	Field Testing		
	"N" Value	Penetrn/ Recovery	Depth	Blows /6"				Sal. 0/00	So. Cond.	HNH
0	11	12	0-2	2-5 6-5	Moist grey silt, some fine sand, little medium to coarse sand, trace of gravel					0
	5	12	2-4	3-2 3-5						0
5	13	12	5-6.5	5-6 7	Wet fine to coarse sand, some fine to coarse gravel, brown silt	4'				0
						8'				0
10	22	12	10-10.5	6-10 12	Wet grey silt, trace of silt					0
15	14	12	15-16.5	5-6 8	Wet grey fine sand, some silt, trace of clay					0
20	28	12	20-21.5	8-9 19	Wet gray silt, with clay seams >1"					0
25	15	12	25-26.5	6-7 8	Wet grey fine sand, trace of silt					0
30	18	12	30-31.5	6-8 10	Wet grey fine sand, trace of silt					0
35					Bottom of Hole @ 31.5 ft.					
40										
45										
50										
55										

DD 5' of screen installed from 24' to 19'
 7' of packed sand installed from 24' to 17'
 2' of bentonite pellets installed from 17' to 15'
 16' of bentonite grout cement installed from 15' to surface
 4" protective lockable cover installed

O'BRIEN & GERE ENGINEERS, INC.						TEST BORING LOG		Report of Boring No.: MH-6D, 6S				
Project Location: Markhams, NY						SAMPLER Type: Split-Spoon Hammer: 140 lbs.		Ground Water Depth Depth File No.: 1171.005		Date Date		
Client: Peter Cooper Corporation						Fall: 30 inches						
Boring Co.: Buffalo Drilling Foreman: Keith Scott DBS Geologist: Peter Bogardus						Boring Location: South East Corner of Site Ground Elevation: Dates: Started: 6/1/88		Ended: 6/6/88				
Depth	Sample					Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing			R m k s*
	No	Depth in ft.	Blows /5"	Penetr/ Recovery	"N" Value				pH	Sp Cond	HNU	
0	1	0-2	3-2-3-4	12	5	Rusty Brown moist silt, little fine to medium sand, trace of medium gravel.	3					.2
												.2
	2	2-4	4-5-6-7	15	13	Brown moist, medium to coarse sand, trace of silt.	4					.2
												.2
	3	4-6	4-5-5-3	15	10		8					.2
5												.2
	4	6-8	4-5-8-4	15	13	Brown moist fine to medium gravel, fine to coarse sand, little silt.	18					.2
												.2
	5	9-11	2-6-10-5	15	16	Brown Very moist medium to coarse sand, some fine to medium gravel, little silt.						
10												
	6	14-16	11-14	15	42	Brown Wet fine to medium sand, trace of silt.						.4
15			28-28									.4
						Gray Wet fine sand and silt.						.4
	7	19-21	14-40	15	84							
20			44-47									
	8	24-26	12-20	15	40	Same as above, 3 ft of blow up in auger.						.2
25			20-24									
	29-31					Same as above, 3 ft of blow up in auger.						
30												

PROJECT: Peter Cooper Markhams R.I.
Dayton, New York

Log of Well No. MW-7S

BORING LOCATION: See Site Plan for MW locations

TOP OF RISER ELEVATION:
1312.52 fmsl

DATUM:
NAD 83

DRILLING CONTRACTOR: Nothnagle Drilling, Inc.

DATE STARTED:
10/9/01

DATE FINISHED:
10/9/01

DRILLING METHOD: 4 1/4" dia. Hollow Stem Augers

TOTAL DEPTH:
16.0 fbgs

SCREEN INTERVAL:
6-16 fbgs

DRILLING EQUIPMENT: CME 750 ATV

DEPTH TO
WATER: 13 ft

FIRST
COMPL.

CASING:
2" dia. PVC

SAMPLING METHOD: Not sampled for lithology

LOGGED BY:
MAC

HAMMER WEIGHT: Autohammer

DROP: NA

RESPONSIBLE PROFESSIONAL:
Richard H. Frappa

REG. NO.

DEPTH (feet)	SAMPLES				OVM (ppm)	DESCRIPTION	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS	
	Sample No.	Sample	Blows/ foot	NAME (USCS Symbol): color, moist, % by weight, plast., structure, cementation, react. w/HCl, geo. inter.				
						Surface Elevation: 1309.62 fmsl		2.5' stickup (approx.)
1						MW-7S not logged for lithology. See log of MW-7D for lithologic descriptions.		schedule 40 PVC riser
2								cement/bentonite grout to surface
3								3/8" dia. bentonite pellet seal
4								
5								
6								
7								
8								
9								
10								#00N filter sand
11								
12								
13								0.010" slot schedule 40 PVC well screen
14								
15								
16							End of boring at 16.0 fbgs.	
17								
18								
19								
20								

WELL_OVM MARKHAMS MWS.GPJ (2/05)

PROJECT: Peter Cooper Markhams R.I. Dayton, New York		Log of Well No. MW-7D	
BORING LOCATION: See Site Plan for MW locations		TOP OF RISER ELEVATION: 1312.35 fmsl	DATUM: NAD 83
DRILLING CONTRACTOR: Nothnagle Drilling, Inc.		DATE STARTED: 10/8/01	DATE FINISHED: 10/8/01
DRILLING METHOD: 4 1/4" dia. Hollow Stem Augers		TOTAL DEPTH: 32.0 fbs	SCREEN INTERVAL: 22-32 fbs
DRILLING EQUIPMENT: CME 750 ATV		DEPTH TO WATER: 13 ft	COMPL. CASING: 2" dia. PVC
SAMPLING METHOD: 2" dia. S.S. Split Spoons		LOGGED BY: MAC	
HAMMER WEIGHT: Autohammer	DROP: NA	RESPONSIBLE PROFESSIONAL: Richard H. Frappa	REG. NO.

DEPTH (feet)	SAMPLES			OVM (ppm)	DESCRIPTION NAME (USCS Symbol); color, moist, % by weight, plast., structure, cementation, react. w/HCl, geo. inter.	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
	Sample No.	Sample	Blows/foot			
					Surface Elevation: 1309.39 fmsl	2.5' stickup (approx.)
1	1		3	0	PEAT, leaf and vegetative matter, wood pieces with fine sand, damp to moist.	
2						
3	2		5	0	POORLY GRADED SAND with SILT fine sand with silt, trace fine subrounded gravel, 2.5Y 5/6, loose, dry (OUTWASH UNIT)	
4						
5	3		13	0		
6						
7	4		19	0		
8						
9	5		8	0	A.A., with fine to medium sand, increasing gravel content (15-20%)	
10						
11	6		10	0		
12						
13	7		21	0	POORLY GRADED SAND with SILT very fine sand with silt, saturated at 13.0' bgs, 10YR 4/6 grading to 10YR 4/1, firm (LACUSTRINE UNIT)	
14						
15	8		19	0	Varved clay and silt layer @ 14.5' bgs, 10YR 4/1, damp	
16					fine to med. sand with silt, 10YR 4/1, wet	
17	9		26	0		
18						
19	10		26	0	WELL GRADED SAND with SILT very fine sand with trace silt, 10YR 4/1, wet, firm (LACUSTRINE UNIT)	
20						
21	11		32	0		
22						
23	12		46	0		
24						
25	13		31	0		
26						
27	14		31	0		
28						
29	15		32	0		
30						
31	16		30	0		
32						
33					End of boring at 32.0 fbs.	
34						
35						
36						
37						
38						
39						
40						

WELL_OVM MARKHAMS MWS.GPJ (2/05)

PROJECT: Peter Cooper Markhams R.I. Dayton, New York		Log of Well No. MW-8S	
BORING LOCATION: See Site Plan for MW locations		TOP OF RISER ELEVATION: 1303.93 fmsl	DATUM: NAD 83
DRILLING CONTRACTOR: Nothnagle Drilling, Inc.		DATE STARTED: 10/5/01	DATE FINISHED: 10/5/01
DRILLING METHOD: 4 1/4" dia. Hollow Stem Augers		TOTAL DEPTH: 10.0 fbgs	SCREEN INTERVAL: 5-10 fbgs
DRILLING EQUIPMENT: CME 750 ATV		DEPTH TO WATER: 6 ft	COMPL. CASING: 2" dia. PVC
SAMPLING METHOD: Not sampled for lithology		LOGGED BY: MAC	
HAMMER WEIGHT: Autohammer	DROP: NA	RESPONSIBLE PROFESSIONAL: Richard H. Frappa	REG. NO.

DEPTH (feet)	SAMPLES				DESCRIPTION NAME (USCS Symbol): color, moist, % by weight, plast., structure, cementation, react. w/HCl, geo. inter.	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS	
	Sample No.	Sample	Blows/foot	OVM (ppm)			
					Surface Elevation: 1301.06 fmsl		2.5' stickup (approx.)
1					MW-8S not logged for lithology. See log of MW-8D for lithologic descriptions.		schedule 40 PVC riser
2							cement/bentonite grout to surface
3							3/8" dia. bentonite pellet seal
4							
5							
6							#00N filter sand
7							
8							0.010" slot schedule 40 PVC well screen
9							
10							
11					End of boring at 10.0 fbgs.		
12							
13							
14							
15							
16							
17							
18							
19							
20							

WELL_OVM MARKHAMS MWS.GPJ (2/05)

PROJECT: Peter Cooper Markhams R.I. Dayton, New York				Log of Well No. MW-8D			
BORING LOCATION: See Site Plan for MW locations				TOP OF RISER ELEVATION: 1304.03 fmsl		DATUM: NAD 83	
DRILLING CONTRACTOR: Nothnagle Drilling, Inc.				DATE STARTED: 10/4/01		DATE FINISHED: 10/4/01	
DRILLING METHOD: 4 1/4" dia. Hollow Stem Augers				TOTAL DEPTH: 28.0 fbgs		SCREEN INTERVAL: 18-28 fbgs	
DRILLING EQUIPMENT: CME 750 ATV				DEPTH TO WATER:	FIRST 6 ft	COMPL.	CASING: 2" dia. PVC
SAMPLING METHOD: 2" dia. S.S. Split Spoons				LOGGED BY: MAC			
HAMMER WEIGHT: Autohammer		DROP: NA		RESPONSIBLE PROFESSIONAL: Richard H. Frappa			REG. NO.

DEPTH (feet)	SAMPLES			OVM (ppm)	DESCRIPTION	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
	Sample No.	Sample	Blows/ foot		NAME (USCS Symbol); color, moist, % by weight, plast., structure, cementation, react. w/HCl, geo. inter.	
					Surface Elevation: 1300.98 fmsl	
1	1	X	15	13	Brown organic SILT, leaf matter, rootlets, dry, loose, 10YR 2/2	2.5' stickup (approx.) schedule 40 PVC riser cement/bentonite grout to surface 3/8" dia. bentonite pellet seal 0.010" slot schedule 40 PVC well screen #00N filter sand
2		X			POORLY GRADED SAND and SILT with GRAVEL	
3		X			fine to medium sand (60%) with silt (20%) and fine subrounded gravel (20%), dry, loose, 10YR 6/6 (OUTWASH UNIT)	
4		X				
5	3	X	5	0		
6		X			saturated at 6.0 fbgs, color grading to 10YR 3/4	
7	4	X	11	0		
8		X				
9	5	X	15	0	POORLY GRADED SAND and SILT fine sand with silt, 10YR 4/2, wet, grading to 7.5 YR 5/1, firm (LACUSTRINE UNIT)	
10	12	X	13	0		
11	6	X	12	0	CLAY with SILT 80% high plasticity fines with 20% silt, 10YR 4/1, fine grained representation of lacustrine unit	
12		X				
13	7	X	24	0		
14		X				
15	8	X	16	0		
16		X			POORLY GRADED SAND with SILT fine sand (80%) with silt (20%), 7.5YR 2/1, wet, soft	
17	9	X	22	0		
18		X				
19	10	X	8	0		
20		X			A.A., with fine to med. sand (80%)	
21	11	X	22	0		
22		X				
23	12	X	18	0		
24		X				
25	13	X	31	0		
26		X				
27	14	X	30	0		
28		X				
29					End of boring at 28.0 fbgs.	
30						
31						
32						
33						
34						
35						
36						
37						
38						
39						
40						

Project No. 7603

Geomatrix Consultants

WELL_OVM MARKHAMS MWS.GPJ (2/05)
 Page 1 of 1

PROJECT: Peter Cooper Markhams R.I. Dayton, New York		Log of Well No. MW-9S	
BORING LOCATION: See Site Plan for MW locations		TOP OF RISER ELEVATION: 1313.95 fmsl	DATUM: NAD 83
DRILLING CONTRACTOR: Nothnagle Drilling, Inc.		DATE STARTED: 10/2/04	DATE FINISHED: 10/2/01
DRILLING METHOD: 4 1/4" dia. Hollow Stem Augers		TOTAL DEPTH: 11.0 fbg	SCREEN INTERVAL: 6-11 fbg
DRILLING EQUIPMENT: CME 750 ATV		DEPTH TO WATER: 7 ft	COMPL. CASING: 2" dia. PVC
SAMPLING METHOD: 2" dia. S.S. Split Spoons		LOGGED BY: MAC	
HAMMER WEIGHT: Autohammer	DROP: NA	RESPONSIBLE PROFESSIONAL: Richard H. Frappa	REG. NO.

DEPTH (feet)	SAMPLES				OVM (ppm)	DESCRIPTION	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS	
	Sample No.	Sample	Blow/ foot			NAME (USCS Symbol): color, moist, % by weight, plast. structure, cementation, react. w/HCl, geo. inter.		
						Surface Elevation: 1311.49 fmsl		2.5' stickup (approx.)
1						MW-9S not logged for lithology. See log of MW-9D for lithologic descriptions.		schedule 40 PVC riser
2								cement/bentonite grout to surface
3								3/8" dia. bentonite pellet seal
4								
5								
6								
7								
8								0.010" slot schedule 40 PVC well screen
9								
10								#00N filter sand
11								
12						End of boring at 11.0 fbg.		
13								
14								
15								
16								
17								
18								
19								
20								

WELL_OVM MARKHAMS MWS.GPJ (2/05)

PROJECT: Peter Cooper Markhams R.I. Dayton, New York				Log of Well No. MW-9D			
BORING LOCATION: See Site Plan for MW locations				TOP OF RISER ELEVATION: 1314.12 fmsl		DATUM: NAD 83	
DRILLING CONTRACTOR: Nothnagle Drilling, Inc.				DATE STARTED: 10/1/04		DATE FINISHED: 10/2/01	
DRILLING METHOD: 4 1/4" dia. Hollow Stem Augers				TOTAL DEPTH: 30.0 fbgs		SCREEN INTERVAL: 20-30 fbgs	
DRILLING EQUIPMENT: CME 750 ATV				DEPTH TO WATER:	FIRST 7 ft	COMPL.	CASING: 2" dia. PVC
SAMPLING METHOD: 2" dia. S.S. Split Spoons				LOGGED BY: MAC			
HAMMER WEIGHT: Autohammer		DROP: NA		RESPONSIBLE PROFESSIONAL: Richard H. Frappa			REG. NO.

