Prepared for

Honeywell International Inc.
301 Plainfield Road, Suite 330
Syracuse, New York 13212

Parsons Corporation
301 Plainfield Road, Suite 350
Syracuse, New York 13212

ONONDAGA LAKE BOTTOM
PHASE I – SEDIMENT CONSOLIDATION AREA CONSTRUCTION
CONSTRUCTION QUALITY ASSURANCE (COA)
FINAL REPORT – Volume I
ONONDAGA COUNTY
TOWN OF CAMILLUS, NEW YORK

Prepared by

Geosyntec consultants

engineers | scientists | innovators

289 Great Road
Acton, Massachusetts 01720

1255 Roberts Boulevard, Suite 200
Kennesaw, Georgia 30144

Project Number GJ4706B

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EXECUTIVE SUMMARY

Honeywell International Inc. (Honeywell) entered into a Consent Decree (United States District Court, Northern District of New York, 2007) (89-CV-815) with the New York State Department of Environmental Conservation (NYSDEC) to implement the selected remedy for Onondaga Lake as outlined in the Record of Decision (ROD) issued on July 1, 2005. Under the agreement, Honeywell is required to construct a sediment consolidation area (SCA) over Wastebed 13, located in the Town of Camillus, New York. The SCA is being constructed to accept sediments dredged from nearby Onondaga Lake.

The SCA is being developed in several phases of construction, dependent of the area needed; they are numbered one through three. This Construction Quality Assurance (CQA) Final Report presents a summary of the Phase I area construction activities for the Onondaga Lake SCA. The activities discussed in this report include: (i) a portion of engineered fill construction; (ii) low-permeability soil layer construction; (iii) gravel drainage layer construction; and (iv) installation of geosynthetics (i.e., geotextile, geosynthetic clay liner in sump area only, and geomembrane liner). As appendices to the report, quality assurance/quality control (QA/QC) documentation is provided.

This report provides certification by an engineer, registered in the State of New York, that the area was constructed in accordance with the approved plans and specifications, and modifications approved by the Designer and NYSDEC. The test requirements for each of the major components of the lining system are summarized on the tables that follow

TABLE 1
Geotechnical Laboratory Testing Summary
Honeywell / Parsons
Sediment Consolidation Area - Phase I
Camillus, NY

	DESCRIPTION	TEST STANDARD	PROJECT SPECIFICATIONS	UNITS	FREQUENCY QUALITY CONTROL	FREQUENCY QUALITY ASSURANCE	ESTIMATED No. of QA TESTS REQUIRED (1)	No. of QA TESTS PERFORMED (failures)
A.	**Engineered Fill - Perimeter Berm (reference Tables A-1 & A-2 of CQA Plan and Section 02200 of Specifications)**							
	Estimated volume of less than: 84,715 cyd over an area of: 28.6 acres (per cyd)							
a.	Restricted Use Soil Cleanup Objectives (Reference RFI No. 1)	Table 375-6.8(b) NYDEC Subpart 375	less than Industrial Standards	-	2,500	-	See Parsons' CD	
b.	Soil Classification (Reference RFI Nos. 2 & 15)	ASTM D2487	SC, SM, ML, CL, GM, GC, or GW GPw/sand, GP-GM, GP-GM w/sand, SP-SM w/Gravel, or SW-SM w/Gravel	USCS	2,500	1 per 10 QC tests	4	4
c.	Sieve Analysis	ASTM D422	remove visible rocks max. clod - 3 for 8-in thick lift max. 4 for 4-in thick lift max. 2	in.	2,500	1 per 10 QC tests	4	4
d.	Standard Proctor	ASTM D698	–	lb/ft3	2,500	1 per 10 QC tests	4	4
e.	Atterberg Limits	ASTM D4318A	–	%	2,500	1 per 10 QC tests	4	4
f.	Organic Content / Loss of Ignition	ASTM D2974	–	%	2,500	1 per 10 QC tests	4	4
g.	Moisture Content	ASTM D2216	-2 to +2	%	2,500	1 per 10 QC tests	4	4
h.	Nuclear Field Moisture/Density (FDT)	ASTM D3017/2922	≥ 95 R.C. (non-bridge lift)	%	NP	5 tests/acre	-	152 (31) - ATL 93 (0) - Geosyntec
i.	Sand Cone/Drive Cylinder	ASTM D1556/2937	≥ 95 R.C. (non-bridge lift)	%	NP	1 per 25 FDT	2	4
j.	Thickness (Reference RFI Nos. 3 & 16)	visual	Bridge Lift: 22 to 26-in (loose) Typical Lift: 7 to 10-in (loose) Hand Compacted: 3 to 5-in (loose)	-	during construction	during construction	-	-
k.	Survey	Record Drawings	+0.3% of designed slope along 50-ft edge	-	-	-	-	-
B.	**Low Permeability Soil Layer (reference Tables A-1 & A-2 of CQA Plan and Section 02250 of Specifications)**							
	Estimated volume of less than: 174,262 cyd over an area of: 28.6 acres (per cyd)							
a.	Restricted Use Soil Cleanup Objectives	Table 375-6.8(b) NYSDEC Subpart 375	less than Industrial Standards		1 per source	-	see Parsons' CD	
b.	Soil Classification (Reference FCF No. 2 - not implemented)	ASTM D2487	SC, SM, ML, or CL	USCS	2,500	1 per 10 QC tests	7	7
c.	Sieve Analysis	ASTM D422	remove visible rocks >1-in 100% 1-in. 100-50% No. 200 sieve	in.	2,500	1 per 10 QC tests	7	7
d.	Standard Proctor	ASTM D698	–	lb/ft^3	5,000	1 per 10 QC tests	4	7
e.	Atterberg Limits	ASTM D4318A	-	%	1,000	1 per 10 QC tests	18	22
f.	Organic Content / Loss of Ignition	ASTM D2974	-	%	2,500	1 per 10 QC tests	7	7
g.	Moisture Content	ASTM D2216	-3 to +3	%	1,000	1 per 10 QC tests	18	83
h.	Permeability @3,000 psf / i ≤ 30	ASTM D5084	≤ 10-6	cm/s	5,000	1 per 10 QC tests	4	6
i.	Permeability- Shelby tubes	ASTM D5084	upper 6-in ≤ 10-6	cm/s	NP	1 test/acre top lift	29	29
j.	Nuclear Field Moisture/Density (FDT)	ASTM D3017/2922	≥ 95 R.C. top 6-in ≥ 90 R.C. mid lifts	%	NP	18 tests/acre test pad 9 test/acre top lift	533	Geos - 698
k.	Sand Cone/Drive Cylinder	ASTM D1556/2937	see above	%	NP	1 per 25 FDT	21	29
l.	Interface Direct Shear (700, 2100, 3500 psf @0.004 in/min)(3) (Reference RFI Nos. 12 & 14)	ASTM D5321	peak: 14.5 - 18.5 deg residual: 12 - 16 deg	-	1		-	1
m.	Thickness (Reference RFI No. 3 and FCF No. 3)	visual	Minimum: 12-in / Sump: 18-in Top: 6-in must meet perm req. with desiccation cracks less than width of dime Bridge Lift: 10 to 14-in (loose) Typical Lift: 6 to 10-in (loose) Hand Compacted: 3 to 5-in (loose)	-	during construction scarify min. 2-in moisture condition	during construction	-	-
n.	Survey	Top Surface: measure 50 by 50-ft grid thickness cals 100 by 100-ft grid (see Appx. N - Geot. Monit. Plan) For less than 18-in thick LP - install square steel plate and auger on 100 by 100-ft grid	+0.2% of designed slope along 50-ft edge	-	-	-	-	-
C.	**Gravel Drainage Layer (reference Tables A-1 & A-2 of CQA Plan and Section 02300 of Specifications)**							
	Estimated volume of less than: 77,382 cyd over an area of: 28.6 acres (per cyd)							
a.	Restricted Use Soil Cleanup Objectives	Table 375-6.8(b) NYSDEC Subpart 375	less than Industrial Standards		1 per source	-	see Parsons' CD	
b.	Soil Classification	ASTM D2488	GW or GP	USCS	1,000	1 per 10 QC tests	8	11
c.	Sieve Analysis (Reference RFI No. 17)	ASTM C136	100% +4-in. 0-5% No. 4 sieve 0-3% No. 200 sieve	in.	1,000	1 per 10 QC tests	8	11
d.	Hydraulic Conductivity	ASTM D2434	≥ 10	cm/s	2,500	1 per 10 QC tests	4	5
e.	Interface Direct Shear (Reference RFI Nos. 12 & 14)	ASTM D5321	peak: 14.5 - 18.5 deg residual: 12 - 16 deg	-	1		-	1
f.	Thickness (Reference FCF Nos. 1 & 7)	visual	Minimum: 12-in / 24-in under access roads	-	during construction	during construction	-	-
g.	Survey	Record Drawings	+/-0.2% of designed slope along 50-ft edge Reference FCF-1	-	-	-	-	-

Notes:

(1) Based upon received volume. Reference FCF No. 5 regarding QA test frequency reliant on volumes.

(2) First lift of LP soil is considered a bridge lift and not subjected to compaction requirement.
The lifts between the upper and bridge lifts are considered intermediate-lifts. Portions deeper than 3-ft below surface shall be less than 2-in dia., 50% or greater passing No. 200 sieve, and be classified as SC, SM, ML or CL. Reference FCF No. 2 for details.

(3) The LP soil sample shall be compacted at 95 percent and at approximately +3% of the maximum as determined by the standard Proctor compaction test. Reference Request For Information (RFI) and Field Change Form (FCF) for additional details.

NA-Not Applicable; NP-Not Provided; NR-Not Required

TABLE 2
Geosynthetic Laboratory Testing Summary
Honeywell / Parsons
Sediment Consolidation Area
Camillus, NY

DESCRIPTION	TEST STANDARD	PROJECT SPECIFICATIONS	UNITS	MQC TEST FREQUENCY	MQC UNIT	QA TEST FREQUENCY	QA UNIT	MQC No. of TESTS REQUIRED (1)	QA No. of TESTS REQUIRED (1)	MQC No. of TESTS PERFORMED (failures)	QA No. of TESTS PERFORMED (failures)
A. Geomembrane (reference Part 4/Table A-4 of CQA Plan & Section 02070 of Specifications)											
Estimated delivered material:	1,719,900	sft	consisting of 147 rolls each roll 520 by 22.5-ft								
Estimated area of installed:	1,159,799	sft to cover:	28.61 acres for Phase I								
Estimated production seaming:	56,816	lin ft measured during installation									
a. Thickness	ASTM D5994	MARV 60	mil	50,000	SF	250,000	SF	35	7	148	8
b. Asperity Height	ASTM D7466	MARV 10	mil	50,000	SF	NR	-	35	-	148	-
c. Tensile Properties	ASTM D6693			50,000	SF	250,000	SF	35	7	41	8
Strength at Break	-Type IV	≥ 90	lb/in								
Elongation at Break		100	%								
Strength at Yield		≥ 126	lb/in								
Elongation at Yield		100	%								
d. Density/Specific Gravity	ASTM D792A / D1505	≥ 0.940 (sheet) 0.93 (resin)	g/cm^3	50,000	SF	250,000	SF	35	7	41	8
e. Melt Flow	ASTM D1238E	≤ 1.0	g/10 min	certify	-	-	-		-	4	-
f. Carbon Black Content (Reference RFI No. 13)	ASTM D1603 / 4218	2 to 3	%	50,000	SF	250,000	SF	35	7	41	8
g. Carbon Black Dispersion	ASTM D5596	9 out of 10-Cat 1, 2 10 out of 10-Cat 1, 2, 3	Cat.	50,000	SF	250,000	SF	35	7	41	8
h. Tear Resistance	ASTM D1004C	≥ 42	lb	50,000	SF	250,000	SF	35	7	41	8
i. Puncture Resistance	ASTM D4833	≥ 90	lb	50,000	SF	250,000	SF	35	7	41	8
j. Oxidative Induction Time	ASTM D3895	MARV 100	min	batch	-	NR	-	4	-	4	-
k. Stress Crack Resistance	ASTM D5397	≥ 300 (on smooth edges)	hrs	batch	-	NR	-	4	-	4	-
l. Seam Destructive Tests	ASTM D6392	fusion peel - 91 extrusion peel - 78 fus./ext. shear - 120	ppi	NA	-	500	LF	-	114	-	117 (13) 19 additional + 4 caps
m. Field Conditions	6-in above surface	weld 40 - 104 degrees wind 0 to 20 mph GRI GM9 below 32 deg	F	-	-	-	-	-	-	-	-
n. Non-Destructive Tests	-	5 psi-Vacuum 25-30 (±3) psi-Air Leak Location Survey	20-secs 5min -	every seam	-	-	-	-	-	-	-
o. Interface Friction Angle-Geosynthetic/Soil	ASTM D5321	See Spec. 02250					-	-	-	-	1
Interface Friction Angle-Geosynthetic (Reference RFI Nos. 12 & 14)	ASTM D5321	peak: 14.5 - 18.5 deg residual: 12 - 16 deg			1		-	-	-	-	1
B. Geosynthetic Clay Liner (reference Part 4/Table A-3 of CQA Plan & Section 02772 of Specifications)											
Estimated area of less than:	62,775	sft; assuming a total of	27	rolls (15.5' by 150')							
Bentonite Component											
a. Bentonite Fluid Loss	ASTM D5891	≤ 18	ml	110,000	LB	110,000	LB	1	1	2	1
b. Bentonite Moisture Content	ASTM D4643	≤ 40	%	5,000	SY	110,000	LB	2	1	2	1
c. Bentonite Free Swell Index	ASTM D5890	≥ 24	mL/2g	110,000	LB	110,000	LB	1	1	2	1
Geotextile Component											
d. Cap Mass Per Unit Area	ASTM D5993	MARV 5.8	oz/yd^2	25,000	SY	250,000	SF	1	1	3	1
e. Carrier Mass Per Unit Area	ASTM D5993	MARV 3.0	oz/yd^2	25,000	SY	250,000	SF	1	1	2	1
GCL											
f. Mass Per Unit Area	ASTM D5993	MARV 0.75	lb/ft^3	5,000	SY	250,000	SF	2	1	2	1
g. Index Flux	ASTM D5887	≤ 1E-6	m^3/m^2/s	30,000	SY	250,000	SF	1	1	1	1
h. Peel Strength	ASTM D6496	≥ 2.5	lb/in	5,000	SY	250,000	SF	2	1	2	1
i. Tensile Strength	ASTM D6768	MARV 30	lb/in	25,000	SY	250,000	SF	1	1	2	1
j. Seaming	visual	loose bentonite 1/4 lb/lin ft min. 6-in overlap min. 12-in at butt seams hor. seams >5-ft from toe of slope	-	visual	-	visual		-	-	-	-
C. Nonwoven Geotextile Cushion (reference Part 4/Table A-5 of CQA Plan & Section 02074 of Specifications)											
Estimated area of less than:	1,268,190	sft, a total of	427	rolls - typically 15' by 198'							
a. Mass Per Unit Area	ASTM D5261	≥ 24	oz/yd^2	90,000	SF	250,000	SF	15	6	16	6 (1)
b. Grab Strength	ASTM D4632	≥ 230	lb	90,000	SF	250,000	SF	15	6	16	6
c. Puncture Resistance (Reference RFI No.)	ASTM D4833	≥ ~~5,000~~ 250	lb	90,000	SF	250,000	SF	15	6	16	6
d. Trapezoidal Tear Strength	ASTM D4533	≥ 95	lb	90,000	SF	250,000	SF	15	6	16	6
e. UV Resistance (Reference FCF No. 6)	ASTM D4355	≥ 70	%	Batch	-	Certify	-	-	-	Cert	See SGI results on 80 day sample & conformance results
f. Seaming	ASTM D6193	single thermal weld (6-in overlap seam Stitch Type 401 / 3-ft overlap of butt seams shingled in direction of fill placement)	-	visual	-	visual	-	-	-	-	-
g. Interface Direct Shear (Reference RFI Nos. 12 & 14)	ASTM D5321	peak: 14.5 - 18.5 deg residual: 12 - 16 deg	-		1			-	-	-	1

Notes:

(1) Based upon the testing frequency presented in the Project Documents. Material quantities provided by Site. Actual quantities may vary.
Basic area is assumed to be: 28.61 acres or 1,246,252 sft

(2) Two 100-mil thick smooth HDPE rolls, used for sump rub sheet, were delivered to site. No conformance testing was required.
Trial seams performed at the beginning of each seam period; min. 15-ft long with two & two samples tested in shear & peel, respectively.

(3) Reference Request For Information (RFI) and Field Change Form (FCF) for additional details.
ARV- Min. Average Value; NA-Not Applicable; NP-Not Provided; NR-Not Required

Geosyntec
consultants

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1. INTRODUCTION

1.1 Overview

This final report summarizes the Construction Quality Assurance (CQA) activities performed by Geosyntec Consultants (Geosyntec) of Acton, Massachusetts and Kennesaw, Georgia during construction of Phase I at the Honeywell International Inc. (Honeywell) Onondaga Lake Sediment Consolidation Area (SCA) in Camillus, Onondaga County, New York. Honeywell entered into a Consent Decree (CD) (United States District Court, Northern District of New York, 2007) (89-CV-815) with the New York State Department of Environmental Conservation (NYSDEC) to implement the selected remedy for Onondaga Lake as outlined in the Record of Decision (ROD) issued on 1 July 2005. The following documents are appended to the CD: ROD, Explanation of Significant Differences (ESD), Statement of Work (SOW), and Environmental Easement and can be referenced for additional information.

The CQA activities performed by Geosyntec included monitoring of: (i) a portion of engineered fill construction; (ii) low-permeability soil layer construction; (iii) gravel drainage layer construction; and (iv) installation of geosynthetics (i.e., geotextile, geosynthetic clay liner (GCL) in sump area only, and geomembrane liner). The CQA activities were performed to confirm construction materials and procedures that were monitored were in compliance with the Subpart 360 Regulations, as required by NYSDEC Solid Waste Management.

This report was prepared for Mr. Larry Somer of Honeywell by Mr. Marcus Fountain, Dr. Young Min Cho, Mr. Erik Miller, Mr. Douglas Hamilton, and Mr. David Williams, and was reviewed by Mr. David Bonnett, P.E., all of Geosyntec.

1.2 Report Organization

This final report is organized as described below.

- A description of the project is provided in Section 2.
- A summary description of the CQA program is presented in Section 3.
- A description of the CQA monitoring and testing activities performed during the earthwork portion of the project is provided in Section 4.

- A description of the CQA monitoring and testing activities performed during the geosynthetics installation is provided in Section 5.

- A description of the CQA monitoring and testing activities performed during miscellaneous construction, such as sump components installation, is provided in Section 6.

- A summary of the observations resulting from the CQA monitoring and testing activities performed by Geosyntec and a certification statement signed and sealed by a professional engineer registered in the State of New York are presented in Section 7.

Documentation and record drawings presenting the results of the CQA monitoring and testing activities performed by Geosyntec are contained in the appendices to this report. Construction quality control (QC) information provided by Parsons is also presented for completeness.

2. PROJECT DESCRIPTION

The Onondaga Lake is a 4.6 square mile (approximately 3,000 acre) lake located in central New York State, immediately northwest of the City of Syracuse. Honeywell is currently working on a sediment removal and lake remediation project to restore the lake. Parsons of Syracuse, New York and Geosyntec are members of the team assisting Honeywell in this effort. The remediation of the Onondaga Lake bottom is on the New York State Registry of Inactive Hazardous Waste Sites and is part of the Onondaga Lake National Priorities List. As specified in the ROD [NYSDEC and USEPA, 2005], the major components of the remedy include construction of a hydraulic control system (consisting of a hydraulic barrier wall and a groundwater collection system); hydraulic dredging of contaminated sediments on the lakeside of the barrier wall; pumping of the dredge material to a sediment containment area (i.e., SCA); placing of the sediments within geotextile tubes for the purpose of dewatering in the SCA; and the collection and treatment of the decanted water through an on-site treatment facility.

The SCA is located on Wastebed 13, which encompasses approximately 163 acres. It is bordered to the north by Ninemile Creek and the CSX Railroad tracks; to the west by an Onondaga County Garage property and a former gravel excavation owned by Honeywell; and to the east and south by Wastebeds 12 and 14, respectively. Wastebed 13 was originally designed as a settling basin for the disposal of Solvay waste and has recently been used by the State University of New York College of Environmental Science and Forestry (SUNY ESF) and Honeywell for willow/evapotranspiration cover pilot test plots. The SCA has been designed to provide safe, long-term containment of the dredged sediment. The SCA has been designed to hold up to the ROD specified volume of 2,653,000 cubic yards (cyd) of dredged sediment.

The base liner system design of the SCA incorporates a single-composite liner system and other engineering controls that meet the requirements established in the New York State approved "Onondaga *Lake Sediment Consolidation Area (SCA) Civil and Geotechnical Final Design*", dated March 2011. The design of the SCA includes a centrally located 200 foot wide (east-west direction) sump corridor. The single-composite liner system consists of the following components (from top to bottom):

- 12-in thick (minimum) gravel drainage layer with 24-in minimum in traffic areas, having a minimum permeability of 10 cm/sec;

- 24 oz/syd nonwoven, needle-punched geotextile cushion;
- 60-mil thick textured high density polyethylene (HDPE) geomembrane liner;
- geosynthetic clay liner (GCL) in sump areas only;
- 12-in (minimum) outside of the sump corridor and 18-in thick (minimum) within the sump area of a low-permeability (LP) soil layer, the upper six inches of which requiring permeability not exceeding 1×10^{-6} cm/sec;
- varying thickness of low-permeability soil bridge lift over existing Solvay waste; and
- varying thickness of engineered fill along the perimeter.

The Phase I footprint has a rectangular configuration and is approximately 1,700-ft long (east-west) and approximately 700-ft wide (north-south). Future Phase II is location south of Phase I, while future Phase III is located to the north. Two SCA basins are being constructed adjacent to the eastern and western extents of Phase I. These basins are considered part of the sediment management system (SMS) for the SCA. Four 24-in diameter conveyance pipes connect each of the basins to the SCA. Construction and CQA of the basins is on-going. Upon completion, the details of the SMS CQA program will be provided under separate cover.

The original design and construction drawings were prepared by Geosyntec and Parsons. Parsons performed construction of the majority of the Phase I earthwork components, including the engineered fill, low-permeability soil and gravel drainage layers. The geosynthetics installer for the project was Chenango Contracting (Chenango or installer), of Johnson City, New York. Parsons retained THG Geophysics (THG) of Murrysville, Pennsylvania to conduct the liner integrity or leak location testing. The final leak location survey of Phase I was submitted under separate cover.

The surveyor retained by Parsons for the project was Thew Associates (Thew) of Canton, New York. Thew established initial survey control for the site and was used occasionally to verify elevations. As required by the Phase I project documents, Parsons surveyed the required layers of the low-permeability soil and drainage layers and prepared certified record drawings. Parsons used global positioning system (GPS)

based survey equipment to accomplish this task. Geosyntec provided the construction quality assurance (CQA) monitoring, testing, and documentation. A list of personnel involved in construction of Phase I is included in Section 3.2 of this report.

A list of the key construction activities and associated dates are provided below.

- Geosyntec arrived on site to observe initial earthwork construction associated with Phase I on 3 May 2011.
- Low-permeability soil layer construction was initiated on 9 May 2011.
- Geomembrane installation commenced on 19 August 2011.
- Gravel drainage layer placement began on 9 September 2011.
- Winter shutdown occurred between 30 December 2011 and 26 March 2012. Minor work, such a pouring of concrete slabs in the sumps, was accomplished during this time period.
- Construction of Phase I was substantially complete 21 May 2012.

This revised Final Report pertains primarily to construction of Phase I of the SCA, monitored by Geosyntec, which primarily occurred in 2011. However, due to the nature of the construction, activities overlapped and some information is included that relates to Phase II (e.g., field reports). A portion of the engineered fill placement occurred in 2010 and 2011 prior to Geosyntec's mobilization to the site. Delays in construction due to inclement weather caused completion of Phase I to occur in 2012. The appendices to this report provide information collected in 2011 along with specific information regarding work performed in 2012 to complete construction of Phase I. The photographs presented in Appendix A, for example, were primarily obtained in 2011 and are supplemented by several obtained of the completed Phase I area. In Appendix B, only the 2011 weekly reports are presented; the 2012 weekly reports will be included in future reports.

3. CONSTRUCTION QUALITY ASSURANCE PROGRAM

3.1 Scope of Services

3.1.1 Overview

The scope of CQA monitoring, testing, and documentation services performed by Geosyntec during Phase I construction included review of documents, field CQA operations, and preparation of this Final Report and record drawings. These are described in the following subsections.

3.1.2 Review of Documents

As previously noted, this final report summarizes the CQA activities performed by Geosyntec during Phase I construction. The CQA activities conducted by Geosyntec were intended to satisfy the requirements of the following documents:

- Permit Drawings entitled "*Sediment Consolidation Area Final Design, Camillus, New York*", dated July 2010, revised April 2011, prepared by Parsons and Geosyntec;

- "*Construction Quality Assurance Plan, Onondaga Lake Sediment Consolidation Area (SCA) Final Design*", prepared by Geosyntec, dated April 2011; and

- Specifications entitled "*Onondaga Lake Sediment Consolidation Area (SCA) Final Design Submittal*", prepared by Parsons and Geosyntec, dated April 2011.

Geosyntec reviewed the above documents for familiarity prior to the commencement of on-site CQA activities. During construction, clarifications of the project specifications and drawings were typically requested in the form of Request for Information (RFI). Changes to the design documents were handled through Construction Field Change Forms (FCF). The RFIs and FCFs were issued by the contractor with responses by the Designer. The FCF were also signed by the Owner and the NYSDEC. The design changes were typically reviewed routinely during weekly progress meetings. Copies of the RFIs and FCFs are provided in Appendix B.

A major change to the CQC and CQA testing program included the following:

- FCF No. 5: "in lieu of using the number of CQC samples, CQA sample frequency will be tied to the delivered volumes such that the test frequency shall become: volume of soil delivered to the site divided by CQC test frequency and divided by ten".

Reference to the various RFIs and FCFs are provided throughout the report in the various related sections as well as in the material tables found in the executive summary.

All of the above documents will be collectively referred to as the CQA Plan in this final report.

3.1.3 Field CQA Operations

The following activities were performed as part of Geosyntec's on-site CQA services:

- attending daily health and safety meetings;
- attending weekly progress meetings;
- maintaining photographic documentation of the construction;
- summarizing construction and CQA activities in weekly field reports;
- documenting construction progress and CQA activities in daily field reports;
- conducting field density tests of the engineered fill and low-permeability soil layer;
- collecting samples of soils and geosynthetics; and
- coordinating geomembrane as-built surveys.

Earthwork:

- collecting samples of soils considered for use as engineered fill (i.e., berms), low-permeability soil layer, and gravel drainage layer for testing at either an on-site or off-site geotechnical laboratory;

- reviewing and evaluating geotechnical laboratory test results for compliance with the requirements of the CQA Plan;
- visual monitoring of placement, grading, and compaction operations of the soil layers of the cell;
- visually monitoring site preparation; and
- selective monitoring perimeter berms and pipe installation.

Geosynthetics:

- monitoring and tracking the inventory of geosynthetic materials delivered to the site;
- collecting geosynthetic conformance samples from delivered rolls and forwarding samples to an off-site geosynthetics testing laboratory;
- collecting and reviewing geosynthetic manufacturers' certification documents (through contractor's submittals) and geosynthetic laboratory conformance test results for compliance with the requirements of the CQA Plan;
- monitoring installation of geosynthetic materials, including trial seaming, destructive and nondestructive sampling, and repair operations; and
- selective monitoring of the anchorage of the geosynthetics in the perimeter anchor trench.

During construction activities involving monitoring and/or testing, the observations made and results obtained by Geosyntec CQA personnel were compared to the CQA Plan. The construction manager, and/or the appropriate contractor were notified of deficiencies in construction practices and/or materials so the contractor or installer could implement the appropriate corrective actions. The corrective actions were monitored and/or tested by CQA personnel for compliance with the CQA Plan.

3.1.4 Final Report and Record Drawings

Record drawings and this Final CQA Report were prepared as the final task of the CQA program. During construction, CQA documentation of on-site activities was maintained by CQA personnel in Daily Field Reports (DFRs) and summarized in weekly reports. In addition, quality control (QC) certificates for the geosynthetic materials and as-built drawings were provided to Geosyntec for review. The weekly reports are included in the appendices to this report. CQA personnel also documented the results of on-site and off-site geotechnical testing conducted as part of the CQA program. Descriptions of the construction activities and the CQA documentation are presented in this Final CQA Report which contains the report text, summary tables, and Appendices A through O.

3.2 Personnel

3.2.1 Project Personnel

Senior personnel or representatives for the firms involved in the project are as follows:

Honeywell International Inc. (Owner)

- Larry Somer

New York State Department of Environmental Conservation (Regulatory Agency)

- Tom Annal
- Jim Christopher
- Bob Edwards
- Sam Efein
- Carsten Floess
- Donald Hesler
- Mike Spiera
- Timothy Larson
- William Zeppetelli

Parsons and Geosyntec (Designer)

- Paul Blue
- Laura Brussel
- Xiaodong Huang
- David Steele
- John Beech
- Ramachandran Kulasingam
- Joseph Sura
- Ming Zu

Geosyntec (CQA Consultant)

- Brett Banquer
- David Bonnett
- John (Billy) Carruth
- Young Min Cho
- Marcus Fountain
- Douglas Hamilton
- Erik Miller
- Douglas Murphy
- Aaron Reeder
- David Williams

Parsons (Earthwork Contractor)

- Michael Dobson
- Adam Dorn
- Josh Hawley
- Dhana Hillenbrand
- Mark Hoffmann
- Bill Moon
- Ron Prohaska
- Ken Sommerfield
- David Steele
- Al Steinhoff
- Sean Sullivan
- Scott Swift

Thew Associates (Surveyor)

- Michael Merithew

GeoTesting Express (Off-site Geotechnical Laboratory)

- Mark Dobday
- Joe Tomei

SGI Testing Services, Inc. (Off-site Geotechnical Laboratory)

- Zehong Yuan

Chenango Contracting (Installer, senior personnel only)

- Carl Burdick
- Martin Bystrak
- Matt Bilodeau
- Charlie Parks
- Khamson Phouthavong
- Vong Soumphonphakyd

4. CONSTRUCTION QUALITY ASSURANCE - EARTHWORK

4.1 Overview

As described in Section 3.1 of this report, several administrative activities were routinely performed by CQA personnel throughout the duration of construction. Many of these administrative activities were related to documenting overall construction status and progress. Other activities presented under general CQA services included monitoring of the related components and facilities for the construction project. Photographs of the construction were obtained on a regular basis and select photographs are presented in Appendix A. CQA personnel summarized the daily construction and CQA activities in weekly field reports. Weekly field reports are presented in Appendix B.

The contractor was responsible to perform general civil site work for the project. The work included site preparation (dewatering, pre-loading future sump areas, excavating, relocating Solvay waste onsite, preparing subgrade, including clearing and grubbing); provision of imported fills (such as stockpiling, placing and compacting engineered fill and low-permeability soil layer, and screening and placing gravel drainage layer); establishment of infrastructure (such as installing instrumentation, piping, and installing manhole risers); and survey control associated with earthworks and as-built drawings. It should be noted that at the end of 2011, the majority of the Phase I site work had been completed with the exception of gravel drainage layer placement in a small area located near the western sump, as well as around the manhole structures in the sump areas. This work occurred in early 2012 during Phase II construction along with reworking of the gravel drainage layer.

As part of the site preparation, Parsons removed oversized and woody vegetation by various means, including manually and using compact track loader mounted with a Bradco or Caterpillar BR166 brush cutters, Caterpillar SG18 stump grinder, or a landscape rake (see RFI No. 10). NYSDEC along with CQA personnel would typically approve an area referred to as a grid. If areas required additional work, the area of concern was identified using survey flags. Once a grid area had been deemed suitable, the contractor was notified and the area approved for placement of low-permeability material.

Geosyntec's CQA personnel visually monitored the construction of the various earthwork components. Different material types were used to construct the various components of the single-composite liner system. These materials included clay for the low-permeability soil layer, gravel for the gravel drainage layer, and engineered fill material for the perimeter berm. Various sources were pre-qualified to supply the soils by Parsons. The earthwork construction activities using these materials are described below.

- The perimeter berms were constructed using engineered fill material obtained from the Granby and Sennett sources, placed and compacted initially in approximately 14-in thick (loose) bridge lift (that was not required to be tested) and subsequent 7 to 10-in thick (loose) lifts. It is noted that the majority of the initial bridge lift and the majority of the southern perimeter berm was constructed prior to Geosyntec's mobilization in May 2011. A third party laboratory tested this engineered fill under the direction of the contractor (field test results, referred to as quality control (QC) tests, are included in Appendix E).

- The cell area was cleared and partially grubbed of vegetation, a bridge lift of low-permeability material was placed and compacted (that was not required to be tested) over the prepared subgrade with soils obtained from Marcellus or Black Creek sources.

- The minimum 12-in thick low-permeability layer was constructed using 6- to 10-in thick lifts (loose) material obtained from the Marcellus and Black Creek borrow sources. As mentioned above, in the two sump areas the minimum thickness of low-permeability material was 18 inches.

- The minimum 12-in thick gravel drainage layer was constructed in one lift using material obtained from several sources; the majority of the material was received from the Granby source. The other sources included Sennett source and material initially used to pre-load the basin sumps in 2010.

CQA personnel observed these earthwork construction activities and tested the soil materials to confirm that the material properties conformed to the CQA Plan, specific lift thicknesses were not exceeded, and compaction requirements were met. Geosyntec personnel also performed geotechnical soil tests during construction. The testing was

performed either: (i) in-place; (ii) on-site; or (iii) off-site, at GeoTesting Express (GTX) in Acton, Massachusetts. The contractor was responsible for obtaining and testing QC samples. The geotechnical QC samples were tested by Atlantic Testing Laboratories Inc. (ATL) in Syracuse, New York or P-W Laboratories, Inc. (PW) in East Syracuse, New York. These laboratories also supported Parsons in various capacities such as collecting samples and monitoring borrow sources. It is noted that Parsons obtained soil samples prior to Geosyntec's mobilization and performed in-place density tests. For purposes of this report, the samples associated with the in-place density testing are presented as QC samples in this report. Both the QC laboratory sample and in-place filed density test results are presented in Appendices D and E for completeness.

Separately, the contractor was required to perform analytical testing at each source on a minimum frequency of one representative composite sample per 2,500 cyd. This was done internally by Parsons to ensure samples met the NYSDEC Subpart 375, Table 375-6.8(b). A summary of the analytical testing and an e-mail from NYSDEC provided by Parsons are presented in Appendix C.