DEPTH (feet)	SAMPLES			OVM (opm)	DESCRIPTION NAME (USCS Symbol): color, moist, % by weight, plast., structure, cementation, react. w/HCl, geo. inter.	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
	Sample No.	Sample	Blows/ foot			
					Surface Elevation: 1311.64 fmsl	2.5' stickup (approx.)
1	1		11	0	POORLY GRADED SAND with SILT and GRAVEL fine to medium sand with silt and trace find to medium subrounded gravel (OUTWASH UNIT), 7.5 YR 4/3, dry to damp, loose A.A., with increasing fine to medium gravel (50-60%)	
2						
3	2		19	0		
4						
5	3		10	0		
6						
7	4		5	0	saturated at 7.0 fbgs, grading to 5 YR 4/2, soft	
8						
9	5		17	0		
10						
11	6		28	0		
12					locally fine to medium sand with fine gravel interbedded with fine sand and silt, 7.5 YR 3/4	
13	7		6	0		
14						
15	8		44	0		
16						
17	9		47	0	very firm soils below 15 fbgs	
18						
19	10		52	0		
20						
21	11		45	0		
22					WELL GRADED SAND with SILT fine sand with silt, 1 FOR GLEY 5/10Y, wet, soft (LACUSTRINE UNIT)	
23	12		43	0		
24						
25	13		28	0		
26						
27	14		6	0	CLAY with SILT 90% high plasticity fines, 10% silt, 2.5Y 5/1, wet, firm to hard, fine grained representation of lacustrine unit	
28						
29	15		14	0		
30						
31						
32					End of boring at 30.0 fbgs	
33						
34						
35						
36						
37						
38						
39						
40						

Project No. 7603

Geomatrix Consultants

WELL_OVM MARKHAMS MWS.GPJ (2/05)

Page 1 of 1

PROJECT: Peter Cooper Markhams R.I. Dayton, New York		Log of Boring No. B-1	
BORING LOCATION: See Site Plan for Boring Locations		ELEVATION: 1,317.38 fmsl	DATUM: NA
DRILLING CONTRACTOR: Nothnagle Drilling, Inc.		DATE STARTED: 10/2/01	DATE FINISHED: 10/2/01
DRILLING METHOD: 4 1/4" dia. Hollow Stem Augers		TOTAL DEPTH: 14.0 fbgs	MEASURING POINT: ground surface
DRILLING EQUIPMENT: CME 750 ATV		DEPTH TO WATER:	FIRST COMPL.
SAMPLING METHOD: 2" dia. S.S. Split Spoons		LOGGED BY: MAC	
HAMMER WEIGHT: Autohammer	DROP: NA	RESPONSIBLE PROFESSIONAL: Richard H. Frappa	REG. NO.

DEPTH (feet)	SAMPLES				OVM (ppm)	DESCRIPTION NAME (USCS Symbol): color, moist, % by weight, plast., structure, cementation, react. w/HCl, geo. inter.	DRILLING REMARKS
	Sample No.	Sample	Blows/ foot				
						Surface Elevation: 1317.38 fmsl	
1						Advance 4 1/4" dia. hollow stem augers to 2 fbgs.	
2							
3	1		3		0	POORLY GRADED SAND with SILT fine sand with silt, trace detrital matter (rootlets, leaves), 2.5Y 4/2, damp (cover soil/fill)	
4							
5	2		5		0		
6							
7	3		15		0	POORLY GRADED GRAVEL with SILT and SAND 60% fine subrounded gravel with fine sand and silt, damp to moist, 2.5Y 5/2, soft	
8						Organic peat layer (8.0-8.2 fbgs), wood fiber, moist	
9	4		9		0		
10						POORLY GRADED GRAVEL with SILT and SAND 60% fine subrounded gravel with fine sand and silt, damp to moist, 2.5Y 5/2, soft	
11	5		9		0		
12							
13	6		7		0	POORLY GRADED SAND with SILT and GRAVEL 80% fine sand with silt and fine subrounded gravel, soft, 2.5YR 4/4, moist (OUTWASH UNIT)	
14						End of boring at 14.0 fbgs	
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							

PROJECT: Peter Cooper Markhams R.I. Dayton, New York		Log of Boring No. B-1A	
BORING LOCATION: See Site Plan for Boring Locations		ELEVATION: 1,313.00 fmsl	DATUM: NA
DRILLING CONTRACTOR: Nothnagle Drilling, Inc.		DATE STARTED: 10/2/01	DATE FINISHED: 10/2/01
DRILLING METHOD: 4 1/4" dia. Hollow Stem Augers		TOTAL DEPTH: 20.0 fbs	MEASURING POINT: ground surface
DRILLING EQUIPMENT: CME 750 ATV		DEPTH TO WATER:	FIRST COMPL.
SAMPLING METHOD: 2" dia. S.S. Split Spoons		LOGGED BY: MAC	
HAMMER WEIGHT: Autohammer	DROP: NA	RESPONSIBLE PROFESSIONAL: Richard H. Frappa	REG. NO.

DEPTH (feet)	SAMPLES			OVM (ppm)	DESCRIPTION NAME (USCS Symbol): color, moist, % by weight, plast., structure, cementation, react. w/HCl, geo. inter.	DRILLING REMARKS
	Sample No.	Sample	Blows/ foot			
					Surface Elevation: 1313.00 fmsl	
1						
2					Advance 4 1/4" dia. hollow stem augers to 4 fbs.	
3						
4						
5	1	WH			Waste material, black silt with sand, trace animal hair, trace fine gravel, moist to wet	
6						
7	2	WH				
8						
9	3		5	1.0	grading to SILT with CLAY with trace waste material and wood fiber.	
10						
11	4		10	0	POORLY GRADED SAND with SILT and GRAVEL fine to medium sand with fine rounded gravel, trace silt and low plasticity fines (OUTWASH UNIT), 5Y 3/1, moist to wet, loose	
12						
13	5		11	0		
14						
15	6		9	0		
16						
17	7		7	0		
18					grading to black in color	
19	8		10	0	grading to POORLY GRADED SAND with SILT very fine sand with silt, 5Y 4/2, moist to wet (LACUSTRINE UNIT)	
20						
21					End of boring at 20 fbs.	
22						
23						
24						
25						

PROJECT: Peter Cooper Markhams R.I. Dayton, New York					Log of Boring No. B-2	
BORING LOCATION: See Site Plan for Boring Locations					ELEVATION: 1,314.88 fmsl	DATUM: NA
DRILLING CONTRACTOR: Nothnagle Drilling, Inc.					DATE STARTED: 10/2/01	DATE FINISHED: 10/2/01
DRILLING METHOD: Direct-push drive point					TOTAL DEPTH: 4.0 fbgs	MEASURING POINT: ground surface
DRILLING EQUIPMENT: CME 750 ATV					DEPTH TO FIRST WATER:	COMPL.
SAMPLING METHOD:					LOGGED BY: MAC	
HAMMER WEIGHT: Autohammer			DROP: NA		RESPONSIBLE PROFESSIONAL: Richard H. Frappa	REG. NO.

DEPTH (feet)	SAMPLES			OVM (ppm)	DESCRIPTION	DRILLING REMARKS
	Sample No.	Sample	Blows/ foot		NAME (USCS Symbol): color, moist, % by weight, plast., structure, cementation, react. w/HCl, geo. inter.	
Surface Elevation: 1314.88 fmsl						
1	1		NA	NA	*Exploratory boring. Blows/foot not recorded.	
2					Non-waste-fill material encountered, consisting of concrete, roofing shingles, plastic pieces, dry throughout.	
3	2		NA	NA		
4						
5					End of boring at 4.0 fbgs	
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						

Project No. 7603.


Geomatrix Consultants

BORING MARKHAMS BORINGS.GPJ (2/05)
 Page 1 of 1

PROJECT: Peter Cooper Markhams R.I. Dayton, New York		Log of Boring No. B-3	
BORING LOCATION: See Site Plan for Boring Locations		ELEVATION: 1,314.50 fmsl	DATUM: NA
DRILLING CONTRACTOR: Nothnagle Drilling, Inc.		DATE STARTED: 10/5/01	DATE FINISHED: 10/5/01
DRILLING METHOD: 4 1/4" dia. Hollow Stem Augers		TOTAL DEPTH: 7.0 fbg	MEASURING POINT: ground surface
DRILLING EQUIPMENT: CME 750 ATV		DEPTH TO FIRST WATER:	COMPL.
SAMPLING METHOD: 2" dia. S.S. Split Spoons		LOGGED BY: MAC	
HAMMER WEIGHT: Autohammer	DROP: NA	RESPONSIBLE PROFESSIONAL: Richard H. Frappa	REG. NO.

DEPTH (feet)	SAMPLES				OVM (ppm)	DESCRIPTION NAME (USCS Symbol); color, moist, % by weight, plast., structure, cementation, react. w/HCl, geo. inter.	DRILLING REMARKS
	Sample No.	Sample	Blows/ foot				
						Surface Elevation: 1314.50 fmsl	
1	1	NA				COVER SOIL (shelby tube sample location)	
2	2	WH		0		Poorly sorted sand, silt and gravel, dry, soft, reworked native soils (NON-WASTE FILL)	
3						A.A. without organic matter, grading to 10YR 3/3, trace fine subangular gravel, moist	
4	3		10	0			
5							
6	4		21	0		POORLY GRADED SAND with SILT fine sand with silt, trace rootlets and wood fiber, 10YR 4/4, dry, loose (OUTWASH UNIT)	
7							
8						End of boring at 7.0 fbg	
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							

PROJECT: Peter Cooper Markhams R.I. Dayton, New York		Log of Boring No. B-4	
BORING LOCATION: See Site Plan for Boring Locations		ELEVATION: 1,327.70 fmsl	DATUM: NA
DRILLING CONTRACTOR: Nothnagle Drilling, Inc.		DATE STARTED: 10/5/01	DATE FINISHED: 10/5/01
DRILLING METHOD: 4 1/4" dia. Hollow Stem Augers		TOTAL DEPTH: 22.0 fbgs	MEASURING POINT: ground surface
DRILLING EQUIPMENT: CME 750 ATV		DEPTH TO WATER: 20 feet	COMPL.
SAMPLING METHOD: 2" dia. S.S. SplitSpoons		LOGGED BY: MAC	
HAMMER WEIGHT: Autohammer	DROP: NA	RESPONSIBLE PROFESSIONAL: Richard H. Frappa	REG. NO.

DEPTH (feet)	SAMPLES				OVM (ppm)	DESCRIPTION NAME (USCS Symbol): color, moist, % by weight, plast., structure, cementation, react. w/HCl, geo. inter.	DRILLING REMARKS
	Sample No.	Sample	Blows/ foot				
						Surface Elevation: 1327.70 fmsl	
1	1	WH			0	Brown silt with organic matter (rootlets, wood fiber), little gravel, 2.5YR 3/2 grading to 10YR 4/2 below 1.0 fbgs, dry	
2							
3	2	WH			0	WASTE MATERIAL/ FILL black fine sand and silt with gravel, animal hair, moist	
4							
5	3	WH	15	(max)			
6							
7	4		14		1		
8							
9	5		3		7		
10							
11	6		27		30 max	locally silty at 11.0 fbgs	
12							
13	7		21		0		
14							
15	8		34		0		
16						POORLY GRADED SAND with SILT and GRAVEL fine sand with silt and fine to medium subangular gravel, 1 FOR GLEY 4/ 10Y, wet, soft (OUTWASH UNIT)	
17	9		11		0		
18							
19	10		13		0		
20						Saturated at 20 fbgs, locally coarser grained with med. sand and gravel near bottom of boring	
21	11		48		0		
22						End of boring at 22 fbgs	
23							
24							
25							

BORING MARKHAMS BORINGS.GPJ (2/05)

PROJECT: Peter Cooper Markhams R.I. Dayton, New York		Log of Boring No. B-5	
BORING LOCATION: See Site Plan for Boring Locations		ELEVATION: 1,311.75 fmsl	DATUM: NA
DRILLING CONTRACTOR: Nothnagle Drilling, Inc.		DATE STARTED: 10/9/01	DATE FINISHED: 10/9/01
DRILLING METHOD: 4 1/4" dia. Hollow Stem Augers		TOTAL DEPTH: 18.0 fbgs	MEASURING POINT: ground surface
DRILLING EQUIPMENT: CME 750 ATV		DEPTH TO WATER:	FIRST 16 feet COMPL.
SAMPLING METHOD: 2" dia. S.S. Split Spoons		LOGGED BY: MAC	
HAMMER WEIGHT: Autohammer	DROP: NA	RESPONSIBLE PROFESSIONAL: Richard H. Frappa	REG. NO.

DEPTH (feet)	SAMPLES				OVM (ppm)	DESCRIPTION NAME (USCS Symbol): color, moist, % by weight, plast., structure, cementation, react. w/HCl, geo. inter.	DRILLING REMARKS
	Sample No.	Sample	Blows/ foot				
						Surface Elevation: 1311.75 fmsl	
1	1		1		0	POORLY GRADED SAND and SILT very fine sand with silt, trace fine rounded gravel, cover soil, damp, soft to loose 7.5 YR 2.5/2	
2							
3	2		4		0.1	WASTE MATERIAL black silt with little fine to med. sand, trace animal hair, moist	
4							
5	3		5		10		
6							
7	4		4		17 (max)		
8							
9	5		7		10	POORLY GRADED SAND with SILT and GRAVEL medium sand with silt and little fine rounded gravel, moist, 1 FOR GLEY 2.5Y 3/1, soft, (OUTWASH UNIT)	
10							
11	6		18		NA		
12							
13	7		18		NA	grading to fine to med. sand with trace fine subrounded gravel, moist, 2.5 YR 3/2	
14							
15	8		20		5 (max)		
16						CLAY with SILT high plasticity fines with little silt, fine grained representation of <u>LACUSTRINE UNIT, 2.5 YR 3/2, saturated</u>	
17	9		26		5		
18						POORLY GRADED SAND with SILT fine to medium sand with little silt and trace fine subrounded gravel, saturated, 2.5Y 4/4 (LACUSTRINE UNIT)	
19							
20						End of boring at 18 fbgs	
21							
22							
23							
24							
25							

BORING MARKHAMS BORINGS.GPJ (2/05)

PROJECT: Peter Cooper Markhams R.I. Dayton, New York					Log of Boring No. B-6				
BORING LOCATION: See Site Plan for Boring Locations					ELEVATION: 1,316.00 fmsl		DATUM: NA		
DRILLING CONTRACTOR: Nothnagle Drilling, Inc.					DATE STARTED: 10/9/01		DATE FINISHED: 10/9/01		
DRILLING METHOD: 4 1/4" dia. Hollow Stem Augers					TOTAL DEPTH: 13.0 fbgs		MEASURING POINT: ground surface		
DRILLING EQUIPMENT: CME 750 ATV					DEPTH TO WATER:		FIRST 11 feet		COMPL.
SAMPLING METHOD: 2" dia. S.S. Split Spoons					LOGGED BY: MAC				
HAMMER WEIGHT: Autohammer			DROP: NA		RESPONSIBLE PROFESSIONAL: Richard H. Frappa			REG. NO.	

DEPTH (feet)	SAMPLES				OVM (ppm)	DESCRIPTION	DRILLING REMARKS
	Sample No.	Sample	Blows/ foot	ft		NAME (USCS Symbol): color, moist, % by weight, plast., structure, cementation, react. w/HCl, geo. inter.	
						Surface Elevation: 1316.00 fmsl	
1						COVER SOIL- Advance 4 1/4" dia. hollow stem augers to 5 fbgs. Cuttings consist of fine to med. sand with little fine rounded gravel, dry	
2							
3							
4							
5							
6	1		NA		NA	WASTE MATERIAL black silt with little sand, animal hair, moist	
7						POORLY GRADED SAND with SILT and GRAVEL fine to medium sand with silt and little fine subrounded gravel, 1 FOR GLEY 4/1, soft to loose, (OUTWASH UNIT) saturated at 11 fbgs	
8	2		6		4		
9							
10	3		7		5 (max)		
11							
12	4		9		1		
13						End of boring at 13 fbgs.	
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							

Project No. 7603.

Geomatrix Consultants

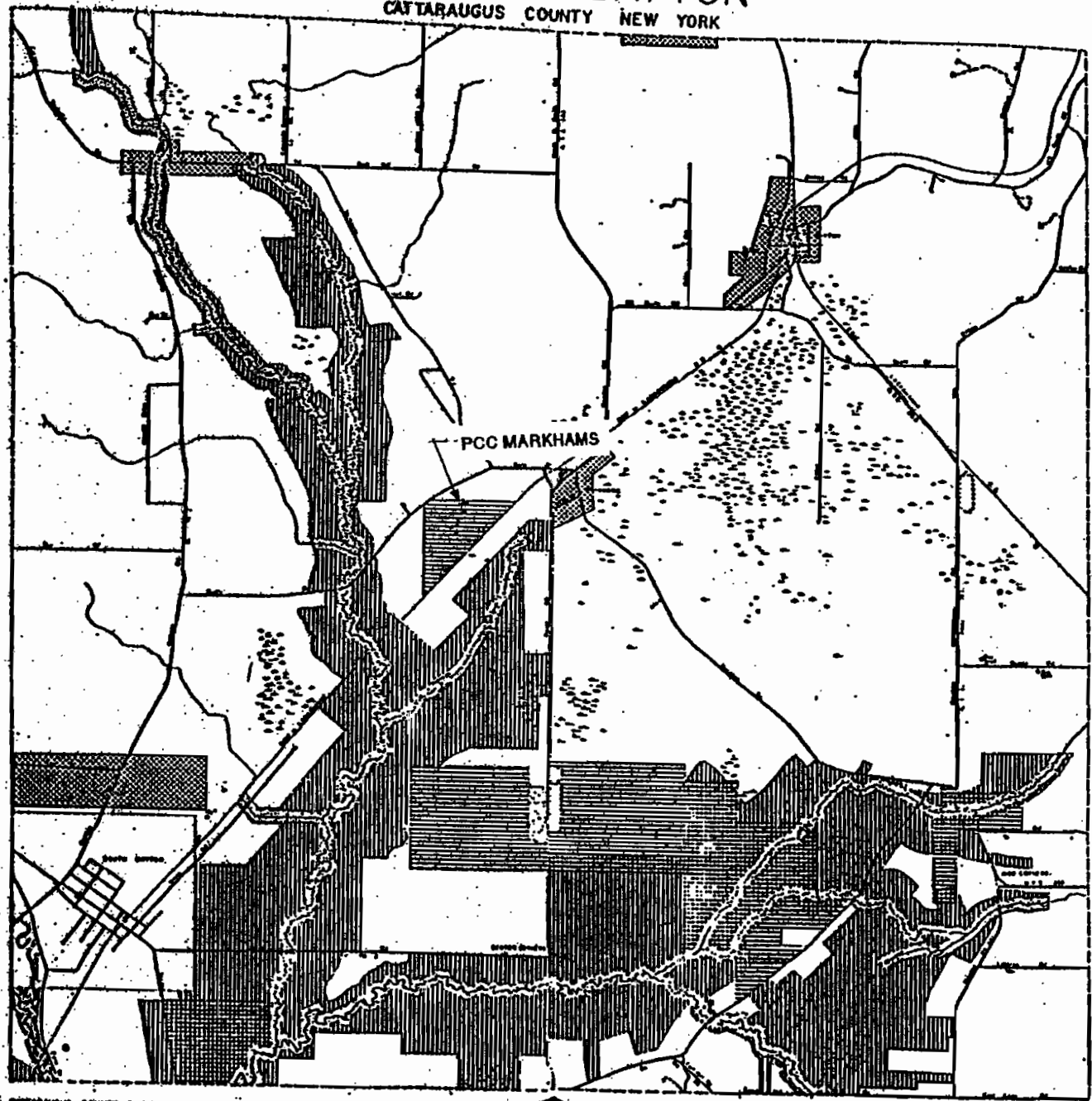
BORING MARKHAMS BORINGS.GPJ (2/05)
 Page 1 of 1

APPENDIX F

Town of Dayton, New York Zoning Map

TOWN OF DAYTON

CATTARAUGUS COUNTY NEW YORK



CATTARAUGUS COUNTY PLANNING BOARD
Scale 1" = 1,000'

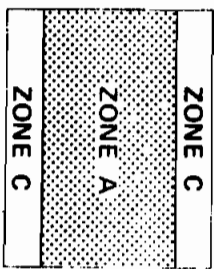
May 1979

ZONING DISTRICTS			
	AG-FORESTRY AF-1		INDUSTRIAL I-1
	RESIDENTIAL R-1		FLOODWAY FV
	BUSINESS B-1		FLOODWAY PRINCE VI

APPENDIX G

FEMA Mapping – Flood Plain

KEY TO SYMBOLS



Base Flood Elevation Line with elevation in feet
Base Flood Elevation where uniform within zone (EL 987)
Elevation Reference Mark RM7X
River Mile M1.5

EXPLANATION OF ZONE DESIGNATIONS

A flood insurance map displays the zone designations for a community according to areas of designated flood hazards. The zone designations used by FEMA are:

- Zone Explanation
- A Areas of 100 year flood base flood elevations and flood hazard factors not determined
 - AO Areas of 100-year shallow flooding (flood depth 1 to 3 feet, product of flood depth (feet) and velocity (feet per second) less than 15
 - AI Areas of 100 year shallow flooding where depths are between one (1) and three (3) feet base flood elevations are shown, but no flood hazard factors are determined
 - A1-A30 Areas of 100-year flood, base flood elevations and flood hazard factors determined
 - AS9 Areas of 100-year flood to be protected by a flood protection system under construction, base flood elevations and flood hazard factors not determined
 - B Areas between limits of 100-year flood and 500-year flood areas of 100-year shallow flooding where depths less than 1 foot
 - C Areas outside 500-year flood
 - D Areas of undetermined but possible flood hazards
 - V Areas of 100-year coastal flood with velocity (wave action) base flood elevations and flood hazard factors not determined
 - V1-V30 Areas of 100-year coastal flood with velocity (wave action) base flood elevations and flood hazard factor determined

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only. It does not necessarily show all areas subject to flooding in the community or all planning features outside special flood hazard areas.

Refer to the FLOOD INSURANCE RATE MAP EFFECTIVE date shown on this map to determine when actuarial rates apply to structures in the zones where elevations or depths have been established.

To determine if flood insurance is available in this community contact your insurance agent or call the National Flood Insurance Program, at (800) 638-6620.

INITIAL IDENTIFICATION: AUGUST 9, 1974

FLOOD HAZARD BOUNDARY MAP REVISIONS: JULY 2, 1976

FLOOD INSURANCE RATE MAP EFFECTIVE: MAY 25, 1984

FLOOD INSURANCE RATE MAP REVISIONS

federal emergency management agency



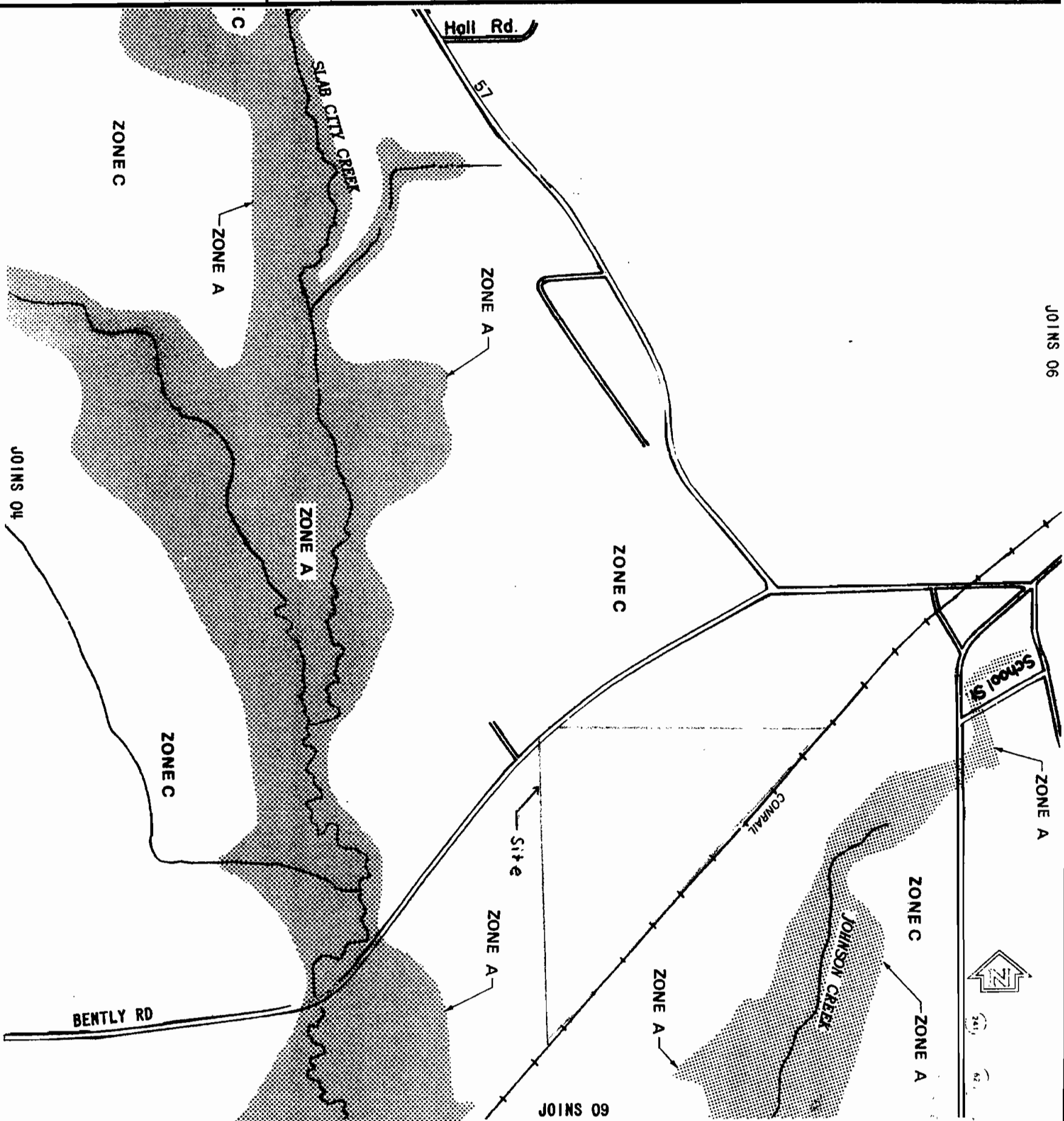
FIRM

FLOOD INSURANCE RATE MAP 01-13
MAP INDEX

TOWN OF DAYTON, NY
CATTARAUGUS COUNTY

COMMUNITY NUMBER 360066 B

JOINS 06



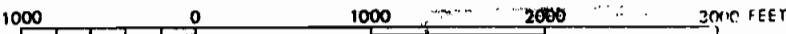
JOINS 09

federal emergency management agency

TOWN OF DAYTON, NY
CATTARAUGUS COUNTY

MAP 05

APPROXIMATE SCALE



FLOOD INSURANCE RATE MAP
COMMUNITY NUMBER 360066 B

EFFECTIVE DATE
MAY 25, 1984

APPENDIX H

2002 Phase IA Cultural Resources Survey Investigation Report

**PHASE IA CULTURAL RESOURCES INVESTIGATION
FOR THE PROPOSED REMEDIATION
OF THE PETER COOPER MARKHAMS SITE,
TOWN OF DAYTON,
CATTARAUGUS COUNTY, NEW YORK**

Prepared for:

**GEOMATRIX CONSULTANTS, INC
336 Harris Hill Road
Williamsville, New York 14221**

Prepared by:

**Michael A. Cinquino, Ph.D., Co-Principal Investigator
Frank J. Schieppati, Ph.D., Co-Principal Investigator
Mark A. Steinback, M.A., Historian
Rebecca J. Emans, M.A., Archaeologist**

**PANAMERICAN CONSULTANTS, INC.
Buffalo Branch Office
2390 Clinton Street
Buffalo, New York 14227-1735
(716) 821-1650**

November 2001

Management Summary

Panamerican Consultants, Inc. was contracted by Geomatrix Consultants, Inc., Williamsville, New York, to conduct a Phase IA cultural resources investigation for proposed remediation of approximately 91 acres on Bentley Road in the hamlet of Markhams, Town of Dayton, Cattaraugus County, New York. Between 1955 and 1972 the project area served as a dump for the former Peter Cooper Corporation animal-glue factory in Gowanda, New York. The project area is referred to as the Peter Cooper Markhams site. The glue-factory dump site was added to the U.S. Environmental Protection Agency (USEPA) Superfund National Priorities List (NPL) in February 2000. It was initially listed as a Superfund site in 1998 (USEPA 2000).