During construction, the contractor was responsible for erecting and maintaining erosion and sediment (E&S) controls. The E&S controls that were installed included: silt fence, temporary soil diversion berms, and operation of a wheel wash located at the entrance of the main gate. Geosyntec field personnel were not actively engaged in monitoring E&S activities. However, from time to time recommendations were made in an effort to minimize potential damage to the single-composite lining system.

4.2 Soil Source Sampling Activities

Representative samples of engineered fill, low-permeability material, and drainage material were obtained from their respective sources and tested to verify conformance with the CQA Plan. Soils for the project were provided by Riccelli Enterprises, Inc. (Riccelli) of Syracuse, New York. Riccelli excavated and transported material from several sources to meet the needs of the project. The source and associated layer are listed below, followed by the common reference in parentheses.

Engineered Fill:

- Riccelli Syracuse Sand & Gravel, 489 County Rt 85, Granby, New York (Granby source)
- Chatfield Road, Sennett, New York (Sennett source)

Low-Permeability Soil:

- County Rt 174, Marcellus, New York (Marcellus source)
- Black Creek Road, Caughdenoy, New York (Black Creek source)

Drainage Gravel:

- Riccelli Syracuse Sand & Gravel, 489 County Rt 85, Granby, New York (Granby source)
- Chatfield Road, Sennett, New York (Sennett source)

The geotechnical tests were performed to confirm that the following requirements were met.

- Engineering fill material used in construction classified as SC, SM, ML, CL, GM, or GW (reference RFI Nos. 2 and 15 for additional classifications for GP, SP and SW) according to the Unified Soil Classification Systems (USCS) when evaluated in accordance with ASTM D2487; had a nominal dimension less than 4 inches for 8 inches ± 2 inches thick loose lifts and 2 inches for 4 inches ± 1 inch thick loose lifts.

- Low-permeability soil material used in construction classified as SC, SM, ML, or CL according to the Unified Soil Classification Systems (USCS) when evaluated in accordance with ASTM D2487; had a maximum particle size of 1-in diameter and had not less than 50 percent of the particles, by weight, passing through the standard U.S. No. 200 standard sieve when evaluated in accordance with ASTM D422 (sieve analysis); and the hydraulic conductivity (i.e., permeability) requirement of the upper 6 inches was 1×10^{-6} cm/s or less, when evaluated in accordance with ASTM D5084.

- The material used in construction of the gravel drainage layer was classified as GW or GP according to the USCS when evaluated in accordance with ASTM D2487; had a nominal particle size of 4-in diameter, maximum of five percent and three percent passing the No. 4 and No. 200 sieves, respectively when tested in accordance with ASTM C136/D422 (reference RFI No. 17 for maximum diameter acceptance); and the hydraulic conductivity requirement was 10 cm/s or greater when evaluated in general accordance with ASTM D2434. (Note that the test method was modified by the testing laboratories due to the ‘oversized’ particles contained in the gravel.)

A description of the geotechnical tests performed on placed materials and results of these tests are presented in the next section of this report. Details of construction of the perimeter termination trench for anchorage of the geosynthetic components of the single-composite liner are described in Section 4.6 of this report.

4.3 Field Monitoring and Testing

4.3.1 General

Geosyntec's CQA personnel monitored the placement of soil as described in Section 3.1.3. At times, several earthwork construction operations were conducted simultaneously in the Phase I area. When this occurred, the on-site personnel monitored the operations considered most critical to the performance of the liner system. Potentially nonconforming or questionable practices observed by CQA personnel were brought to the attention of the concerned parties for review and correction.

As part of CQA activities, geotechnical testing was performed on each of the soil components of the Phase I single-composite liner system. Depending on the specific test, testing was performed either in-place, at the on-site laboratory, or off-site at GTX. In 2010, Parsons used their independent laboratory to sample and to perform in-place testing of engineered fill (i.e., QC tests). Also prior to Geosyntec mobilizing a nuclear density gauge, the independent laboratory performed additional in-place tests; these tests were reviewed and included in Geosyntec's database while the 2010 tests are presented separately as QC tests in Appendix E

The following geotechnical tests were performed:

- In-place nuclear moisture/density tests were performed on compacted lifts of engineered fill, and low-permeability layer. The tests were performed in general accordance with ASTM D2922 and ASTM D3017.

- Standard Proctor compaction tests were conducted on the soils used for engineered fill and low-permeability layer. The tests were performed in general accordance with ASTM D698.

- Moisture content tests were performed on engineered fill and low-permeability soil material. The tests were performed in general accordance with ASTM

D2216. On-site microwave moisture content tests were occasionally run in general accordance with ASTM D4643 as a periodic check during construction.

- Particle-size distribution tests were conducted on engineered fill, low-permeability soil layer, and gravel drainage layer. The tests were performed in general accordance with ASTM D422 or C136.

- Atterberg limits tests were conducted on the soils used for low-permeability material. The tests were performed in general accordance with ASTM D4318.

- Soil classification was performed on soils used for engineered fill, low-permeability soil layer, and gravel drainage layer in general accordance with ASTM D 2487.

- Hydraulic conductivity tests were performed on the low-permeability and drainage material. The hydraulic conductivity tests on low-permeability soil material were conducted in accordance with ASTM D5084. The hydraulic conductivity test on granular material (i.e., gravel drainage material) was performed in general accordance with ASTM D2434. The test method for granular materials was modified slightly by the testing laboratories to accommodate the larger particles contained in the gravel.

- Interface direct shear testing was conducted on the liner system (i.e., gravel, geotextile cushion, geomembrane, and clay); both the Marcellus and Black Creek sources were used. The tests were performed in general accordance with ASTM D5321; reference RFI Nos. 12 and 14 for additional details.

The results of the geotechnical laboratory tests are presented in Appendix D. The interface shear test results are presented in Appendix G. It is noted that other sources were investigated by Parsons but only the results of the borrow sources that were used are included in this report.

The results of the in-place nuclear moisture/density tests are presented in Appendix E. A grid layout of the site was used to visually locate the in-place tests and sample locations. CQA personnel used the physical features, such as toe of slope to estimate the test locations. Since only visual positioning of test locations was used, the test and sample locations given in the appendices are approximate.

As mentioned previously, ATL supplied a nuclear gauge (i.e., Troxler model 3430, Serial No. 36267) initially under the direction of Parsons. In 2011, Geosyntec mobilized a nuclear gauge (i.e., Troxler model 3440, Serial No. 28800). Both were used to perform the moisture/density tests. Standard counts were performed daily prior to use of a gauge. These counts were recorded on a standard count log, which is presented in Appendix E. The accuracy of the nuclear gauge was checked periodically by comparing test results with results observed using the drive cylinder method (conducted in general accordance with ASTM D2937) and with moisture content tests (conducted in general accordance with ASTM D2216 or D4643).

The moisture results are presented along with the in-place moisture/density test results in Appendix D.

4.3.2 Engineered Fill

CQA personnel monitored the placement of the fill for perimeter berms when on-site. During construction of the western berm, Geosyntec observed the placement of fill, and performed in-place testing of the upper lifts only. The QC independent laboratory ATL, monitored the construction and performed in-place density tests for the initial work.

Construction of the perimeter berm consisted of the following activities:

- Engineered fill material was hauled directly from the Sennett or Granby sources and unloaded;
- Lifts of material were typically spread using Caterpillar D-5 or D-6 LGP and were compacted using a smooth drum roller; and
- The surface of each lift was typically scarified with tracks of a bulldozer prior to placement of subsequent lifts or layers.

Engineered fill was required to be compacted to a minimum relative compaction of 95 percent of the maximum dry unit weight at a moisture content ±2 percent of the optimum moisture content, as determined by the Standard Proctor compaction test method (ASTM D698). CQA personnel conducted in-place nuclear moisture/density tests at a frequency of 5 tests per acre (estimated one test per 200 feet of berm per lift along the perimeter berms). A total of 245 field moisture/density tests were performed, of which 31 failed to meet the minimum compaction requirement. A total of 93 of these

tests were performed by Geosyntec, all of which met the minimum project requirements. A total of 152 tests were performed by ATL or PW on behalf of Parsons, of which 31 failed to meet the minimum project requirements.

For each lift of engineered fill along the SCA berm, Parsons had field density tests performed at approximately 100-ft intervals along the berm. When tests not meeting the density or moisture content requirements were observed, the top lift was reworked by scarifying and re-compacting approximately 50-ft long on each side of the failed test location. Depending on the moisture content, the scarified area was moisture conditioned as necessary before re-compaction. The re-worked area was re-tested, and the procedure was repeated until satisfactory results were achieved. The results of the field moisture/density tests are presented in Appendix E.

In addition to the in-place density testing, grain-size distribution tests, soil classification tests, and standard Proctor compaction tests were performed on the engineered fill material. The results of these geotechnical tests are presented in Appendix D.

4.3.3 Low-Permeability Soil Layer

After completing the removal of woody vegetation, CQA personnel observed the placement of the low-permeability soil layer. Initially, a test pad was constructed to familiarize all parties with the handling and compaction characteristics of the low-permeability material. A test pad was constructed in 2010. Geosyntec observed the completed pad and provided input on construction procedures. The pad was eventually removed. A second test pad was constructed in May 2011 using the Marcellus material that was left in-place as part of the bridge lift after it was tested.

The test pads were constructed using the procedures and equipment that would be used to construct the compacted low-permeability soil layer itself. The test pads were located in the northeast corner of the Phase I cell. CQA personnel performed nuclear moisture/density tests on frequency of 18 tests per acre of the second test pad and obtained thin-walled tube samples (i.e., Shelby tubes), which were sent to the off-site geotechnical laboratory for hydraulic conductivity testing. A hydraulic conductivity criterion was required to be met on the upper 6-in lift. Test pad construction testing results established that the low-permeability material could be used to construct the compacted low-permeability soil layer.

RFI No. 3 and FCF No. 3 provided topographic surveys of the subgrade and top of low-permeability layer. The difference between the layers determined the thickness of the low-permeability layer. The Specification (Section 2250 Part 3.02.B) allowed the first lift (referred to as a bridge lift) to be placed without compaction requirements in a 10 to 14-in thick (loose) lift). The intermediate lifts, placed in 6 to 10-in thick (loose) lifts, were required to be compacted to 90 percent of the maximum dry density at a moisture content ±3% of optimum moisture, as determined by the standard Proctor test (ASTM D698). The upper lift was to be compacted to 95 percent of the maximum dry density at a moisture content ±3% of optimum moisture, determined by ASTM D698.

The construction sequence of the compacted low-permeability soil layer is described below.

- Low-permeability material was delivered directly from either the Marcellus or Black Creek sources. At the source, an excavator loaded the material into various sized on-road trucks. Trucks were weighed before being unloaded in or next to the Phase I area.

- Generally sources were not mixed in-place as unloading of a source occurred in separate areas of Phase I (e.g., separated lifts, Black Creek material placed north of sump area, etc.).

- The top surface of each lift was typically scarified with the tracks of a bulldozer prior to placement of the subsequent lift.

- Low-permeability material was placed in appropriately thick (loose) lifts (e.g., 10 to 14-in for bridge lift and 6 to 10-in for other lifts). Typically the lifts were placed using Caterpillar D-3, D-5, or D-6 LGP bulldozers. Occasionally, laborers were used to manually remove rocks and roots.

- After spreading, if necessary, water was added to increase the soil moisture content or if too wet, a tractor with a draw type disc harrow was used to mix the water and break up the clods.

- Each lift of soil was compacted using a Caterpillar CS56 or CP56 vibratory compactor.

- A Caterpillar D-5 or D-6 LGP bulldozer (with GPS) was used to fine grade the low-permeability material.

The final lift was rolled with various sizes of smooth drum rollers to seal the top surface of the compacted low-permeability soil liner in preparation for geosynthetics deployment.

- The contractor confirmed the final grade elevations using GPS methods.

Prior to deployment of the geosynthetics, the compacted low-permeability soil layer surface was visually observed by the installer and CQA personnel for surface cracks (e.g., less than the width of a dime) and greater than 1-in diameter particles. If drying or cracking of the surface was observed, the contractor was required to moisture condition and rework the affected area. Observed oversized particles were manually removed. Initially, CQA personnel observed pumping of the low-permeability soil surface. Discussions with the contractor and installer regarding the surface condition of the low-permeability soil layer resulted in implementation of alternate compaction methods (i.e., smaller rollers to remove ledges created by adjacent passes of heavier rollers) and geomembrane deployment methods (i.e., substitution of compact track loaders for wheeled telehandlers).

As part of the initial Phase I construction, instrumentation was installed within the Solvay waste for settlement monitoring purposes. Details of the installation and monitoring program is presented in a report prepared by Geosyntec and Parsons, "*Geotechnical Instrumentation Installation Report – 2010 and 2011, Onondaga Lake Sediment Consolidation Area*," dated 1 November 2011.

During construction of the low-permeability soil layer, a mini-excavator was used to investigate and repair the instrumentation system. After the repair was conducted, low-permeability soil material was placed in 8-in thick lifts and compacted. Once the final grades were re-established, the final lifts were compacted using a smooth drum roller and tested.

A series of tests were performed on the material used to construct the compacted low-permeability soil liner. Grain-size distribution tests, moisture-density relationships (i.e., Proctor tests) and remolded permeability tests were performed. In addition Atterberg

limits tests were performed on the low-permeability liner material to classify the material. The geotechnical test results are presented in Appendix C.

Off-site geotechnical laboratory permeability tests were performed on thin-walled (i.e., Shelby) tube samples to confirm the material met the permeability criterion. Samples were obtained from the upper lift during cell construction. Tubes were obtained on a minimum one per acre basis for the final lift of installed soil liner. A total of 28 thin-walled sample pairs were removed from the compacted low-permeability layer. A total of 29 samples were tested and all met the hydraulic conductivity criterion of 1×10^{-6} cm/s or less.

CQA personnel performed in-place nuclear moisture/density tests on a frequency of nine tests per acre for each lift above the bridge lift of the compacted low-permeability layer including the final lift. A total of 698 field moisture/density tests were performed by Geosyntec, none of which failed to meet the minimum compaction requirement of 95 or 90 percent. The results of the field moisture/density tests are presented in Appendix E.

To verify that the minimum thickness was achieved, the contractor used various methods to measure the thickness in Phase I. The contractor surveyed the low-permeability layer on 50 foot grid pattern, performed thickness calculations on 100-ft grid pattern, and in areas with design thickness of less than 18 inches, installed 12-in square steel plates on a 100-ft grid pattern. Initially, a hand drill with a 24-in long drill bit was used to bore into the low-permeability soil. If the plate had not been reached at a depth of 24 inches, then a pointed rod was hammered down to the plate. Once the bit or rod had been driven to the steel plate, a mark was made on the bit or rod. Once the bit or rod was extracted, a measurement was made to determine the low-permeability clay thickness. The thickness verification results are presented in Appendix E.

Perforations in the low-permeability soil were filled with bentonite/soil material. The material was manually tamped into the perforations.

4.3.4 Gravel Drainage Layer

CQA personnel periodically monitored the placement of the gravel drainage material for the Phase I area. The 12-in thick (minimum) gravel drainage layer was constructed using material obtained from several sources, with the majority of material being

provided by the Granby source. The construction sequence of gravel drainage layer was as follows:

- Gravel was screened at the source (e.g., Turbo Chieftain 1400 power screener) and stockpiled at the quarry;
- Front-end loaders or tracked excavators loaded on-road live bottom trucks or end dump trucks at the source. Each truck was weighed and the trucks hauled the material to the cell area or to an on-site screening and washing plant (Metso Lokotrack ST358 mobile screener); and
- The gravel was either spread in one 12-in thick (minimum) lift using a Caterpillar D-5 or D-6 LGP bulldozer or processed through an on-site screening plant (e.g., washed). In the latter case, a tracked excavator loaded end dumps that transported the washed material to the cell area.

The contractor used spotters to assist with off-loading activities. The spotters would direct traffic to ensure trucks operated on 4-ft thick minimum roads/ramps and occasionally reject loads with observed high fine content. Plywood was temporarily placed under the gravel and over the geosynthetics for added protection under ramps. In these areas of high traffic, the gravel was observed to have a higher fines content and therefore it was necessary to re-process the material through the on-site screening plant.

During placement of the gravel drainage layer, CQA personnel periodically monitored the contractor's activities to assure that the risk of damage to the underlying geosynthetics was minimized. CQA personnel also confirmed that the contractor operated bulldozers in areas where at least 1-ft thick layer of gravel was maintained over the geosynthetics, and that a minimum 4-ft thick layer of gravel was maintained over the geosynthetics in heavily trafficked areas.

During placement, multiple discussions were held between parties regarding the fines content of the gravel. As indicated above, delivered loads containing high fines content were periodically observed and when observed, the load was rejected. From field observations, fines could coat the rock particles when the rock was wet and accumulate in small pockets after precipitation events. Visits to the quarry confirmed that, on occasion, front-end loader operators were too aggressive by loading from the base of the

stockpile (an area of fines accumulation) or fine grain material accumulated in the loading bucket (from previous loading operations) and were mixed in with the gravel.

After approximately two weeks of gravel delivery, Parsons deployed an ATL technician to monitor loading operations at the source. The ATL technician monitoring the operations at the borrow source also identified occasional lenses of fines. When observed in the quarry, the material was re-processed through the quarry screening plant.

During grading operations, CQA personnel and NYSDEC personnel marked high fines content areas in the cell using high-visibility sand bags or surveyed the locations using GPS. NYSDEC site personnel communicated directly with Parsons regarding removal of areas of observed high fines content. On 11 October 2011, gravel importation was temporarily stopped by Parsons. On 2 November 2011, a screening plant with wash bar apparatus was mobilized to the site. The screening plant was located to the west of Phase I and was used to re-process material being delivered from the quarry as well as to reprocess rejected material from the cell.

In 2011, areas within the cell with observed high fines content were removed using low ground pressure equipment. The determination of these areas of concern was subjective (i.e., through observation). Results of the CQA tests indicated the fines content (by weight) as well as the fixed wall permeability tests were in compliance with the requirements of the CQA Plan. However, to mitigate observed pockets of fines, a mini-excavator (Caterpillar 305-5D) or a compact track loader was used to excavate the area of concern and load low-ground pressure vehicles (i.e., Morooka rubber tracked vehicles) which typically transported the material to various access ramps within the cell. This material was then loaded into an end dump using a tracked excavator. The end dump trucks transported the gravel to the on-site screening plant, where it was stockpiled. The stockpiled material and in-coming loads of gravel were then re-processed through the on-site screening plant before being placed into the cell.

To further address the NYSDEC concerns, Geosyntec and Parsons visually located additional areas to remediate on 21 March 2012 using GPS. Parsons held a demonstration in April 2012 using a compact track loader with flip-screen attachment. Based on the results, a flip-screen was mobilized to the site and used to complete the remediation of surface fines in May/June 2012.

Geosyntec had off-site laboratory geotechnical tests performed on the material used for the gravel drainage layer as part of the CQA activities during Phase I construction. Samples were obtained directly from the soil source and from the in-place material and typically included two to twelve 5-gallon sized buckets. GTX performed an off-site hydraulic conductivity tests and grain size distribution tests on representative samples. The laboratory test results are presented in Appendix D.

4.4 Soil Anchorage of Geosynthetics

4.4.1 General

Geosyntec CQA personnel periodically monitored the method of anchorage for the geosynthetic material around the Phase I perimeter. Along the southern edge, the layers of geosynthetics were extended into the future Phase II area. Along the north, sand bags were placed over top of the last geosynthetic layer deployed. Soil was subsequently placed and compacted in the trench to provide permanent anchorage of the single-composite liner system. Details of the anchoring are discussed below.

4.4.2 Perimeter Anchor Trench

As required by the CQA Plan, a permanent anchor trench was constructed around the eastern and western perimeter of the Phase I construction area. The construction sequence of the perimeter anchor trench was as follows:

- a 2-ft deep by 2-ft wide (minimum) trench was excavated approximately 4-ft from the crest of slope of perimeter berm;
- the geosynthetic components were subsequently placed in and across the bottom of the anchor trench (including a sacrificial geomembrane) and ballasted with sandbags; and
- lifts of backfill were placed over these materials and compacted.

The anchor trench backfill was compacted using a mechanical walk-behind compactor/vibratory plate.

5. CONSTRUCTION QUALITY ASSURANCE - GEOSYNTHETICS

5.1 General

The following types of geosynthetic materials were deployed in Phase I:

- GCL was installed directly on a prepared surface (i.e., low-permeability soil layer) in the two sump areas;
- 60-mil thick textured HDPE geomembrane liner was installed over the low-permeability soil layer or over the GCL, depending on location; and
- non-woven geotextile cushion was installed over the geomembrane liner. (In the base of the sump areas, a 100-mil thick HDPE geomembrane was used as a rub sheet over the geotextile).

Geosyntec CQA personnel monitored installation of geosynthetic components of the SCA. Field and laboratory tests were conducted to assure that the material properties were in compliance with construction documents and that prescribed installation procedures were followed. The specific geosynthetic monitoring and testing activities are described in the following subsections.

As previously indicated, interface direct shear tests, ASTM D5321, were conducted on the single-composite sandwich. The CQC and CQA requirements were modified to run one set of tests (see RFI Nos. 12 and 14 for further details). The tests were performed by SGI Testing Services, LLC (SGI) of Norcross, Georgia under normal stresses of 700; 2,000; and 3,500 lb/ft^2. The minimum peak and residual (or long-term) friction angles measured were achieved using the Black Creek low-permeability soil source that indicated angles of 18 and 16 degrees, respectively. The interface friction test results are presented in Appendix G.

Periodically during construction, temperatures fell below 40 degrees Fahrenheit (°F) and occasionally were below 32°F. As indicated in Geosynthetic Research Institute (GRI) Test Method GM9 – *Cold Weather Seaming Geomembranes*, the installation and seaming procedures were modified to take into consideration the colder temperatures (e.g., slower welding speeds) and increased moisture (e.g., panel edges were dried). However the installer did not use nor require moveable enclosures. The installer would typically conduct his production welding well after sunrise and well before sunset.

Trial welds were used to confirm a welder's ability to seam in the actual field conditions. It is noted that several initial destructive seam samples failed in August 2011. These failures were associated with one particular fusion welder (ID No. W-32). Once identified as being an issue, the welding machine was removed from the project.

After installation, water was observed to have accumulated under the geomembrane in low areas. When this occurred, the installer would cut the geomembrane liner to allow the water to drain. Prior to repairing the liner, the underlying surface was observed to ensure no visible damage had occurred. The installer followed the repair procedures described below.

5.2 CQA of Geosynthetic Clay Liner

5.2.1 Conformance Testing and Documentation

A geosynthetic clay liner (GCL) was used in construction of the two sump areas. The GCL, designated as BentoLiner NSL, was supplied by GSE Lining Technology, LLC (GSE) of Houston, Texas. CQA personnel obtained one conformance sample from the 27 rolls delivered to the site. The total area of GCL delivered to site was 62,775 ft^2. The sampling frequency of one sample per 62,775 ft^2 of material exceeds the minimum acceptable sample frequency of one per 250,000 ft^2 required by the CQA Plan. The conformance samples were forwarded to GTX for testing. The conformance test results and the manufacturer's quality control (QC) letters and certificates were reviewed by CQA personnel and were found to be in compliance with the CQA Plan. The manufacturer's QC documentation and the results of the conformance tests are presented in Appendices E and F, respectively.

5.2.2 Field Monitoring Activities

5.2.2.1 Delivery and On-Site Storage

Upon delivery, GCL rolls were unloaded in an area located southeast of the construction area and covered with a tarpaulin. The rolls were typically transported on site using a telehandler or Caterpillar 287 compact track loader was used during deployment. CQA personnel periodically monitored the installer's delivery, unloading, and storage procedures and observed that the GCL was handled in an appropriate manner. An inventory of delivered rolls was maintained by CQA personnel.

5.2.2.2 Deployment

CQA personnel monitored the deployment of the GCL rolls. During deployment, the CQA personnel checked for the following:

- manufacturing defects;
- damage that may have occurred during shipment, storage, and handling; and
- damage resulting from installation activities.

If materials were observed to be damaged, the installer was notified and the damaged materials were either discarded or repaired. CQA personnel observed repair locations to verify conformance with the requirements of the CQA Plan.

CQA personnel also periodically monitored the deployment of the GCL as well as its condition after installation to ensure that the installer followed the following procedures:

- the GCL was unrolled and placed in a manner which kept the GCL in sufficient tension to avoid excessive wrinkling; the panels were positioned using laborers within and around each sump area.
- adjacent GCL panels were overlapped a minimum of 6 in along the sides and 12 in along the ends of the installed panels;
- granular or powdered bentonite was added between overlap areas;
- measures were taken to keep the GCL free of contamination and protected from premature hydration; and
- geomembrane installation immediately followed installation of the GCL.

Observed holes or tears in the GCL were repaired by the installer by placing a patch of the same material over the hole or tear and at a distance of at least 1 ft in all directions beyond the edges of the hole or tear on slopes 5 percent or flatter and 2 ft in all directions beyond the edges of the hole or tear on slopes greater than 5 percent. In areas

where premature hydration of the GCL was detected, the GCL was removed and replaced with new material.

5.3 CQA of Geomembrane

5.3.1 Conformance Testing and Documentation

A textured geomembrane was installed directly over the low-permeability layer, or over the GCL in the sump areas. The geomembrane liner, HDT-60, was supplied by GSE Lining Technology, LLC (GSE) of Houston, Texas. Of the 148 rolls produced for the project all but one roll were delivered, totaling 1,719,900 ft^2 in area. Geomembrane conformance samples were taken randomly from the 60-mil thick HDPE textured geomembrane rolls by CQA personnel from the delivered rolls on site. A total of eight (8) conformance samples were obtained (not including one sample obtained for interface friction testing). This sample frequency of one sample per 214,988 ft^2 of delivered geomembrane exceeds the minimum acceptable sample frequency of one sample per 250,000 ft^2 required by the CQA Plan. A total of 1,159,799 ft^2 was installed, as observed by CQA personnel.

Two 100-mil thick geomembrane rolls or 16,358 ft^2 were delivered and installed as rub sheets in the Phase I sumps. One roll of geomembrane liner, 500T-1003, was supplied by Solmax of Varennes, Quebec, Canada while GSE supplied a second roll, HDS-100AE. The two rolls were delivered and stored with the 60-mil thick geomembrane rolls. No conformance testing on the rub sheet material was required by the CQA Plan.

The conformance test results for the 60-mil liner and the manufacturer's QC certificates for both 60 and 100-mil products were reviewed by CQA personnel and were found to be in compliance with the CQA Plan. It was noted that several of the initial 60-mil thick conformance samples failed the tensile test (ASTM D6693) and density test (ASTM D1505). After following up with the testing laboratory, GTX confirmed that the cutting dye used to prepare the test coupons for the tensile tests was faulty and that the calculations for density were performed incorrectly. After the cutting dye was replaced, the retests showed the material meet the CQA Plan requirements. The density tests achieved the minimum project requirements when properly calculated. The geomembrane manufacturer's QC documentation, including resin and geomembrane certifications, is presented in Appendix E. The conformance tests results are presented in Appendix F.

5.3.2 Field Monitoring Activities

5.3.2.1 Delivery and On-Site Storage

Upon delivery to the site, geomembrane rolls were stored in an area located to the southeast of the construction area. The rolls were typically transported by a Caterpillar 330 excavator (initial rolls only), Caterpillar 287 compact track loader, Gehl 258 or Skytrak telehandler. CQA personnel periodically monitored the installer's delivery, unloading, and storage procedures to ensure that the material was handled in an appropriate manner. The CQA personnel also compared the roll numbers of the geomembrane rolls delivered to the manufacturer's bill of lading and maintained an inventory of delivered materials.

5.3.2.2 Deployment

Prior to geomembrane deployment, the surface of the soil barrier layer was visually checked for cracks and sharp objects. The installer signed certificates of acceptance of the subgrade surface, which are presented in Appendix G. The geomembrane rolls were lifted using a spreader bar attached to a tracked excavator or compact track loader. Prior to deployment and when needed, the surface of the low-permeability soil layer was prepared by pulling a weighted, chain link fence behind a four-wheel, low-ground pressure, all-terrain vehicle (ATV) or a with a compact track loader with a smooth drum attachment.

During deployment, a 16 gauge, solid, type S wire was installed under geomembrane panels on approximately 200-ft centers. The installer marked each end of the wire for future reference for the leak location survey. Details of the leak location survey are provided in Section 5.3.3.2.

CQA personnel monitored the deployment of geomembrane panels. During deployment, the CQA personnel checked for the following:

- manufacturing defects;
- damage that may have occurred during shipment, storage, and handling; and
- damage resulting from installation activities, including damage as a consequence of panel placement, seaming operations, or weather.

If materials were observed to be damaged or deficient, the installer was notified and the damaged materials were either discarded or repaired. CQA personnel observed and documented the repair locations to verify compliance with the CQA Plan. Details of the geomembrane panel placement were recorded by CQA personnel on panel placement logs, which are presented in Appendix I.

5.3.2.3 Trial Seams

Prior to production seaming, the installer prepared geomembrane trial seams for each technician using each piece of seaming equipment. Typically, either a Demtech Services Inc., a Concord Geotech Services, LLC, or a Pro-Wedge welder was used. Additional trial seams were prepared every four to five hours. CQA personnel evaluated the trial seams as follows:

- trial seam samples in the beginning of the day were typically 15-ft long for fusion and 3 ft long for extrusion and over 12 in. wide;
- trial seams were welded under similar conditions as for seaming;
- test strips were cut from the trial seams at random locations across each trial-seam weld using a manual die press; each strip was 1 in. wide and 6 in. long; and
- test strips were tested for seam strength using a calibrated field tensiometer; two of the weld test strips were tested two in peel and two were tested in shear using a calibrated field tensiometer (two separate units were used) - the passing criteria for the tests were as follows:

  Fusion

  - *Peel tests* - a minimum bonded seam strength of 91 lb/in -(Film Tear Bond) FTB; and
  - *Shear test* - a minimum bonded seam strength of 120 lb/in.

Extrusion

- *Peel test* - a minimum bonded seam strength of 78 lb/in -(Film Tear Bond) FTB; and
- *Shear test* - a minimum bonded seam strength of 120 lb/in.

A total of 235 trial seams were observed by CQA personnel during Phase I construction; 152 trial seams were made using double-track fusion (i.e., hot wedge) welders and 83 were made using extrusion welders. Of these trial welds, one fusion and no extrusion samples failed to meet the criteria above. In the case of a failing test, the machine or welding process would be adjusted and a new trial seam would be made. The new sample would be tested with the same strength requirements. The procedure would be repeated until passing results were observed.

Trial seam samples were not archived. Details of the trial seams, including the trial seam test results, are presented in Appendix I. The calibration certificates for the tensiometers are provided in Appendix J.

5.3.2.4 Production Seams

Geomembrane production seaming operations were monitored by CQA personnel. The majority of the geomembrane production seams were fabricated using double-track fusion welders. Seam repairs were made using hand-held extrusion welders. Rub sheets were periodically used during production seaming to provide a clean surface to weld over. During or after fabrication, the geomembrane seams were visually examined for workmanship and continuity. Geomembrane seaming logs are presented in Appendix J.

5.3.3 Nondestructive Testing

5.3.3.1 Scope

Nondestructive testing of geomembrane was periodically monitored by CQA personnel. Leak location survey was performed in a portion of the geosynthetics. A spark test was conducted on pipe boots. Geomembrane seams were nondestructively tested for continuity by the installer using the air pressure procedure for double-track fusion seams and the vacuum-box test procedure for extrusion-welded seams. Failed air-

pressure test seams, if applicable, were capped and then retested using vacuum-box test methods after determining the failed seam length. Leaks identified using the vacuum-box method were repaired and retested as described in Section 5.3.5.

5.3.3.2 Leak Location Survey

As required by the CQA Plan, an electrical leak location method was used to survey the installed geomembrane liner. An independent contractor, THG Geophysics Ltd (THG) of Murrysville, Pennsylvania, conducted the surveys. The surveys were performed following ASTM D6747 - *Standard Guide for Selection of Techniques for Electrical Detection of Leaks in Geomembranes.* An initial survey was performed in October and November 2011 on an exposed geomembrane following ASTM D7002 - *Standard Practices for Electrical Methods for Leak Location on Exposed Geomembranes Using Water Puddle Method*.

After placement of the gravel drainage layer, THG re-mobilized several times to perform leak location surveys following guidelines from ASTM D7007 - *Standard Practices for Electrical Methods for Locating Leaks in Geomembranes Covered with Water or Earth Materials.*

Generally a direct current was established between a stainless steel cathode (installed in the gravel) and the anode (16-gauge wire under the liner). Water was added, as needed. Anomalies in the potentiometric measurements caused by electrical current flowing through probable holes were monitored.

During April and May surveys of the geomembrane liner, five defects were identified. The contractor removed the overlying drainage gravel and geotextile in the identified areas and the geomembrane was observed by project personnel for obvious holes or tears. The located damage was repaired by the installer as described in Section 5.3.5. Resurvey of the repaired area and areas disturbed during rework of the gravel drainage layer were submitted under separate cover.

5.3.3.3 Air Pressure Testing

Accessible double-track fusion seams were nondestructively tested using the air pressure test. The procedure used by the installer for air pressure testing was as follows:

- visually observe the integrity of the annulus of the section of seam being tested and isolating the section by sealing the ends using heat and pressure;
- insert the needle of a pressure test apparatus into the annulus at one end of the seam;
- inflate the annulus to a gauge pressure of a minimum 25 - 30 psi with an air pump and maintain the gauge pressure for at least five minutes;
- if the pressure loss exceeded 3-psi, or if the pressure did not stabilize, the faulty area was repaired in accordance with Section 5.3.5 of this report; and
- confirm airflow through the entire annulus by releasing the air from the seam at the opposite end from where the needle was inserted.
- Nondestructive test results are presented with the production seam logs in Appendix K.

5.3.3.4 Vacuum-Box Testing

The vacuum-box was used by the installer to nondestructively test extrusion repairs. The procedure used by the installer for vacuum testing was as follows:

- wet a strip of seam with a soapy solution;
- place the vacuum-box assembly over the wetted area, close the bleed valve and open the vacuum valve;
- force the box onto the sheet until an approximate 5-psi vacuum is observed;
- examine the seam through the viewing window for a period of 20 seconds (when observed by CQA personnel) to allow for observance for the occurrence of air bubbles;
- remove the assembly and continue the process over the entire seam with a typical 3-in wide overlap; and
- record the location of observed leaks.

If nondestructive testing indicated repairs were necessary, repairs were made in accordance with procedures presented in Section 5.3.5 of this report and vacuum testing was repeated. Vacuum test results are presented with the production seam logs and repair summary logs in Appendices J and K, respectively.

5.3.3.5 Spark Testing

Geomembrane boots were welded around pipe penetrations (e.g., four discharge pipes to each SMS basin). A spark test was used to nondestructively test extrusion seams used to fabricate the pipe boots. The spark test requires a continuous copper wiring to be extrusion welded into the seam. An electric current is applied while a probe is passed next to the seam. Any seam discontinuity is detected by the generation of a spark passing between the wire and the probe. When a spark was observed, repairs were made and the seam re-tested. After being non-destructively tested, three stainless steel straps with neoprene gaskets were installed and the ends of the pipe penetration were sealed using a silicone sealant.

5.3.4 Destructive Seam Sample Testing

5.3.4.1 Scope

In accordance with the CQA Plan, CQA personnel identified and collected geomembrane seam samples for destructive testing. The samples were tested in the field prior to being forwarded to the independent laboratory, GTX.

During Phase I construction, 117 geomembrane seam samples were taken initially from approximately 56,816 linear ft of seams constructed. This corresponds to an approximate sample frequency of one per 485 linear ft of seam. This frequency meets the minimum acceptable sample frequency of one per 500 linear ft of production seams, as required by the CQA Plan. Prior to the removal of the full seam sample, two geomembrane test strips were taken by the installer from either end of the destructive sample. Each strip was peel-tested in the field. If the peel samples exhibited passing results, the adjacent destructive seam sample was shipped to the laboratory for testing.

For a destructive seam sample to be considered as passing, the seam strength criteria, which are described in Section 5.3.4.3, had to be met.

5.3.4.2 Sampling Procedures

At each destructive seam sample location, a test sample measuring approximately 12 in. across the seam and 42 in. along the seam was obtained. The sample was divided into three pieces and distributed to: (i) the geosynthetics laboratory for testing, (ii) the installer, and (iii) for an on-site archive.

5.3.4.3 Test Results

Off-site laboratory testing of geomembrane seam samples was performed in accordance with the CQA Plan. At the testing laboratory (i.e., GTX), 1-in wide test specimens were removed from the destructive seam sample using a die press. On a calibrated tensiometer, five test specimens were peel-tested for adhesion strength. For fusion seams, peel tests were performed on both the inside and outside tracks. Additionally, five specimens were tested for shear strength. The seam strength acceptance/rejection criteria described in Section 5.4.2.3 (for trial welds) were used to evaluate the destructive seam samples.

For Phase I, a total of 117 destruct sample locations were selected. During testing operations, three samples were observed to fail field-testing, while ten samples were noted to fail laboratory testing. In the case of failed samples, additional test strips were taken from the seam at locations approximately 10 ft from each side of the failing sample location. If the additional test strips had passing results, a full destructive seam sample was taken. If the samples did not pass, test strips were obtained at another location approximately 10 ft further from the failure, repeating until passing samples were obtained and the failing area was localized. Once the bounds of the failing seam were determined, the entire seam length between the passing samples was repaired by the procedures described in the following subsection. For extended repairs (i.e., greater than 150-ft), a destructive sample was obtained from the repair. A total of four destructive samples were removed from capped areas; all passed the seam strength acceptance/rejection criteria described in Section 5.4.2.3 (for trial welds). In the case of failing destructive sample Nos. 2, 4, and 6, the repairs overlapped each other and shared the same bounding destructive samples; see the panel layout drawing in Appendix O for details. The destructive seam test results are presented in Appendix L.

5.3.5 Geomembrane Repairs

The repair procedures presented in this subsection were used by the installer to patch holes and tears, spot-extrude impact damage or other minor scratches. In the cases where patches or caps were used to repair the damaged geomembrane (i.e., small holes, tears, or on seams which failed nondestructive or destructive testing), an approximately 12-in wide capping strip was used.

Next to the east sump area and adjacent to the four 24-in diameter stormwater conveyance pipes, it was noted that water had accumulated under the liner. Holes were cut through the liner, the water removed, the low-permeability surface observed before the liner was repaired.

During the repair or panel tie-in operations, the following procedures were implemented:

- technicians and seaming equipment used were required to pass trial welds;
- patches or caps extended at least 6-in beyond the edge of the defect and all corners were rounded; and
- repairs were vacuum tested and visually observed for continuity.

Seam and panel repair logs are presented in Appendix M. Complete panel layout drawings illustrating the location of seam and panel repairs are shown in the record drawings in Appendix O.

5.4 CQA of Geotextile

5.4.1 Conformance Testing and Documentation

A non-woven geotextile was used as a cushion between the gravel drainage layer and geomembrane liner. The non-woven geotextile, GSE NW24, was manufactured by GSE Lining Technology, LLC (GSE) of Kingstree, South Carolina. The needle-punched, non-woven geotextile has a nominal weight per unit area of 24-oz/yd^2. During the design phase, a hydrostatic puncture test, ASTM D5514 (modified), was performed on a geosynthetic sandwich over a 55 hour duration to verify that no

puncture or holes were observed in the geomembrane after the application of a 5,000 lb/ft^2 normal stress.

A total of six (6) passing conformance samples were obtained (not including one sample obtained for interface friction testing). During construction, CQA personnel initially obtained five conformance samples from the 427 rolls delivered to the site and one from a geotextile after installation. The total area of geotextile delivered to site was 1,268,190 ft^2. The sampling frequency of one sample per 211,365 ft^2 of material exceeds the minimum acceptable sample frequency of one per 250,000 ft^2 required by the CQA Plan.

It is noted that one conformance sample, No. 5, had a low mass per unit area (ASTM D5261) during the initial testing. Though the Minimum Average Roll Value (MARV) may have met the project requirements, a second geotextile sample was obtained from a representative roll and re-tested to confirm all the parameters were meet.

During geotextile installation and prior to placement of the gravel drainage layer, the geotextile exposure exceeded the ultraviolet (UV) exposure requirement of fourteen days (reference Section 02710 Part 3.01.c). To confirm the now-woven geotextile would function as intended after exposure an exposed geotextile sample was obtained and a similar hydrostatic puncture test, ASTM D5514 (modified), that has been performed during design was performed on a geosynthetic sandwich over a 55 hour duration to verify that no puncture or holes were observed in the geomembrane after the application of a 5,000 lb/ft^2 normal stress; see FCF No. 6 for details and results.

The conformance test results and the manufacturer's quality control (QC) letters and certificates were reviewed by CQA personnel and were found to be in compliance with the CQA Plan. The manufacturer's QC documentation and the results of the conformance tests are presented in Appendices E and F, respectively.

5.4.2 Field Monitoring Activities

5.4.2.1 Delivery and On-Site Storage

Upon delivery to the site, geotextile rolls were typically stored in an area located south of the construction area. The geotextile rolls were transported on site by a Gehl 258 or Skytrak forklift. CQA personnel periodically monitored the delivery, unloading, and

storage procedures to ensure that the material was handled in an appropriate manner. An inventory of delivered rolls was maintained by CQA personnel.

5.4.2.2 Deployment and Seaming

The non-woven geotextile was manually unrolled over the geomembrane liner. CQA personnel monitored the deployment of the non-woven geotextile rolls for manufacturing defects, damage that may have occurred during shipment, storage, and handling, and damage resulting from installation activities. If any materials were observed to be damaged, the installer was notified and the damaged materials were either discarded or repaired. CQA personnel observed repair locations to verify conformance with the requirements of the CQA Plan.

After deployment of the geotextile, CQA personnel observed that the installer overlapped geotextile panels a minimum of 4 to 6-in then used a wedge welder to seam the panels together.

As required by the CQA Plan, Parsons prepared a geotextile panel layout. A copy of the panel layout is presented in Appendix O.

6. MISCELLANEOUS CONSTRUCTION

6.1 Overview

Various structures were constructed in support of the SCA. As previously indicated, construction of two basins for the SMS are on-going and details will be provided in a separate report. Within the Phase I of the SCA, two sump areas were constructed, referred to as east and west. Details of the sump are discussed below.

6.2 Sump Construction

The bases of the sumps were approximately 40.5-ft by 55.5-ft with 2.5:1 side slopes. Solvay waste was excavated and re-located before low-permeability soil material was placed and compacted. Within the sump area after the low-permeability material was tested, geosynthetics were deployed (from the bottom to top): a GCL, 60-mil thick HDPE geomembrane liner, cushion geotextile with two 100-mil thick HDPE geomembrane rub sheets being installed in the base of the sump.

The components of the sump de-watering system include the following:

- 5-ft diameter polyethylene (PE) standard dimension ration (SDR) –26 perforated manhole, with 8 rows of 1 in. diameter perforations on 6-in centers and staggered by 3-in; and

- 12-in. diameter PE SDR–11 perforated collection pipe, with 8 rows of 1 in. diameter perforations on 3-in centers.

A total of four manholes were installed in each sump along with multiple collection pipes. The sump was backfilled with 12-in thick minus 4-in dia. gravel and the pipes were surrounded by greater than 4-in less than 12-in dia. aggregate; see FCF No. 8 for details.

CQA personnel monitored the placement of the soils, geosynthetics, manhole, pipe, and backfill. In mid-July 2011, work on the east sump was initiated. The location of the sump was field adjusted by Parsons to avoid possible interference by the existing instrumentation system. After a major precipitation event that occurred 8th through 10th of August 2011, CQA personnel noticed that the stormwater stored in the eastern sump had suddenly drained. On 17 August 2011, a field investigation was conducted in the

sump area. A Caterpillar 325 excavator was used to expose the underlying Solvay waste within the sump area. No major voids in the waste were observed. A reduction in the low-permeability layer's thickness was observed potentially caused by erosion. On 21 August 2011, after re-grading, the subgrade was re-established and the low-permeability material was replaced, compacted, and retested, and geosynthetics were eventually installed.

After the low-permeability layer was tested and the geosynthetics installed, the manholes were lifted into position typically using an excavator. In 2012, concrete was placed over the rub sheets and around the four manhole structures in each sump. The concrete base for the western sump was placed 23 February 2012 and was approximately 17-ft long, 14-ft wide, and 8-in thick. The concrete base for the eastern sump was placed 15 March 2012 and was approximately 18-in long, 16-ft wide, and 8-in thick.

The 5-ft diameter HDPE manholes had 1-in diameter perforations on 6-in centers, staggered by 3-in and were fabricated by Vari-Tech, of Liverpool, New York. The concrete was 4,000 psi and fibermesh reinforced and supplied by Saunders Companies of Nedrow, New York.

The pipe was supplied by the pipe manufacturer, Chevron Phillips Chemical Company, LP (DriscoPlex) PW4100 of Plano, Texas. CQA personnel verified the proper size and spacing of the perforations by visual observation of the pipe during installation. No conformance testing of the pipe was required by the CQA Plan. The bills of laden are presented in Appendix F.

The pipe, when delivered to the site, was stockpiled in an area located south of the construction area. The pipe was typically transported from the stockpile to the construction area by an excavator.

Pipe sections were joined using butt-fusion or electro-fusion welding techniques. CQA personnel periodically monitored the installation of the various components of the de-watering system to ensure that industry-accepted procedures were used by the installer for butt-fusing and electro-fusing the pipes.

7. SUMMARY AND CONCLUSIONS

Observation of the construction of Phase I at the Onondaga Lake Sediment Consolidation Area was performed by Geosyntec during the period of 2 May 2011 to 21 May 2012. During this time, CQA personnel monitored the installation of the following components:

- earthwork (subgrade preparation, compacted low-permeability soil liner, and gravel drainage layer construction);
- geosynthetics (installation of GCL in sump areas only, geomembrane liner, and geotextile cushion); and
- sump area de-watering system (installation of manholes and collection pipe).

During construction of the above components, CQA personnel verified that conformance and CQA testing were performed on the construction materials at the frequencies required in the CQA Plan (as defined in Section 3.1.2 of this report), and that materials meeting the CQA Plan requirements were used. CQA personnel also verified that conditions or materials identified as not conforming to the CQA Plan were replaced, repaired, and/or retested, as described in this report.

The results of the CQA activities undertaken by Geosyntec as described in this report indicate that Phase I of the Onondaga Lake Sediment Consolidation Area was constructed in accordance with the Specifications, as well as the design clarifications.

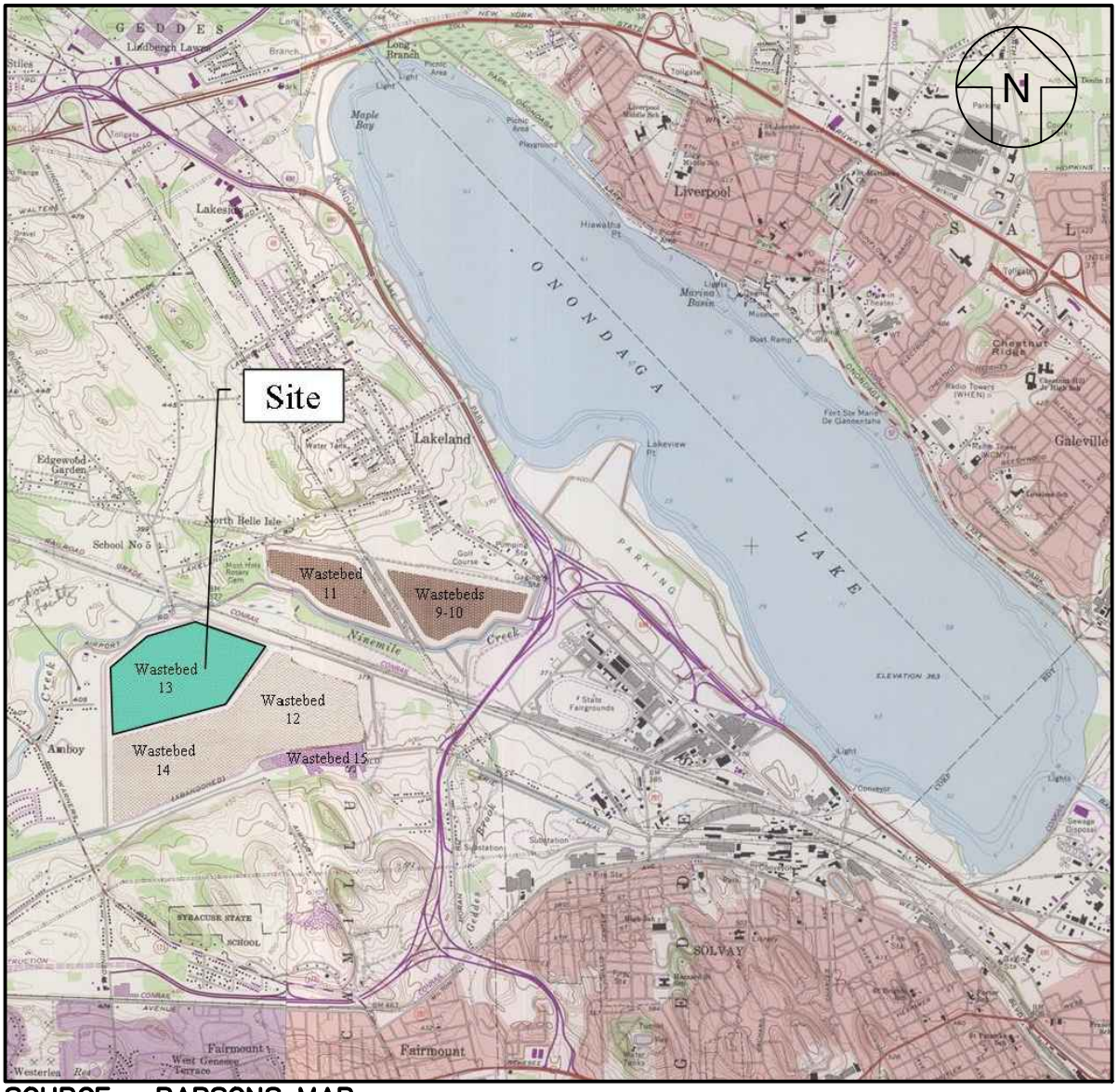
Marcus Fountain
CQA Manager

David J. Bonnett, P.E.
CQA Engineer-of-Record
New York PE #89889

I, David J. Bonnett, certify that I am currently a New York State Registered Professional Engineer, who had primary responsibility to ensure implementation of the subject construction program, and that I certify that the Remedial Design Plans and Specifications were implemented and that construction activities were completed in substantial conformance with the approved NYSDEC approved Remedial Design and Specifications including modifications approved by the Designer and/or NYSDEC.

FIGURE

SITE LOCATION MAP



SOURCE: PARSONS MAP

L:\CADD\O\ONONDAGA LAKE\PERMIT\SCA GEOTUBES\ISSUED FOR CONSTRUCTION REV-0\REDUCED SET (NO FINAL COVER)\4706F001

Geosyntec consultants

KENNESAW, GA

DATE:	May-12	SCALE:	NTS
PROJECT NO.	GJ4706B	FILE NO.	4706f001
DOCUMENT NO.	-	FIGURE NO.	1

APPENDIX A

Photographic Documentation

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME:	ONONDAGA LAKE SEDIMENT CONSOLIDATION AREA	PROJECT NO.:	GJ4706A-07
CLIENT.:	HONEYWELL/PARSONS	FILE NAME:	OL.SCA.PHASE_I.PPT

Photograph 1: The Sediment Consolidation Area (SCA) was cleared and partially grubbed prior to placement of engineered fill and low–permeability (LP) soil layer. In 2010, a LP soil test pad, shown in the background, was constructed.

Photograph 2: Initially, surface debris was removed using a combination of manual labor and light equipment.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME:	ONONDAGA LAKE SEDIMENT CONSOLIDATION AREA	PROJECT NO.:	GJ4706A-07
CLIENT.:	HONEYWELL/PARSONS	FILE NAME:	OL.SCA.PHASE_I.PPT

Photograph 3: Request for Information (RFI) No. 10 allowed the use of low-ground pressure bulldozers to strip the vegetation and debris. A skid loader with a brushcutter was used as well a bulldozer.

Photograph 4: A landscape rake was also used to remove roots and debris from the subgrade surface.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME: ONONDAGA LAKE SEDIMENT CONSOLIDATION AREA	PROJECT NO.: GJ4706A-07
CLIENT.: HONEYWELL/PARSONS	FILE NAME: OL.SCA.PHASE_I.PPT

Photograph 5: Stumps were ground below the subgrade surface using a grinder. The prepared subgrade was observed and approved by NYSDEC and CQA personnel before placement low permeability layer.

Photograph 6: Pumps were used during construction to remove stormwater from the work area.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME:	ONONDAGA LAKE SEDIMENT CONSOLIDATION AREA	PROJECT NO.:	GJ4706A-07
CLIENT.:	HONEYWELL/PARSONS	FILE NAME:	OL.SCA.PHASE_I.PPT

Photograph 7: Off-site engineered fill was used to construct perimeter berms. A bulldozer was used to spread the soil in lifts that were densified with a compactor. In-place compaction tests were performed by the contractor's laboratory or by CQA personnel after mobilization.

Photograph 8: The initial 12-in thick lift of low permeability soil was placed over the approved cleared area. This lift was considered a bridge lift.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME:	ONONDAGA LAKE SEDIMENT CONSOLIDATION AREA	PROJECT NO.:	GJ4706A-07
CLIENT.:	HONEYWELL/PARSONS	FILE NAME:	OL.SCA.PHASE_I.PPT

Photograph 9: Low permeability soil was delivered from two off-site sources, placed, and compacted to the grades defined in RFI No. 3 and Field Change Form (FCF) No. 3.

Photograph 10: Lifts of low permeability soil were compacted by a smooth drum or, as shown above, a pad-foot roller.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME:	ONONDAGA LAKE SEDIMENT CONSOLIDATION AREA	PROJECT NO.:	GJ4706A-07
CLIENT.:	HONEYWELL/PARSONS	FILE NAME:	OL.SCA.PHASE_I.PPT

Photograph 11: Water was added to the low permeability soil, as needed. Occasionally, a tractor or bulldozer with a draw type harrow was used to condition the low permeability soil.

Photograph 12: Prior to geosynthetics installation, the surface of the low permeability layer was fine graded. Occasionally, an all-terrain vehicle pulling a weighted chain link fence was used to drag the surface, filling minor surface irregularities.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME:	ONONDAGA LAKE SEDIMENT CONSOLIDATION AREA	PROJECT NO.:	GJ4706A-07
CLIENT.:	HONEYWELL/PARSONS	FILE NAME:	OL.SCA.PHASE_I.PPT

Photographs 13 and 14: In small areas, various compaction and surface preparations were performed. A Wacker 4614 or a Caterpillar CB24 rollers were used.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME:	ONONDAGA LAKE SEDIMENT CONSOLIDATION AREA	PROJECT NO.:	GJ4706A-07
CLIENT.:	HONEYWELL/PARSONS	FILE NAME:	OL.SCA.PHASE_I.PPT

Photograph 15: Visible rocks were removed manually from the low permeability soil layer prior to geomembrane deployment.

Photograph 16: CQA personnel verified the in-place moisture-density of the low permeability soil. Thin-walled (i.e. Shelby) tube samples were obtained from the upper lift, forwarded to an off-site testing laboratory, and tested to confirm the material met the hydraulic conductivity requirement.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME:	ONONDAGA LAKE SEDIMENT CONSOLIDATION AREA	PROJECT NO.:	GJ4706A-07
CLIENT.:	HONEYWELL/PARSONS	FILE NAME:	OL.SCA.PHASE_I.PPT

Photographs 17 and 18: Steel plates were installed within the Phase I sump corridor area. After low permeability placement, a drill was used to confirm that minimum clay thicknesses were achieved. Holes were backfilled using granular bentonite.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME:	ONONDAGA LAKE SEDIMENT CONSOLIDATION AREA	PROJECT NO.:	GJ4706A-07
CLIENT.:	HONEYWELL/PARSONS	FILE NAME:	OL.SCA.PHASE_I.PPT

Photograph 19: Four 24-in dia. drainage pipes were installed through the eastern and western berms to connect to the Sediment Management System (SMS) stormwater basins.

Photograph 20: Pipe bedding material was manually compacted. Engineered fill above the bedding material was compacted using a walk-behind compactor plate.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME: ONONDAGA LAKE SEDIMENT CONSOLIDATION AREA	PROJECT NO.: GJ4706A-07
CLIENT.: HONEYWELL/PARSONS	FILE NAME: OL.SCA.PHASE_I.PPT

Photograph 21: Two sumps were excavated. The Solvay waste was re-located and the sump was lined with low permeability soil.

Photograph 22: Geomembrane rolls were delivered and stockpiled in an area east of the construction area, near the construction support trailers. A telehandler or lull was used to manage the rolls.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME: ONONDAGA LAKE SEDIMENT CONSOLIDATION AREA	PROJECT NO.: GJ4706A-07
CLIENT.: HONEYWELL/PARSONS	FILE NAME: OL.SCA.PHASE_I.PPT

Photograph 23: Geosynthetic clay liner (GCL) was required in the sump areas. Rolls were stockpiled and covered next to the geomembrane rolls.

Photograph 24: The rolls of cushion geotextile were generally stored south of the construction area, adjacent to the installer's trailer.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME: ONONDAGA LAKE SEDIMENT CONSOLIDATION AREA	PROJECT NO.: GJ4706A-07
CLIENT.: HONEYWELL/PARSONS	FILE NAME: OL.SCA.PHASE_I.PPT

Photograph 25: Geomembrane rolls were deployed using a spreader bar attached to a piece of equipment, such as a Caterpillar 3250 excavator as shown above.

Photograph 26: A skid loader was also used to deploy geomembrane rolls. Panels were manually positioned before being welded. A wire was deployed under geomembrane panels to facilitate the leak location survey.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME:	ONONDAGA LAKE SEDIMENT CONSOLIDATION AREA	PROJECT NO.:	GJ4706A-07
CLIENT.:	HONEYWELL/PARSONS	FILE NAME:	OL.SCA.PHASE_I.PPT

Photograph 27: A dual track fusion welder used to seam geomembrane panels together.

Photograph 28: CQA personnel monitored the geosynthetics installation and marked out destructive seam samples, as shown above. The samples were removed and tested to confirm the strength of the welds. The installer performed non-destructive test to confirm the integrity of the seams.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME:	ONONDAGA LAKE SEDIMENT CONSOLIDATION AREA	PROJECT NO.:	GJ4706A-07
CLIENT.:	HONEYWELL/PARSONS	FILE NAME:	OL.SCA.PHASE_I.PPT

Photograph 29: The installer repaired the geomembrane liner by extrusion welding patches, as shown above.

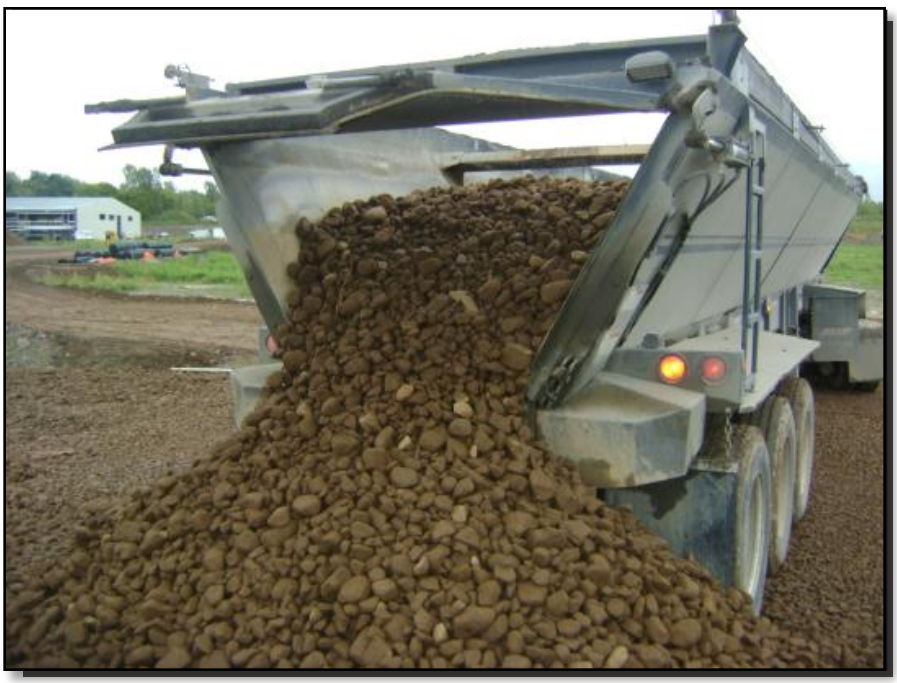
Photograph 30: A non-woven geotextile cushion was deployed over the geomembrane. Adjacent panels were thermally bonded using a single fusion welder.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME:	ONONDAGA LAKE SEDIMENT CONSOLIDATION AREA	PROJECT NO.:	GJ4706A-07
CLIENT.:	HONEYWELL/PARSONS	FILE NAME:	OL.SCA.PHASE_I.PPT

Photograph 31: Prior to placement of the gravel drainage layer, plywood was installed over the geosynthetics and gravel placed on top to establish access ramps.



Photograph 32: Gravel was delivered primarily from the Granby source using live bottom trucks.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME:	ONONDAGA LAKE SEDIMENT CONSOLIDATION AREA	PROJECT NO.:	GJ4706A-07
CLIENT.:	HONEYWELL/PARSONS	FILE NAME:	OL.SCA.PHASE_I.PPT

Photograph 33: Low-ground pressure dozers were used to place the gravel in a single lift.

Photograph 34: Low-ground pressure equipment such as the Caterpillar 299 compact skid loader and Hitachi TB235 mini-excavator were used to remove areas of excessive fines.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME: ONONDAGA LAKE SEDIMENT CONSOLIDATION AREA	PROJECT NO.: GJ4706A-07
CLIENT.: HONEYWELL/PARSONS	FILE NAME: OL.SCA.PHASE_I.PPT

Photographs 35 and 36: Areas of excessive fines were noted in the gravel drainage layer. These areas were marked out using orange sand bags.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME:	ONONDAGA LAKE SEDIMENT CONSOLIDATION AREA	PROJECT NO.:	GJ4706A-07
CLIENT.:	HONEYWELL/PARSONS	FILE NAME:	OL.SCA.PHASE_I.PPT

Photograph 37: On 2 November 2011 a screening unit fitted with a wash bar was mobilized to the site to process the gravel on site.

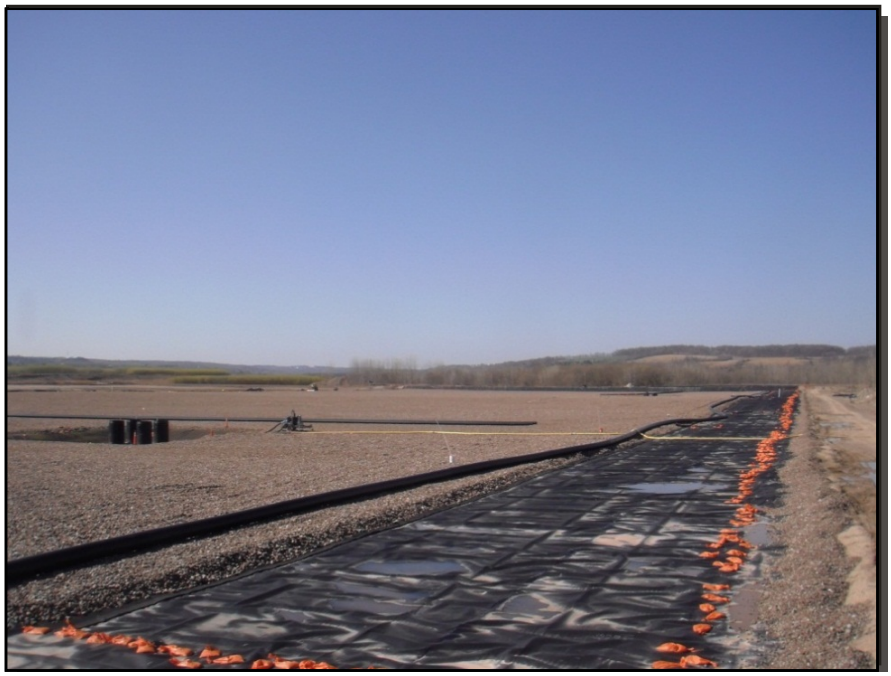
Photograph 38: In May 2012, a flip screener was used to further remediate areas of observed fines in the gravel drainage layer.

Geosyntec consultants

PHOTOGRAPH LOG

PROJECT NAME: ONONDAGA LAKE SEDIMENT CONSOLIDATION AREA	PROJECT NO.: GJ4706A-07
CLIENT.: HONEYWELL/PARSONS	FILE NAME: OL.SCA.PHASE_I.PPT

Photograph 39: In February 2012, polyethylene manholes were installed in the two sump areas. Concrete was placed around the four manholes. Gravel was later placed in the sump.



Photograph 40: A view of the substantially completed Phase I area from the north west corner.

APPENDIX B

Field Reports and Correspondence

- Request For Information
- Field Change Forms
- Weekly Field Reports

Request For Information

Geosyntec consultants

PARSONS

CONSTRUCTION REQUEST FOR INFORMATION (RFI) LOG

PROJECT: **Onondaga Lake Sediment Consolidation Area (SCA) Phase I Constructio** PROJECT NO. **GJ4706** TASK NO.: **01**

LOCATION: **522 Gerelock Road, Camillus, NY 13209** YEAR: **2011-2012**

DESCRIPTION: **Sediment Consolidation Area (SCA)**

SITE OWNER: **Honeywell**

CONTRACTOR: **Parsons**

REFERENCE NO.	DESCRIPTION	STATUS	DATE SUBMITTED (day/mo)	RE-SUBMIT YES	RE-SUBMIT NO	RESOLUTION
RFI-001	Earthwork Sample Frequency	Closed	22-Sep-10		X	Sample frequency not changed.
RFI-002	Structural Fill Classification	Closed	25-Oct-10		X	Use of GP approved for berm material; use of GP in other areas will require approval.
RFI-003	Subgrade Elevations	Closed	14-Apr-11		X	Revised clay grades sent on 4/28 (Phase I) and 6/3 (Phase II). Berms to be built to design height, not elevation (6/24).
RFI-004	5' SDR-26 HDPE Riser Pipe	Closed	9-May-11		X	Number of risers can be reduced from 6 to 4, but connection details need to be checked. The use of concrete instead of HDPE is not acceptable due to friction/downdrag/chemical resistance/etc.
RFI-005	Liquid Mgmt. System	Closed	9-May-11		X	(1) Riser perforations can't be changed due to flow requirements. (2) Laterals to be installed as close to riser bottom as possible. (3) Optional connectors to be installed as close to riser bottom as possible, using any practical method. (4) Laterals connected to risers via a long stub.
RFI-006	Conveyance Culverts	Closed	9-May-11		X	(1) East berm conveyance culverts will be 36" SDR-17. (2) 4x24" Culverts crossing east berm require 30" spread for connections, rather than the 12" inches in design. Acceptable.
RFI-007	Weir Box Abandonment	Closed	12-May-11		X	The proposed fill is acceptable.
RFI-008	Basins Subgrade	Closed	5-Jul-11		X	Geosyntec responded - Dave Steele to work with Geosyntec to finalize. Finally closed based on emails between Kula, Darcy Jones, Tim Larson, and Laura.
RFI-009	Basins Liner Uplift	Reviewed as Noted	5-Jul-11		X	Geosyntec responded - Dave Steele to work with Geosyntec to finalize at the appropriate time.
RFI-010	Clearing and Grubbing	Closed	13-Jul-11		X	Stripping vegetation with a bulldozer will be considered acceptable, however clearing&grubbing shall not get too far ahead of clay placement.
RFI-011	Sump Riser Modifications	Closed	18-Jul-11		X	Separate 8'x8' concrete pads are acceptable. Concrete pad should be constructed to prevent separation between pad and riser. Laterals should be placed directly on pad. 2' minimum gravel road thickness for concrete trucks to access sump.
RFI-012	Interface Shear Testing	Closed	20-Jul-11		X	Interface shear test shall have 24" Granby gravel, GSE NW24 geotextile, GSE HDPT060AE geomembrane, 12 inch Low Perm Soil layer. Run tests at 700, 2100 and 3500 psf.
RFI-013	GM Carbon Black Testing	Closed	22-Jul-11		X	Using ASTM D1603 instead of ASTM D4218 is acceptable.
RFI-014	Interface Shear Results	Accepted as Noted	6-Sep-11		X	Interface shear results (peak Φ= 27°/18°, resid Φ=24°/16°) meet the intent of the design.
RFI-015	Structural Fill Classification Follow-Up	Accepted as Noted	6-Sep-11		X	Use of GP w/Sand, GP-GM, GP-GM w/ Sand, SP-SM w/ Gravel, and SW-SM w/ Gravel is acceptable. 4" max particle size. Erosion protection measures as needed,
RFI-016	Berm Elevations	Closed	17-Oct-11		X	East and West Berm elevations must be OK for water storage and perimeter drainage channel installation in closure. As-built elevations will be reviewed by Geosyntec as appropriate. Phase I/III intercell berm - Minimum EL.434 ft msl. Phase I/II intercell berm - Minimum EL.436 ft msl.
RFI-017	Gravel Drainage Size	Closed	8-Dec-11		X	Gravel material satisfies specification. Areas of concentrated fines should be removed by LGP equipment.
RFI-018	Geotextile Cushion Puncture	Closed	24-Apr-12		X	24 oz/sy puncture strength of 250 lb. Heat bonding of geotextile overlaps & patches is acceptable.
RFI-019	Geomembrane Density Standard	Closed	24-Apr-12		X	Use of ASTM D792 (Method B) may be substituted for ASTM D1505.