The investigation included archival and documentary research, field inspection of the project area, and photographic documentation of site conditions and areas of disturbance. A review of files of the New York State Office of Parks, Recreation, and Historic Preservation (OPRHP) was conducted to identify known prehistoric or historic sites and structures listed in New York State or National Registers of Historic Places that may lie within the area of potential effect. The cultural resource investigation was conducted in compliance with the New York State Environmental Quality Review Act (SEQRA), the State Historic Preservation Act (SHPA), and appropriate federal legislation. Fieldwork was conducted according to the New York Archaeological Council (NYAC)'s Standards for Archaeological Investigations.

Due to the proximity of the project area to two water resources (Slab City Creek and Johnson Creek) and the presence of wetland areas within the site boundaries, the Peter Cooper Markhams project area is sensitive for prehistoric sites. Therefore, a Phase IB investigation is recommended for those portions of the project area which will be impacted by remediation activities (roads and borrow areas) and have not been previously disturbed. A Phase IB investigation is not recommended for the disturbed areas of waste piles within the project area.

The Phase IB survey should conform to NYAC standards and comply with all relevant Occupational Safety and Health Administration requirements for excavating within a hazardous waste site.

Table of Contents

Management Summary	ii
List of Figures	iv
List of Photographs	v
1.0 Introduction	1
1.1 Project Description	1
1.2 Environmental Setting	1
2.0 Historical and Archival Review	4
2.1 Prehistoric Period	4
2.2 Historic Period	8
2.3 Documentary Research	15
2.3.1 Historic Map Analysis	15
2.3.2 Site File and Archival Review	15
3.0 Cultural Resources Sensitivity Assessment	18
3.1 Methodology	18
3.2 Sensitivity	19
3.2 Conclusions and Recommendations	19
4.0 References	21
Appendices	
Appendix A: Photographs	A-1
Appendix B: Vitae of Project Principals	B-1

List of Figures

FIGURE	PAGE
1. Location of the Peter Cooper Markhams project area within the Town of Dayton, Cattaraugus County, New York	2
2. Location of the Peter Cooper Markhams project area within the Town of Dayton in 1869	16
3. Locations of photograph angles, geographic features, and disturbances within the Peter Cooper Markhams project area	20

List of Photographs

PHOTOGRAPH	PAGE
1. A view of waste piles in the central part of the project area, facing southeast. . .	A-2
2. A view of waste piles in the central part of the project area, facing south . . .	A-2
3. A view of waste piles in the northern part of the project area, facing south . .	A-3
4. A view of waste piles in the northern part of the project area, facing east . . .	A-3
5. A view of the abandoned railroad bed from the southern part of the project area, facing northeast	A-4
6. A view of waste piles from the abandoned railroad bed in the southern part of the project area, facing northwest	A-4
7. A view of the abandoned railroad bed from the northern part of the project area, facing southwest	A-5
8. The northern edge of the project area with a cornfield in the background, facing northwest	A-5

1.0 Introduction

1.1 PROJECT DESCRIPTION

Panamerican Consultants, Inc. was contracted by Geomatrix Consultants, Inc., Williamsville, New York, to conduct a Phase IA cultural resources investigation for proposed remediation of approximately 91 acres on Bentley Road in the hamlet of Markhams, Town of Dayton, Cattaraugus County, New York (Figure 1). Between 1955 and 1972 the area served as a dump for the former Peter Cooper Corporation animal-glue factory in Gowanda, New York. The project area is referred to as the Peter Cooper Markhams site. The glue-factory dump site was added to the U.S. Environmental Protection Agency (USEPA) Superfund National Priorities List (NPL) in February 2000. It was initially listed as a Superfund site in 1998 (USEPA 2000).

The cultural resource investigation was conducted in compliance with the New York State Environmental Quality Review Act (SEQRA), the State Historic Preservation Act (SHPA), the New York Archaeological Council's (NYAC) Standards for Archaeological Investigations, and relevant federal legislation.

The Phase IA survey included a site file and literature check, archival and documentary research, and a walkover site inspection, which included photographic documentation of site conditions. Dr. Michael A. Cinquino and Dr. Frank J. Schieppati, Co-Principal Investigators, conducted the sensitivity assessment. Ms. Rebecca J. Emans, M.A., served as Project Archaeologist, and Mr. Mark A. Steinback, M.A., served as Project Historian.

1.2 ENVIRONMENTAL SETTING

Topography. The project area is situated within the glaciated Allegheny Plateau, one of the two physiographic provinces located within Cattaraugus County (unglaciated Allegheny Plateau is the other). The province is a plateau dissected by streams, where the rugged, rolling topography is characterized by steep valley walls and wide ridge tops that were smoothed by glacial action (Van Diver 1985:viii; Cressey 1977:33-34; Ritchie 1980). The project area is relatively flat, with a moderate slope to the west-southwest.

Geology. Bedrock underlying Cattaraugus County formed in horizontal bands of sandstones and shales oriented east-west during the Devonian Period (Pearson and Cline 1956:5). Chemung shale and sandstone and small outcroppings of Cattaraugus shale (Carboniferous period) comprise the bedrock. These rocks are overlain by glacial till, except in the vicinity of Allegany State Park which was not glaciated (Cressey 1977:23-24, 33). Bedrock underlying the project area is of the Canadaway group (Van Diver 1985:250). The group is about 450-m (1,500-ft) thick and consists of interdeposits of shale, sandstones, and siltstones oriented northeast-southwest (Puglia 1994:3).

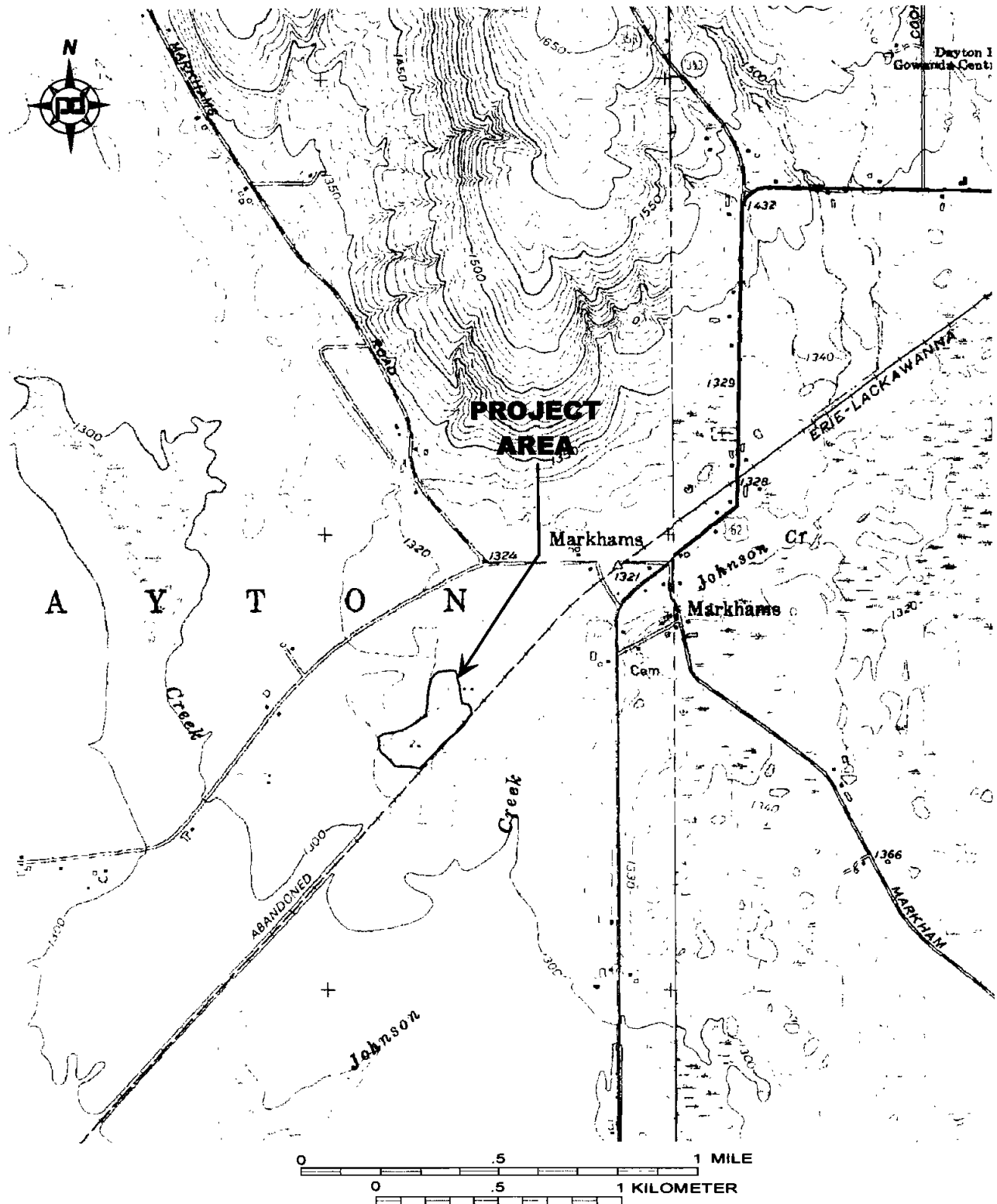


Figure 1. Location of the Peter Cooper Markhams project area within the Town of Dayton, Cattaraugus County, New York (USGS 7.5' Quadrangle, Perrysburg, NY, 1978 [1954], Gowanda, NY, 1988 [1963]).

Soils. There is no modern detailed soil survey for Cattaraugus County, although a survey is in progress. The U.S. Department of Agriculture published a soil survey in 1940 (Pearson et al. 1940) and the Seneca Nation also published a soil survey, but neither of these contains a generalized soil map (Puglia 1994:11). According to the General Soil Map of New York State (Cline and Marshall 1976), the project area is located in the Canandaigua group of soils formed in Lake and Marine sediments. They are limey soils on glacial lake sediments over level to undulating terrain (de Laubenfels 1977b:106). The General Soil Map for Chautauqua County (Puglia 1994) shows Canandaigua soils less than five miles due west of Markhams. In that soil survey, Canandaigua soils are described as having formed in very deep lake laid deposits. These soils are dominantly nearly level and gently sloping, very deep, somewhat poorly drained to very poorly drained, medium textured silt. They occur on broad flats in valleys (Puglia 1994:98).

Drainage. The drainage of Cattaraugus County can be divided into two categories: the Allegheny-Ohio-Mississippi River system for the Allegheny Plateau and the Lake Erie-St. Lawrence River system (Pearson et al. 1940). The project area is located between two water sources. Johnson Creek is located 243 m (800 ft) east of the project area; it flows in a southwesterly direction from a pond at the Village of Markhams (see Figure 1). Slab City Creek, 730 m (2400 ft) west of the project area, flows into Johnson Creek, southwest of the project area. Intermittent portions of the project area are designated wetlands that would have been suitable sources of water for small prehistoric camps.

Vegetation. The project area lies within the Northern Hardwood zone which occurs in higher elevations away from the lakes. It is not uniform and is comprised of a variety of species, dominated by beech and sugar maple (de Laubenfels 1977a:92). In cooler areas, the third most prevalent tree is yellow birch. Though not evenly distributed, all types of evergreens are abundant among hardwoods in the cooler regions, the most popular of which include hemlock, white pine and white cedar. The number of hemlock trees was greatly reduced during the nineteenth century by lumbermen for the bark was a source of tannin (de Laubenfels 1977a:92, 95-96). Vegetation in the project area consists of wooded areas intermittent with open fields. Dense grassy vegetation and thick low-lying brush are present on the waste fill piles (Appendix A: Photographs 1 through 4, 6, and 8).

Manmade Features and Alterations. Portions of the project area have been impacted by waste disposal activities from an animal-glue and adhesives factory located in Gowanda, New York. Fill piles from these disposal episodes are dispersed throughout the project area and a series of rudimentary access roads circumscribe these fill piles. A former rail spur is located along the southeastern portion of the project area (Appendix A: Photographs 5 and 7).

2.0 Historical and Archival Review

2.1 PREHISTORIC PERIOD

The three major cultural traditions manifested in Western New York State during the prehistoric era are the Paleo-Indian, the Eastern Archaic, and Woodland traditions. Cultural change of the region can be summarized as a gradual increase in social complexity, punctuated by several important cultural or technological innovations.

Paleo-Indian Period (ca. 10,000-8000 BC). Hunter-gatherer bands of the Paleo-Indian culture were the first humans in New York State after the last glacial retreat approximately 11,500 years ago. While much of the northern part of the state was locked in ice, it is possible that the environmental fluctuations that occurred during this early period were conducive to periodic forays by the Paleo-Indian groups into the region when conditions were suitable. As the climate gradually became more temperate, these forays likely became more extended.

The archaeological record suggests that Paleo-Indian subsistence strategies emphasized hunting big game species, many of which are extinct. These included mastodon, mammoth, great beaver, caribou and moose-elk, along with a variety of smaller game. Few tool associations have been made with aquatic resources, although this food source was probably utilized as the climate moderated (Funk 1972:11; Ritchie 1980; Salwen 1975). The remains of mammoths and mastodon have been throughout much of the state (Ritchie 1980:10-11).

Adapted to the tundra, Paleo-Indians utilized a nomadic settlement system in which their movements followed that of game. During the seasonal resource peaks, larger populations occupied strategically located base camps; and during periods of scarce resources, the population dispersed, occupying small camp sites and rockshelters on a temporary basis. A band level social organization is attributed to Paleo-Indian groups, with each band consisting of 25 or 30 people (Snow 1980:150, after Beardsley et al. 1956; Fitting 1968; Funk 1978). As climatic conditions allowed more permanent occupation of an area, this wandering became more restrictive and bands settled into loose territories.

Technologically, the Paleo-Indian period has been associated with the fluted Clovis point industry. These points are generally large (2.5 to 10 centimeters [1 to 4 inches] in length), with a flute on each face that facilitated hafting (Funk and Schambach 1964; Snow 1980).

Archaic Period (ca. 8000-1500 BC). The Archaic period is differentiated from the Paleo-Indian period by a functional shift in lithic technology, an apparent increase in population, changes in the subsistence strategy, and a less nomadic settlement system (Funk 1978; Tuck 1978b). These changes reflect an adaptation to an improved climate

and a more diversified biome (Funk 1972:10). Three subdivisions are generally recognized for the Archaic: Early, Middle, and Late.

The Early Archaic tool kit consisted of Hardaway, Dalton, Palmer corner-notched, Kirk corner-notched, and bifurcate base points which frequently had serrated edges (Funk 1993). People of the Early Archaic also used end scrapers, side scrapers, spokeshaves, drills, gravers, choppers, hammers, and anvil stones. Although archaeological sites from the Early and Middle Archaic are rare, important sites have been found in central and eastern New York, in Ulster County and near Sylvan Lake, as well as western Connecticut, the upper Delaware valley and the Susquehanna valley (Dent 1991; Funk 1991, 1993; Nicholas 1988).