PARSONS
301 Plainfield Road
Suite 350, 3rd Floor
Syracuse, NY 13212

REQUEST FOR INFORMATION
No. 00001

TITLE: Earthwork Sample Frequency
PROJECT: HW SCA CONSTRUCTION
TO: Attn: David D Steele
PARSONS
301 Plainfield Road
Suite 350
Syracuse, NY 13212
Phone: 315-552-9736 Fax: 315-451-9570

DATE: 9/22/2010
JOB: 446199

STARTED: 10/13/2010
COMPLETED: 11/11/2010
REQUIRED: 9/29/2010

QUESTION:

Onondaga Lake SCA Final Design Earthwork Specification 02200 1.05 D. 1. requires a representative composite sample be obtained from each 2,500 cubic yards or part thereof with a minimum of one (1) sample from each borrow source area with consistent appearance.

Is this mandated by the NYSDEC? The first specification we were working with had the sample frequency at 5,000 cubic yards for earthwork materials. If this is mandated by NYSDEC the cost and time would change from what we have orginally estimated.

ANSWER:

Per David Steele " I recommend we do not change the specs for this issue at this time due to the mixed analytical results we have obtained. Data does not support reducing the frequency and would be tough to justify."

COMPLETED

Requested By: PARSONS **Date:** 9/22/2010

Signed: _____
Mark J. Hoffman

From: Hoffmann, Mark
Sent: Tuesday, September 21, 2010 7:53 AM
To: Hillenbrand, Dhana
Cc: Steinhoff, Alan; Sommerfield, Kenneth; Steele, David; Brussel, Laura
Subject: RFI

Categories: Red Category

Dhana,

Al and Ken have requested that a RFI be submitted regarding the Earthwork sample frequency.

Onondaga Lake SCA Final Design Earthwork Specification 02200 1.05 D. 1. requires a representative composite sample be obtained from each 2,500 cubic yards or part thereof with a minimum of one (1) sample from each borrow source area with consistent appearance.

Is this mandated by the NYSDEC? The first specification we were working with had the sample frequency at 5,000 cubic yards for earthwork materials..

Mark J. Hoffmann
Quality Control Manager
PARSONS
301 Plainfield Road
Suite 350
Syracuse, NY 13212
315-552-9757 (office)
315-378-8205 (cell)
mark.hoffmann@parsons.com

Safety - Make It Personal

Hillenbrand, Dhana

From:	Steele, David
Sent:	Sunday, September 26, 2010 6:52 PM
To:	Hillenbrand, Dhana
Cc:	Sommerfield, Kenneth; Steinhoff, Alan
Subject:	RE: RFI no Answer, with Proposed Solution, Drawings, Distribution list- CASCADING

Team, I recommend we do not change the specs for this issue at this time due to the mixed analytical results we have obtained. Data does not support reducing the frequency and would be tough to justify.

-----Original Message-----
From: Hillenbrand, Dhana
Sent: Wednesday, September 22, 2010 11:56 AM
To: Steele, David
Cc: Sommerfield, Kenneth; Steinhoff, Alan
Subject: FW: RFI no Answer, with Proposed Solution, Drawings, Distribution list- CASCADING

David,
Please take a look at the attached RFI (exp1285170629679.pdf).
Please supply me with an answer by September 27, 2010.

FYI: These will usually come directly from the Contract Manager System, but today for some reason it is having a glitch.

Dhana Hillenbrand
Senior Document Control Coordinator

522 Gerelock Road♦ Syracuse, New York 13209 Phone – 315-256-7318 Mailing Address:
301 Plainfield Road ♦ Syracuse, New York 13212 dhana.hillenbrand@parsons.com ♦
www.parsons.com

-----Original Message-----
From: Hillenbrand, Dhana
Sent: Wednesday, September 22, 2010 11:51 AM
To: Hillenbrand, Dhana
Subject: RFI: RFI no Answer, with Proposed Solution, Drawings, Distribution list- CASCADING

You can view this document in Contract Manager by clicking the following link (you will need an Contract Manager User Name and Password):

PARSONS
301 Plainfield Road
Suite 350, 3rd Floor
Syracuse, NY 13212

REQUEST FOR INFORMATION
No. 00002

TITLE: Structural Fill Classification

DATE: 10/25/2010

PROJECT: HW SCA CONSTRUCTION

JOB: 446199

TO: Attn: David Steele
PARSONS
301 Plainfield Road
Suite 350
Syracuse, NY 13212
Phone: 315-552-9736 Fax: 315-451-9570

STARTED:
COMPLETED:
REQUIRED: 11/1/2010

WORK	SCHEDULE	COST
IMPACT: Unknown	**IMPACT:** Yes	**IMPACT:** No

REQUEST:

Can you please clarify if we would be able to use material that has been tested as GP w/sand on the berm work.

PROPOSED SOLUTION:

Earthwork specification 02200 2.01B gives the following allowable soil classification for use as structural fill (SC, SM, ML, CL, GM, GC, or GW). We have a readily available material that was tested as a GP w/sand (results attached) that we would like to include for use as first 14" bridge lift over SOLW. Limited use of this material would only be allowed as first 14" bridge lift. All other subsequent lifts would follow the current specifications. We believe this type of material would greatly enhance the bridging capability when places as a 14" lift over the SOLW. We believe this material would give a more stable foundation to complete the berm construction and allow work to continue in Syracuse fall and early winter weather conditions.

ANSWER:

Dave Steele approved the proposed solution. He stated this would need to now go to Geosyntec since it would be a submittal change and would need their approval as well.

Geosyntec responded "Acceptable for use under the berms; use in other areas of the SCA will require prior approval"

COMPLETED

Requested By: PARSONS Date: _____

Signed: _____
Mark Hoffmann

PARSONS

REQUEST FOR INFORMATION
RFI-002

Request

Information:
1. Estimated Cost Impact: Unknown
2. Estimated Schedule Impact: Would allow continuation of berm work in Syracuse fall and early winter weather conditions..
3. Prepared By: Mark Hoffmann
4. Requested Response By: 10/29/10
5. Written Description (attach sketches if applicable): Earthwork specification 02200 2.01B gives the following allowable soil classification for use as structural fill (SC, SM, ML, CL, GM, GC, or GW.
6. Subcontractor's Solution: We have a readily available material that was tested as a GP w/Sand (results attached) that we would like to include for use as first 14" bridge lift over SOLW. Limited use of this material would only be allowed as first 14" bridge lift. All other subsequent lifts would follow the current specifications. We believe this type of material would greatly enhance the bridging capability when placed as a 14" lift over the SOLW. We believe this material would give a more stable foundation to complete the berm construction and allow work to continue in Syracuse fall and early winter weather conditions.
7. Project Engineer's Response:
Attachment Sheets: ST3104SL-37-09-10 (2 pages)

Subcontractor: _____ Date: 10/22/10

Project Engineer: _____ Date: _____

PARSONS

REQUEST FOR INFORMATION
RFI-002

Request

Information:
1. Estimated Cost Impact: Unknown
2. Estimated Schedule Impact: Would allow continuation of berm work in Syracuse fall and early winter weather conditions..
3. Prepared By: Mark Hoffmann
4. Requested Response By: 10/29/10
5. Written Description (attach sketches if applicable): Earthwork specification 02200 2.01B gives the following allowable soil classification for use as structural fill (SC, SM, ML, CL, GM, GC, or GW.
6. Subcontractor's Solution: We have a readily available material that was tested as a GP w/Sand (results attached) that we would like to include for use as first 14" bridge lift over SOLW. Limited use of this material would only be allowed as first 14" bridge lift. All other subsequent lifts would follow the current specifications. We believe this type of material would greatly enhance the bridging capability when placed as a 14" lift over the SOLW. We believe this material would give a more stable foundation to complete the berm construction and allow work to continue in Syracuse fall and early winter weather conditions.
7. Project Engineer's Response:
Attachment Sheets: ST3104SL-37-09-10 (2 pages)

Subcontractor: _____ Date: 10/22/10

Project Engineer: _____ Date: 29 Oct 2010

Acceptable for use under berms - use in other areas of SCA will require prior approval. JFB

ATLANTIC TESTING LABORATORIES

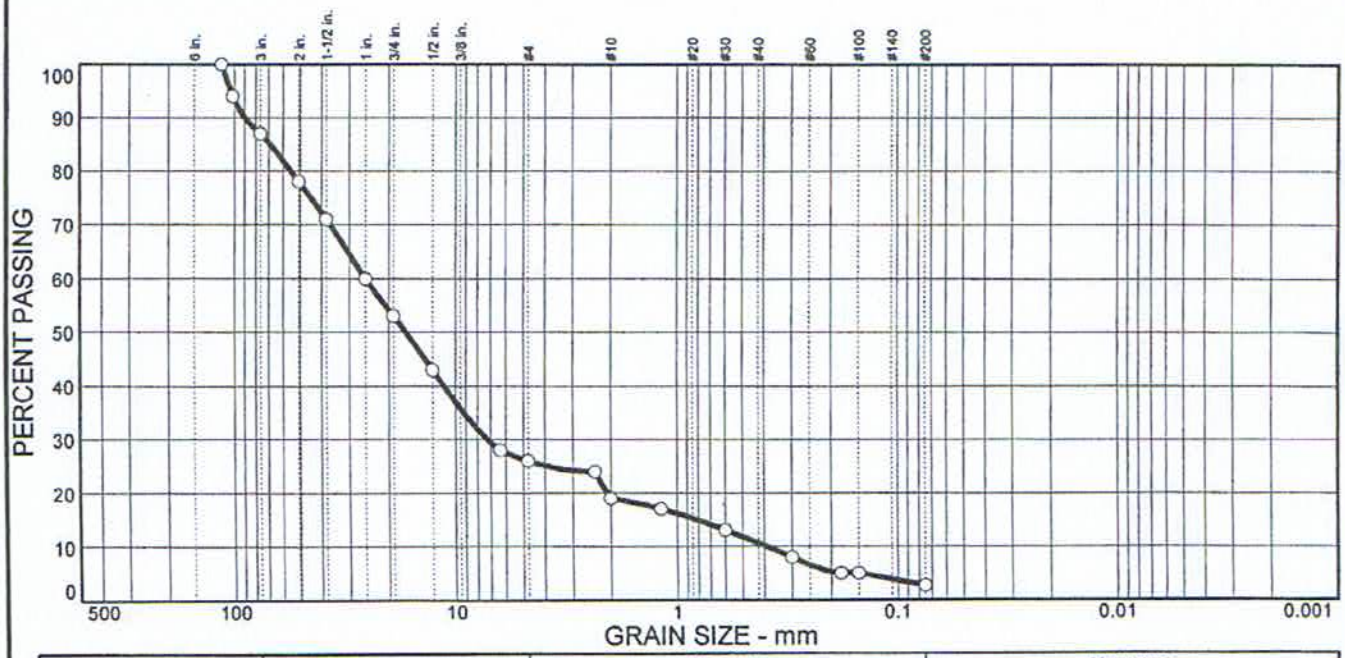
Particle Size Distribution Report

Project: SCA Phase 1A **Report No.:** ST3104SL-37-09-10

Client: Parsons Engineering of New York, Inc. **Date:** 09-13-2010

Sample No: S72-SF10 **Source of Sample:** Granby Quarry

Location: Stockpile **Elev./Depth:** ---



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
13	34	27	7	8	8	3	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	OUT OF SPEC. (X)
4.5 in.	100		
4 in.	94		
3 in.	87		
2 in.	78		
1.5 in.	71		
1.0 in.	60		
3/4 in.	53		
1/2 in.	43		
1/4 in.	28		
#4	26		
#8	24		
#10	19		
#16	17		
#30	13		
#50	8		
#80	5		
#100	5		
#200	2.7		

* (no specification provided)

Soil Description

Brown cm+f GRAVEL; some cm+f SAND; little COBBLES; trace SILT/CLAY
Structural Fill (SF10)
ASTM D 2974 Percent Organic = 0.5%

Atterberg Limits

PL= NP LL= NP PI= NP

Coefficients

D_{85}= 68.7 D_{60}= 25.4 D_{50}= 16.8
D_{30}= 7.23 D_{15}= 0.822 D_{10}= 0.390
C_u= 65.10 C_c= 5.27

Classification

USCS= GP w/ Sand AASHTO= ---

Remarks

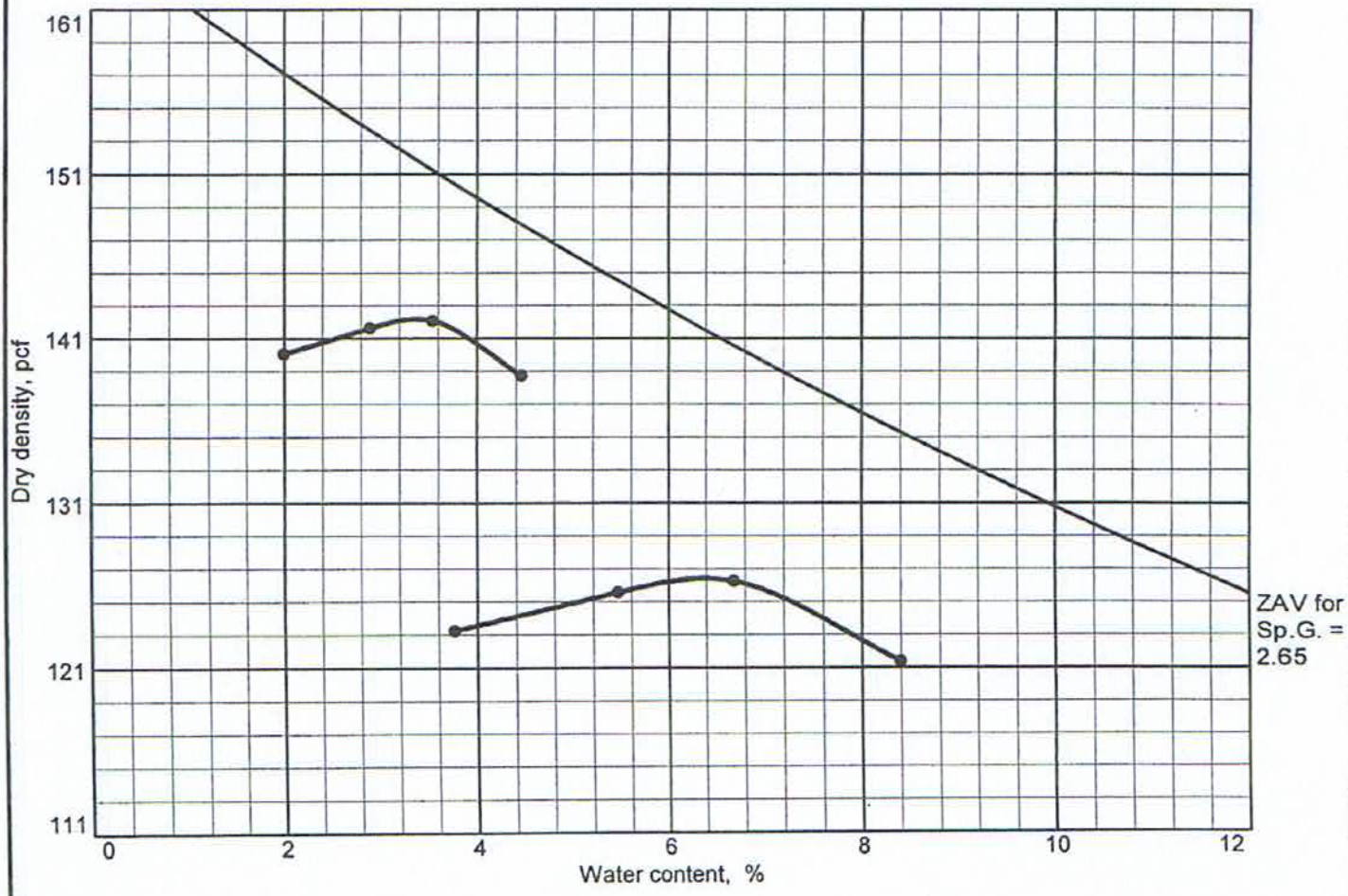
ASTM D 136,ASTM D 4318 and ASTM D 2487
Sampled by A. Stanton on 09-02-10
ASTM D 2216 Recieved Moisture = 5.6%

ATLANTIC TESTING LABORATORIES, LIMITED

Reviewed by: _____ Date: 9/14/10

ATLANTIC TESTING LABORATORIES

COMPACTION TEST REPORT



Test specification: ASTM D 698-00 Method C Standard
Oversize correction applied to each point

Elev/ Depth	Classification		Received Moist.	Sp.G.	LL	PL	PI	% > 3/4 in.
	USCS	AASHTO						
---	GP w/ Sand	---	5.6	2.65	NP	NP	NP	47.0

CORRECTED TEST RESULTS

Maximum dry density = 142.2 pcf

Optimum moisture = 3.4 %

MATERIAL DESCRIPTION

Brown cm+f GRAVEL; some cm+f SAND; little COBBLES; trace SILT/CLAY
Structural Fill (SF10)
ASTM D 2974 Percent Organic = 0.5%

Report No.: ST3104SL-37-09-10 **Client:** Parsons Engineering of New York, Inc.
Project: SCA Phase 1A
Sample No.: S72-SF10 **Source of Sample:** Granby Quarry
Location: Stockpile **Date:** 09-13-2010

Since this sample contained more than 30% plus 3/4" material, the Maximum Laboratory Dry Density and Optimum Moisture Content values may not be determined in strict accordance with ASTM D 698. Percent compaction determined by utilizing the Maximum Laboratory Dry Density may not be representative of compacted soil and should only be used as an indicator of percent compaction.

Remarks:
ASTM D 2216 and ASTM D 698
Sampled by A. Stanton on 09-02-10
Dry Preparation

Rammer: Mechanical
Specific Gravity: Assumed

Reviewed by: _____ Date: 9/14/10

PARSONS
301 Plainfield Road
Suite 350, 3rd Floor
Syracuse, NY 13212
Phone: 315-552-9737
Fax: 315-457-9571

REQUEST FOR INFORMATION
No. 00003

TITLE: Subgrade Elevations
DATE: 4/14/2011

PROJECT: HW SCA CONSTRUCTION
JOB: 446199

TO: Attn: John (Jay) Beech
GEOSYNTEC CONSULTANTS
1255 Roberts Boulevard NW
Suite 200
Kennesaw, GEORGIA 30144
Phone: 678-202-9500 Fax: 404-267-1102

STARTED:
COMPLETED:
REQUIRED: 4/15/2011

WORK IMPACT:	SCHEDULE IMPACT:	COST IMPACT:
Unknown	No	

QUESTION:
The Berm and Subgrade Grading Plan is +/- one (1) foot higher than the actual elevation measured in the field. This will have a significant cost impact for both the structural fill and the clay if built per current design plans. (Spec # 0220 and 02250) The SCA plans on starting clay placement Monday, April 25, 2011 and need resolution on this issues ASAP to support our project schedule.

PROPOSED SOLUTION:

ANSWER:
The following approach was discussed in the field:

Provide the northings, eastings, and elevations for points on a 50 ft grid across Phase I, and any high points between the grid points. From this information Geosyntec will prepare a contour drawing of the existing surface. We will provide a drawing with this surface for review and approval within two working days of receipt of the survey information.
Once approved we will prepare a revised top of clay layer within 2 to 3 working days of approval of the revised existing surface.

NOTE: Revised clay grades have been received from Geosyntec and the berms are to be built to the height (i.e., vertical distance between the ground and the top of the dike) shown in the design (elevation can be lower than design elevation). per Dave Steele (24 Jun 11)

COMPLETED

Requested By: PARSONS **Date:** 4/14/2011

Signed: _____
Alan Steinhoff

L:\CADD\ONONDAGA LAKE\PERMIT\SCA GEOTUBES\ISSUED FOR CONSTRUCTION REV-0\REDUCED SET (NO FINAL COVER)\REV-3\4299X006_TOP OF LINER (Revised with Phase II).dwg, 6/14/2011 2:20:30 PM, JSpeed,

1:250

PARSONS

REQUEST FOR INFORMATION
No. 00004

TITLE: 5' SDR-26 HDPE Riser Pipe

DATE: 5/9/2011

PROJECT: HW SCA CONSTRUCTION

JOB: 446199

TO: Attn: John (Jay) Beech
GEOSYNTEC CONSULTANTS
1255 Roberts Boulevard NW
Suite 200
Kennesaw, GEORGIA 30144
Phone: 678-202-9500 Fax: 404-267-1102

STARTED:

COMPLETED:

REQUIRED: 5/16/2011

WORK IMPACT:	SCHEDULE IMPACT: Yes	COST IMPACT: Yes

QUESTION:

Reference :Drawings 444853-101-C-010 Liquid Management System Details, 444853-200-M-007 SCA Piping Sections & Details, and 444853-101-C-005 Sump Grading Plan
The plan calls for six (6) 5' risers in each sump (2 primaries and 4 temporaries). If only four (4) pipes are going to be used during filling and the two permanent are not being utilized then why don't we just cut the two permanents out of the design and leave two of the temporaries in place once operations are over. Is this possible?

PROPOSED SOLUTION:

ANSWER:

It appears that number of risers can be reduced from 6 to 4. However, the sumps should not be arbitrarily removed. The connection and there ability to perform as temporary and permanent sumps needs to be checked.

Jay Beech

Total: $200,000.00

Requested By: PARSONS **Date:** 5/9/2011

Signed: _____
William Mathe

PARSONS

REQUEST FOR INFORMATION
No. 00005

TITLE: Liquid Management System

DATE: 5/9/2011

PROJECT: HW SCA CONSTRUCTION

JOB: 446199

TO: Attn: David Steele
PARSONS
301 Plainfield Road
Suite 350
Syracuse, NY 13212
Phone: 315-552-9736 Fax: 315-451-9570

STARTED:

COMPLETED:

REQUIRED: 5/16/2011

WORK IMPACT:	SCHEDULE IMPACT: Yes	COST IMPACT: Yes

QUESTION:

Regarding: Liquid Management System Sediment Consolidation Area Drawing number 444853-101-C-005 Sump Grading Plan, 444853-101-C-010 Liquid Management Systems Details and 444853-200-M-007 SCA Piping sections and details.
(A) On the 12 lateral piping that penetrates the 5' riser pipes it calls perforations 3" apart with a 1" diameter hole (Drawing Number 444853-101-C-010). Varitech recommends that we use a ½" or smaller whole 6" on center spaced at 12, 3, 6 and 9. This will cut done on labor and save on cost of pipe. Can this be done?
(B) At what elevation on the 5' risers do the 12" laterals penetrate? Drawing number 444853-101-C-010 shows it penetrating flush with the concrete pad and drawing 444853-200-M-007 shows it penetrating elevated off the concrete pad. Can you clarify this design?
(C) Drawing number 444853-101-C-005 Sump Grading Plan shows 1' optional connectors (SDR11) between and the risers. What elevations do these pipes need to penetrate the risers? What type of connection will these require?
(D) Vari- tech recommends manufacturing the risers with a 12" long stub to connect the laterals to the risers. Will this be a sufficient means of joining these pipes?

PROPOSED SOLUTION:

ANSWER:

(A) This appears to be significantly less area of holes than the design. We need to meet the design, which is about 13 square inches per foot of laterals.
(B) Install the laterals as close to the bottom of the riser as practical.
(C) Install the optional connectors as close to the bottom of the riser as practical. There are not specific requirements for connectors. Please present a desired method.
(D) Yes

Requested By: PARSONS **Date:** 5/9/2011

Signed: _____
William Mathe

PARSONS

REQUEST FOR INFORMATION
No. 00006

TITLE: Conveyance Culverts East Berm

DATE: 5/9/2011

PROJECT: HW SCA CONSTRUCTION

JOB: 446199

TO: Attn: David Steele
PARSONS
301 Plainfield Road
Suite 350
Syracuse, NY 13212
Phone: 315-552-9736 Fax: 315-451-9570

STARTED:

COMPLETED:

REQUIRED: 5/16/2011

WORK IMPACT:	SCHEDULE IMPACT: Yes	COST IMPACT: Yes

QUESTION:

Regarding: Request for Information – Conveyance Culverts East Berm drawing 444853-201-C-012
(A) Is the 36" Diameter SDR-17 Conveyance pipe approved by the DEC? In order to place the 24" SDR -11 culverts we will need the header for the 36" manufactured and on-site.
(B) The four (4) 24" culverts crossing the East berm call for a 12" spread, they will require a 30" spread in order to make the proper connections to the 24"x36" manifold. Is this possible? In order to place these culverts we need the 24"x36" manifold fabricated and on-site to place all as one unit.

PROPOSED SOLUTION:

ANSWER:

(A) Yes, 36" pipe is approved.

(B) Yes, a 30" spread between culverts is acceptable.

COMPLETED

Requested By: PARSONS **Date:** 5/9/2011

Signed: _____
William Mathe

PARSONS
301 Plainfield Road
Suite 350
Syracuse, NY 13212
Phone: 315-552-9736
Fax: 315-451-9570

REQUEST FOR INFORMATION
No. 00007

TITLE: Weir Box Abandonment

DATE: 5/12/2011

PROJECT: HW SCA CONSTRUCTION

JOB: 446199

TO: Attn: John (Jay) Beech
GEOSYNTEC CONSULTANTS
1255 Roberts Boulevard NW
Suite 200
Kennesaw, GEORGIA 30144
Phone: 678-202-9500 Fax: 404-267-1102

STARTED:

COMPLETED:

REQUIRED: 5/16/2011

WORK IMPACT:	SCHEDULE IMPACT:	COST IMPACT:
Unknown	Unknown	Unknown

QUESTION:

Detail 1 Weir Box Abandonment shows slurry fill going all the way to the top of the weir box. We want to propose the use of excavated material for a portion of that depth. (Drawing 444853-101-C-0012 Rev. 2)

PROPOSED SOLUTION:

1.) Place flowable fill into weir box up to 15' down from the ground surface. Flowable fill vendor will be requested to deliver flowable fill with the appropriate slump so that it flows into the horizontal pipe a short distance. The intent is to plug the horizontal pipe and to match surrounding Solvay Waste geotechnical properties as closely as practical, so a weaker mix is acceptable.

2.) Using an excavator, remove the wooden planks down to 15' down from ground surface, which will likely leave an excavation larger than the existing weir box.

3.) Backfill excavation with excavated material up to 2' down from the ground surface. The excavated materials properties should meet the surrounding Solvay Waste well.

4.) Backfill remaining 2' with soil fill layer.

ANSWER:

The proposed flowable fill is acceptable.

Jay Beech

Requested By: PARSONS

Date: _____

Signed: _____
David Steele

PARSONS

REQUEST FOR INFORMATION
No. 00008

TITLE: East and West Basins Subgrade
DATE: 7/1/2011

PROJECT: HW SCA CONSTRUCTION
JOB: 446199

TO: Attn: John (Jay) Beech
GEOSYNTEC CONSULTANTS
1255 Roberts Boulevard NW
Suite 200
Kennesaw, GEORGIA 30144
Phone: 678-202-9500 Fax: 404-267-1102

STARTED:
COMPLETED:
REQUIRED: 7/12/2011

WORK IMPACT:	SCHEDULE IMPACT:	COST IMPACT:
Unknown	Unknown	Unknown

QUESTION:
What is the final decision/deatil for the SCA East and West Basin subgrade preparation and liner system?

PROPOSED SOLUTION:

ANSWER:
(1) According to an email by David Steele of Parsons dated 7/5/2011 sent to Ramachandran Kulasingam, Jay Beech and Laura Brussel, David Steele was collecting information related to RFI-00008 and RFI-0009. As of 12 July 2011, no further communication has taken place.

(2) Geosyntec notes that we have received these RFI's and will work with Parsons going forward in crafting an official response to the addressed questions.

UPDATED ANSWER:
Geosyntec (with approval from NYSDEC and Parsons design team), has determined that the Basin Liner System will be in accordance with the details shown on drawing number 444853-201-C-008 and that the geomembrane may be placed directly on solvay waste in accordance with direction from Dave Steele and NYSDEC PER DARCY JONES, PARSONS EMAIL DATED: 27 Jul 11

Geosyntec confirms that the first three details (1/8, 2/8, and 3/8) showing the proposed liner system for the basin on drawing number 444853-201-C-008 (attached) are still good from a design standpoint. Geosyntec is okay with stripping the vegetative mat and placing the geomembrane, as proposed. Consistent with the SCA low permeability soil layer specifications, visible rock particles at the subgrade surface with a maximum dimension larger than one inch should be removed before placing the geomebrane.

I have copied the Engineer-of Record Jay Beech and he is good with the above. The attached email from Tim Larson of NYSDEC was forwarded to me by you, and seems to indicate that NYSDEC is good with the proposed geomembrane placement method. I would assume Laura Brussel would confirm that Parsons design team's approval. PER R. KULA KULASINGAM, GEOSYNTEC EMAIL DATED 27 Jul 11

Requested By: PARSONS **Date:** 7/1/2011

Signed: _____
Darcy Jones

PARSONS

REQUEST FOR INFORMATION
No. 00008

TITLE: East and West Basins Subgrade

DATE: 7/1/2011

PROJECT: HW SCA CONSTRUCTION

JOB: 446199

TO: Attn: John (Jay) Beech
GEOSYNTEC CONSULTANTS
1255 Roberts Boulevard NW
Suite 200
Kennesaw, GEORGIA 30144
Phone: 678-202-9500 Fax: 404-267-1102

STARTED:

COMPLETED:

REQUIRED: 7/12/2011

WORK IMPACT:	SCHEDULE IMPACT:	COST IMPACT:
Unknown	Unknown	Unknown

FYI, placing the SCA basins liner directly on the Solvay Waste is acceptable and needs to be consistent with Dave's attached email. Please contact me if you have any questions relating to this issue.
Thank you,
Tim PER TIM LARSON, DEC EMAIL DATED 26 Jul 11

We can comply with the requirements below with the following clarifications:
a)The slope of the basin liner subgrade will be as indicated on the design drawings. This slope, which is less than 2%, uses berms and the existing topography of Wastebed 13 to provide for the necessary temporary storage capacity.
b)It is not feasible to perform compaction and compaction testing on this subgrade. The subgrade will be cleared to meet the requirements described in the email below and graded to be smooth and uniform. A foundation analysis was performed and the subgrade, without compaction, was found to have sufficient structural integrity to support the loads and stresses on the liner imposed when the basin is in operation. The geomembrane installation subcontractor will inspect the subgrade and certify that it is acceptable for geomembrane installation.
Dave PER DAVID STEELE, PARSONS EMAIL DATED: 11 Jul 11

COMPLETED

Requested By: PARSONS **Date:** 7/1/2011

Signed: _____
Darcy Jones

PARSONS
301 Plainfield Road
Suite 350
Syracuse, NY 13212
Phone: 315-552-9736
Fax: 315-451-9570

REQUEST FOR INFORMATION
No. 00010

TITLE: Stripping Vegetation with Bulldozer

DATE: 7/13/2011

PROJECT: HW SCA CONSTRUCTION

JOB: 446199

TO: Attn: David Bonnett
GEOSYNTEC CONSULTANTS

STARTED:

COMPLETED:

REQUIRED: 7/20/2011

WORK IMPACT:	SCHEDULE IMPACT:	COST IMPACT:

QUESTION:

Is Geosyntec OK with stripping vegetation with a bulldozer (i.e., clearing and grubbing -although we may not completely grub)?

PROPOSED SOLUTION:

ANSWER:

The current method that involves manual and light equipment and the proposed method of using a low ground pressure bulldozer are acceptable. Clearing and grubbing operation shall not get too far in front of the clay placement operation.

After the stripping is complete, the area shall be observed by NYSDEC with CQC and CQA personnel to approve and record acceptable area.

COMPLETED

Requested By: PARSONS **Date:** 7/13/2011

Signed: _____
David Steele

PARSONS
301 Plainfield Road
Suite 350
Syracuse, NY 13212
Phone: 315-552-9736
Fax: 315-451-9570

REQUEST FOR INFORMATION
No. 00011

TITLE: SCA Sumps and Manholes
DATE: 8/23/2011

PROJECT: HW SCA CONSTRUCTION
JOB: 446199

TO: Attn: David Bonnett
GEOSYNTEC CONSULTANTS

STARTED:
COMPLETED:
REQUIRED: 7/25/2011

COMPLETED

WORK IMPACT:	SCHEDULE IMPACT:	COST IMPACT:
No	No	No

QUESTION:

This RFI is to:
1) Propose a modified concrete placement in the SCA sumps
2) Request the size of the concrete to be installed around the manhole base

Justification: The manhole supply vendor has recommended that the pump and manhole anchor bolts do not penetrate through the manhole bottom. They recommend that the manhole be held down by concrete around the base and they recommend that the pump be secured to concrete inside the manhole. The vendor has proposed that the manhole base be fabricated with a 4" lip around the outside of the manhole.

PROPOSED SOLUTION:

ANSWER:

PER DAVE STEELE EMAIL DATED 23 Aug 11
Approve it with this change to their previous note. Insert this language and close it out.

PER GEOSYNTEC REPLY DATED 08 Aug 11
We agree to change the requirement from 3 ft to 2 ft, but leaving the language about the road in our response reinforces the spec requirements and reminds everyone involved the applicability for this specific instance. We put in 3 ft earlier because of tendency of large trucks to cause rutting.

PER DAVE STEELE EMAIL DATED 01 Aug 11
Guys, we will probably be asked why the minimum gravel thickness under the concrete truck is required to be 3' when the specs only require 2' under traffic. I think this justification should be added to your RFI response or the requirement should be changed to 2' (which could probably be left off the RFI response since it's already in the specs).