In addition to an improved climate and more diversified biome, a few technological changes, such as the production of ground and polished stone tools, serve to identify the Middle Archaic period (6000-4000 BC) (Funk 1991; Kraft 1986). The bannerstone, probably used as an atlatl weight, and the bell pestle were Middle Archaic innovations (Griffin 1967). People began to develop woodworking tools during this period, using coarse-grained stones and river cobbles as their raw materials. The Middle Archaic tool kit included anvil stones, choppers, netsinkers, an array of projectile points, axes, adzes, gouges, choppers and other woodworking implements (Funk 1991; Kraft 1986). The territorial "settling in" process begun during the Early Archaic continued into the Middle Archaic, stimulating a process of group isolation. Sites from these periods cluster along major rivers and marshy, swampy land as well as lowlands.

During the Late Archaic period (4000-1500 BC) hunting, fishing, and gathering remained the principal daily activities, although greater emphasis was placed on deer and small game like birds and turtles, shellfish, nuts and possibly wild cereal grains like *Chenopodium*. Associated with the shift in subsistence strategies was the increase in population densities, and as population increased, camps became larger and more numerous. Bands moved seasonally or when resources dwindled. Most sites of the Late Archaic period were seasonal, special purpose habitation sites such as hunting camps, spring fishing stations, fall nut gathering and processing stations, and shellfish processing, while some settlements located near major rivers or lakes were multi-activity spring and summer villages (Ritchie and Funk 1973). Groups probably congregated cyclically for exchange and socialization. Houses of this period may have been rectangular, 4.3 to 4.8 m (14 to 16 ft) long and 2.1 to 4 m (7 to 13 ft) wide.

The Terminal Archaic, sometimes called the Transitional period (ca. 1500-1000 BC), features a continuation of Late Archaic cultural and economic patterns, with a few innovative traits. Among these are a developing burial/ceremonial complex and, toward the end of the period, the introduction of ceramics. The shift to pottery appears to have been preceded by the adoption of steatite or soapstone pots which made cooking and food preparation easier (Ritchie and Funk 1973:87; Funk 1993:198).

Woodland Period (1000 BC-AD 1500). The Woodland period in the Northeast can be characterized as one of innovation. While the previous hunting and gathering economy continued as a means of subsistence during Woodland times, native groups became more and more dependent on domesticated plants for food. This gradual shift to domestication is in itself less important than the ramifications of the shift. Agriculture brought with it a score of new problems that required new adaptations, and every aspect of native culture was transformed. With agriculture came settled village life, a general increase in population, technological changes, warfare, and a litany of social and political changes. Early and Middle Woodland sites often contain exotic and numerous trade goods within burials which suggest the existence of widespread exchange or trade networks.

The Early Woodland period (1000-100 BC) is marked by the Meadowood phase in western New York. Meadowood sites are usually small and found on terraces or along rivers or streams. The Riverhaven 2 site, located along the Niagara River on Grand Island, represents one of the most important and well-studied Meadowood assemblages in the northeast. The site appears to have been intensively and repeatedly occupied from late autumn to early spring. Although, the Early Woodland is marked by an increase in burial ceremonialism, few sites which may be interpreted as such have been recorded in western New York. Granger (1978) reported one that had been reported on Buffalo Creek but was subsequently destroyed by urban development. It was a burial site where bodies of several individuals were covered with red ochre and were accompanied by caches of chert blades (Herold 1993:23).

The Middle Woodland period (100 BC-AD 1000) shows continued long distance exchange, although perhaps with varying strength at different times. In the Finger Lakes and surrounding locales in central and western New York, a sequence of occupation sites shows evidence of a long, Middle Woodland cultural tradition referred to as Point Peninsula (Ritchie 1980).

Point Peninsula tradition is expressed primarily by ceramic traits and is usually thinner than previous types and cordmarked on the exterior. It is often decorated with dentate-stamped, rocker-stamped or cord-wrapped-stick markings. Point Peninsula pottery has been found at the Martin site on Grand Island (Herold 1993:25). No house structure patterns have been found in New York, but analogous Canadian sites show the presence of rectangular structures measuring 10 to 16 feet by 16 to 23 feet, and containing single hearths. The single hearth and the house size would suggest a basic household social unit no larger than an extended family.

In New York State, the two primary Late Woodland Traditions are Owasco (beginning ca. AD 1000) and the prehistoric Iroquois (ca. AD 1300). Like most cultures in the northeast at this time, Owasco subsistence was based on hunting, gathering, fishing and horticulture. The Owasco were the first in this area to rely on a significant cultivation of maize. By the fifteenth century, a variety of Northern Flint corn proliferated after the introduction of beans and squash. The development of bean and

squash horticulture is roughly correlated to a growth in population and village size. As time passed, Owasco peoples became more and more dependent on these cultigens, until they finally became the primary source of subsistence (Winter 1971).

The horticultural complex of corn, beans and squash, a common occurrence in North and Central America, are found together in some of the earliest Late Woodland sites in this region (Ritchie and Funk 1973), indicating the importance of these plants for at least some early garden systems and subsistence strategies (Fritz 1990; Smith 1992). It is generally accepted that a heavy reliance on corn horticulture was supplemented by growing beans and squash, with declining roles for hunting, fishing and gathering. Many local cultures with a lower reliance on agriculture may have included wild foods in the subsistence mix to a greater extent, particularly where animal protein could be substituted for the amino acid complement provided elsewhere by beans. Primary animal prey most likely included one or more of deer, fish, and shellfish, based on faunal evidence, site locations, and the prevalence of netsinkers and other fishing technology at some sites (Cleland 1982; Ritchie 1980; Ritchie and Funk 1973).

Each of the five Iroquois nations is represented by a cluster of sites during the late prehistoric and protohistoric periods. In some cases, Owasco sites occur in sufficient proximity to suggest hypothetical ancestors of the Iroquois site cluster (Tuck 1971, Snow and Starna 1986), although settlement pattern change is apparent. Owasco sites are often located adjacent to rivers, other sizable streams and lakes, or on bluffs or terraces immediately overlooking these kinds of water bodies. Iroquois villages, however, tend to be located on hillier sites, often defensible elevations near springs or small creeks.

Near the beginning of the Late Woodland period, groups lived in semi-sedentary villages. Like the later Huron, these groups moved their villages every 15 to 20 years in response to changing environmental conditions. While the impetus for village relocation most often cited is soil depletion (White 1960, 1961), other factors including game and fire wood depletion and refuse accumulation may also have contributed. Game depletion, in particular, may have been a strong motivation for relocation, since deer provided a resource for both food and clothing (Gramly 1977).

To the north, in Erie County, there were two contemporaneous villages located just south of Buffalo which are known to have moved their villages between A.D. 1560 and 1650. One village moved from Elma to East Aurora, while the other shifted from South Buffalo to West Seneca, to Orchard Park and finally to Hamburg. Along the Cattaraugus River there are a number of village sites that are believed to represent the movement of another Iroquois community (Englebrecht 1993:29)

In conclusion, important changes occurring in this period were social rather than technological or economic. The technology of the period is characterized by refinement of the developments of earlier periods with styles and techniques becoming more

regionalized. Horticulture, primarily the growing of corn, beans and squash, was the primary source of plant food for the prehistoric Iroquois, but never totally supplanted the hunting, fishing, and collecting strategy as the most important means of subsistence procurement. Agriculture necessitated sedentarism and, with the added premium placed on land, territorialism also increased.

2.2 HISTORIC PERIOD

Three Iroquoian peoples occupied western New York prior to the arrival of the Europeans: the Neutral, the Wenro, and the Erie. A fourth Iroquoian group, the Seneca, inhabited areas well northeast of the project area, but would assert their power in the region's affair beginning in the seventeenth century (White 1978a, 1978b; Abler and Tooker 1978). The Erie occupied parts of Erie, Chautauqua, and Cattaraugus counties south of Buffalo Creek to Sandusky, Ohio (Parker 1922:493). Seneca hunting territory extended from Lake Ontario to the headwaters of the smaller Finger Lakes, and from the Genesee River to the Cayuga Lake (Tuck 1978a; Tooker 1978; White 1961).

The fur trade was central to the Seneca Iroquois economy and they vigorously protected their position as suppliers of pelts. After 1600 AD, the supply of animal skins diminished within Seneca territory. Because of this shift in resources, the Seneca expanded the range of their hunting and trading efforts into the traditional areas of other Iroquoian groups. Between 1638 and 1655, the Seneca warred against their rivals in western New York to secure the resources of the Niagara Frontier. The Seneca "dispersed" (e.g., annihilation and assimilation) the Wenro (by 1638), the Huron Confederacy (1649), the Petun (1650), the Neutral Confederacy (1651) and, finally, the Erie Confederacy (1655). By the mid-seventeenth century, the League Iroquois of New York emerged as a politically, militarily, and economically united confederacy with sole access to both the land and resources surrounding the lower Great Lakes. The immediate project area remained a sparsely settled, hinterland of the Seneca, subject to hunting and resource procurement (Abler and Tooker 1978:505-507; White 1978b:414-416; Turner 1974 [1850]:116-119, 143-147, 184; Trigger 1978:354-356).

The French were the first Europeans to explore Western New York. As early as the 1620s, Jesuit missionaries and French traders were establishing contacts with the local native groups. Father Roche-d'Allion, a French Jesuit, is reported to have noted a petroleum pool near Cuba (at the Cattaraugus-Allegany county line) in July 1627 (Frisbie 1996). These visits to the region were infrequent until the 1660s (Doty et al. 1940; White 1978a:409). For almost all of the seventeenth and eighteenth centuries European activities in the Niagara Frontier involved limited religious, commercial, and military endeavors. In 1678-1679, as part of general reconnoitering and trade expeditions by the French in the Niagara valley, men under the direction of René-Robert Cavelier de La Salle constructed a ship called *Le Griffon* along the Niagara River which would be the first sail vessel to ply the waters of Lake Erie and prosecute

the Great Lakes fur trade. During their explorations of the interior of what is now Chautauqua County, La Salle and his party were the first Europeans to see what is now Chautauqua Lake (Abler and Tooker 1978:505-507; White 1978b:414-416; Turner 1974 [1850]:116-119; Trigger 1978:354-356).

As the fur trade became an imperial concern for the European powers during the seventeenth and eighteenth centuries, competition among these powers resulted in the erection of fortified trading posts along the frontier, such as the French Fort Conti in 1679 (later, Fort Niagara), and the British fort near the future village of Geneva. Despite consistent failures in establishing permanent trading posts, French strategists continued to accept the idea that asserting control over the Great Lakes offered strategic advantages for their imperial goals. As a result, by the middle of the eighteenth century, the French had created a string of military and trading installations. These forts extended from Fort Niagara along Lake Ontario, south to Buffalo Creek, and along the southern shore of Lake Erie to Presque Isle (present-day Erie, Pennsylvania) into the Ohio valley. West of Cattaraugus County, forts included Fort Le Boeuf at French Creek, and Fort Machault at the confluence of French Creek and the Allegheny River (Abler and Tooker 1978:506-507; Tooker 1978:431-432; Turner 1974 [1850]:143-147, 184). In 1749, a French expedition under the direction of Captain Bienville de Celeron marched through the Chautauqua County woods in an effort to drive out British interlopers. As they went, they dropped engraved plates which proclaimed French sovereignty of the area. The party is known to have camped in what is now the Town of Ellicott, southwest of the project area (Tooker 1978:432-434; Turner 1974 [1850]:69, 184-185; White 1978b:415-416).

The rivalry between the British and the French intensified during the course of the eighteenth century, reaching a crescendo during the 1750s, when the two countries again went to war. After a 19-day siege, British troops captured Fort Niagara in July 1759. This crippled the French presence in the region, although skirmishing between Native Americans and the English continued until the closing days of the French and Indian War (Turner 1974 [1850]:228-233).

During the American Revolution, warfare on the frontier remained in eastern New York, and consisted of raids along the Mohawk and Wyoming valleys (Abler and Tooker 1978:508). In 1779, Major General John Sullivan led a punitive assault into the heart of Iroquois country in an effort to halt Iroquois incursions against American settlers. After defeating a combined force of British Rangers and Native Americans at Newtown (the future city of Elmira), the large invading army moved north, up the east side of Seneca Lake, adopting "scorched earth" tactics and destroying everything in their path. The swath of destruction stretched from Newtown all the way to Canandaigua and Honeoye, to the Genesee River. As part of that campaign, Colonel Daniel Broadhead led a complementary maneuver to drive Indians and their British allies from the Allegheny valley. His troops destroyed ten native villages during their march up the Allegheny River between Fort Pitt (present-day Pittsburgh) and Olean Point (Abler and Tooker 1978:507-508; Ellis et al. 1967:115-117).

Badly beaten, the Iroquois retreated to the Niagara valley where they suffered through a miserable winter of hardship and hunger. While Iroquois raids would continue for the remainder of the war, the Seneca were no longer a major military threat. Abandoned by their British allies after the Treaty of Paris (1783), which formally ended the Revolutionary War, the Iroquois were forced to deal with the Americans, who aspired to usurp their lands (Abler and Tooker 1978: 507-508; Ellis et al. 1967:115-117).

As a result of the Second Fort Stanwix Treaty (1784) the Iroquois lost all their land west of the Genesee River, except for small reservations. This treaty was disputed by several groups of Iroquois until 1794, when another treaty was signed at Canandaigua between the United States and the Six Nations which defined the boundaries of Seneca lands and the reservations to the other Iroquois groups (Abler and Tooker 1978:508; Goldman 1983:27-31). Native American title to the land in western New York was largely extinguished with the Treaty of Big Tree (present-day Geneseo, New York) in 1797, although several areas were still reserved for the Native Americans to use and live on. Among these areas were the Cattaraugus, Allegany, Buffalo Creek and Tonawanda Creek reservations as well as areas along the Genesee River and a one square-mile reservation at Oil Spring (Turner 1974 [1850]:403; Abler and Tooker 1978:508-509, 512; Goldman 1983:27-31). The Cattaraugus reservation, which straddles Cattaraugus Creek, is approximately 6 miles north of the project area. Recently, some Iroquois groups have challenged several late-eighteenth century and early-nineteenth century treaties in U.S. federal court, attempting to have some of their former lands in western and central New York State returned.