PER GEOSYNTEC REPLY DATED 28 JUL 11
The original design drawings proposed a 25 ft x 25 ft concrete pad with a thickness of 6 inches. Teh risers were proposed to be bolted using corrosion resistant anchor bolts per manufacturer specifications to this single concrete pad.

The RFI proposes using separate concrete pads for the risers. The design calculations approved by NYSDEC are based on individual concrete pads for each riser. Therefore, separate concrete pads with dimensions of 8 ft x 8 ft for each riser are acceptable. This 8 ft includes the outside pad area, riser wall thickness, and the pad area inside the riser.

PARSONS
301 Plainfield Road
Suite 350
Syracuse, NY 13212
Phone: 315-552-9736
Fax: 315-451-9570

REQUEST FOR INFORMATION
No. 00011

TITLE: SCA Sumps and Manholes
DATE: 8/23/2011

PROJECT: HW SCA CONSTRUCTION
JOB: 446199

TO: Attn: David Bonnett
GEOSYNTEC CONSULTANTS

STARTED:
COMPLETED:
REQUIRED: 7/25/2011

WORK IMPACT:	SCHEDULE IMPACT:	COST IMPACT:
No	No	No

The concrete pad portion outside the riser should rest on the (2) 100-mil HDPE geomembrane sheets, with no gap in between. Concrete pad should also be constructed in a manner to not lead to separation of the pad and the riser. The proposed lip thickness of 4 inches should be conformed with the manufacturer/installer as adequate to provide the transfer of the concrete to the riser without leading to separation during uplift.

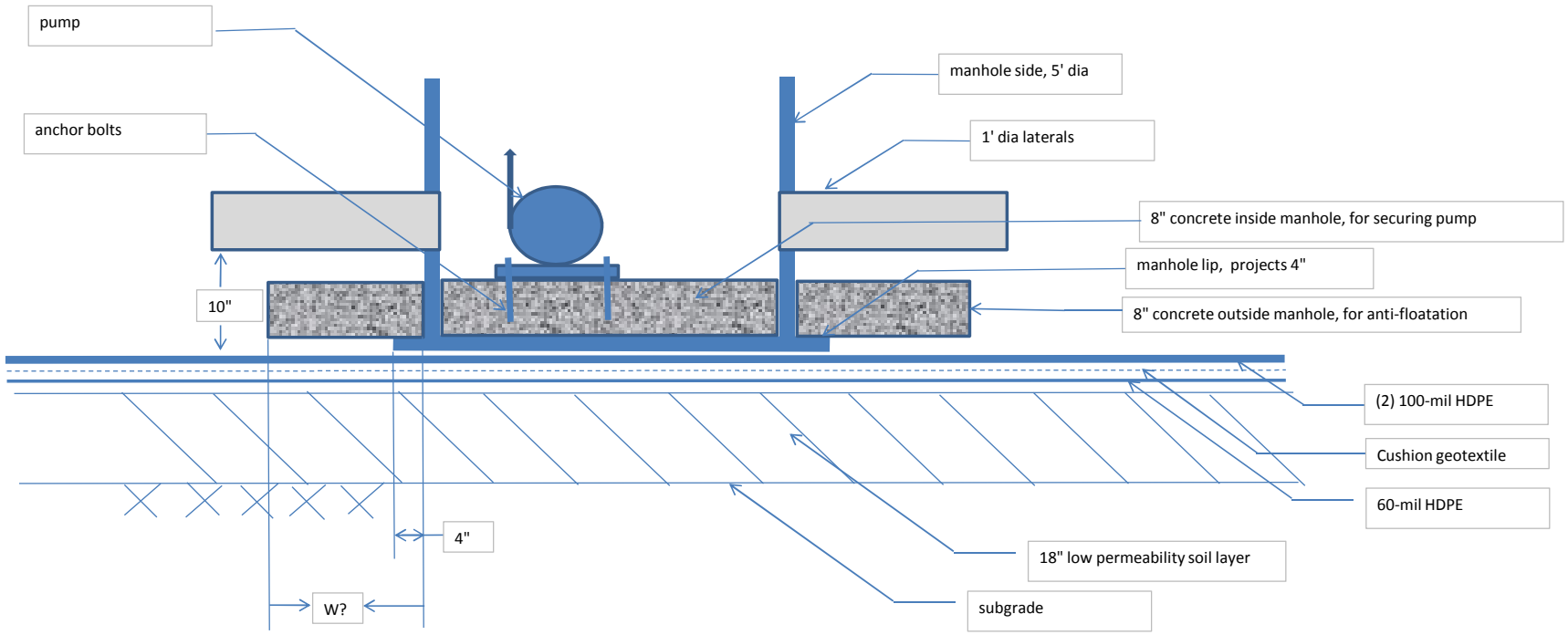
The 12 inch diameter lateral pipes should be placed directly on the concrete pad and should be provided with firm bedding beyond the concrete pad. The low point of these lateral pipes should be the riser connection and the straight run on the concrete pad.

What is the "pump off" water level for the proposed pumps? What is the proposed method for accessing the bolted pumps for repair/maintenance? The design only covered permanent pumps after closure.

Permanent pumps were proposed to be submersible and lifted to the surface for maintenance.

The concrete must be placed in the sump and therefore may need to be pumped since access will be restricted. Alternatively a 3-ft thick gravel road will need to be installed to access the sump.

PER R. KULASINGAM EMAIL DATED: 28 JUL 11 -The associated sump riser shop drawing sent to David Bonnet will be handled separately by our CQA team (David Bonnet) as a submittal.


pump
anchor bolts
manhole side, 5' dia
1' dia laterals
8" concrete inside manhole, for securing pump
manhole lip, projects 4"
8" concrete outside manhole, for anti-floatation
10"
(2) 100-mil HDPE
Cushion geotextile
60-mil HDPE
4"
18" low permeability soil layer
W?
subgrade

PARSONS
301 Plainfield Road
Suite 350
Syracuse, NY 13212
Phone: 315-552-9736
Fax: 315-451-9570

REQUEST FOR INFORMATION
No. 00012

TITLE: Interface Friction Testing
DATE: 7/19/2011

PROJECT: HW SCA CONSTRUCTION
JOB: 446199

TO: Attn: David Bonnett
GEOSYNTEC CONSULTANTS

STARTED:
COMPLETED:
REQUIRED: 7/25/2011

WORK IMPACT:	SCHEDULE IMPACT:	COST IMPACT:

QUESTION:

: Interface Friction Testing(Specification Section 02250 – Low Permeability Soil Layer)
To follow-up on coordination of interface direct shear (ASTM D5321) testing - Reference Specification Section 02250 Part 2.01.F.1:
The Contractor shall perform a minimum of one round of the following tests per borrow source, prior to material being delivered to the site:
1. Interface Direct Shear (ASTMD 5321)

The CQA Plan required one test per 10 CQC tests

PROPOSED SOLUTION:

ANSWER:

To streamline the process as well as a concern for the CQA Independent Testing Laboratory's ability to conduct a sandwich test, the following is proposed.
The project will require one interface direct shear per borrow source for the upper 12 to 18-in thick low-permeability soil layer. Each test shall consist of testing the following cross-section, from top to bottom:
•24-in thick gravel drainage layer – from the Granby Pit
•Geotextile cushion – GSE NW24;
•Geomembrane liner - GSE HDT-060AE-BBB-B-WO; and
•12-in LP soil layer – two sources to date; Black Creek and Marcellus sources.
The clay shall be remolded to 95% of the maximum dry density as determined by the standard Proctor test (ASTM D698) at approximately 3% wet of the optimum moisture content.
Three points shall be performed at the following normal stresses: 700, 2,100, and 3,500 psf (similar to pre-design study). The test will be run at 0.004 in per minute.
The minimum sample size for soils is three 5 gallons buckets and for the geosynthetics, is a minimum of three wide by roll width.

COMPLETED

Requested By: PARSONS **Date:** 7/18/2011

Signed: _____
David Steele

PARSONS

REQUEST FOR INFORMATION
No. 00013

TITLE: ASTM D4218 Testing
DATE: 7/22/2011

PROJECT: HW SCA CONSTRUCTION
JOB: 446199

TO: Attn: John (Jay) Beech
GEOSYNTEC CONSULTANTS
1255 Roberts Boulevard NW
Suite 200
Kennesaw, GEORGIA 30144
Phone: 678-202-9500 Fax: 404-267-1102

STARTED:
COMPLETED:
REQUIRED: 7/29/2011

WORK IMPACT:	SCHEDULE IMPACT:	COST IMPACT:
Unknown	Unknown	Unknown

QUESTION:

Specification 02740 states HDPE Geomembrane Liner to be tested per ASTM D4218 for carbon black content. GSE manufcturer tested per ASTM D1603. As testing per ASTM D1603 also meets the required testing criteria Parsons requests that ASTM D1603 be used in place of ASTM D4218.
Drawings 444853-101-C-009 through 444853-101-C-012

PROPOSED SOLUTION:

Parsons proposes substituting ASTM D1603, which also meets specified requirements, for ASTM D4218.

ANSWER:

Proposed solution is acceptable.

COMPLETED

Requested By: PARSONS **Date:** 7/22/2011

Signed: _____
Michael Dobson

GEOSYNTEC CONSULTANTS

REQUEST FOR INFORMATION
No. 00014

TITLE: Interface Friction Testing
DATE: 8/29/2011

PROJECT: HW SCA CONSTRUCTION
JOB: 446199

TO: Attn: David Steele
PARSONS
301 Plainfield Road
Suite 350
Syracuse, NY 13212
Phone: 315-552-9736 Fax: 315-451-9570

STARTED:
COMPLETED:
REQUIRED: 9/5/2011

WORK IMPACT:	SCHEDULE IMPACT: No	COST IMPACT: No

Subcontractor: GEOSYNTEC CONSULTANTDavid Bonnett **Architect:**

QUESTION:

RFI SUBJECT(s): Interface Friction Testing (Specification Section 02250 – Low Permeability Soil Layer Part 2.01.F.1 and see RFI-11 for details)

QUESTION:
To confirm results meet the project requirements. The interface direct shear (ASTM D5321) tests were performed at the following normal stresses: 700, 2,100, and 3,500 psf and run at 0.004 in per minute. The results are attached for approval by the design engineer.

PROPOSED SOLUTION:

The results meet the intent of the design.

ANSWER:

PER JAY BEECH 07 Sep 11
The results meet the intent of the design.

PER DAVID STEELS' email dated 01 Sep 11
I approve this RFI. We need to send to the Design Engineer for approval.

COMPLETED

PARSONS
301 Plainfield Road
Suite 350
Syracuse, NY 13212
Phone: 315-552-9736
Fax: 315-451-9570

REQUEST FOR INFORMATION
No. 00015

TITLE: SF Classification
DATE: 9/6/2011

PROJECT: HW SCA CONSTRUCTION
JOB: 446199

TO: Attn: John (Jay) Beech
GEOSYNTEC CONSULTANTS
1255 Roberts Boulevard NW
Suite 200
Kennesaw, GEORGIA 30144
Phone: 678-202-9500 Fax: 404-267-1102

STARTED:
COMPLETED:
REQUIRED: 9/13/2011

WORK IMPACT:	SCHEDULE IMPACT:	COST IMPACT:

QUESTION:

Specification Section 02200-2.01B states:
"Soil materials used for engineered fill shall consist of relatively homogeneous natural soils free of materials, which, due to nature or size, are deleterious to he intended use. Unless otherwise specified herein, engineered fill shall classify as SC, SM, ML, CL, GM, GC, or GW according to the Unified Soil Classification System (per ASTM D 2487) or combinations of these materials. Classification shall be based on the results of soil conformance tests."
This RFI is to ask if materials can be used for SCA berm construction that that are relatively homogeneous natural soils free of deleterious materials and classify as the following:
•GP w/Sand
•GP-GM
•GP-GM w/Sand
•SP-SM w/Gravel
•SW-SM w/Gravel

The following field observations are presented to justify acceptance of this material:
1) berms have held up to construction traffic, including loaded trucks, with minimal signs of deflection, and
2) berms have help up since fall of 2010 with minimal signs of erosion.

PROPOSED SOLUTION:

ANSWER:

PER JAY BEECH 08 Sep 11
The proposed materials may be used, with the restiction that the maximum particle size should be 4 inches. Erosion protection measures should be applied as necessary.

COMPLETED

PARSONS
301 Plainfield Road
Suite 350
Syracuse, NY 13212
Phone: 315-552-9736
Fax: 315-451-9570

REQUEST FOR INFORMATION
No. 00016

TITLE: Elevations for East and West Berms
DATE: 10/17/2011

PROJECT: HW SCA CONSTRUCTION
JOB: 446199

TO: Attn: John (Jay) Beech
GEOSYNTEC CONSULTANTS
1255 Roberts Boulevard NW
Suite 200
Kennesaw, GEORGIA 30144
Phone: 678-202-9500 Fax: 404-267-1102

STARTED:
COMPLETED:
REQUIRED: 10/24/2011

WORK IMPACT:	SCHEDULE IMPACT: No	COST IMPACT: No

QUESTION:

Drawing C-006 shows the elevations for the top of the berms around the SCA. Drawing C-009 shows the height of the temporary berm to be 5.7 feet. The east and west berms of the SCA are being built 0.5 feet lower than the design to account for the land-based topography data (as discussed in Field Change Form #3). This RFI is to ask what elevations are required for the top of the east and west berms and the top of the temporary berm to provide the necessary containment during the period when only Phase I and II are in operation.

PROPOSED SOLUTION:

ANSWER:

(1) The elevations of the East and West Berms vary along their profiles and must be sufficient for both water retention and installation of the perimeter drainage channel during closure. Geosyntec will review as appropriate when the as-built elevations are provided.
(2) The temporary berm between Phases I and III shall have a minimum elevation of 434 ft msl.
(3) The temporary berm between Phases I and II shall have a minimum elevation of 436 ft msl.

See attached file for more information

COMPLETED

Geosyntec consultants

PARSONS

REQUEST FOR INFORMATION (RFI) RESPONSE

TO:	David Steele, Dhana Hillenbrand	**Date:** 7 Nov. 2011	**Job No.:** GJ4706
ADDRESS:	Parsons	Sediment Consolidation Area (SCA)	
	Gerelock Road	Phase I	
	Syracuse, NY	Camillus, NY	

RFI No.: SCA-RFI-00016	**Revision No.:** 0	**Date of RFI:** 17 October 2011

RFI SUBJECT(s): Berm Elevations

QUESTIONS:

RFI-00016: This RFI is to ask what elevations are required for the Top of East and West Berms and the top of the temporary berm to provide the necessary containment during the period when only Phase I and II are in operation.

RESPONSES:

(1) The elevations of the East and West Berms vary along their profiles and must be sufficient for both water retention and installation of the perimeter drainage channel during closure. Geosyntec will review as appropriate when the as-built elevations are provided.

(2) The temporary berm between Phases I and III shall have a minimum elevation of 434 ft msl.

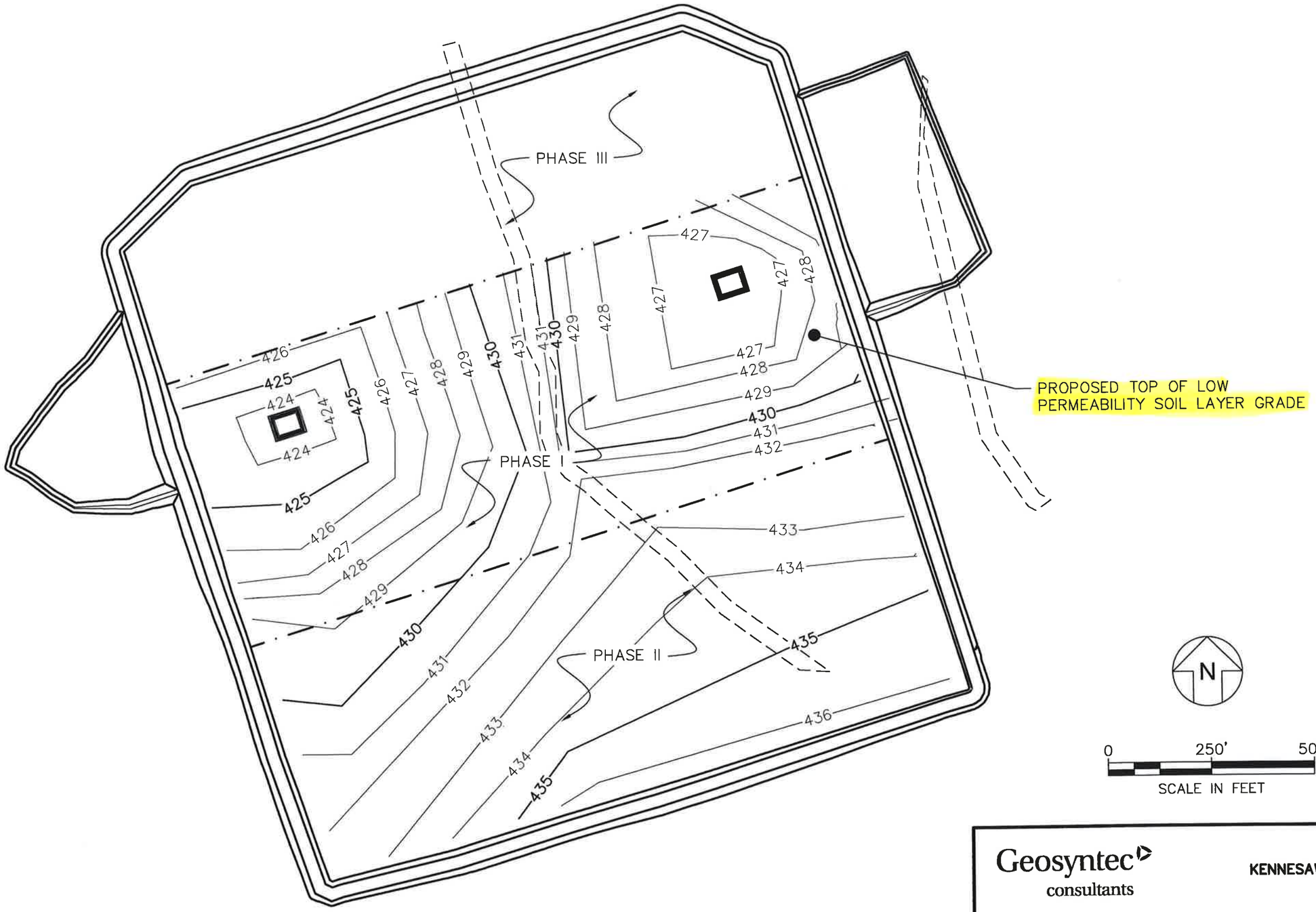
(3) The temporary berm between Phases I and II shall have a minimum elevation of 436 ft msl.

Prepared by	Date	Engineer-of-Record	Date
Name: Joseph Sura	7 Nov. 2011	Name: Jay Beech, P.E.	7 Nov. 2011

Distribution: ☒ David Steele, Parsons ☒ Ming Zhu, Geosyntec ☒ Ramachandran Kulasingam, Geosyntec

Attachments

RECEIVED
Nov -7 2011
Dhana
PARSONS

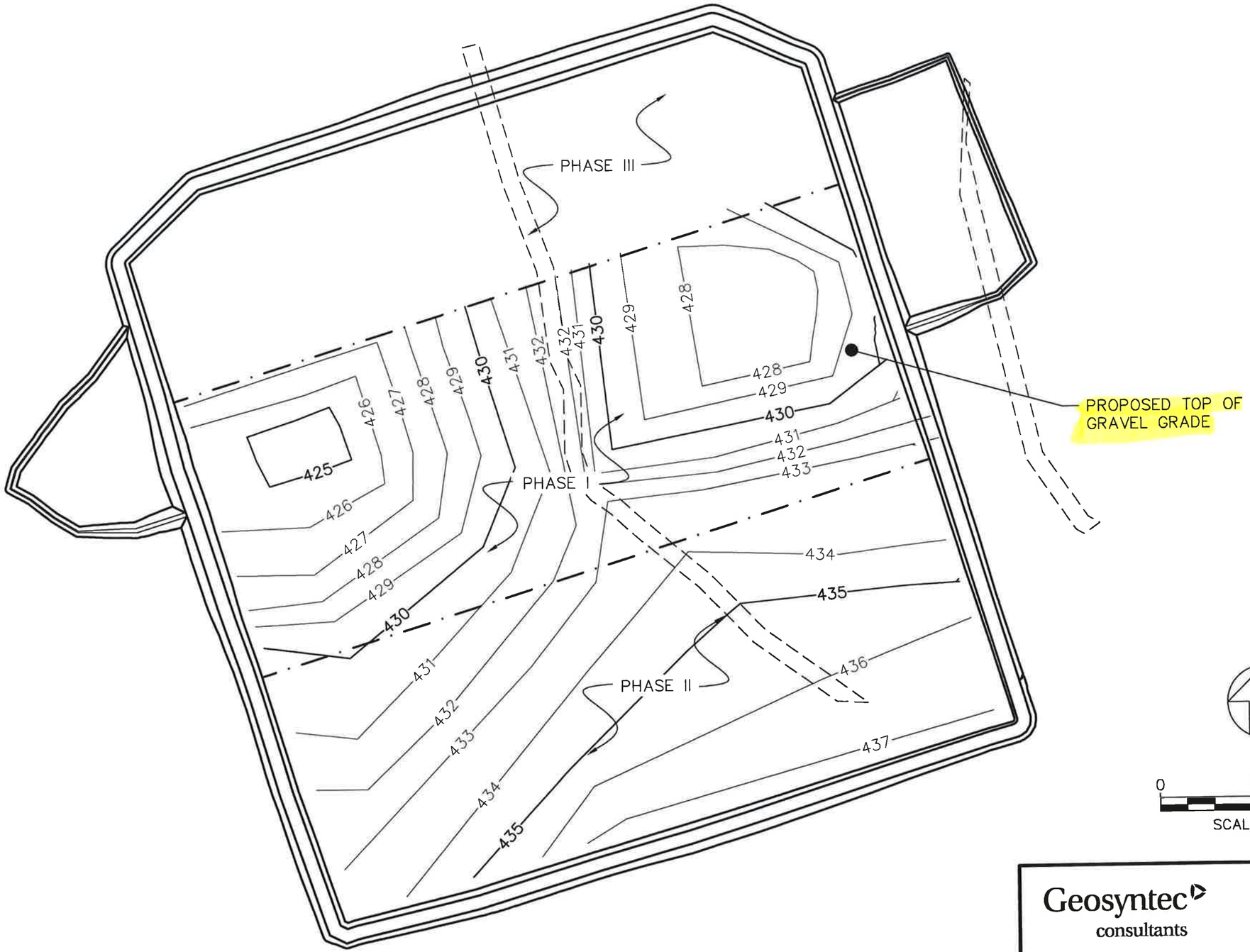


Geosyntec consultants

KENNESAW, GA

DATE:	Aug-11	SCALE:	AS SHOWN
PROJECT NO.	GJ4706.08	FILE NO.	–
DOCUMENT NO.	–	FIGURE NO.	1

L:\CADD\O\ONONDAGA LAKE\PERMIT\SCA GEOTUBES\ISSUED FOR CONSTRUCTION REV-0\REDUCED SET (NO FINAL COVER)\REV-3\DRAWINGS\4299X006_TOP OF LINER (REVISED WITH PHASE II RELOCATED EAST SUMP)



Geosyntec consultants

KENNESAW, GA

DATE:	Aug-11	SCALE:	AS SHOWN
PROJECT NO.	GJ4706.08	FILE NO.	–
DOCUMENT NO.	–	FIGURE NO.	2

L:\CADD\O\ONONDAGA LAKE\PERMIT\SCA GEOTUBES\ISSUED FOR CONSTRUCTION REV-0\REDUCED SET (NO FINAL COVER)\REV-3\DRAWINGS\4299X006_TOP OF GRAVEL (REVISED WITH PHASE II RELOCATED EAST SUMP).

Original Analysis - Before survey bust, minimum berm elevation of 434 ft msl

Phase	Design Storm (24-hour)	Lowest Berm EL (ft msl)		Freeboard (ft.)	
		West Area	East Area	West Area	East Area
I	25-year	434.0	434.0	3.95	2.35
I	100-year	434.0	434.0	3.65	2.15
I & II	25-year	434.0	434.0	2.41	1.35
I & II	100-year	434.0	434.0	1.40	1.06
I, II & III	25-year	434.0	434.0	0.86	0.61

Revised Analysis - Includes survey bust, allows different minimum berm elevation

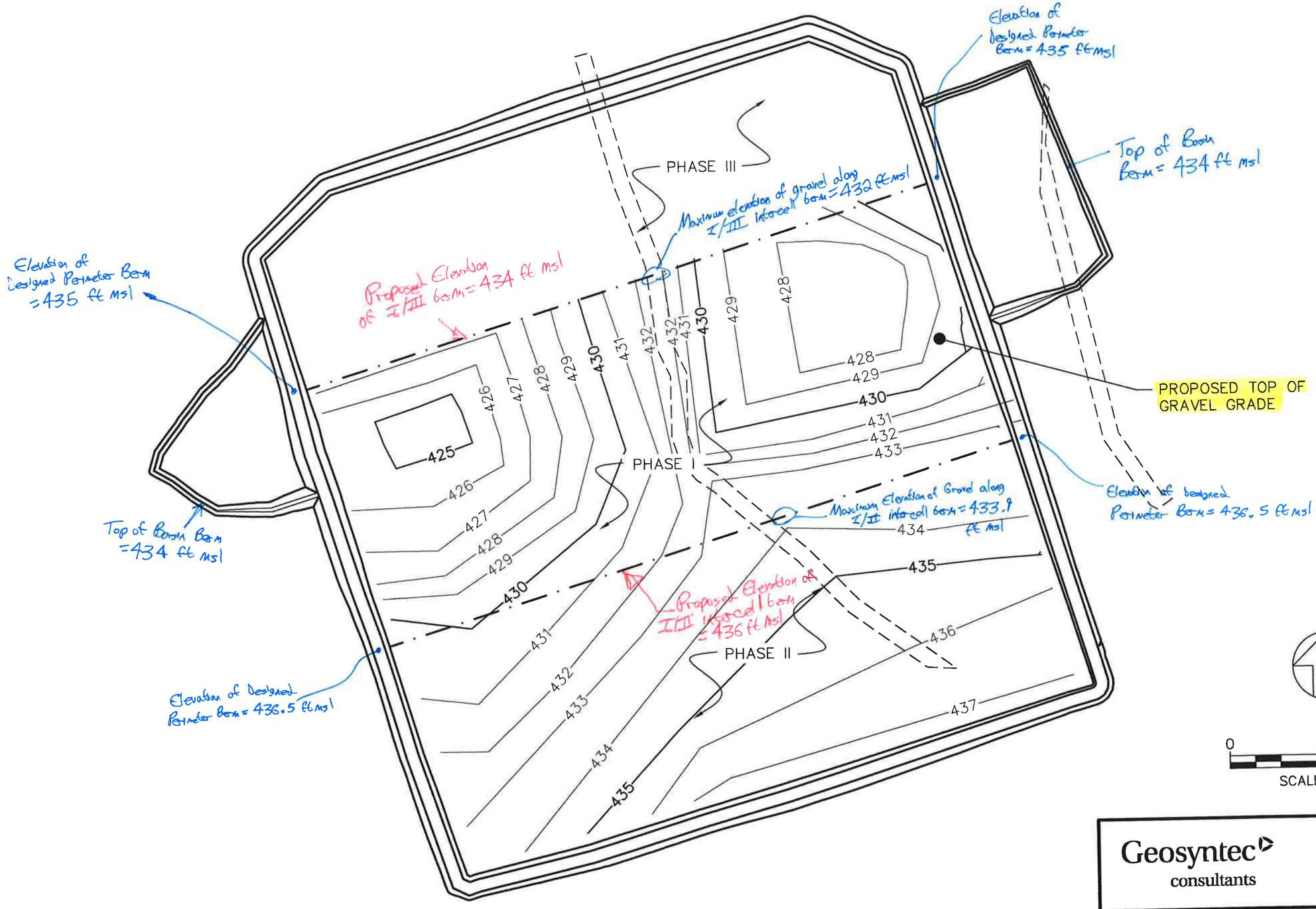
Phase	Design Storm (24-hour)	Lowest Berm EL (ft msl)		Freeboard (ft.)	
		West Area	East Area	West Area	East Area
I	25-year	434.0	434.0	3.69	2.14
I	100-year	434.0	434.0	3.33	1.92
II (Liner Only)	25-year	436.0		1.23	
II (Liner Only)	100-year	436.0		0.99	
I & II	25-year	434.0	434.0	1.88	1.13
I & II	100-year	434.0	434.0	1.29	0.78
I, II & III	25-year	Not updated - Analyses can be performed if Phase III is needed			

Notes:

1.) It is noted that the minimum height of the berm is considered to be 2 ft above the Top of Gravel. This results in a minimum berm elevation of 434 ft msl in Phase I and 436 ft msl in Phase II.

2.) The minimum freeboard requirement is considered to be 0.5 ft (6").

L:\CADD\O\ONONDAGA LAKE\PERMIT\SCA GEOTUBES\ISSUED FOR CONSTRUCTION REV-0\REDUCED SET (NO FINAL COVER)\REV-3\DRAWINGS\4299X006_TOP OF GRAVEL (REVISED WITH PHASE II RELOCATED EAST SUMP)



Geosyntec consultants

KENNESAW, GA

DATE:	Aug-11	SCALE:	AS SHOWN
PROJECT NO.	GJ4706.08	FILE NO.	—
DOCUMENT NO.	—	FIGURE NO.	3

GEOSYNTEC CONSULTANTS

REQUEST FOR INFORMATION
No. 00017

COMPLETED

TITLE: Gravel Drainage Grain Size

DATE: 12/8/2011

PROJECT: HW SCA CONSTRUCTION

JOB: 446199

TO: Attn: John (Jay) Beech
GEOSYNTEC CONSULTANTS
1255 Roberts Boulevard NW
Suite 200
Kennesaw, GEORGIA 30144
Phone: 678-202-9500 Fax: 404-267-1102

STARTED:

COMPLETED:

REQUIRED: 12/15/2011

E-MAILED
15 Dec 11

WORK IMPACT:

SCHEDULE IMPACT:

COST IMPACT:

QUESTION:

Regarding Gravel Drainage Layer (Specification Section 02300-2.01.B and see FCF#1)

(i) To confirm the tested material properties of the gravel meets the intent of the project. The results from construction quality assurance (CQA) testing, specifically the grain size analysis (ASTM D422) tests, indicate oversized material was retained on the 4-in diameter sieve. See summary attached for detail.

(ii) To confirm the removal procedure to be used in the field to remove marginal material observed during gravel placement.

PROPOSED SOLUTION:

(i) The material with oversized material meets the intent of the specification. The Contractor should avoid dumping gravel directly on the lining system using a maximum drop of less than 3-ft.

(ii) During gravel placement operations, accumulation of fines has been observed. These areas have been delineated using high visibility sand bags. It appears fines become concentrated in high traffic areas (e.g., off access roads) or can become accumulated by the washing of fines through precipitation. These areas of concentrated fines will require removal.

Small low ground pressure equipment should be used to remove observed accumulated fines. The equipment bucket should be a straight edge with plastic, flexible rubber or similar material to avoid excessively sharp edges. The removal work should be coordinated with CQA personnel and a spotter should be present during removal activities to ensure no damage occurs to the existing lining system.

ANSWER:

(i) The material with oversized material meets the intent of the specification. The Contractor should avoid dumping gravel directly on the lining system using a drop of less than 3-ft.
(ii) During gravel placement operations, accumulation of fines has been observed. These areas have been delineated using high visibility sand bags. It appears fines become concentrated in high traffic areas (e.g., off access roads) or can become accumulated by the washing of fines through precipitation. These areas of concentrated fines will require removal.

Small low ground pressure equipment should be used to remove observed accumulated fines. The equipment bucket should be a straight edge with plastic, flexible rubber or similar material to avoid excessively sharp edges. The removal work should be coordinated with CQA personnel and a spotter should be present during removal activities to ensure no damage occurs to the existing lining system.

Detail Summary for SCA RFI 17

TEST STANDARD			CLASSIFICATION (ASTM D2487)	GRAIN SIZE (ASTM D 422)						HYDRAULIC CONDUCTIVITY (ASTM D2434)
QA TEST FREQUENCY QA TEST REQUIRED			10,000 cyd 3	@ 10,000 cyd 3						@25,000 cyd 1
SAMPLE No.	LOCATION	APPROX. VOLUME PLACED	(%)	PASSING 4-in. dia. SIEVE (%)	PASSING 3-in. dia. SIEVE (%)	PASSING 2-in. dia. SIEVE (%)	PASSING 1-in. dia. SIEVE (%)	PASSING NO.4 SIEVE (%)	PASSING NO.200 SIEVE (%)	PERMEABILITY (CM/S)
GDL-	Specs:		GW or GP	100				0 - 5	0 -3	≥ 10
1	On-site		GP	100	76	35	3	0	0	
3	Granby Source		GP	99	77	30	3	1	1	23.1
4	Granby Imported Grid N10		GP	89	74	48	4	2	0	14.6
5	Granby Imported Grid 09		GP	93	54	28	1	1	0	

GEOSYNTEC CONSULTANTS

REQUEST FOR INFORMATION
No. 00018

TITLE: Modify Geotex Cushion Punct Streng

DATE: 4/24/2012

PROJECT: HW SCA CONSTRUCTION

JOB: 446199

TO: Attn: John (Jay) Beech
GEOSYNTEC CONSULTANTS
1255 Roberts Boulevard NW
Suite 200
Kennesaw, GEORGIA 30144
Phone: 678-202-9500 Fax: 404-267-1102

STARTED:
COMPLETED:
REQUIRED: 5/1/2012

RFI SUBJECT: SCA Specification Section 02710 – Geotextile Cushion

(i) Reference Table 2710-1: Request to modify geotextile cushion puncture strength (ASTM D4833) from 5,000 psf to 250 lb.

(ii) Reference Part 3.02 and 303, which indicates geotextile seams shall be overlapped or seamed. Patches will extend a minimum one foot beyond damaged area and sewn into place

Requested By: GEOSYNTEC CONSULTANTS **Date:** 4/24/2012

Signed: _____
David Bonnett

ANSWER:

(i) During the design, geotextile performance tests were performed and a 24 oz/syd material was chosen. The 24 oz/syd puncture strength of 250 pounds is acceptable per GRI-GT12(a).

(ii) Heat bonding of geotextile overlaps and patches is acceptable. The Contractor shall take care to avoid disturbing repairs during gravel placement.

CLOSED

Answered By: GEOSYNTEC CONSULTANTS **Date:** 5/1/2012

Signed: _____
John (Jay) Beech

GEOSYNTEC CONSULTANTS

REQUEST FOR INFORMATION
No. 00019

TITLE: Test Substitution

DATE: 4/24/2012

PROJECT: HW SCA CONSTRUCTION

JOB: 446199

TO: Attn: John (Jay) Beech
GEOSYNTEC CONSULTANTS
1255 Roberts Boulevard NW
Suite 200
Kennesaw, GEORGIA 30144
Phone: 678-202-9500 Fax: 404-267-1102

STARTED:
COMPLETED:
REQUIRED: 5/1/2012

RFI SUBJECT: SCA Specification Section 07240 - Geomembrane

Request change to the specification for Geomembrane (Section 020740) to allow substitution of the test method ASTM D792 used for QC testing of the material for sheet density/specific gravity in place of ASTM D1505 specified.

Requested By: GEOSYNTEC CONSULTANTS **Date:** 4/24/2012

Signed: _____
David Bonnett

ANSWER:

The proposed changes are acceptable.

Density provides an indication of a material's molecular structure and degree of crystallinity. It can be measured using a water displacement method or in a gradient column. ASTM D792 (Method B) and ASTM D1505 are considered equal and are industry standards, as discussed in GRI GM-13.

CLOSED

Answered By: GEOSYNTEC CONSULTANTS **Date:** 5/1/2012

Signed: _____
John (Jay) Beech

Field Change Forms

Geosyntec consultants

PARSONS

CONSTRUCTION FIELD CHANGE FORM (FCF) LOG

PROJECT: **Onondaga Lake Sediment Consolidation Area (SCA) Construction** PROJECT NO. **GJ4706** TASK NO.: **01**

LOCATION: **522 Gerelock Road, Camillus, NY 13209** YEAR: **2011-2012**

DESCRIPTION: **Sediment Consolidation Area (SCA)**

SITE OWNER: **Honeywell**

CONTRACTOR: **Parsons**

REFERENCE NO.	DESCRIPTION	STATUS	SUBMITTED (day/mo)	NYSDEC APPROVAL (day/mo)	RE-SUBMIT		RESOLUTION
					YES	NO	
FCF #1	Gravel Layer Thickness	Approved	16-May-11	7-Jun-11		X	Reduced thickness of gravel to 1 ft minimum. No requirement for average gravel thickness.
FCF #2	Low Permeability Soil Layer Requirements	Closed	28-Jun-11	***		X	In areas >3 ft thickness, additional clay will have 2" maximum particle size and no permeability requirement.
FCF#3	Revised Clay Grades	Approved	3-Aug-11	22-Aug-11		X	Revised clay grades and GCL elevations have been designed due to issues with the initial survey.
FCF#4	Well Abandonment	Approved	20-Aug-11	21-Sep-11		X	11 missing wells within test pad area are acceptable.
FCF#5	CQC Frequency	Approved	V0: 26-Aug-11 V1: 14-Oct-11	V1: 31-Oct-11		X	CQA Test Frequency is now = (Volume of Soil) ÷ (CQC Frequency) ÷ 10
FCF#6	Geotextile Storage/Exposure	Approved	V0: 6-Sep-11 V1: 12-Sep-11 V2: 18-Jan-12	V2: 1-Feb-12		X	Maximum exposure time of at least 80 days meets the design intent of adequate protection of the underlying geomembrane.
FCF#7	Instrumentation	Approved	V0: 7-Sep-11 V1: 21-Sep-11 V2: 3-Oct-11	V2: 13-Oct-11		X	Settlement monuments will be used along with piezometers, settlement cells and inclinometers. Profiler 2 will be monitored in Phase 1 until completion of gravel.
FCF#8	Gravel in Sumps	Parsons	11-Apr-12	Pending		X	Gravel in SCA sumps will be 1-ft of 4" minus drainage gravel (current specs), overlain by 4" to 12" stone up to the top of the drainage gravel at sump edge. Quarry certificate and written placement methodology shall be provided for review.

SCA CONSTRUCTION
CAMILLUS, NEW YORK

FIELD CHANGE FORM # 1
Page 1 of 3

Project Number: 444853	Date: 6/1/11
Construction Manager: Ken Sommerfield	
Contractor: Parsons	

You are hereby authorized and instructed to complete the following modifications to the approved Final Design:

The original design of the SCA drainage layer includes a maximum slope of 1 percent. The basis for the slope requirement was to facilitate geotextile tube operation; however, in more recent discussions with geotextile tube operators, it has been confirmed that geotextile tube operations can be effectively performed at slopes of 3 percent. Therefore, an increased slope of 3 percent is proposed for the top of the SCA gravel drainage layer. The following paragraphs discuss how the proposed change meets the design and performance criteria defined in the SCA final design, meets some additional performance criteria related to storage capacity and emissions, and provides additional benefits.

The proposed changes meet the design and performance criteria for the liner system defined in the SCA Final Design as follows:

- Design in accordance with the requirements of NYSDEC Regulations Part 360, Section 2.14(a):
    - Efficiency calculations that were provided in Appendix I, "Evaluation of Hydraulic Performance for SCA Design," of the SCA design still apply (i.e., the bottom slope of the drainage layer does not change). With an efficiency greater than 99.99%, it can be demonstrated that the proposed system would effectively protect groundwater quality at the site.
- Maintain a positive slope toward the sumps during operations and post-closure:
    - Although the slope of the top of the gravel layer has changed, the SCA liner system would still maintain a positive slope toward the sumps during operations and post-closure. The top slope of the gravel drainage layer would have a steeper slope towards the sumps, and the bottom of the gravel drainage layer (i.e., top of the SCA liner) would be unaffected by this change.

- Achieve a head no greater than 1 ft. on the liner during operations and post-closure; however, consistent with Part 360, Section 2.14(a), heads greater than 1 ft. in the sump areas and for some interim periods during operations may occur:
    - Both the original and proposed design meet this criteria by augmenting the flow capacity of the bottom 1' of gravel with a temporary pumping system (consisting of mobile pumps with flexible hoses) and using the SCA basins to provide temporary storage for large flows during storm events. The change in gravel layer top grade will not affect the ability of the liner system to achieve a head no greater than 1 ft. during operations, since both original and proposed designs provide for a minimum of 1 ft. gravel.
- Handle remaining consolidation water that is generated by the continuing dewatering of the dredge material within the tubes and the precipitation that infiltrates through the SCA cover after the operational period is over.
    - After the operational period, the capacity of the bottom 1' of the gravel drainage layer (in both the original and proposed designs) can handle the estimated rate of consolidation water that would be generated by the continuing dewatering of the dredge material within the tubes and the precipitation that would infiltrate through the SCA cover. The change in gravel layer top grade will not affect the approach for liquids management after the operational period is over, since both original and proposed designs provide for a minimum of 1 ft. gravel.

Both the original design and the proposed design provide significant storage capacity in the void spaces of the gravel (approximately 9.3 million gallons [original] versus 6.4 million gallons [proposed] of storage in Phases I and II). However, this capacity has not been incorporated into either the original or proposed design evaluations because access to the gravel layer becomes limited after placement of the first layer of tubes. The required storage capacity is provided by the basins. Therefore, this design change does not impact the anticipated storage capacity.

In addition to meeting the design and performance criteria, the proposed change in the gravel layer will not affect gravel layer emissions. Gravel layer emissions, as estimated in the June 8, 2010 memo, are based on water flowing beneath the surface elevation of the gravel layer. Additional depth of gravel above the surface of the water is not modeled. Both the original design and the proposed design are consistent with this model because the gravel layer depth is greater than or equal to the designed water depth (1 ft.). Therefore, the proposed change in gravel drainage layer top grade and thickness does not change the emissions model.

Finally, the proposed gravel layer design modifications have the following benefits as compared to the original design:

- Reduced load, and resulting settlement, on the SCA liner system
- Increased capacity for dredged material within the footprint of the SCA
- Reduced SCA construction duration

- Reduced truck traffic to SCA
    - Reduced impact to surrounding roads
    - Reduced truck emissions
    - Reduced traffic hazards
- Reduced excavation and disturbance at gravel quarry

The information provided above describes how the proposed gravel layer change (maximum 3% slope) meets the design and performance criteria defined in the SCA final design, meets some additional performance criteria related to storage capacity and emissions, and provides additional benefits as compared to the original design. Therefore, this design change is recommended for implementation.

APPROVALS:

Design Engineer

Name: Jay Beech, P.E.
Signature: J.L. Beech
Date: 06/03/2011

Contractor Representative

Name: David Steele, P.E.
Signature: David Steele
Date: 6/3/11

Owner

Name: Larry M. Somer
Signature: L.M. Somer
Date: 06/03/2011

NYSDEC Representative

Name: TIMOTHY J. LARSON
Signature:
Date: 6/7/11

ORIGINAL

SCA CONSTRUCTION
CAMILLUS, NEW YORK

FIELD CHANGE FORM # 2

Project Number: 444853	Date: 6/28/11
Construction Manager: Ken Sommerfield	
Contractor: Parsons	

You are hereby authorized and instructed to complete the following modifications to the approved Final Design:

For portions of the low permeability soil layer that are deeper than 3' below the top of the low permeability soil layer, the following changes are proposed to Specification 02250 Section 2.01.C:

Low Permeability Soil Layer material shall meet the following requirements:

1. Meet the following particle size requirements (ASTM D 422):
   a. the Low Permeability Soil Layer shall have 100 percent of the particles having a maximum dimension not greater than two (2) inch;
   b. the Low Permeability Soil Layer shall have not less than 50 percent of the particles, by weight, passing through the standard U.S. No. 200 standard sieve; and
   c. the Low Permeability Soil Layer shall classify as SC, SM, ML, or CL according to the Unified Soil Classification System (per ASTM D 2487) or combinations of these materials.

Since the upper 3' of the low permeability soil layer will meet the original specification requirements, implementation of this proposal will result in a low permeability soil layer that will meet the design requirements.

ORIGINAL

SCA CONSTRUCTION
CAMILLUS, NEW YORK

FIELD CHANGE FORM # 3

Project Number: 444853 Date: 8/3/11

Construction Manager: Ken Sommerfield

Contractor: Parsons

You are hereby authorized and instructed to complete the following modifications to the approved Final Design:

The clay grading in the SCA design was based on topography of the site developed through aerial methods. Upon mobilization, land-based survey methods were used to re-evaluate the site topography. Two drawings showing revised subgrade and top of clay grading and limits of GCL (based on the land-based site topography) are attached. The revised clay grading and limits of GCL meet the design and performance criteria defined in the SCA Final Design.

APPROVALS:

Design Engineer

Name: J.F. Beech, Ph.D., P.E.
Signature:
Date: 3 August 2011

Contractor Representative

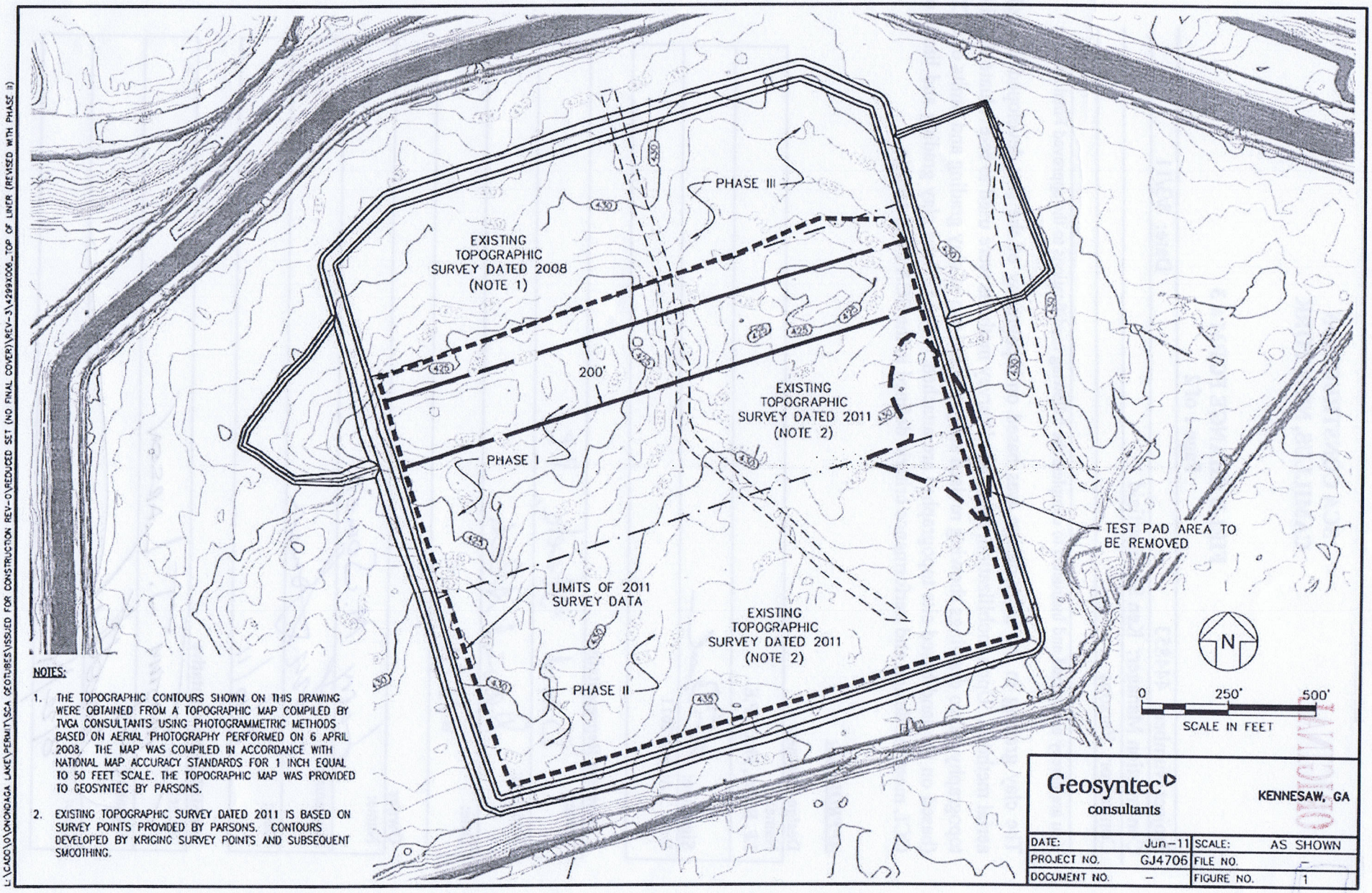
Name: David Steele, P.E.
Signature: David Steele
Date: 8/3/11

Owner

Name: Larry M. Somer
Signature:
Date: 8/10/11

NYSDEC Representative

Name: Timothy J. Larson
Signature:
Date: 8/22/11



NOTES:

1. THE TOPOGRAPHIC CONTOURS SHOWN ON THIS DRAWING WERE OBTAINED FROM A TOPOGRAPHIC MAP COMPILED BY TVGA CONSULTANTS USING PHOTOGRAMMETRIC METHODS BASED ON AERIAL PHOTOGRAPHY PERFORMED ON 6 APRIL 2008. THE MAP WAS COMPILED IN ACCORDANCE WITH NATIONAL MAP ACCURACY STANDARDS FOR 1 INCH EQUAL TO 50 FEET SCALE. THE TOPOGRAPHIC MAP WAS PROVIDED TO GEOSYNTEC BY PARSONS.

2. EXISTING TOPOGRAPHIC SURVEY DATED 2011 IS BASED ON SURVEY POINTS PROVIDED BY PARSONS. CONTOURS DEVELOPED BY KRIGING SURVEY POINTS AND SUBSEQUENT SMOOTHING.

Geosyntec consultants — KENNESAW, GA

DATE:	Jun-11	SCALE:	AS SHOWN
PROJECT NO.	GJ4706	FILE NO.	–
DOCUMENT NO.	–	FIGURE NO.	1

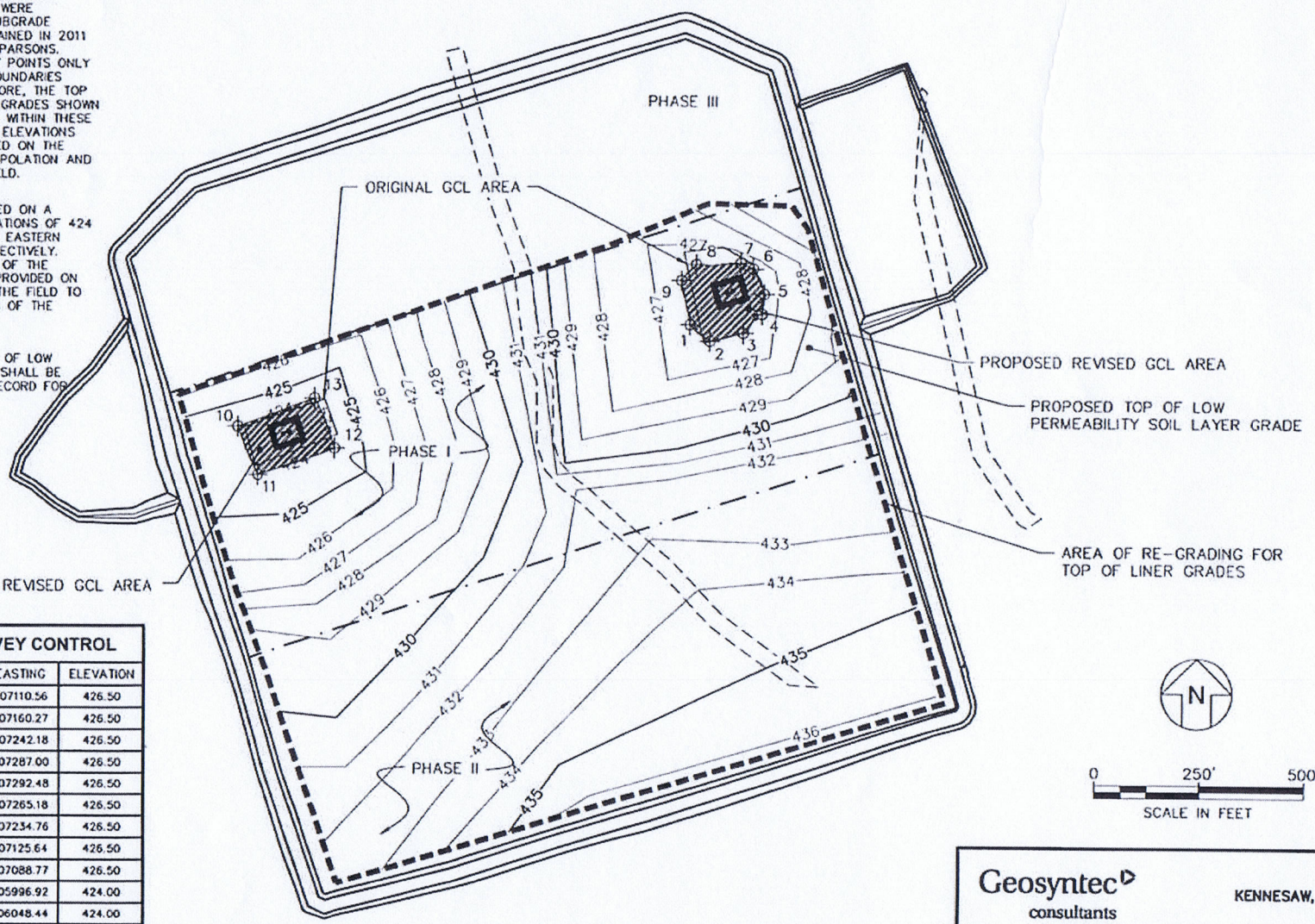
L:\CAD\O\ONONDAGA LAKE\PERMIT\SCA GEOTUBES\ISSUED FOR CONSTRUCTION REV-0\REDUCED SET (NO FINAL COVER)\REV-3\V4299X008_TOP OF LINER (REVISED WITH PHASE II)

NOTES:

1. THE TOP OF LOW PERMEABILITY SOIL LAYER GRADES SHOWN ON THIS DRAWING WERE DEVELOPED USING THE EXISTING SUBGRADE TOPOGRAPHIC SURVEY POINTS OBTAINED IN 2011 AND PROVIDED TO GEOSYNTEC BY PARSONS. THESE EXISTING SUBGRADE SURVEY POINTS ONLY COVERED THE AREA WITHIN THE BOUNDARIES SHOWN ON THE DRAWING. THEREFORE, THE TOP OF LOW PERMEABILITY SOIL LAYER GRADES SHOWN ON THIS DRAWING ARE ONLY VALID WITHIN THESE BOUNDARIES. EXISTING SUBGRADE ELEVATIONS WITHIN THE TEST PAD AREA MARKED ON THE DRAWING WERE OBTAINED BY INTERPOLATION AND NEED TO BE CONFIRMED IN THE FIELD.

2. THE GCL PLACEMENT AREA IS BASED ON A TARGET AREA WITHIN DESIGN ELEVATIONS OF 424 AND 426.5 FOR THE WESTERN AND EASTERN PARTS OF THE SCA PHASE I, RESPECTIVELY. DUE TO THE ONGOING SETTLEMENT OF THE SUBGRADE, THE CONTROL POINTS PROVIDED ON THIS DRAWING SHALL BE USED IN THE FIELD TO STAKEOUT THIS AREA, REGARDLESS OF THE ACTUAL ELEVATIONS.

3. AN AS-BUILT SURVEY OF THE TOP OF LOW PERMEABILITY SOIL LAYER GRADES SHALL BE PROVIDED TO THE ENGINEER-OF-RECORD FOR APPROVAL.



SUMP GCL LIMIT SURVEY CONTROL

POINT NUMBER	NORTHING	EASTING	ELEVATION
1	1120561.18	907110.56	426.50
2	1120521.66	907160.27	426.50
3	1120541.02	907242.18	426.50
4	1120587.10	907287.00	426.50
5	1120634.83	907292.48	426.50
6	1120696.76	907265.18	426.50
7	1120710.96	907234.76	426.50
8	1120707.66	907125.64	426.50
9	1120667.27	907088.77	426.50
10	1120319.85	905996.92	424.00
11	1120202.94	906048.44	424.00
12	1120265.16	906239.42	424.00
13	1120387.43	906188.22	424.00

Geosyntec consultants — KENNESAW, GA

DATE:	Aug-11	SCALE:	AS SHOWN
PROJECT NO.	GJ4706	FILE NO.	–
DOCUMENT NO.	–	FIGURE NO.	2

L:\CAD\O\ONONDAGA LAKE\PERMIT\SCA GEOTUBES\ISSUED FOR CONSTRUCTION REV-0\REDUCED SET (NO FINAL COVER)\REV-3\DRAWINGS\429X006_TOP OF LINER (REVISED WITH PHASE

SCA CONSTRUCTION
CAMILLUS, NEW YORK

ORIGINAL

FIELD CHANGE FORM # 4

Project Number: 444853 Date: 8/20/11

Construction Manager: Ken Sommerfield

Contractor: Parsons

You are hereby authorized and instructed to complete the following modifications to the approved Final Design:

Specification Section 02085 lists the wells and piezometers to be abandoned as part of SCA construction. Eleven piezometers, located within the test fill footprint, could not be located and will not be abandoned. Attempts to locate these piezometers included marking the as-built coordinates of the piezometers using survey-grade GPS equipment and excavating past the bottom of the test fill material and 3' into the Solvay Waste. Evidence of the PVC conduit or piezometer wire was not found.

All of these piezometers are vibrating-wire, pressure-transducer-type piezometers. Since the piezometers are pressure transducers, a standpipe does not extend from the screened zone to the surface; rather, there is either only a cable, or a cable enclosed in 1" PVC pipe. Some of these pressure-transducer piezometers are conventional installations and some are push-in installations. Conventional installations consist of (from bottom to top): a piezometer pressure transducer surrounded by a sand pack, a bentonite seal (typically about 5 feet), and cement-bentonite grout. For the conventional installations, the pressure transducer cable was threaded through a 1" diameter PVC pipe from the pressure transducer to the ground surface. Push-in installations consist of (from bottom to top): a pressure transducer pushed into the existing ground, a bentonite seal (typically 5 feet), and cement-bentonite grout. For the push-in installations, no PVC pipe was used and the only visible evidence of the piezometer would be the cable.

A rigorous effort has been made to locate the piezometers. Since it has been determined (by excavation) that the piezometers are not within 3' of the bottom of the SCA liner at their as-built location, it is unlikely that the piezometers will have an effect on the SCA liner.

APPROVALS:

Design Engineer

Name: J.F. Beech, Ph.D., P.E.
Signature: J. Beech
Date: August 23, 2011

Contractor Representative

Name: David Steele, PE
Signature: David Steele
Date: 8/25/11

Owner

Name: Larry M. Somer
Signature: Larry Somer
Date: 8/24/11

NYSDEC Representative

Name: TIMOTHY LARSON
Signature:
Date: 9/21/11

SCA CONSTRUCTION
CAMILLUS, NEW YORK

FIELD CHANGE FORM # 5

Project Number:	444853	Date: 14 October 2011
Construction Manager:	Ken Sommerfield	
Contractor:	Parsons	

You are hereby authorized and instructed to complete the following modifications to the approved Final Design:

The Earthwork Specifications Sections 02200/02250/02300 Part 1.05 D set the minimum construction quality control (CQC) soil sample testing frequency. The Construction Quality Assurance (CQA) Plan Table A-1 requires that conformance samples be collected typically 1 test per 10 CQC tests. It is proposed that the CQA sampling frequency for soils be modified. In lieu of using the number of CQC samples, CQA sample frequency will be tied to delivered volumes such that the test frequency shall become:

- Volume of soil delivered to the site divided by CQC test frequency (presented in Spec Part 1.05.D for each material type) and divided by ten.

This change is proposed so that CQA personnel can track material deliveries and sample as the appropriate quantities are reached, rather than on number of CQC samples (the number of which can be related to additional factors beyond material delivery quantities, including borrow investigations).

APPROVALS:

Design Engineer

Name:	J.F. Beech
Signature:	J.F. Beech
Date:	14 Oct 2011

Contractor Representative

Name:	David Steele
Signature:	David Steele
Date:	17/Oct/11

Owner

Name:	Larry M. Somer
Signature:	Larry Somer
Date:	10/17/11

NYSDEC Representative

Name:	Timothy J. Larson
Signature:	Timothy Larson
Date:	10/31/11

SCA CONSTRUCTION
CAMILLUS, NEW YORK

ORIGINAL

FIELD CHANGE FORM # 6

Project Number:	444853	Date: 18 January 2012
Construction Manager:	Ken Sommerfield	
Contractor:	Parsons	

You are hereby authorized and instructed to complete the following modifications to the approved Final Design:

The SCA Specification 02710 Geotextile Cushion Part 3 Execution 3.01.C Placement states, "After unwrapping the geotextiles from their opaque cover, do not leave them exposed for a period in excess of 14 days". A geotextile sample was collected on 6 December 2011 from an area located in the north-east corner of Phase I. According to our records, the geotextile had been deployed on 17 September 2011 (i.e., an exposure period of approximately 80 days). The sample was tested under the same conditions as the original design test and the results of both tests are attached. The results demonstrates that the sampled geotextile can be exposed for at least 80 days at the site and meet the design intent (i.e., protect the underlying geomembrane from being damaged by the drainage gravel). The test demonstrates that the exposed geotextile provides adequate protection of the underlying geomembrane.

APPROVALS:

Design Engineer

Name:	J. F. Beech
Signature:	J.F. BEECH
Date:	18 JAN 2012

Contractor Representative

Name:	David Steele
Signature:	David Steele
Date:	24 Jan 2012

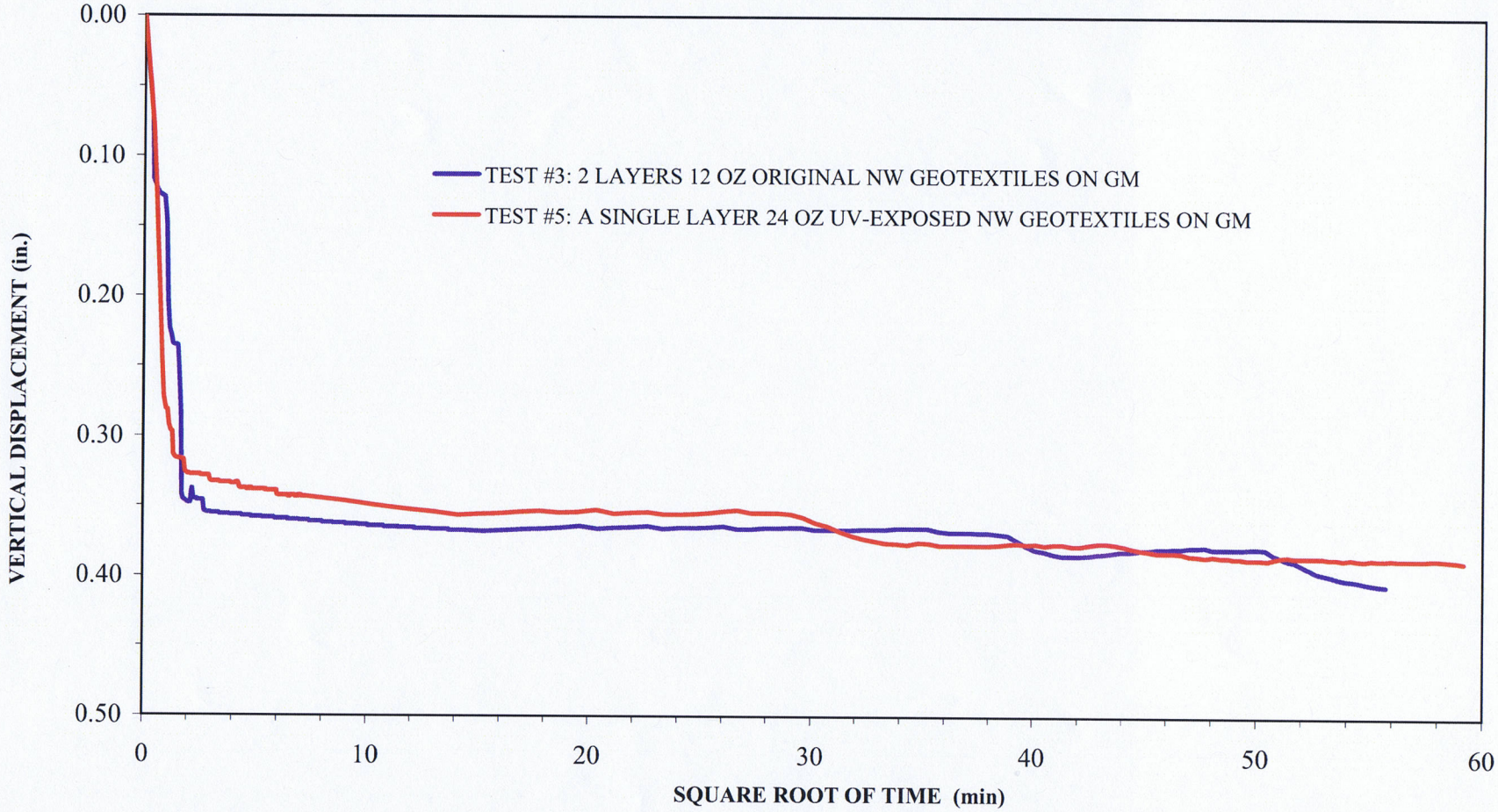
Owner

Name:	Larry M. Somer
Signature:	Larry Somer
Date:	20 Jan 2012

NYSDEC Representative

Name:	TIMOTHY J. LARSON
Signature:	
Date:	2/1/12

PARSONS - ONONDAGA LAKE
HYDROSTATIC PUNCTURE TESTING (ASTM D 5514 MODIFIED)
COMPARISON OF THE VERTICAL DISPLACEMENT-TIME CURVES (TEST #3 VS. TEST #5)



SGI TESTING SERVICES, LLC

DATE OF REPORT:	1/15/2012
FIGURE NO.	A-2
PROJECT NO.	SGI10043
DOCUMENT NO.	
FILE NO.	

SGI10043-03R&05R.Comparison.xls

SCA CONSTRUCTION
CAMILLUS, NEW YORK

FIELD CHANGE FORM # 7

Project Number:	444853	Date: 03 October 2011
Construction Manager:	Ken Sommerfield	
Contractor:	Parsons	

You are hereby authorized and instructed to complete the following modifications to the approved Final Design:

Settlement Monuments will be installed in the drainage gravel layer, no more than six inches below the top of the drainage gravel layer, to monitor settlement of the SCA. Locations for the Settlement Monuments are shown on the attached figure. The Settlement Monuments will consist of four-foot-by-four-foot steel plate with a vertical three-inch-diameter steel tube that will be extended up as layers of geotextile tubes are placed (between the geotextile tubes). The Settlement Monuments should be impervious from damage because:

- they are constructed of large components made with strong materials,
- significant heavy equipment traffic is not expected after the Settlement Monuments are installed, and
- the geotextile tubes will be deployed with sufficient offset from the Settlement Monuments to avoid excessive load against them during filling.

Difficulties have been experienced during installation and initial monitoring of the Settlement Profilers and they will not be monitored except in the area of Profiler 2 located within SCA Phase 1. This area of Profiler 2 will continue to be monitored, and readings recorded, until such time as the final elevation of the drainage gravel material has been achieved. In the period before the Settlement Monuments are installed, the elevation of top of the geomembrane liner or the top of the drainage gravel (depending on the progress of construction) will be monitored at the locations shown on the attached figure. The liner surface elevation monitoring, and the Settlement Monument monitoring, will be conducted at the frequencies specified for the Settlement Profilers in the Geotechnical Instrumentation Monitoring Plan. The Settlement Cells, Piezometers, and Inclinometers shown on Figure 444853-101-C-007 will also be monitored in addition to the Settlement Monuments.

APPROVALS:

Design Engineer

Name:	J.F. BEECH
Signature:	J.F. Beech
Date:	3 OCT 2011

Contractor Representative

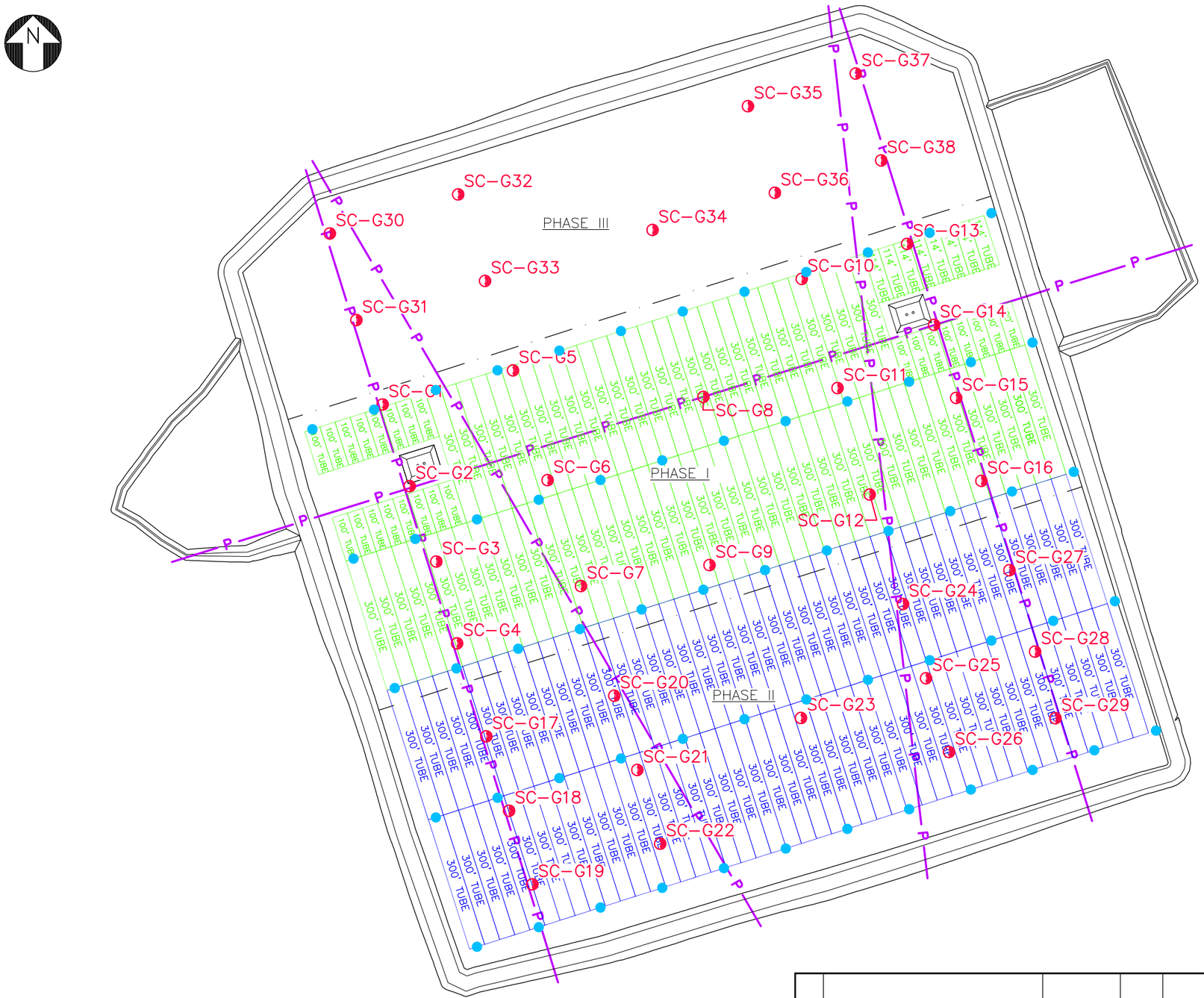
Name:	David Steele
Signature:	David Steele
Date:	10/10/11

Owner

Name:	Larry M. Somer
Signature:	Larry M. Somer
Date:	10/4/11

NYSDEC Representative

Name:	TIMOTHY J. LARSON
Signature:	
Date:	10/13/11



NOTES:

1. BASE PLAN DEVELOPED FROM INFRASTRUCTURE ALTERNATIVES' DRAWING, "MONUMENT LAYOUT–P–LINES, SHEET 6"; AND GEOSYNTEC'S INSTRUMENTATION AND MONITORING PLAN.
2. SETTLEMENT CELLS IN PHASES I AND II HAVE BEEN INSTALLED. SETTLEMENT CELLS IN PHASE 3 WILL BE INSTALLED IF PHASE 3 IS NEEDED.

LEGEND:

SC–G38	SETTLEMENT CELL
●	SETTLEMENT MONUMENT
P	SETTLEMENT PROFILER
– · –	PHASE BOUNDARY

250 0 250 500

SCALE: 1"=250'
(WHEN PRINTED ON 11"x 17")

NO.	DESCRIPTION	DATE	DRAWN	CHK'D	APPV'D
A	ISSUED FOR INFORMATION ONLY	10/10/11	JTS		

PARSONS
COMMERCIAL TECHNOLOGY GROUP
301 PLAINFIELD ROAD
SYRACUSE, NY 13212
(315) 451–9560

DRAWING TITLE
Honeywell
SEDIMENT CONSOLIDATION AREA
GEOTUBE LAYER ONE PLAN

DRAWN BY JTS	CHECKED BY	DRAWING NO. SK–444853–000–C–100	SCALE 1"=250'
DATE	APPROVED BY		JOB 444853

FILE NAME: P:\HONEYWELL –SYR\444853 – LAKE DETAIL DESIGN\10 TECHNICAL CATEGORIES\10.1 CAD\DESIGN_TASK 100 SCA CIVIL–GEOTECH DESIGN\CIVL\SKETCH\SK–444853–000–C–100 REV–A.DWG
PLOT DATE: 10/10/2011 11:54 AM PLOTTED BY: SIVALIA, JACK

SCA CONSTRUCTION
CAMILLUS, NEW YORK

FIELD CHANGE FORM # 8

Project Number:	444853	Date: 11 April 2012
Construction Manager:	Ken Sommerfield	
Contractor:	Parsons	

You are hereby authorized and instructed to complete the following modifications to the approved Final Design:

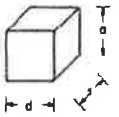
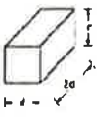
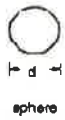
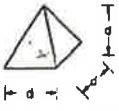
Gravel to be placed in the SCA sumps will consist of one foot of 4" minus drainage gravel (meeting current specifications), overlain by 4" to 12" stone up to the top of the drainage gravel at the sump edge. The stone sizes shall meet one of the NYDOT riprap size specifications (refer to table below) for fine, light, or medium stone. The maximum sizes for light and medium specifications can be increased to 150 pounds or 12 inches. The material shall be washed to remove fines and meet the above specifications. The stones shall be rounded. Crushing can only be allowed if approved specifically by the Design Engineer. The puncture resistance of the geotextile tubes that may be in contact with this larger size stones shall be evaluated and approved by the Design Engineer for the Sediment Management System (SMS) Design.

A quarry certificate for the material and a sample shall be provided to the design engineer for inspection. The materials shall be reasonably free of thin, flat, or elongated pieces, shall contain no organic matter, or soft friable particles, and shall not contain visible asbestos or hydrocarbons. The stone materials shall be certified by the quarry as not based of limestone origin.

The Contractor shall provide a written placement methodology for review and approval by the Design Engineer. Placement of the material shall be performed without damaging the riser pipes or geotextile tubes. Stockpiled materials shall be managed and controlled to prevent mixing with other materials.

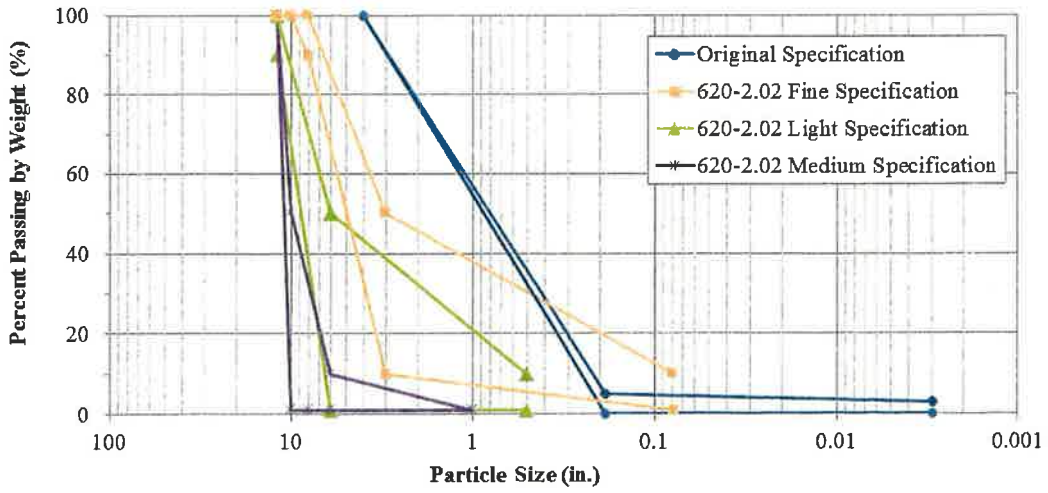
The purpose of this modification is to reduce the potential for clogging of the gravel based on concern expressed by the geotextile tube operator.

FIGURE 620-1 STONE FILLING GRADATION REQUIREMENTS			
Stone Filling Item	**See Notes**	**Stone Size[1]**	**Percent of Total by Weight**
Fine	2, 3, 4	Smaller than 8 inch	90 - 100
		Larger than 3 inch	50 - 100
		Smaller than No. 10 Sieve	0 - 10
Light	2, 3, 4	Lighter than 100 pounds	90 - 100
		Larger than 6 inch	50 - 100
		Smaller than 1/2 inch	0 - 10
Medium	2, 4	Heavier than 100 pounds	50 - 100
		Smaller than 6 inch	0 - 10
Heavy	2, 4, 5	Heavier than 600 pounds	50 - 100
		Smaller than 6 inch	0 - 10

APPROXIMATE SHAPE					
Specified Weights and Sizes					
600 pounds	d = 18 inches	d = 23 inches	d = 15 inches	d = 23 inches	d = 27 inches
300 pounds	d = 15 inches	d = 18 inches	d = 12 inches	d = 18 inches	d = 21 inches
150 pounds	d = 12 inches	d = 15 inches	d = 9 inches	d = 15 inches	d = 17 inches
100 pounds	d = 10 inches	d = 13 inches	d = 8 inches	d = 13 inches	d = 15 inches
d = 8 inches	50 lbs.	25 lbs.	100 lbs.	25 lbs.	16 lbs.
d = 6 inches	20 lbs.	10 lbs.	40 lbs.	10 lbs.	7 lbs.

NOTES:
1. Stone sizes, other than weights, refer to the average of the maximum and minimum dimensions of a stone particle as estimated by the engineer.
2. Materials shall contain less than 20 percent of stones with a ratio of maximum to minimum dimension greater than three.
3. Air-cooled blast furnace slag, cobbles or gravel having at least one fractured face per particle are acceptable substitutes for stone under these items, provided that the soundness and gradation requirements are met.
4. Materials shall contain a sufficient amount of stones smaller than the average stone size to fill in the spaces between the larger stones.
5. Heavier gradings of this item may be required on some projects, in which case the requirements will be stated on the plans or in the proposal.

Approximate grain size distributions derived using the above stone specifications are provided for reference below. Cube shape was assumed for converting weights to stone sizes.



Weekly Field Reports

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I WEEK ENDING: 06 May 2011

This report is written for the period of 02 May 2011 to 08 May 2011. Geosyntec was on-site 4 days (4 days total to date), beginning Tuesday, 03 May 2011 to provide CQA services during construction of Onondaga Sediment Consolidation Area (SCA) Phase I. Temperatures generally ranged during the hours worked between a low of 39° F and a high of 67° F. Approximately 2.5-in of precipitation was recorded during the work week leaving the site saturated. The majority of the precipitation occurred between 02 and 04 May 2011 Representatives from the NYDEC, Geosyntec and Parsons were on-site throughout the week. Mr. Tim Larson (NYDEC Project Manager) was on site Wednesday, 04 May 2011. A weekly construction meeting was held on Tuesday, 03 May 2011.

Work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported

EARTHWORK:

- Approximately 1,200 compacted cubic yards of clay soil from the Marcellus borrow was onsite prior to 03 May; the material had been used to construct a test pad in 2010.
- Parsons began the construction of a new test pad on 02 May 2011 in the northeast corner of the Phase I Cell. This work was discontinued and did not resume as a result of the saturated conditions.
- Approximately 400 compacted cubic yards of low permeability material were delivered from the Black Creek borrow during the reporting period, for a total of approximately 1,600 compacted cubic yards onsite to date. CQA testing is pending as a result of saturated conditions.
- Parsons removed vegetation debris from the surface of the subgrade in the northeast quarter of Phase I Monday afternoon thru Wednesday morning. Completed vegetation removal from the southeastern quadrant on Friday, 06 May 2011.
- A site walk over the area of the northeastern quarter of Phase I Cell was conducted with the NYDEC on Wednesday afternoon and approval to proceed with low permeability soil liner was granted by the NYDEC. It was agreed NYDEC will participate in another site walk on Wednesday, 11 May 2011.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I WEEK ENDING: 06 May 2011

- Parsons setup one (1) 6-in dia. pump on the west side and a second 6-in dia. pump on the north side.
- Parsons utilized one (1) D-6 Caterpillar dozer to back drag and dress haul roads to facilitate low permeability material importing operations.

GEOSYNTHETICS:

- No geosynthetic materials were delivered or installed during the reporting period.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I WEEK ENDING: May 15, 2011

This report is written for the period of 09 to 15 May 2011. Geosyntec was on-site 5 days, Monday through Friday, (9 days total to date) to provide CQA services during construction of Onondaga Sediment Consolidation Area (SCA) Phase I. Temperatures during the hours worked generally ranged between a low of 46° F and a high of 75° F. No precipitation was observed throughout the work week. Representatives from the NYDEC, Geosyntec, and Parsons were on-site throughout the week. Mr. Bob Edwards of the NYDEC was on site Monday and Tuesday, 09 and 10 May, respectively. Mr. William Zeppetelli of the NYDEC was on site 11 through 13 May. A weekly construction meeting was held on-site Tuesday, 10 May at 1:00 PM.

An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Parsons resumed and completed construction of the low permeability (LP) soil Test Pad area in the northeast corner of Phase I. This work had been halted due to inclement weather conditions since mid day Monday, 02 May. The Test Pad Area is approximately 0.8 acres in size and is generally square in shape. The Test Pad Area was constructed to a compacted lift thickness of 12-in. Parsons prepared a 50-ft x 50-ft area to a 12-in compacted lift thickness on Monday, 09 May. A field density test (FDT) was performed and a Shelby tube sample was obtained from this area. Parsons then resumed constructing the remainder of the Test Pad Area. The construction and testing was completed on Tuesday, 10 May. The work was monitored by Geosyntec.
- Parsons placed a 2nd lift over the Test Pad area and continued with 1st lift LP soil placement westward. Parsons sealed the areas of placed LP soil prior to departure on Friday, 13 May.
- Parsons labor personnel performed removal of vegetation and debris from the surface of the subgrade in the southwestern quadrant of Phase I throughout the work week.
- The site walk with the NYDEC scheduled for Wednesday, 11 May was postponed.
- Phase I continues to have standing water in the western half of the phase and Parsons has two (2) 6–in diameter pumps operating during working hours for most of the week.
- Parsons continued construction of the west berm area on 10, 11, and 13 May.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I WEEK ENDING: May 15, 2011

- A total of 30 FDTs were performed this week, with one (1) performed on engineered fill, 18 performed on the Test Pad, and 11 performed on LP soil layer outside the Test Pad. The FDTs passed with the exception of two (2) from the area outside the Test Pad. Parsons reworked the failing areas, which passed upon retest.
- The following LP clay samples were obtained this week. LP-004 thru LP-027 and EF-001.
- A total of approximately 9,645 cubic yards of LP clay was imported to the site this week. Parsons is receiving the material by the ton and used a conversion factor of 1.8 tons per cubic yard to calculate the volume.
- A total of approximately 6,705 cubic yards of engineered fill was imported to the site this week. Parsons is receiving the material by the ton and using a conversion factor of 1.5 tons per cubic yard.

GEOSYNTHETICS:

- No geosynthetic materials were delivered or installed during the reporting period.

COPY TO: File, Xiaodong Huang PER: Brett P. Banquer

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I WEEK ENDING: May 22, 2011

This report is written for the period of 5/16/11 to 5/22/11. Geosyntec was on-site 5 days, Monday through Friday (14 days total to date), to provide CQA services during construction of Onondaga Sediment Consolidation Area Phase I. Temperatures generally ranged during the hours worked between a low of 46° F and a high of 46° F. Approximately 2.05" of precipitation occurred throughout the work week, with precipitation recorded for each work day during the week. Representatives of Geosyntec & Parsons were on-site throughout the week. A weekly construction meeting was held on 5/17/11. A QA/QC operational meeting was held on 5/20/11.

An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.
- Parsons onsite safety department conducted an emergency drill on 5/20/11.

EARTHWORK:

- Soil placement operations were not conducted during the week due to weather conditions.
- Vegetation and debris removal from the surface of the subgrade within the central and southwestern area of Phase I was performed from 5/16/11 thru 5/20/11.
- The western half of Phase I continues to have standing water. Parsons has been utilizing two (2) 6-in pumps to transfer water to the Phase III area.
- Parsons has periodically utilized one (1) D-6 Caterpillar dozer to maintain haul roads.

GEOSYNTHETICS:

- Parsons offloaded and stockpiled 48 rolls of 60-mil textured geomembrane. This material was inventoried by Geosyntec.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I WEEK ENDING: May 29, 2011

This report is written for the period of 23 to 29 May 2011. Geosyntec was on-site 5 days (19 days total to date) to provide CQA services during construction of Onondaga Sediment Consolidation Area Phase I. Temperatures generally ranged between a low of 60° F and a high of 79° F during the hours worked. Approximately 0.45" of precipitation occurred early Tuesday 5/24/11 morning, with no other precipitation observed during the remainder of the work week. Representatives of Geosyntec & Parsons were on-site throughout the week. A weekly construction meeting was held on 5/24/11. A QA/QC operational meeting was held on 5/27/11. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Monitored and documented Parsons construction operations for low-permeability (LP) soil placement in the Phase I Cell area on 23, and 25 thru 27 May.
- Parsons labor personnel worked on removing vegetation debris from the surface of the subgrade in the southwest ¼ of the Phase I area from 23 thru 27 May.
- A site walk with NYDEC representative William Zeppetelli was conducted on Wednesday (25) and additional subgrade area was accepted for LP soil placement.
- The far western area of Phase I continues to have standing water, however, a reduction in the surface area of the standing water was observed throughout the week. Parsons utilized two (2) 6-in dia. pumps working during work hours from Monday (23) thru mid day Wednesday (25). Parsons then removed one of the pumps and completed the week with one (1) 6-in dia. pump.
- Parsons continued with the placement of the 1st lift of low-permeability soil layer and began the placement of the 2nd lift.
- No Field Density Test (FDT) were required nor conducted during this week.
- No LP soil samples were needed nor obtained during this week.
- A total of approximately 5,635 CY (loose) of LP soil was imported to the site this week with a total of approximately 16,880 CY (loose) total to date. Parsons is receiving the material by the ton and using a conversion factor of 1.6 tons per cubic yard (i.e., .

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I WEEK ENDING: May 29, 2011

- Parsons did not conduct engineered fill placement operations on the west berm during the week.

GEOSYNTHETICS:

- Parsons offloaded and stockpiled 99 rolls (147 to date) of 60-mil thick textured HDPE geomembrane and 1 roll of 100-mil thick textured HDPE geomembrane. This material was inventoried and a total of eight (8) conformance samples were obtained (GM-01 thru GM-08). Roll number 102158869, was listed within the roll list provided by GSE, but was not received onsite.
- Parsons offloaded and stockpiled 25 rolls of Geosynthetic Clay Liner (GCL). This material was inventoried and one conformance sample, GC-01, was obtained.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I WEEK ENDING: June 05, 2011

This report is written for the period of 30 May to 05 June 2011. Geosyntec was on-site 4 days (23 days total to date) to provide CQA services during construction of Onondaga Sediment Consolidation Area Phase I. Temperatures generally ranged between a low of 48° F and a high of 92° F during the hours worked. No precipitation was recorded on site this week. Representatives of Geosyntec & Parsons were on-site Tuesday through Friday, following observance of Memorial Day on Monday. A weekly construction meeting was held on Tuesday, 31 May. A QA/QC operational meeting was held on Friday, 03 June. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Monitored and documented Parsons' construction operations for low permeability (LP) soil placement in the Phase I area Tuesday through Friday. Placement generally consisted of placing material from the two sources over the approved subgrade in separate areas. The moisture content of the material is estimated to be greater than the optimum moisture content, as determined by ASTM D698. It is expected that the upper lift of the LP soil will be re-worked prior to testing and acceptance (i.e., work focused on production). Exposed surfaces were sealed using a smooth drum roller; rutting of the surface was observed.
- Parsons labor personnel performed vegetation debris removal from the surface of the subgrade in areas of the Phase I area Tuesday through Friday.
- A site walk was conducted by representatives from Parsons, Geosyntec, and NYDEC on Wednesday and Friday, 01 and 03 June, respectively. Subgrade area was accepted for low-permeability soil placement during both events. An area extending from the eastern boundary of Phase I to a point approximately 900' westward has been approved to date.
- The western portion of Phase I has been dewatered and pumps in the area were removed.
- No Field Density Test (FDT) were required nor conducted during this week. Testing of the upper (i.e., second lift) will occur after re-working and compaction performed.
- One low-permeability soil sample from Marcellus source, sample number LP-028, was obtained from Grid P-12 this week.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I WEEK ENDING: June 05, 2011

- A total of approximately 10,004 CY (loose) of low-permeability soil was imported to the site this week; consisting of 7,848 CY (loose) of Black Creek material and 2,156 CY (loose) of Marcellus material. Parsons has imported approximately 26,884 CY (loose) of low permeability soil to date. Parsons continues to receive the material by the ton and using a conversion factor of 1.6 Tons per Cubic Yard.
- No Engineered Fill was imported during this week.

GEOSYNTHETICS:

- No activities associated with Geosynthetics were conducted this week.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I WEEK ENDING: June 12, 2011

This report is written for the period of 06 to 12 June 2011. Geosyntec was on-site 5 days (28 days total to date) to provide CQA services during construction of Onondaga Sediment Consolidation Area Phase I. Temperatures generally ranged between a low of 52° F and a high of 97° F during the hours worked. No precipitation was received on site this week. Representatives of Geosyntec & Parsons were on-site throughout the week. A weekly construction meeting was held on Tuesday, 07 June. A QA/QC operational meeting was held on Friday, 10 June. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Parsons labor personnel performed vegetation debris removal from the surface of the subgrade in areas of the Phase I area Monday through Friday.
- A site walk with representatives of NYDEC and Geosyntec was conducted on Wednesday, 08 June. Additional subgrade area was accepted for LP soil placement. An area extending from the eastern boundary of Phase I to a point approximately 1,100' westward has been approved to date.
- Monitored and documented Parsons construction operations for low-permeability (LP) soil placement in the Phase I Cell area Monday through Friday. Placement generally consisted of placing material from the two sources over the approved subgrade in separate areas. Parsons continued with 1st lift operations with two (2) separate crews, each having one (1) spotter and one (1) Caterpillar D-6N LGP dozer. Exposed surfaces were sealed using a smooth drum roller. The lifts were placed in approximately 12 inch thick lifts; thicker than specified lift was observed but corrected by the blading down the lift.
- The far western area of Phase I remained free of standing water throughout the week and areas of previous standing water have dried.
- Field Density Test (FDT) FDT 3-012 through FDT 3-020 were conducted this week. All indicated passing results.
- Moisture samples LP-029 thru LP-037 and permeability sample ST-003 were collected. Samples were forwarded to off-site laboratory, GeoTesting Express (GTX).

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I WEEK ENDING: June 12, 2011

- A total of approximately 14,375 CY (loose) of low-permeability soil was imported to the site this week; consisting of approximately 6,684 CY (loose) of Black Creek material and 7,691 CY (loose) of Marcellus material. Parsons has imported approximately 41,259 CY (loose) of low-permeability soil material to date. Parsons continues to receive the material by the ton and is using a conversion factor of 1.6 Tons per CY.
- No Engineered Fill was imported during this week.

GEOSYNTHETICS:

- A geosynthetic clay liner (GCL) submittal was reviewed and comments returned to Parsons.

COPY TO: File PER: Brett Banquer

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I WEEK ENDING: June 19, 2011

This report is written for the period of 13 to 19 June 2011. Geosyntec was on-site 5 days (34 days total to date) to provide CQA services during construction of Onondaga Sediment Consolidation Area Phase I. Temperatures generally ranged during the hours worked between a low of 56° F and a high of 86° F. Approximately 0.20 inches of precipitation was received on site this week on Tuesday, 14 June. Representatives of Geosyntec & Parsons were on-site throughout the week. A weekly construction meeting was held on Tuesday. A QA/QC operational meeting was held on Friday, 17 June. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Phase I remained free of standing water throughout the week.
- Parsons labor personnel performed vegetation debris removal from the surface of the subgrade in areas of Phase I Monday through Friday.
- A site walk with representatives of NYDEC and Geosyntec was conducted on Thursday, 16 June. Additional subgrade area was accepted for LP soil placement. An area extending from the eastern boundary of Phase I to a point approximately 1,200-ft westward has been approved to date.
- Monitored and documented Parsons construction operations for low-permeability (LP) soil placement in the Phase I Cell area Monday through Friday. Placed material from the two sources over the approved subgrade in separate areas. Parsons continued with 1st lift (considered a bridge lift) operations and began 2nd lift operations on the east side of Phase I. Operations for placement are being executed by two (2) separate crews, each having one (1) spotter and one (1) Caterpillar D-6N LGP dozer. Parsons has also conducted sealing and compaction operations. The surface of previous lifts is scarified and moisture conditioned prior to placement of the subsequent lift.
- Field Density Test (FDT) were not yet required nor conducted this week.
- Soil Samples were not needed nor collected this week.
- A total of approximately 10,049 CY (loose) of low-permeability soil was imported to the site this week consisting of approximately 4,442 LCY of Black Creek material and 5,607

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I WEEK ENDING: June 19, 2011

LCY of Marcellus material. Parsons has imported approximately 51,308 LCY or 82,100 tons of low-permeability soil to the site to date. Parsons continues to receive the material by the ton and using a conversion factor of 1.6 tons per loose cubic yard.

- Engineered Fill operations were not conducted during the week.

GEOSYNTHETICS:

- Geosyntec received preliminary conformance sample results for 60-mil thick HDPE geomembrane samples GM-01 though GM-08. Initially, samples GM-03, GM-06, and GM-08 were reported as failing to Parsons due to low tensile strength at break (ASTM D6693) of a single specimen out of ten for each of the three samples. GeoTesting Express (GTX), the Quality Assurance laboratory, inspected the cutting die used to remove test specimen from the sample, at the request of Geosyntec, and determined the cutting surface/backing plate may have damaged the specimen during collection. GTX is currently retesting the material reported as failing.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I WEEK ENDING: June 26, 2011

This report is written for the period of 20 to 26 June 2011. Geosyntec was on-site 5 days (39 days total to date) to provide CQA services during construction of Onondaga Sediment Consolidation Area Phase I. Temperatures generally ranged during the hours worked between a low of 58° F and a high of 88° F. Approximately 2 inches of precipitation was received on site this week on Wednesday and Thursday, 22 and 23 June, respectively. Representatives of Geosyntec and Parsons were on-site throughout the week. A weekly construction meeting was held on Tuesday, 21 June. A QA/QC meeting was held on Friday, 24 June. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Parsons labor personnel worked on removing vegetation debris from the surface of the subgrade in areas of the Phase I area on Monday, Tuesday, and Friday.
- A site walk with representatives of NYDEC and Geosyntec was conducted on Friday. Additional subgrade area was accepted for LP soil placement. An area extending from the eastern boundary of Phase I to a point approximately 1,300-ft westward has been approved to date.
- Phase I remained free of standing water throughout the week, however, areas of previously placed low-permeability soil remain wet after Wednesday's rains.
- Parsons continued with the low-permeability soil placement in Phase I, proceeding with 1st lift and 2nd lift operations on the north and east sides of Phase I. Operations for placement are being executed by two (2) separate crews, each having one (1) spotter and one (1) Caterpillar D-6N LGP dozer. Parsons has also conducted compaction and sealing operations. The surface of previous lifts is scarified and moisture conditioned prior to placement of the subsequent lift.
- Field Density Test (FDT) were not yet required nor conducted this week.
- Samples LP-038 through LP-042 were collected this week and analyzed onsite for moisture content of materials as delivered. Moisture contents of the Black Creek material ranged from a low of 25.4 percent to a high of 32.8 percent, while optimum moisture content ranges from 20 to 22 percent. Moisture contents of the Marcellus material ranged

from a low of 19.2 percent to a high of 19.7 percent. Optimum moisture content for the Marcellus material is 19.5 percent. It is anticipated that a set of discs will be used to moisture condition the LP material.

- A total of approximately 6,469 CY (loose) of low-permeability soil was imported to the site this week, consisting of approximately 3,393 CY (loose) of Black Creek material and 3,076 CY (loose) of Marcellus material. Parsons has imported approximately 57,777 CY of low-permeability soil to the site to date. Parsons continues to receive the material by the ton and is using a conversion factor of 1.6 tons per loose cubic yard.
- Engineered Fill activities were not conducted during the week.
- Representatives of NYDEC, Parsons, and Geosyntec met Wednesday to discuss monitoring and testing of the LP soil layer. Topics of the meeting included:
  - high moisture content of the material being imported for LP soil;
  - monitoring of LP soil placement;
  - use of harrowing disks for moisture conditioning of the soil;
  - aggregate particles in the LP soil layer; and
  - testing of placed materials.
- Geosyntec reviewed Submittals SCA-02200-001(earthwork) and SCA-02085-003 (wells) and provided comment to Parsons.

GEOSYNTHETICS:

- Geosyntec received conformance results for the tensile strength at break (ASTM D 6693) retests for geomembrane samples GM-03, GM-06, and GM-08. Geomembrane conformance samples tested to date (GM-01 through GM-08) have met the requirements of the Specifications and CQA Plan. Geosyntec is currently awaiting additional QC data related to Submittal SCA-02740-008 (geomembrane) to approve the material for use.
- The installer, Chenango, provided Geosyntec additional information regarding the geosynthetic clay liner (GCL) material, however, the additional information is required to complete Submittal SCA-02772-001.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I WEEK ENDING: July 03, 2011

This report is written for the period of 27 June to 03 July 2011. Geosyntec was on-site 5 days (44 days total to date) to provide CQA services during construction of Onondaga Sediment Consolidation Area Phase I. Temperatures generally ranged between a low of 58° F and a high of 87° F during the hours worked. Approximately 1.1-in of precipitation was received onsite this week, occurring Sunday, 26 June and Tuesday, 28 June. Representatives of Geosyntec & Parsons were on-site throughout the week. A weekly construction meeting was held on Tuesday, 28 June. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Parsons labor personnel performed vegetation debris removal from the surface of the subgrade in areas of the Phase I area Monday through Friday.
- A site walk with representatives of NYDEC and Geosyntec was conducted on Thursday, 30 June. Additional subgrade area was accepted for low-permeability (LP) soil placement. An area covering approximately 60,000 square feet was approved in the northwest corner of Phase I.
- Monitored and documented Parsons construction operations for LP soil placement in the Phase I Cell area Monday through Friday. Placement generally consisted of placing material from the two sources over the approved subgrade in separate areas. Parsons continued with 1st lift and 2nd lift operations with two (2) separate crews, each having one (1) spotter and one (1) Caterpillar D-6N LGP dozer. Exposed surfaces were sealed using a smooth drum roller. The lifts were placed in approximately 12 to 14 inch thick loose lifts and 8 to 10 inch thick loose lifts, respectively.
- The far western area of Phase I remained free of standing water throughout the week. The eastern sump area accumulated water during the rain events described above. Parsons pumped the water from the eastern sump area to the proposed Phase III area. By week's end, areas of previous standing water had dried.
- No field density tests were required nor performed this week.
- Moisture samples LP-044 through LP-050 and were collected and tested in onsite by means of ASTM D4643. Moisture content results ranged from a low of 19.8 percent to a

high of 31.6 percent. Samples were forwarded to the off-site laboratory, GeoTesting Express (GTX) for testing via method ASTM D2216.

- A total of approximately 10,640 CY (loose) of LP soil was imported to the site this week; consisting of approximately 5,694 CY (loose) of Black Creek material and 4,946 CY (loose) of Marcellus material. Parsons has imported approximately 68,417 CY (loose) of low-permeability soil material to date. Parsons continues to receive the material by the ton and is using a conversion factor of 1.6 Tons per CY.
- No Engineered Fill was imported during this week.

GEOSYNTHETICS:

- Geomembrane submittals SCA-02740-010 and SCA-02740-011 were reviewed by Geosyntec and comments were returned to Parsons.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I WEEK ENDING: July 03, 2011

This report is written for the period of 04 to 10 July 2011. Geosyntec was on-site four (4) days (48 days total to date) to provide CQA services during construction of Onondaga Sediment Consolidation Area (SCA) Phase I. No work was performed onsite for the holiday Monday, 04 July. Temperatures generally ranged between a low of 60° F and a high of 89° F during the hours worked. Less than 0.1-in of precipitation was received onsite this week, with accumulation occurring Wednesday, 06 July. Representatives of Geosyntec & Parsons were on-site throughout the work week. A weekly construction meeting was held on Tuesday, 05 June. A QA/QC operational meeting was held on Thursday and Friday, 07 & 08 July. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with one near miss reported Wednesday. The near miss involved an over-the-road haul truck and privately owned vehicle.

EARTHWORK:

- Parsons labor personnel performed vegetation debris removal from the surface of the subgrade in areas of the Phase I area Tuesday through Friday.
- No additional subgrade was approved for low-permeability soil placement in Phase I this week.
- The Phase I area remained acceptable for low-permeability (LP) soil placement throughout the work week.
- Monitored and documented Parsons construction operations for LP soil placement in the Phase I area Tuesday through Friday. Placement generally consisted of placing material from the two sources over the approved subgrade in separate areas. Parsons continued with 1st lift, 2nd lift, and 3rd lift operations with two (2) separate crews, each having one (1) spotter and one (1) Caterpillar D-6N LGP dozer. Exposed surfaces were sealed using a smooth drum roller. The lifts were placed approximately 14 inches thick for lift 1 and 10 inches thick for subsequent lifts. Prior to placement of subsequent lifts, the surface of prior lifts were scarified and moisture conditioned. Parsons also conditioned loads of LP material by tracking delivered material with bulldozers.
- Field density tests FDT 2-001 thru FDT 2-092 were performed this week. All FDTs met the minimum requirements of the layer tested.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I WEEK ENDING: July 03, 2011

- Moisture samples LP-051 thru LP-052 were collected from the imported low-permeability soil as it was dumped from the haul trucks and testing was performed onsite using method ASTM D4643. Results of this testing ranged from a high of 22.9% and a low of 22.5%. Portions of the samples were forwarded to the off-site laboratory, GeoTesting Express (GTX) for testing via ASTM D2216.
- Moisture samples LP-053 thru LP-067 were collected from Field Density Test sites FDT 2-001 thru 2-092 respectively. These samples were forwarded to GeoTesting Express (GTX) for analysis.
- Parsons initiated the east sump excavation in Phase I and began placement of the low-permeability soil. The sump was relocated by Parsons in the field approximately 7-ft westward to avoid previously installed instrumentation system components. The new location was surveyed and is being verified by the design team.
- A total of approximately 13,428 CY (loose) of low-permeability soil was imported to the site this week; consisting of approximately 6,872 CY (loose) of Black Creek material and 6,556 CY (loose) of Marcellus material. Parsons has imported approximately 81,845 CY (loose) of low-permeability soil material to date. Parsons continues to receive the material by the ton and is using a conversion factor of 1.6 Tons per CY.
- No Engineered Fill was imported during this week.