European-American settlement of the Niagara Frontier dates from the end of the American Revolution in 1783, although border disputes between New York and Massachusetts, both of which claimed the new territory, frustrated the actual, legal sale of these lands. Under an agreement signed in Hartford, Connecticut in 1786, the land once occupied by the Iroquois came under the jurisdiction of New York State. Nonetheless, the Commonwealth of Massachusetts maintained the right to sell the land west of Seneca Lake. During the next decade large grants of land in western New York were sold to private investors who attempted to open the land to settlement, except for a one-mile wide strip of land along the eastern bank of the Niagara River, which New York State reserved for itself (Ellis et al. 1967:152-156; Schein 1993:5-8; Abler and Tooker 1978:507-509; Turner 1974 [1850]:326). The Commonwealth of Massachusetts sold the rights to the unsurveyed portion of the area to Robert Morris in 1791. Reserving a portion of the land for his own purposes, Morris sold the remainder, including all of the present Cattaraugus County, to a consortium of Dutch investors, called the Holland Land Company, in 1792-1793 (Turner 1974 [1850]:396-403; Ellis et al. 1967:154-156).

Theophilus Cazenove, Philadelphia-based agent of the company, contracted Joseph Ellicott in July 1797 to survey the company's land in western New York and divide it into townships (Doty et al. 1940; Turner 1974 [1850]:62-63). In 1808 the

counties of Niagara (which included what are Erie and Niagara counties), Cattaraugus and Chautauqua were created from Genesee County, although Cattaraugus only existed on paper. Niagara County maintained jurisdiction over Cattaraugus County until 500 taxable inhabitants living within its borders qualified to vote for members of the state assembly. Upon its creation in 1808, Cattaraugus County was coterminous with the Town of Olean until 1812, when the Town of "Ischua" (now Franklinville) was created (Beers 1880:15; Adams 1893:55, 854; Harris and Mack 2000; Doty et al. 1940: 590; Pearson et al. 1940:4).

Although townships had been surveyed and roads in the area cut, settlement and growth were slow to follow. Early European settlers entered the region during the early 1800s up from Pennsylvania, along Cattaraugus Creek, or by Chautauqua Lake and other waterways through neighboring Chautauqua County. The first European settlement in Cattaraugus County was in 1798 at Old Town, by three men from the Society of Friends of Philadelphia (Pearson et al. 1940:4-5; Adams 1893; Ellis 1879). The first permanent settlement in the county took place in 1804 when Robert Hoops erected a cabin at Olean Point (East Olean) along the Allegheny River. Hoops was an agent for his brother Major Adam Hoops and David Heuston. Major Hoops purchased 20,000 acres in what are now Cattaraugus and Allegany counties in January 1803 on advice from his son, Adam, Jr., who was a surveyor for the Holland Land Company. The settlement at Olean Point was chosen because it was at the head of steamboat navigation on the Allegheny River, which would become a major point of embarkation for pioneers heading to Pittsburgh, Cincinnati, and the Western Reserve in Ohio (Beers et al. 1869:97; Olean, Cattaraugus Co. 2001; Adams 1893:57, 854; Ellis 1879:153-154). In 1807 the Allegheny River was made a public highway and Jedediah Strong, Bibbins Follett and Dr. Bradley floated a raft down the river to Pittsburgh from Olean, which set the precedent for the local logging industry (Ellis 1879:154; Adams 1893: 856).

The settler in what is now Gowanda was Turner Aldrich who acquired more than 700 acres on both sides of Cattaraugus Creek in 1810. Turner Aldrich erected a saw mill near Cattaraugus Creek in 1810 and a grist mill nearby in 1815. Known at the time as "Aldrich's Mills," the future village of Gowanda took shape around the mills. Ahaz Allen purchased 300 acres north of Aldrich in 1812 and later erected a dam on the creek to create a saw mill. Other early pioneers included Stephen Lapham, Stephen Wilber, Joshua Palmerton, Stephen Peters, and Augustus Smith in 1810; and Luke Crandall, Allen King, Arnold and John King, John Williams, and Jehial Abbee in 1811. Stephen Lapham and John Lawton erected sawmills in 1811 (White 1898:I:525-526; Hillis 2001). The village of Gowanda due to its location astride Cattaraugus Creek would attract numerous businesses and serves as the commercial and manufacturing center of the area. Early industries included wheat farming, black salts, timber, charcoal, and tanning. Grist and saw milling, sheep and wool-making were important industries later in the century (Doty et al. 1940:810-811). After the Civil War, dairying, butter and cheese manufacturing, and oil/natural gas production in the southern part of the county came into prominence (Doty et al. 1940:812, 814).

The Town of Perrysburg was created from the towns of Olean and Ischua on August 13, 1814, and named for Commodore Oliver Hazard Perry. The first settler in the township was John Clark, ca. 1815. By 1818 the present town of Perrysburg had 49 landowners, most of whom never developed their holdings. Other settlers included Phineas Spencer in 1815, Hugh Campbell, William Cooper, Truman Edwards, Daniel Johnson, Simeon Waterman, Ralph Griswold in 1816 and Elanson Dewey, Ephram Walker, Abel Jolles, and George Fowler in 1817 (Doty et al. 1940:598; Hillis 2001).

The first settlers in the area that would become the Town of Dayton were Silas Nash and his family and Simeon Bunce, his brother-in-law, all of whom settled in the southeastern part of the town in 1810. Nash's son Aras was the first child born in the town (1811), while another son of Silas Nash, De Witt, was the first to die (1812). Nash built the first sawmill in Dayton at West Dayton in 1817. Other early settlers include Joshua Webb, who settled on Lot 56, Ralph Johnson on Lot 301, and Heman and Anson Merrill on Lots 30 and 31, in 1815. The next year Lehman H. Pitcher settled on Lot 58 (Town of Dayton 2001). The project area is located in Lot 37. The owners of land in this lot in 1819 were Lyman Wood, Nathaniel Blasdel, and Frederick A. Redfield (Town of Dayton 2001).

With its population hovering around 537 residents, Cattaraugus County was officially created on March 26, 1817, although the county courts did not open session in Olean until July 3. Due to poor roads, nothing to sell, no market for goods or services, and general frontier poverty, settlement of the area lagged. Early population centers were at Olean and Ellicottville (Adams 1893:58-59, 857; Cattaraugus County 2001). The first inn in what is now the Town of Dayton was opened by Caleb Webb in 1827 and the first store was operated by William H. Leland in 1833. The Town of Dayton was formed from the Town of Perrysburg on February 7, 1835. At the time of its establishment, the town contained four whole schools, and five fractional schools, with a total of 365 children were enrolled (Town of Dayton 2001).

In order to grow crops, the pioneers first had to clear their lots of trees. As a result, lumbering and timber by-products potash, pearl ash and charcoal—were the only early industries and a source of needed income for local homesteaders. Once cut and dried, the timber was burned and processed by asheries into either a white powder called “pearl ash” or potash, sometimes called “black salts.” The sale of wood ashes was the only cash-producing crop for many early settlers during their first years in western New York. Resulting from the burning of wood, potash could be used to make soap or glass, scour wool, bleach and dye cloth, and for other purposes. The production of charcoal at charcoal works and tanbark were other profitable timber-related industries during the nineteenth century. By the 1840s, frame houses had replaced the log homes of the pioneers (Adams 1893:58-59, 404; Fletcher 1971:329; Beers et al. 1869:97; Pearson et al. 1940:4; Town of Dayton 2001).

By the late nineteenth century, the most valuable timber had been removed and farming and dairying replaced lumbering. Much of the remaining trees were removed

and used for destructive-distillation wood products. The trees that remain are mostly secondary and tertiary growth trees. Craftsmen such as blacksmiths and metal workers used charcoal extensively and it was essential in smelting iron ore, one of the leading industries in western New York in the nineteenth and twentieth centuries. A by-product of clearing new ground for farming and lumbering, tanbark was created when bark from oak and hemlock trees was peeled off in the early summer and dried in four-foot strips. The green bark curled into cylinders that were used by local tanneries in curing animal skins while the barkless trees were cut into boards and shingles (Fletcher 1971:329; Ellis 1879:160-161).

While the pioneers worked the land in preparation to sow their crops or graze their animals, an abundance of wild animals provided options as a source of food. Deer, rabbit, raccoon, partridge and wild turkey populated the area's forests, as did dangerous competition from wildcats, wolves and bears. Substantial bounties were advertised for killed wolves, suggesting not only the economic importance the grazing of sheep and cattle held for settlers, but the degree of threat of depredation posed by wild animals (Fletcher 1971; Adams 1893:59).

With the completion of the New York and Erie Railroad from Hornellsville to Dunkirk in 1851 (begun in 1839) and the Genesee Valley Canal to Olean in 1856, agricultural commodities became important. The first product of Cattaraugus fields was grain, especially wheat and spring grains, as well as sheep-grazing; later dairying and mixed farming became preeminent. By 1855 county farmers were growing wheat, corn, oats, hops, and potatoes, and successfully exported maple sugar, honey and beeswax, in addition to butter, milk and cheese (Ellis 1879:159, 377; Beers et al. 1869:97; Adams 1893:60, 81-83).

After the Civil War, Gowanda emerged as the site of local manufacturing and industrial activities. These establishments included Vinton & Sons grist mill (which occupied the site of earlier mills), Gaensslen Brothers' tannery and associated glue factory (after 1874), Charles Kengott's glue factory (beginning in 1869), Agle & Sons' tannery on Thatcher Brook (established in 1845), M.T. Hill's lumber yard and cheese-box factory, as well as the usual wagon shops, blacksmith shops, and mechanics shops, stores and hotels (Ellis 1979:376-380).

Pine Valley (later known as South Dayton), located southwest of the project area in the Town of Dayton, was used as farmland until 1875, when land developers laid the area into lots to establish a village. The land passed through numerous owners prior to the creation of the village, including Lehman H. and James P. Pitcher (in 1816); M.C. Nickerson (no date); Farmer's Loan and Trust Company; William Tweedy (1838); Christopher Smith (1841); Daniel Smith (1845); Homer and Joseph Wheelock (1849); Fredrick C. Phillips (1864); and John and Cynthia Wickham (1865). Wickham sold a portion of his land to Robert F. Ewing in 1875, after which the village of South Dayton was plotted. Baron Hubbard named the growing hamlet Pine Valley in 1855. The first grocery store was opened in 1864 by David Barret. Wickham built a grist mill, hotel,

and 30 other buildings. Ewing constructed and other buildings. L. Rowe built another store in 1875. Mail delivery was on a volunteer basis, as residents took turns going to Perrysburg on behalf of the other residents. A post office was established after 1860. In the late 1890s, the village's name was changed to South Dayton (Town of Dayton 2001).

Although tanning and lumbering remained the principal industries of the county throughout the nineteenth century, the discovery of oil in northern Pennsylvania in 1859, and later in southwestern New York state, spurred a dramatic building boom and the county's prosperity after the Civil War. The first oil well in the county was dug in 1864. By 1878, there were 250 wells producing a high-grade paraffin-based oil (Pearson et al. 1940:4-5). Additional industries include furniture manufacture, tanning, glue making, cutlery manufacture, weaving, canning, and milk processing. In the village of Gowanda, Moench Tanning Company was formed in 1899 and Richard Wilhelm established the Eastern Tanners Glue Factory in 1903 (Hillis 2001).

In the nineteenth and early twentieth centuries, several rail lines served Cattaraugus County in the vicinity of the project area. Northeast of the project area, the Village of Dayton was a station on the main line of the New York & Erie Railroad (later the Erie Railway), beginning in May 1851. The Dayton station was midway between Salamanca and Dunkirk. This road connected with the Atlantic & Great Western Railway at Salamanca. The A&GW reorganized into the New York, Pennsylvania & Ohio Railroad (Nypano), and was leased by the Erie Railroad in 1883. The Erie purchased the entire Nypano capital stock in 1896, and took over the railroad in 1941. In 1960, the Erie Railroad merged with the Delaware, Lackawanna & Western (DL&W) to form the Erie-Lackawanna. In 1972, the line was absorbed into Conrail in 1976 (Fischer 2000a; University of Akron 1996).

Somewhat later, the Buffalo & Jamestown Railroad was organized in March 1872, and completed to Jamestown three years later. Running generally south from Buffalo, this line passed through Erie County before crossing Cattaraugus Creek at Gowanda, then turning southwesterly through the village of Dayton, where the line tunnels under the line of the Erie Railroad. This line serves as the southern boundary of the project area. Due to the economic dislocations caused by "the Panic of 1877," the Buffalo & Jamestown was reorganized as the Buffalo & Southwestern Railroad. The road was leased to the New York, Lake Erie & Western (NYLE&W) Railroad (ca. 1880) and was operated as a division of that until 1895, when the route was consolidated into the Erie Railroad. In the twentieth century, the line was known as the Buffalo Southern and later as the Erie-Lackawanna (Smith 1884:I:318; White 1898:I:419; Fischer 1999, 2000a). At present, a small freight line called the New York & Lake Erie Railroad (NY&LE) runs trains through the tunnel at Dayton between South Dayton and its headquarters in Gowanda. (Fischer 2000b).

In the twentieth century, the extension of Route 17 (the Southern Tier Expressway) through Cattaraugus County and the improvement of state and county highways has

facilitated access to the county as well as its economic development. By 1980, the population of Cattaraugus County was 85,697; and was 85,978 in 2000. The population of the Town of Dayton was 1,945 and the village was 662 in 2000 (Cattaraugus County 2001).

The project area was utilized for farming well into the twentieth century. Historic aerial photographs of the project area were reviewed by Benchmark Environmental Engineering & Science, PLLC, which "substantiate a historically sparse population and rural property use in the Dayton area, with the 1939 photo corroborating the recorded use of the Markhams property for farming prior to purchase by [Peter Cooper Corporation] in 1955" (Geomatrix 2001).

The Eastern Tanners Glue Company under various names manufactured animal-glue from 1903 to 1972 and industrial adhesives from 1972 to 1985 in its factory along Cattaraugus Creek in the Village of Gowanda. The factory was situated northwest of the Moench Tanning Company. In 1976, the Rousselot Gelatin Corporation of France purchased the company, renaming it the Peter Cooper Corporation (Danaky 2000; USEPA 2000). The Peter Cooper Corporation (as it is referred in most documents) purchased the project area southwest of the hamlet of Markhams in 1955 for use as a disposal area for its operations in Gowanda, approximately six miles to the northeast.

Between 1955 and September 1971, a reported 9,600 tons of sludge (both dry and liquid) derived from the animal-glue manufacturing process and the processing of treated animal hides were placed at the site over a 15-acre area. A rail spur was added ca. 1956 to facilitate the transfer of the materials. Later, in compliance with a June 1971 New York State Supreme Court order and judgment, approximately 38,600 tons of previously accumulated waste materials from the Gowanda plant were reportedly transferred to the Markhams Site in 1971 and 1972. No further disposal activities reportedly have occurred at the Markhams Site (Geomatrix 2001; USEPA 2000)

2.3 DOCUMENTARY RESEARCH

2.3.1 Historic Map Analysis. The historic map for the project area does not show any structures within the area of potential effect (Figure 2). The project area is located within the center of Lot 37 (Beers et al. 1869). No structures are shown within the area of potential effect. Historic aerial photographs of the project area were reviewed by Benchmark Environmental Engineering & Science, PLLC, which "substantiate a historically sparse population and rural property use in the Dayton area, with the 1939 photo corroborating the recorded use of the Markhams property for farming prior to purchase by [Peter Cooper Corporation] in 1955" (Geomatrix 2001).

2.3.2 Site File and Archival Review. A review of archaeological site files at the OPRHP was conducted by Ms. Kerry L. Nelson. No archaeological sites were identified within one mile of the project area.

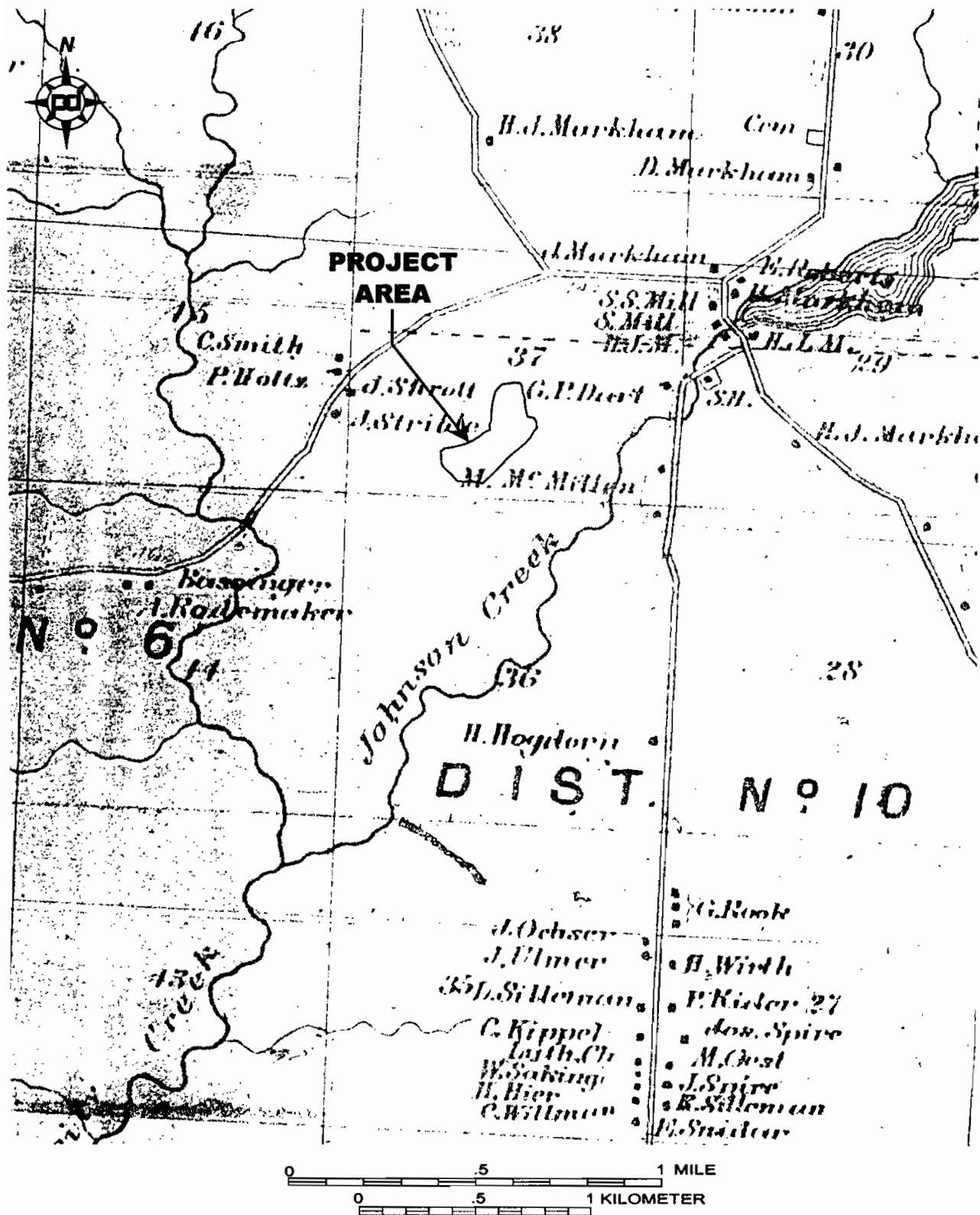


Figure 2. Location of the Peter Cooper Markhams project area within the Town of Dayton in 1869.

The early archaeological surveys by Beauchamp and Parker identify only one site in the Town of Dayton (Beauchamp 1900:32; Parker 1922:496). This site is a burial mound that was first identified by H.L. Reynolds in 1889. It was 36.5 m (120 ft) in circumference and 3 m (10 ft) high. The exact location is unknown. Later archaeological work by Ritchie (1980) and Ritchie and Funk (1973) also does not identify the presence any archaeological sites in the project area or its vicinity.

Previous Surveys. No previous surveys have been conducted for the project area or within one mile of it as recorded in the files of the New York State OPRHP.

3.0 Cultural Resources Sensitivity Assessment

3.1 METHODOLOGY

Cultural resource investigations are designed to provide a complete examination of the impact area in order to identify and assess any known or unknown cultural resources. These resources include archaeological sites (prehistoric and historic), and standing structures or other above-ground features. A Phase IA survey consists of a background/literature search, a site file check, and a field inspection of the project area. A review of archaeological and historic site files at the New York State OPRHP is conducted as an initial step to determine the presence of known archaeological sites within one mile of the area of potential effect. These files include data recorded at both the OPRHP and the New York State Museum. Results of the site file check are summarized in Section 2.3.2. The information regarding the prehistory and history of the project area is collected for the preparation of an historic context, which describes the cultural history of the area and provides the range of cultural ranges which may be present within the area of potential effect. Information collected during the Phase IA survey is used to assess the sensitivity of the project area for the presence of cultural resources.

The sensitivity of the project area is assessed through background research and field examination. Areas that are untestable or severely disturbed are identified according to the following criteria:

- graded and cut areas through surrounding terrain (e.g., hills or gorges) that are the result of road construction
- areas that appear to have over 1.5 meters (5 feet) of fill
- areas previously impacted by construction of utilities, drainage ditches, streets or other obvious areas of significant earth movement
- areas including poorly drained soils and wetlands
- areas having slopes greater than 15 percent

Areas of archaeological potential and high sensitivity are identified based on the following criteria:

- undisturbed areas that are environmentally sensitive with relatively level well-drained soils and/or in the vicinity of potable water such as springs, streams or creeks (these characteristics typify known site locations in the region)
- known prehistoric or historic site locations within or adjacent to the project area
- historic structures identified within or immediately adjacent to the project area

3.2 SENSITIVITY ASSESSMENT

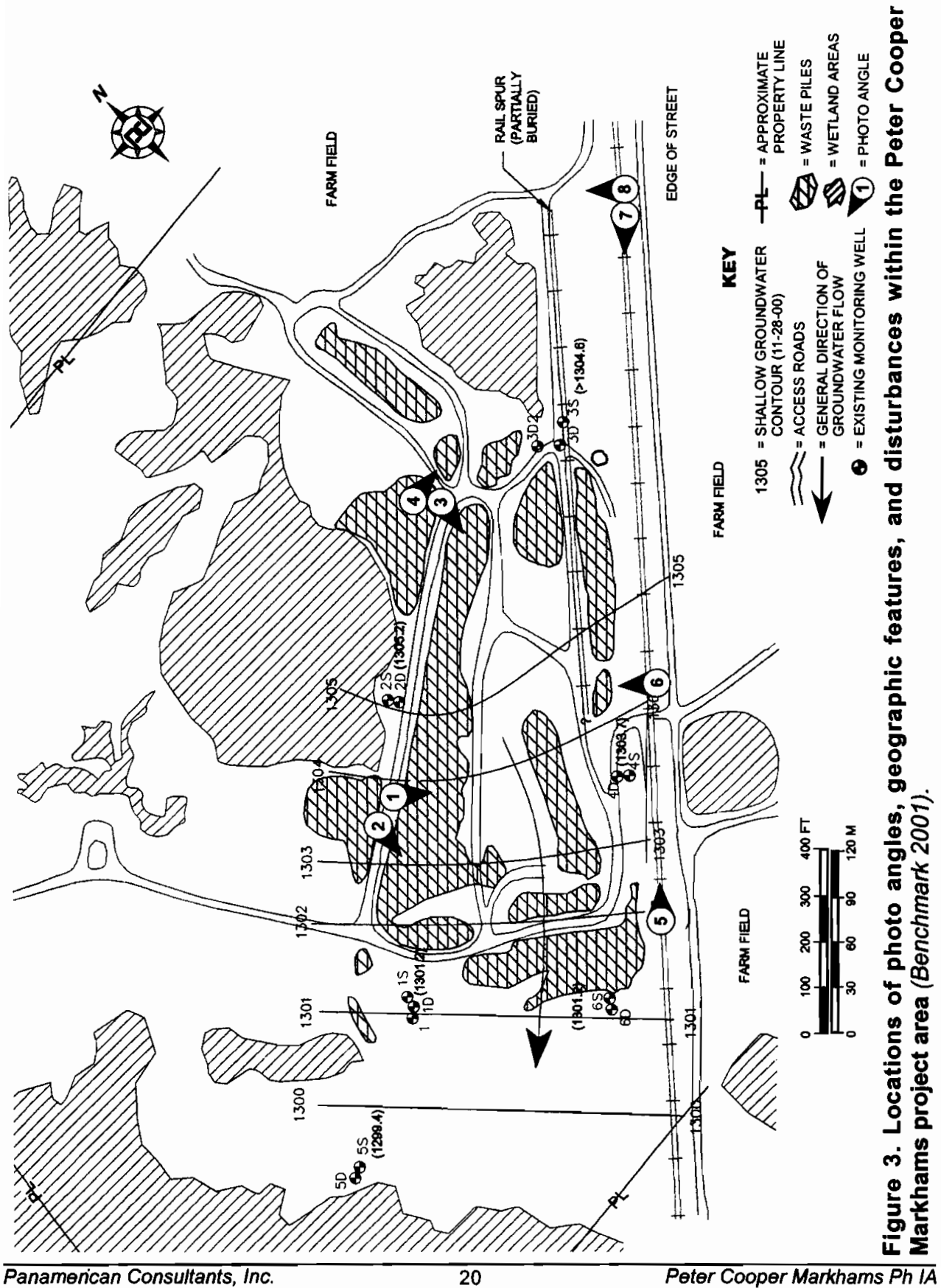
The extensive prior disturbance associated with the Peter Cooper Markhams glue factory results in remote sensitivity with respect to the presence of intact cultural resources in those areas of waste piles (Figure 3). Impact of the remaining areas may be limited to grading.

The Peter Cooper Markhams project area is determined to be sensitive for the presence of prehistoric archaeological sites. This sensitivity assessment is based on one of the three criteria (see Section 1.3): undisturbed areas with relatively level, well drained soils and in the vicinity of potable water such as springs, streams or creeks. Soils within the project area belong to the Canandaigua group of soils, which are dominantly nearly level and gently sloping, very deep, somewhat poorly drained to very poorly drained, medium textured silt on broad flats in valleys (Puglia 1994:98). The project area is located between two water sources. Johnson Creek is east of the project area; it flows in a southwesterly direction from a pond at the Village of Markhams. Slab City Creek, west of the project area, flows north to south, into Johnson Creek, southwest of the project area. Intermittent portions of the project area are designated wetlands that would have been suitable sources of water for small prehistoric camps.

3.2 CONCLUSIONS AND RECOMMENDATIONS

Due to the proximity of the project area to two water resources (Slab City Creek and Johnson Creek) and the presence of wetland areas within the site boundaries, the Peter Cooper Markhams project area is sensitive for prehistoric sites. Therefore, a Phase IB investigation is recommended for those portions of the project area which will be impacted by remediation activities (e.g., roads and borrow areas) and have not been previously disturbed. A Phase IB investigation is not recommended for the disturbed areas of waste piles within the project area.

The Phase IB survey should conform to NYAC standards and comply with all relevant OSHA requirements for excavating within a hazardous waste site.



4.0 References

Abler, Thomas S., and Elisabeth Tooker

1978 Seneca. In *Northeast*, edited by Bruce G. Trigger, pp. 505-517. Handbook of North American Indians, vol. 15, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Adams, William

1893 *Historical Gazetteer and Biographical Memorial of Cattaraugus County, New York*. Lyman, Horton & Company, Ltd, Syracuse.

Beardsley, Richard K., P. Holder, A.D. Krieger, B.J. Meggers, J.B. Rinaldo, and P. Kutsche

1956 Functional and evolutionary implications of community patterning. In *Seminars in Archaeology: 1955*, edited by R. Wauchop. Memoirs of the Society of American Archaeology, No. 11, Salt Lake City, UT.

Beauchamp, William M.

1900 *Aboriginal Occupation of New York*. New York State Museum Bulletin Vol. 7, No. 32. Albany.

Beers, D.G., J.H. Goodhue, and E.F. Sanford

1869 *Atlas of Cattaraugus County, New York*. D.G. Beers & Co., New York.

Cattaraugus County

2001 Demographic & Census Information. On Internet at: <http://www.co.cattaraugus.ny.us/maps-photos/Demographics/ccpopu.htm>.

Cline, M.G., and R.L. Marshall

1976 *General Soil Map of New York State*. Cornell University Agriculture Experiment Station, Soil Conservation Service, U.S. Department of Agriculture.

Cressey, George B.

1977 Land Forms. In *Geography of New York State*, edited by John H. Thompson, pp. 19-53. Syracuse University Press, Syracuse, NY.

Danaky, Linda

2000 Sins of the Fathers: Toxic Waste legacy for Many WNY Communities. *Dunkirk Observer*, December 10, 2000. On Internet at: <http://nibrantfill.freesevers.com/sins.html>.

de Laubenfels, David J.

1977a Vegetation. In *Geography of New York State*, edited by John H. Thomson. pp. 90-103. Syracuse University Press, Syracuse, NY.

1977b Soils. In *Geography of New York State*, edited by John H. Thomson. pp. 104-110. Syracuse University Press, Syracuse, NY.

Dent, Richard J.

1991 Archaeology in the Upper Delaware Valley: The Earliest Populations. In *The People of Minisink*, edited by D.G. Orr and D.V. Campana, pp. 117-144. National Park Service, Philadelphia.

Doty, William J., Charles E. Congdon, and Lewis H. Thornton

1940 *The Historic Annals of Southwestern New York*. 3 vols. Lewis Historical Publishing Co., Inc., New York.

Ellis, David M., James A. Frost, Harold C. Syrett and Harry J. Carmen

1967 *A History of New York State*. Cornell University Press, Ithaca, New York.

Ellis, Franklin

1879 *History of Cattaraugus County, New York*. L.H. Everts, Philadelphia.