GEOSYNTHETICS:

- No work related to geosynthetics was required or performed this week.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I WEEK ENDING: July 17, 2011

This report is written for the period of 11 July 2011 to 17 July 2011. Geosyntec was on-site 6 days (54 days total to date) to provide CQA services during construction of Onondaga Sediment Consolidation Area (SCA) Phase I. Temperatures generally ranged between a low of 59° F and a high of 91° F during the hours worked. Less than 0.1-in of precipitation was received on Wednesday afternoon, 13 July. Representatives of Geosyntec & Parsons were on-site throughout the work week. A weekly construction meeting was held on Tuesday, 12 July. A QA/QC operational meeting was held on Friday, 15 July. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Parsons labor personnel performed vegetation debris removal from the surface of the subgrade in areas of the Phase I area Monday through Friday.
- The subgrade at the northwest corner of Phase 1 was re-inspected after grass growth was cut and approved for low-permeability soil placement in Phase I this week.
- Monitored and documented Parsons construction operations for low-permeability (LP) soil placement in the Phase I area Monday through Saturday. Placement generally consisted of placing material from the two sources over the approved subgrade in separate areas. Parsons continued with 1st lift, 2nd lift, 3rd lift and 4th lift operation with three (3) separate crews, each having one (1) spotter and one (1) Caterpillar D-6N LGP w/GPS dozer or (1) Caterpillar D-6N LGP without GPS dozer. Exposed surfaces were sealed using a smooth drum roller. The lifts were placed in approximately 10 to 14 inch thick loose lifts.
- The Phase I area remained acceptable for low-permeability soil placement throughout the work week.
- Field Density Tests FDT 2-093 thru FDT 2-194 were performed this week. All tests met or exceeded the minimum requirements of the Specifications and CQA Plan.
- Moisture samples LP-070 thru LP-086 were collected from Field Density Test sites FDT 2-132 thru 2-148 respectively. These samples were forwarded to GeoTesting Express (GTX) for ASTM D2216 analysis.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I WEEK ENDING: July 17, 2011

- Parsons re-excavated all four sideslopes of the east sump in Phase I and re-graded the subgrade to the designed slope of 2.5H:1V. The low-permeability soil was replaced in the sideslopes and the remaining low-permeability soil was placed in the base of the sump.
- A total of approximately 15,942 CY (loose) of low-permeability soil was imported to the site this week; consisting of approximately 8,108 CY (loose) of Black Creek material and 7,834 CY (loose) of Marcellus material. Parsons has imported approximately 97,787 CY (loose) of low-permeability soil material to date. Parsons continues to receive the material by the ton and is using a conversion factor of 1.6 Tons per CY.
- No Engineered Fill was imported during this week.

GEOSYNTHETICS:

- A 24 oz/syd geotextile submittal was reviewed and comments returned to Parsons.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I WEEK ENDING: July 24, 2011

This report is written for the period of 18 July 2011 to 24 July 2011. Geosyntec was on-site 5 days (59 days total to date) to provide CQA services during construction of Onondaga SCA Phase I. Temperatures generally ranged between a low of 66° F and a high of 100° F during the hours worked. Approximately 0.55-in of precipitation was received onsite this week between Monday morning and Tuesday morning. Representatives of Geosyntec & Parsons were on-site throughout the work week. A weekly construction meeting was held on Tuesday, 19 July. A QA/QC operational meeting was held on Thursday, 21 July. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Parsons labor personnel performed vegetation debris removal from the surface of the subgrade in areas of the Phase I area Monday through Wednesday and in Phase II Wednesday through Friday.
- The subgrade at the southwest corner of Phase II was inspected and approved for low-permeability soil placement this week.
- The Phase I area was acceptable for low-permeability soil placement from Wednesday through Friday. No low-permeability soil was placed Monday or Tuesday due to wet conditions.
- Monitored and documented Parsons construction operations for engineered fill placement in the Phase I Cell east berm area on Tuesday. Placement consisted of dumping and spreading the material from one source from north to south in 12 inch lifts over the previously placed engineered fill with a spotter and Caterpillar D-6N LGP w/GPS bulldozer. Each lift was compacted with a Caterpillar CS56 smooth drum roller.
- Monitored and documented Parsons construction operations for low-permeability (LP) soil placement in the Phase I Cell area Wednesday through Friday. Activity generally consisted of placing material from the two sources over the approved subgrade in separate areas. Parsons continued with 2nd lift, 3rd lift operation with three (3) separate crews, each having one (1) spotter and one (1) Caterpillar D-6N LGP w/GPS dozer or (1)

Caterpillar D-6N LGP without GPS dozer. Exposed surfaces were sealed using a smooth drum roller. The lifts were placed in approximately 8 inch thick compacted lifts.

- Field Density Tests FDT 2-195 thru FDT 2-216 were performed on the compacted low-permeability soil this week.
- Field Density Tests FDT 1-002 thru FDT 1-016 were performed on the compacted engineered fill this week
- Moisture samples LP-089 thru LP-095 were collected from Field Density Test sites 2-195 thru 2-201 respectively. These samples were forwarded to GeoTesting Express (GTX) for ASTM D2216 analysis.
- Low-permeable soil samples LP-087 and LP-088 and Gravel Drainage sample GD-002 were collected and forwarded to SGI Testing Services (SGI) for Interface Direct Shear testing.
- Engineered fill sample EF-003 was collected from the Phase I east berm placement area. The sample was forwarded to GTX for conformance testing analysis.
- A total of approximately 9,762 CY (loose) of low-permeability soil was imported to the site this week; consisting of approximately 4,773 CY (loose) of Black Creek material and 4,989 CY (loose) of Marcellus material. Parsons has imported approximately 107,549 CY (loose) of low-permeability soil material to date. Parsons continues to receive the material by the ton and is using a conversion factor of 1.6 Tons per LCY.
- A total of approximately 1,682 CY (loose) of engineered fill was imported to the site this week. Parsons has imported approximately 55,432 CY (loose) of engineered fill to date. Parsons continues to receive the material by the ton and is using a conversion factor of 1.6 Tons per LCY.

GEOSYNTHETICS:

- 189 rolls of 24 oz/syd nonwoven geotextile was received and stored onsite southwest of the construction area during the week. The rolls were stockpiled directly on the ground surface.
- A 60 mil textured geomembrane sample GM-9 and a 24 oz/syd nonwoven geotextile sample GT-002 were collected and forwarded to SGI for Interface Direct Shear testing.
- Three 24 oz/syd nonwoven geotextile samples GT-001, GT-003 and GT-004 were collected and forwarded to GTX for conformance testing analysis.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I WEEK ENDING: July 31, 2011

This report is written for the period of 25 to 31 July 2011. Geosyntec was on-site 5 days (64 days total to date) to provide CQA services during construction of Onondaga SCA Phase I. Temperatures generally ranged between a low of 62° F and a high of 84° F during the hours worked. Approximately 0.50-in of precipitation was received Friday, 29 July. Representatives of Geosyntec & Parsons were on-site throughout the work week. A weekly construction meeting was held Tuesday, 26 July. A QA/QC operational meeting was held on Thursday, 28 July. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Parsons labor personnel performed vegetation debris removal from the surface of the subgrade in the west area of the Phase II Monday through Friday.
- Monitored and documented Parsons construction operations for low-permeability (LP) soil placement in Phase I Monday through Friday. Operations generally consisted of placing material from the Black Creek and Marcellus sources in separate locations. Parsons continued with 2nd lift, 3rd lift, 4th lift and 5th lift operation with three (3) separate crews, each having one (1) spotter and one (1) Caterpillar D-6N LGP dozer w/GPS or (1) Caterpillar D-6N LGP dozer without GPS. Exposed surfaces were sealed using a smooth drum roller. The lifts were placed in approximately 10 inch thick loose lifts.No low-permeable soil was placed Friday after 09:30 due to wet conditions.
- Parsons completed placement of LP soil within the east side of Phase I.
- Field Density Tests FDT 2-217 thru FDT 2-353 and FDT 3-021 thru FDT 3-111 were performed on the compacted low-permeable soil this week. All FDTs met or exceeded the minimum requirements of the specifications and CQA Plan.
- Thin-walled (i.e., Shelby) tube samples ST-004 thru ST-014 were obtained this week and shipped to GeoTesting Express (GTX) for testing. Results are pending.
- No engineered fill was imported to the site for construction this week.
- A total of approximately 12,435 CY (loose) of low-permeability soil was imported to the site this week; consisting of approximately 6,785 CY (loose) of Black Creek material and 5,650 CY (loose) of Marcellus material. Parsons has imported approximately 119,984

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I WEEK ENDING: July 31, 2011

CY (loose) of low-permeability soil material to date. Parsons continues to receive the material by the ton and is using a conversion factor of 1.6 Tons per CY.

GEOSYNTHETICS:

- A preconstruction prepatory meeting was held on Thursday, 28 July. The geosynthetics installer is scheduled to mobilize to the site Monday, 1 August and plan to begin deployment Wednesday, 3 July. Expect to mobilize a second technician.
- 54 rolls of 24 oz/syd geotextile were delivered to the site Monday, 25 July, for a total of 243 rolls delivered and inventoried to date. A total of five Conformance samples (four material properties and one interface shear) have been obtained from the geotextile material, to date.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I WEEK ENDING: August 07, 2011

This report is written for the period of 01 to 07 August 2011. Geosyntec was on-site 5 days (69 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged between a low of 62°F and a high of 84°F during the hours worked. Approximately 0.50-in of precipitation was received onsite this week on Wednesday, 03 August. Representatives of Geosyntec & Parsons were on-site throughout the work week. A weekly construction meeting was held on Tuesday, 02 August. A QA/QC operational meeting was held on Friday, 05 August. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Parsons labor personnel performed vegetation debris removal from the surface of the subgrade in the west area of the Phase II Monday through Friday.
- A portion of Phase II subgrade was stripped of vegetation using a D-6N LGP dozer.
- Monitored and documented Parsons construction operations for low-permeability (LP) soil placement in the Phase I area Monday through Wednesday. Placement generally consisted of placing material from the two sources over the approved subgrade in separate areas. Parsons continued with 1st , 2nd , 3rd and 4th lift operation with two (2) separate crews, each having one (1) spotter and one (1) Caterpillar D-6N LGP dozer w/GPS or (1) Caterpillar D-6N LGP dozer without GPS. Exposed surfaces were sealed using a smooth drum roller. The first lift was placed in approximately 12 inches thick compacted (14 inches thick loose) lifts. Subsequent lifts were placed approximately 8 inches thick compacted (10 inches thick loose).
- The Phase I area was acceptable for low-permeability soil placement from Monday through Wednesday. No low-permeable soil was placed Wednesday after 13:00 due to generally wet conditions.
- Field density tests (FDTs) 2-354 through 2-396, and FDTs 3-112 through 3-117 were performed on the compacted LP soil. All tests met or exceeded the minimum requirements of the specifications and CQA Plan.
- FDTs 1-017 through 1-032 compacted engineered fill this week. All tests met or exceeded the minimum requirements of the specifications and CQA Plan.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I WEEK ENDING: August 07, 2011

- A total of approximately 9,812 CY (loose) of low-permeability soil was imported to the site this week; consisting of approximately 5,534 CY (loose) of Black Creek material and 4,278 CY (loose) of Marcellus material. Parsons has imported approximately 129,796 CY (loose) of low-permeability soil material to date. Parsons also imported 1,452 CY of engineered fill this week from the Granby source. Parsons continues to receive both materials by the ton and is using a conversion factor of 1.6 Tons per CY.

GEOSYNTHETICS:

- The installer, Chenango, was onsite from Monday thru Friday.
- Chenango performed mobilization operations and preliminary staging of material for construction.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I WEEK ENDING: August 14, 2011

This report is written for the period of 08 to 14 August 2011. Geosyntec was on-site 5 days (74 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged between a low of 61°F and a high of 82°F during the hours worked. Approximately 3.10-in of precipitation was received onsite this week from Monday, 8 August thru Wednesday, 10 August. Representatives of Geosyntec & Parsons were on-site throughout the work week. A weekly construction meeting was held on Tuesday, 9 August. An outline of work performed over this period is presented below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Weather conditions prevented construction activities for most of the week.
- Parsons labor personnel performed vegetation debris removal from the surface of the subgrade in the west area of the Phase II Monday, 8 August and Thursday, 11 August.
- The Phase I area was not acceptable for construction operations throughout the work week due to wet conditions. The Phase I eastern sump appeared to have drained as a result of a potential void in the Solvay waste.
- The Phase II area was acceptable for low-permeability soil placement on Friday, 12 August however due to the high moisture content of imported material, the material was only able to be pushed into the west end of Phase II utilizing two (2) Caterpillar D-6N LGP dozers. No attempt of performing formal placement or grading out was attempted.
- A total of approximately 1,294 CY (loose) of low-permeability soil was imported to the site this week; consisting of approximately 1,064 CY (loose) of Black Creek material and 230 CY (loose) of Marcellus material. Parsons has imported approximately 131,090 CY (loose) of low-permeability soil material to date. Parsons did not import engineered fill associated with the construction of Phase I or II this week. Parsons continues to receive both materials by the ton and is using a conversion factor of 1.6 Tons per CY.

GEOSYNTHETICS:

- Geosynthetics were no deployed this week due to inclement weather and wet site conditions.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: August 21, 2011

This report is written for the period of 15 to 21 August 2011. Geosyntec was on-site 6 days (80 days total to date) to provide CQA services during construction of Onondaga Sediment Consolidation Area Phase I. Temperatures generally ranged between a low of 60° F and a high of 86° F during the hours worked. Approximately 1.25-in of precipitation was received onsite this week, occurring Monday and Tuesday. Representatives of Geosyntec & Parsons were on-site throughout the work week. Representatives of Chenango Contractors were on site Thursday through Saturday. A weekly construction meeting was held on Tuesday. The QA/QC operational meeting was for this week was postponed at the request of Parsons. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Parsons labor personnel performed vegetation debris removal from the surface of the subgrade in the west side of the Phase II Monday, 15 August through Saturday, 20 August.
- Monitored and documented Parsons construction operations for low-permeability (LP) soil placement in the Phase I/II Cell areas on Monday and Thursday through Saturday. Weather and site conditions did not allow low-permeability soil importation during the other days of the work week.
- Low permeability soil placement operations were conducted in Phase IB and Phase II. Materials were imported using over-the-road dump trucks. Caterpillar D-6N dozers were used to place the materials. Caterpillar CS56 was used to compact the LP soil.
- A total of approximately 5,938 CY (loose) of low-permeability soil was imported to the site this week; consisting of approximately 4,284 CY (loose) of Black Creek material and 1,654 CY (loose) of Marcellus material. Parsons has imported approximately 137,028 CY (loose) of low-permeability soil material to date. Parsons continues to receive both materials by the ton and is using a conversion factor of 1.6 Tons per CY.
- Parsons did not import engineered fill associated with the construction of Phase I or II this week.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: August 21, 2011

- Excavation was performed within the Phase IA sump to investigate the cause of the drainage of stormwater. The LP soil was removed and the excavation was advanced into the under lying solvay waste. No channels or other obvious conduits were observed during the excavation. The excavation was temporarily backfilled with LP soil, with future rework planned to coincide with rework of the entire sump.
- Parsons performed surface preparation of the LP soil surface within Phase IA. Geosyntec noted pumping of the LP soil under the weight of compactors and ridges approximately 6-in high along adjacent roller passes. Geosyntec suggested additional preparation prior to geosynthetics deployment; however, Parsons and Chenango proceeded.

GEOSYNTHETICS:

- Chenango was on site Thursday through Saturday.
- A total of approximately 208,000 sq. ft. of 60 mil HDPE geomembrane was deployed to date.
- A total of approximately 8,710 LF of fusion seaming was performed to date.
- A total of 18 destructive samples were collected to date. This equates to a sample frequency of approximately 1 per 484 LF.
- An additional 30 rolls of 24 oz/sy geotextile fabric were received and inventoried on Friday. A total of 219 rolls (approximately 657,000 SF) of 24 oz/sy geotextile have been delivered to date.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: August 28, 2011

This report is written for the period of 15 to 21 August 2011. Geosyntec was on-site 5 days (85 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged between a low of 56°F and a high of 80°F during the hours worked. Approximately 1.65-in of precipitation was recorded onsite this week on Monday, Thursday, and Friday. Representatives of Geosyntec & Parsons were on-site throughout the work week. Representatives of Chenango Contractors were on site with the exception of Thursday. A weekly construction meeting was held on Tuesday. A QA/QC operational meeting was on Friday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Parsons labor personnel performed vegetation debris removal from the surface of the subgrade of Phase II Monday through Friday.
- Monitored and documented Parsons construction operations for low-permeability (LP) soil placement in the Phase I/II areas on Wednesday, 24 August and engineered fill (EF) on Tuesday, 23 August. The other days of the work week were impacted by weather.
- Procedures for low-permeability soil placement operations remains unchanged from previous construction.
- A total of approximately 2,848 CY (loose) of low-permeability soil was imported to the site this week; consisting of approximately 1,856 CY (loose) of Black Creek material and 992 CY (loose) of Marcellus material. Parsons has imported approximately 139,876 CY (loose) of low-permeability soil material to date. Parsons continues to receive both materials by the ton and is using a conversion factor of 1.6 Tons per CY. Parsons also imported 1,653 CY (loose) of engineered fill material and is using a conversion factor of 1.6 Tons per CY.

GEOSYNTHETICS:

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: August 28, 2011

- No additional 60-mil thick HDPE geomembrane was deployed this week. A total of approximately 210,166 SF of geomembrane has been deployed to date.
- Approximately 94,700 SF of geotextile was deployed Friday as an initial deployment effort.
- An additional 126 rolls (approximately 374,220 SF) of 24 oz/sy geotextile was received and inventoried on Tuesday, 23 August and Friday, 26 August.
- A total of 18 original destructive samples have been collected to date from 9,185 LF of constructed fusion seam. Two original samples failed to meet the minimum seam criteria in the field (DS-6 and DS-15) and two additional samples failed to meet the minimum seam criteria in the laboratory (DS-2 and DS-4). A total of 11 additional samples were obtained to isolate the failures. Two additional samples (DS-4C and DS-6C) were collected from cap repairs that exceeded 150-ft in length.
- A total of 62 repairs were completed this week and to date.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: September 04, 2011

This report is written for the period of 29 August to 04 September 2011. Geosyntec was on-site 6 days (91 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged between a low of 56°F and a high of 88°F during the hours worked. Approximately 1.05-in of precipitation was received onsite this week from the evening of Sunday, 28 August thru Monday, 29 August. Representatives of Geosyntec & Parsons were on-site throughout the work week. Representatives of Chenango Contractors were on site Monday, Thursday, and Friday. A weekly construction meeting was held on Tuesday. A QA/QC site visit to the Granby Quarry was conducted on Friday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being observed or reported.

EARTHWORK:

- Weather and site conditions did not allow low-permeability or engineered fill soil importation on Monday and Tuesday.
- Parsons labor personnel performed vegetation debris removal from the surface of the subgrade in the west and central areas of Phase II on Wednesday and Friday, 02 September. Approximately 3.5 acres of subgrade area was deemed acceptable in Phase II on Wednesday for low permeability (LP) soil placement.
- Monitored and documented Parsons' construction operations for LP soil placement in the Phase I/II areas on Wednesday through Saturday.
- Procedures for LP soil placement operations remains unchanged from previous procedures.
- A total of approximately 10,034 CY (loose) of low-permeability soil was imported to the site this week; consisting of approximately 5,463 CY (loose) of Black Creek material and 4,571 CY (loose) of Marcellus material. Parsons has imported approximately 149,910 CY (loose) of low-permeability soil material to date. Parsons continues to receive both materials by the ton and is using a conversion factor of 1.6 Tons per CY. Parsons did not import engineered fill material this week.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: September 04, 2011

GEOSYNTHETICS:

- Approximately 150,283 SF of 60 mil thick HDPE geomembrane was deployed on Friday. A total of approximately 360,449 SF has been deployed to date.
- A total of approximately 7,443 LF of fusion seaming was performed this week. A total of approximately 16,628 LF of fusion seaming has been performed to date.
- No repairs were performed this week. A total of 62 repairs have been completed to date.
- A total of 10 original destructive samples were collected this week, with a total of 28 original destructive samples collected to date. All destructive samples collected this week were observed to pass field testing. A total of 4 original destructive samples have failed to date, which have required 11 additional samples to isolate the failures.
- One destructive sample was collected from a cap repair this week, resulting in a total of 3 to date.
- Geotextile was not deployed this week. A total of approximately 94,700 SF has been deployed to date.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: September 11, 2011

This report is written for the period of 05 to 11 September 2011. The Labor Day holiday was observed on Monday. Geosyntec was on-site 4 days (95 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged between a low of 54° F and a high of 80° F during the hours worked. Approximately 3.6-in of precipitation was received onsite this week from the evening of Sunday through Wednesday. Representatives of Geosyntec & Parsons were on-site throughout the work week. Representatives of Chenango Contractors were on site Tuesday and Wednesday, however, inclement weather prevented production on Wednesday. A weekly construction meeting was held on Tuesday. A QA/QC operational meeting was held on Friday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Due to saturated site conditions caused by rains, site work was limited to miscellaneous site maintenance Tuesday through Thursday.
- Site conditions did not permit low permeability (LP) soil placement this week. The total LP soil imported to date remains approximately 149,910 CY (loose) of low-permeability soil material.
- Parsons performed placement of engineered fill material for the continuation of the Phase I west berm construction on Friday. The imported amount was approximately 1,409 CY (loose). Engineered fill material is being imported by the ton and is a conversion factor of 1.6 Tons per CY is being used.

GEOSYNTHETICS:

- No deployment of geosynthetics was performed this week. Total geomembrane deployed to date is approximately 360,449 SF. A total of approximately 94,700 SF of 24 oz/sy geotextile has been deployed to date.
- No fusion seaming was performed this week. A total of approximately 16,628 LF of fusion seaming has been performed to date.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: September 11, 2011

- No major repairs were performed this week. A total of 62 repairs have been completed to date.
- A total of 34 original destructive samples have been collected to date. A total of 4 original destructive samples have failed to date, requiring 11 additional samples to isolate the failures.
- A total of 3 destructive samples have been collected to date from cap repairs greater than 150-ft in length.

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WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: September 18, 2011

This report is written for the period of 12 to 18 September 2011. Geosyntec was on-site 7 days (102 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged between a low of 40°F and a high of 89°F during the hours worked. Approximately 1.46-in of precipitation was received onsite this week. Representatives of Geosyntec, Parsons, and Chenango were on-site throughout the work week. A weekly construction meeting was held on Tuesday. A QA/QC operational meeting was held on Friday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Monitored, tested, and documented Parsons Construction operations for low-permeability (LP) soil placement in the Phase 1A and 1B Cells. Weather and site conditions impacted LP soil activities this week.
- The Phase 1A area sump has been reworked and retested. Parsons and Geosyntec personnel verified the thickness of LP soil material in Phase 1A sump.
- Parsons reworked the final lift of the LP soil in portions of the Phase 1B area by disking and moisture conditioning the material.
- Geosyntec conducted 17 field density test (FDT) in Phase IA with passing results. An additional 17 FDTs were conducted in Phase 1B with passing results. Shelby tube samples ST-015 and ST-016 were collected from the final lift of LP soil in Phase 1B and sent to independent testing laboratory for evaluation.
- A total of approximately 8,222 CY (loose) of low-permeability soil was imported to the site this week; consisting of approximately 4,355 CY (loose) of Black Creek material and 3,867 CY (loose) of Marcellus material. Parsons has imported approximately 158,132 CY (loose) of low-permeability soil material to date. Parsons continues to receive both low permeability soil materials by the ton and is using a conversion factor of 1.6 Tons per CY.
- Parsons imported approximately 1,518 CY (loose) of Gravel Drainage Layer material (<4" rounded stone) from the Granby source. The material is being placed in Phase 1A

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: September 18, 2011

over the installed geosynthetics. Parsons is receiving Gravel Drainage Layer material by the ton and using a conversion factor of 1.5 Tons per CY.

GEOSYNTHETICS:

- Approximately 237,600 SF of 60 mil thick HDPE liner was deployed on Tuesday, 13 September and Sunday, 18 September to complete sump area. A total of approximately 598,059 SF has been deployed to date.
- A total of approximately 7,463 LF of fusion seaming was performed this week. A total of approximately 24,091 LF of fusion seaming has been performed to date.
- A total of approximately 95 repairs were performed this week, with a total of 157 repairs to date.
- A total of 38 original destructive samples have been collected to date. Four of these original destructs failed to meet the project requirements, requiring 11 additional samples to delineate the extents of the failed areas. A total of three (3) destructive samples have been removed from cap repairs to date.
- Approximately 14,500 SF of geosynthetic clay liner (GCL) was deployed this week in the sump area.
- Approximately 175,200 SF of 24 oz/sy geotextile was deployed this week, resulting in a total to date of approximately 269,900 SF.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: September 25, 2011

This report is written for the period of 19 to 25 September 2011. Geosyntec was on-site 5 days (107 days total to date) to provide CQA services during construction in the SCA. Temperatures generally ranged between a low of 50°F and a high of 76°F during the hours worked. Approximately 1.18-in of precipitation was received onsite this week on Monday and Wednesday through Friday. Representatives of Geosyntec & Parsons were on-site throughout the work week. Representatives of Chenango Contractors were on site Monday through Thursday. A weekly construction meeting was held on Tuesday. A QA/QC operational meeting was held on Friday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Parsons labor personnel performed vegetation debris removal from the surface of the subgrade in Phase II throughout the week.
- Monitored and documented Parsons Construction operations for low-permeability (LP) soil placement in the Phase I/II areas on Monday and Wednesday. Weather and site conditions limited LP soil work to these two days.
- Geosyntec conducted FDT 2-446 through FDT 2-464 and FDT 3-158 through FDT 3-184 on the LP soil and obtained Shelby Tube samples ST-017 through ST-020.
- A total of approximately 4,988 CY (loose) of LP soil was imported to the site this week; consisting of approximately 2,530 CY (loose) of Black Creek material and 2,458 CY (loose) of Marcellus material. Parsons has imported approximately 163,123 CY (loose) of LP soil material to date. Parsons continues to receive both low permeability soil materials by the ton and is using a conversion factor of 1.6 Tons per CY
- Parsons continued to import gravel drainage layer material throughout the week. Parsons imported approximately 4,327 CY (loose) of the gravel material (<4-in rounded stone) and placed it on the east side of Phase I over the installed geosynthetics. A total of 5,845 CY (loose) of drainage gravel has been placed in the east side of Phase I to date. Parsons continues to receive drainage layer material by the ton and is using a conversion factor of 1.8 Tons per CY.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: September 25, 2011

GEOSYNTHETICS:

- A total of approximately 36,517 SF of 60 mil thick HDPE geomembrane was deployed this week. Total deployed to date is approximately 634,576 sq. ft.
- Approximately 3,404 LF of fusion seaming was performed this week. A total of approximately 20,032 LF of fusion seaming has been performed to date. No extrusion seaming has been performed.
- One additional repair was completed this week, bringing the total to date to 158.
- A total of 18 original destructive samples were collected this week, two of which failed to meet the project requirements. A total of 56 original destructive samples have been collected to date and 6 original destructive samples have failed to date. Four additional samples were required to isolate the two failing seam areas this week, increasing the total to date to 15 additional samples.
- A total of 3 destructive samples from caps have been collected to date from cap repairs greater than 150-ft in length.
- Total geotextile deployed to date is approximately 269,900 SF.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: October 02, 2011

This report is written for the period of 26 September to 02 October 2011. Geosyntec was on-site 5 days (112 days total to date) to provide CQA services during construction in the SCA. Temperatures generally ranged between a low of 61°F and a high of 84°F during the hours worked. Approximately 1.57-in of precipitation was received onsite this week from the evening of Tuesday through Thursday. Representatives of Geosyntec, Parsons, and Chenango were on-site throughout the work week. A weekly construction meeting was held on Tuesday. A QA/QC operational meeting was held on Friday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Parsons labor personnel performed vegetation debris removal from the surface of the subgrade in Phase II Monday through Wednesday.
- Monitored and documented Parsons Construction operations for low-permeability (LP) soil placement in the Phase I/II areas on Monday and Tuesday. Weather and wet site conditions impacted low-permeability soil activities this week, preventing LP soil placement the remainder of the week.
- Geosyntec conducted FDT 1-153 through FDT 1-159 in Grid E-8 during Phase I west culvert back filling operations.
- Geosyntec obtained Drainage Gravel samples GD-004, Grid N-10, GD-005, Grid O-9 and Engineering Fill sample EF-004, Northwest onsite stockpile.
- A total of approximately 2,674 CY (loose) of low-permeability soil was imported to the site this week. All low-permeability soil importation was from the Marcellus pit. The Black Creek pit has ceased to import material due to permitting issues. Parsons has imported approximately 164,561 CY (loose) of low-permeability soil material to date. Parsons continues to receive low permeability soil material by the ton and is using a conversion factor of 1.6 Tons per CY.
- Parsons also imported 7,480 CY of Gravel Drainage Layer material) and placed the material on the east side of Phase I over the installed geosynthetics. A total of 13,072 CY of Drainage Gravel has been placed in the east side of Phase I to date. Parsons continues

to receive Drainage Layer material by the ton and using a conversion factor of 1.5 Tons per CY.

GEOSYNTHETICS:

- A total of approximately 202,686 SF of 60 mil thick HDPE liner was deployed this week. Total deployed to date is approximately 837,262 SF.
- Approximately 9,634 LF of fusion seaming was performed this week. A total of approximately 29,646 LF of fusion seaming has been performed to date.
- Approximately 41 repairs were completed this week, totaling 207 to date.
  A total of 16 original destructive samples were collected this week. A total of 72 original destructive samples have been collected to date. A total of 7 original destructive samples have failed to date, requiring 17 additional samples to isolate the failures.
- A total of four (4) destructive samples from caps have been collected to date from cap repairs greater than 150-ft in length.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: October 09, 2011

This report is written for the period of 03 to 09 October 2011. Geosyntec was on-site 7 days (119 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged between a low of 37°F and a high of 81°F during the hours worked. No precipitation was received onsite this week. Representatives of Geosyntec and Parsons were on-site throughout the work week. Representatives of the geosynthetic installer, Chenango Contractors, were on site throughout the week. A weekly construction meeting was held on Tuesday. A QA/QC operational meeting was held on Friday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Parsons labor personnel performed vegetation debris removal from the surface of the subgrade in Phase II Tuesday through Saturday, working from the west to east.
- Parsons performed low-permeability (LP) soil placement in the Phase I/II areas on Friday and Saturday. A total of approximately 1,553 CY (loose) of LP soil was imported to the site this week. All LP soil importation was from the Marcellus pit. Parsons has imported approximately 166,114 CY (loose) of LP soil material to date. Parsons continues to receive LP soil material by the ton and is using a conversion factor of 1.6 Tons per CY..
- Parsons performed engineered fill placement for the Phase I/II west berm Tuesday through Friday. Parsons also imported approximately 2,659 CY of engineered fill from the Granby pit. Parsons continues to receive engineered fill material by the ton and is using a conversion factor of 1.6 Tons per CY.
- Gravel drainage layer placement was performed Monday through Friday. Parsons also imported 5,170 CY of Drainage Layer material (<4" rounded stone) being placed on the east side of Phase I over geosynthetics in place. A total of 16,995 CY of Drainage Gravel has been placed in the east side of Phase I to date. Parsons continues to receive drainage gravel by the ton and is using a conversion factor of 1.5 Tons per CY.
- Geosyntec performed FDT 1-160 through FDT 1-166 on Phase I west berm construction and FDT 3-185 through 3-225, all test passed. Geosyntec also obtained Shelby Tube samples ST-021 through ST-028.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: October 09, 2011

GEOSYNTHETICS:

- A total of approximately 211,574 SF of 60 mil thick HDPE geomembrane was deployed this week. Total deployed to date is approximately 1,048,836 SF
- Approximately 9,668 LF of fusion seaming was performed this week. A total of approximately 39,314 LF of fusion seaming has been performed to date.
- Approximately 61 additional repairs were completed this week, totaling 268 repairs to date.
- A total of 20 original destructive samples were collected this week. A total of 92 original destructive samples have been collected to date.
- One destructive sample collected this week failed to meet the minimum project requirements, for a total of 8 original destructive samples failed to date. Two additional samples were required to isolate the failing area this week. A total of 19 additional samples to isolate the failures have been collected to date.
- A total of 5 destructive samples from caps have been collected to date from cap repairs greater than 150-ft in length.
- Approximately 184,100 SF of 24 oz/sy non-woven geotextile was deployed this week, for a total of 546,040 SF to date.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: October 16, 2011

This report is written for the period of 10 to 16 October 2011. Geosyntec was on-site 5 days (124 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged between a low of 50°F and a high of 79°F during the hours worked. Approximately 0.7-in of precipitation was received onsite Wednesday through Friday and an additional 0.55-in was received over the weekend, for a weekly total of 1.25-in. Representatives of Geosyntec and Parsons were on-site throughout the work week. Representatives of the installer, Chenango Contractors, were on site Monday through Wednesday, and half days the remainder of the week. A weekly construction meeting was held on Tuesday. A QA/QC operational meeting was held on Friday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Parsons labor personnel performed vegetation debris removal from the surface of the subgrade in Phase II Monday and Tuesday. The remainder of the subgrade in Phase II was accepted for low-permeability (LP) soil placement on Tuesday.
- Parsons continued LP soil placement in the Phase I/II areas Monday through Wednesday. Parsons completed placement of LP soil in the