Englebrecht, William E.

1993 Late Woodland in Western New York. In *Prehistory of Western New York*, pp. 27-34. State University of New York at Buffalo and the Frederick M. Houghton Chapter of New York State Archaeological Association.

Fischer, Mark

1999 Buffalo & Southwestern Railroad in *Western New York Railroad Archive* on Internet at http://wnyrails.railfan.net/bsw_home.htm.

2000a Erie Railroad in *Western New York Railroad Archive* on Internet at http://wnyrails.railfan.net/erie_home.htm.

2000b Dayton, New York in *Western New York Railroad Archive* on Internet at http://wnyrails.railfan.net/dayton_home.htm

Fitting, James E.

1968 Environmental Potential and the Postglacial Readaptation in Eastern North America. *American Antiquity* 33(4):441-445.

Fletcher, Stevenson Whitcomb

1971 *Pennsylvania Agriculture and Country Life, 1640-1840*. Second printing (First printing 1950). Pennsylvania Historical and Museum Commission, Harrisburg.

Frisbie, Richard

1996 Early Allegany County History. On Internet at <http://www.hopefarm.com/allegany.htm>

Funk, Robert E.

1972 Early Man in the Northeast and the Late Glacial Environment. *Man in the Northeast* 4:7-42.

1978 Post-Pleistocene Adaptations. In *Northeast*, edited by Bruce G. Trigger, pp. 16-27. Handbook of North American Indians, vol. 15, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

- 1991 The Middle Archaic in New York. *Journal of Middle Atlantic Archaeology* 7:7-18.
- 1993 *Archaeological Investigations in the Upper Susquehanna Valley, New York State, Volume 1*. Persimmon Press, Buffalo.
- Funk, Robert E., and Frank F. Schambach
1964 Probable Plano Points in New York State. *Pennsylvania Archaeologist* 34:90-93.
- Geomatrix
2001 *Remedial Investigation/Feasibility Study Work Plan Peter Cooper Markhams Site, Dayton, New York*. Geomatrix Consultants, Inc., Williamsville, NY.
- Goldman, Mark
1983 *High Hopes; The Rise and Decline of Buffalo, New York*. State University of New York Press, Albany.
- Gramly, Richard M.
1977 Deerskins and Hunting Territories: Competition for a Scarce Resource in the Northeast. *American Antiquity* 42:601.
- Granger, Joseph E.
1978 Meadowood Phase Settlement Pattern in the Niagara Frontier Region of Western New York. *Anthropological Papers*, Museum of Anthropology, University of Michigan 65. Ann Arbor.
- Griffin, James B.
1967 Eastern North American Archaeology: A Summary. *Science* 156:175-191.
- Hillis, Jean C.
2001 A Brief Early History of the Town of Persia. On Internet at <http://www.buffnet.net/~macdowell/cross/persia.htm>.
- Herold, Elaine B.
1993 Early and Middle Woodland in Western New York. In *Prehistory of Western New York*, pp. 22-26. State University of New York at Buffalo and the Frederick M. Houghton Chapter of New York State Archaeological Association.
- Nicholas, George P. (editor)
1988 Ecological Leveling: The Archaeology and Environmental Dynamics of Early Postglacial Land Use. In *Holocene Human Ecology in Northeastern North America*, pp. 257-296. Plenum Press, New York.
- Olean, Cattaraugus Co. 2001
2001 Olean, Cattaraugus County, NY. On the Internet at <http://www.rootsweb.com/~nycattar/towns/olean.htm>
- Parker, Arthur C.
1922 *The Archaeological History of New York*. New York State Museum Bulletin Nos. 235-238. Albany.

Appendix A PHOTOGRAPHS





Photograph 1. A view of waste piles in the central part of the project area, facing southeast (PCI 2001).



Photograph 2. A view of waste piles in the central part of the project area, facing south (PCI 2001).



Photograph 3. A view of waste piles in the northern part of the project area, facing south (PCI 2001).



Photograph 4. A view of waste piles in the northern part of the project area, facing east (PCI 2001).



Photograph 5. A view of the abandoned railroad bed from the southern part of the project area, facing northeast (PCI 2001).



Photograph 6. A view of waste piles from the abandoned railroad bed in the southern part of the project area, facing northwest (PCI 2001).



Photograph 7. A view of the abandoned railroad bed from the northern part of the project area, facing southwest (*PCI 2001*).



Photograph 8. The northern edge of the project area with a cornfield in the background, facing northwest (*PCI 2001*).

Appendix B

VITAE OF PROJECT PRINCIPALS

PCI BUFFALO • TUSCALOOSA • MEMPHIS • TAMPA

Panamerican Consultants, Inc. • 2390 Clinton Street • Buffalo, NY 14227 • (716) 821-1650 • Fax (716) 821-1607

MICHAEL A. CINQUINO, Ph.D. **Senior Archaeologist, Senior Vice President**

EDUCATION

- Ph.D. Anthropology, State University of New York at Stony Brook, 1986
- M.A. Anthropology, State University of New York at Stony Brook, 1977
- B.A. Sociology, St. John Fisher College, Rochester, New York, 1971

EXPERIENCE

Dr. Cinquino is Senior Vice President of Panamerican Consultants, Inc. (PCI), a senior archaeologist, and director of the Buffalo (New York) Branch Office. He has served as project manager/principal investigator on over 100 cultural resources projects throughout New York, Pennsylvania, New Jersey, Puerto Rico, the U.S. Virgin Islands, and the United States. These projects include natural gas pipelines, developments, transportation projects, flood control projects for the Corps of Engineers, light rail rapid transit systems, industrial parks, wastewater treatment plants, fuel storage projects, interceptor sewers, a demolition project, construction monitoring, and U.S. military installations. In addition, he prepared numerous cultural resource sections for environmental assessment, impact statements, environmental resource documents, and cultural resource management plans and environmental audits.

He is experienced at conducting cultural resource investigations on large-scale projects including corridor pipeline and highway projects, military installations, wastewater projects, etc. which often require detailed archival and historic map research, design of field methodology including predictive site modeling strategies, all phases of archaeological field investigations, documentation and report preparation. He has conducted investigations at military installations throughout the Eastern United States, Puerto Rico and in the Virgin Islands.

Dr. Cinquino also has extensive regulatory experience on the federal and state levels as State Archaeologist and Review and Compliance Archaeologist for the Puerto Rico State Historic Preservation Office (SHPO) and as a consultant for the New York State Department of Environmental Conservation (NYSDEC) directing the cultural resource review for the NYSDEC permit program and SEQRA compliance. As an employee of Ebasco, he assisted in report reviews for the Federal Energy Regulatory Commission.

He is a member of the Register of Professional Archaeologists and certified in Field Research and Archaeological Resource Management. He is also on the New York State SHPO's list of archaeologists and a member of the New York Archaeological Council certified to conduct all phases of investigations in prehistoric and historic archaeology. Dr. Cinquino has completed the hazardous waste training course and is familiar with archaeological investigations in areas of potential hazard (e.g., hazardous materials, unexploded ordnance).

preparing documentation for FERC certificated EISs and EAs. He conducted various cultural resource projects including serving as co-principal investigator for a Stage 1A Cultural Resource Survey, Olean Superfund Site, Cattaraugus County, NY.

Puerto Rico State Historic Preservation Office (3 Years), San Juan, Puerto Rico

Dr. Cinquino served as State Archaeologist and Review and Compliance Archaeologist for the PRSHPO. His responsibilities included direction of the Review and Compliance Section for Archaeology, review of Stage I/A/B, II, and III cultural resource reports, environmental assessments and impact statements for compliance of federal preservation laws and regulations, initial project assessment to determine level of archeological investigation, review of archeological proposals to conduct site testing (Stage II) and data recovery/mitigation (Stage III) investigations, site inspection visits through the island, review of cultural resources for eligibility to the National Register of Historic Places. He helped develop and implement field investigation and report documentation standards at the PRSHPO and for the PR Advisory Council guidelines for local projects.

He was the SHPO representative on the Advisory Council for the Protection of Terrestrial Archeological Patrimony of Puerto Rico, and Secretary for the Advisory Council for the Conservation and Investigation of Underwater Archeological Resource of Puerto Rico. These advisory councils were responsible for preparing archeological standards, reviewing archeological proposals for Stage II and Stage III intensive investigation, reviewing archaeological reports focusing on intensive archeological investigations, implementing Puerto Rican cultural resource laws and regulations, and reviewing and approving permits to conduct underwater salvage and archaeological investigations, and also acting as an arbitration committee for any disputes concerning cultural resources regulation or report review standards. He also served as PRSHPO representative to the Interagency Meeting for permit review held by the Corps of Engineers with EPA and U.S. Fish and Wildlife Service to assess permit applications and potential environmental effects.

NY State Department of Environmental Conservation, Regulatory Affairs, Albany

He was employed as Archaeological Consultant/Director of Cultural Resource Review for State Permits. His responsibilities included direction, coordination, and management of the statewide Uniform Procedure Act's permit program for compliance with the State Historic Preservation Act and State Environmental Quality Review Act (SEQRA). Responsibilities included review of 300 to 400 annual permit applications determining level of cultural resource survey, site testing, and mitigation required; critical report review, and, if required, State Register review (National Register process); and development and implementation of survey standards and guidelines for the program.

Ecology and Environment, Inc., Buffalo, New York (1980-1986)

As Senior Archaeologist Dr. Cinquino's responsibilities included conducting and directing archaeological field surveys and subsequent report preparation, project management, preparing technical proposals, manpower needs, and costing; conducting archival research and site file searches, and client relations including detailing their responsibilities in complying with New York State and Federal cultural resource laws.

Island, IL; and one Category III survey and Cold War Inventory and Assessment at Phillips Air Field, Aberdeen, MD.

Dr. Schieppati has also served as Preservation Planner for four Cultural Resources Management Plans (CRMPs) for the New York District, USACE: Watervliet and Picatinny Arsenals, Rotterdam Housing, and Fort Hamilton. He has served as Principal Investigator on three Phase I surveys, two Phase II investigations and a Phase III data recovery project at the U.S. Military Academy, West Point, Orange County, New York, as well as Phase IB investigations at Picatinny Arsenal, Morris County, New Jersey. Dr. Schieppati has been the Principal investigator for Phase II investigations for the Joseph G. Minish Passaic River Waterfront Park project of the Morris Canal right-of-way, Newark, New Jersey, and for a Phase I/II cultural resources investigation at the Robert E. Lee House, Fort Hamilton, Brooklyn, New York.

In 1999, he served as Principal Investigator for a Phase IB cultural resource investigation of the proposed 15-foot wide, roughly 35-mile long, fiber optic cable route right-of-way between the Town of Hudson, Columbia County, and the Town of Pleasant Valley, Dutchess County, New York. Prepared for Telergy, Inc., East Syracuse, NY, the investigation was conducted in compliance with the SEQRA, the State Historic Preservation Act (SHPA), and appropriate Federal legislation. Fieldwork was conducted according to the New York Archaeological Council's (NYAC) Standards for Archaeological Investigations. In 2000, Dr. Schieppati served as Co-principal Investigator for Phase IA/B cultural resources investigations for a proposed 26-mile fiber optic conduit between the City of Rensselaer through the remainder of Rensselaer County to the Massachusetts-New York state line, and for a Phase IA/B cultural resources investigations for a proposed 130-mile fiber optic conduit along Routes 22 and 684 from Stephentown, Rensselaer County, NY, to White Plains, NY, the eastern portion of New York State, parallel to the state's borders with Massachusetts and Connecticut.

He has served as Project Director or Principal Investigator for at least thirty (40) local (Buffalo area) cultural resources or environmental projects, including Phase IA surveys for the proposed Cayuga Road Sports Complex, Town of Cheektowaga, New York; for the proposed Ellicott Creek Trailway Extension, Town of Amherst, New York; and for the Woodlawn Beach State Park Improvements, Town of Hamburg, New York; and Phase IA/IB surveys for the National Fuel Gas Line K Realignment, Town of Orchard Park, New York; for the proposed French Road Development in West Seneca, New York; for proposed waterline construction in the District #5, Town of Newstead, New York; and for the proposed Quaker Road Retail Development, East Aurora, New York. His most recent assignment is as assistant project manager on PCI's service contract with Niagara Mohawk Power Corporation.

CAREER HISTORY

Director of Environmental Services, City of Niagara Falls, New York (1992-96). As the city's principal environmental officer Dr. Schieppati directed a small staff of environmental professionals charged with the oversight of all environmental issues where the city had interest or regulatory authority. He directed the operation, planning, and application of the city's Geographic Information System (GIS), supervised the review of all City actions and approvals for potential environmental impacts, served as the City's preservation planner, and acted as recycling coordinator. Dr. Schieppati produced the City's first solid waste management plan, devised a plan for composting municipal yard, and coordinated the City's household hazardous waste day. He served as

APPENDIX I

Darcy Flux to Wetlands

Darcy Flux (Q) from Site

(Site discharge through a cross sectional area between MW 5S/D and the railroad tracks)

$$\text{Discharge (Q)} = (K * I * A)$$

where:

K= average hydraulic conductivity (ft/day) ¹	12.50
I= vertical gradient (dh/dl).....	0.004
A= cross sectional area (ft ²).....	21,000

Monitoring Location	Groundwater Elevation	dh ² (ft)	dl ³ (ft)	I
MW-9S	1305.27	6.86	1700	0.004
MW-5S	1298.41			

Q= discharge (ft³/day): 1059

Notes:

1. Average hydraulic conductivity obtained from Table 4-3.
2. dh is defined as the difference between groundwater elevations at monitoring locations
3. dl is defined as the horizontal distance between monitoring locations

Darcy Flux (Q) to Wetlands Calculation

(Calculation of groundwater discharge to Wetland "F" surface water)

$$\text{Discharge (Q)} = (K * I * A)$$

where:

	Low K	High K
K= average hydraulic conductivity (ft/day) ¹	1.45E-02	2.21E-01
I= vertical gradient (dh/dl).....	0.16	0.16
A= cross sectional area (areal extent of wetlands, ft ²).....	520,000	520,000

Monitoring Location	Groundwater/ Surface Water Elevation	dh ² (ft)	dl ³ (ft)	I
MW-5S	1302.62	3.33	23	0.14
SG-2	1299.29			
MW-8S	1302.51	4.01	22	0.18
SG-1	1298.50			

Low Potential Discharge (Q)= discharge (ft³/day): 1229

High Potential Discharge (Q)= discharge (ft³/day): 18804

Notes:

1. Hydraulic conductivity data used are the highest and lowest conductivity Shelby Tube data,
2. dh is defined as the difference between groundwater elevations at monitoring locations
3. dl is defined as the distance between the midpoint of the monitoring well screen and the bottom elevation of the wetland.

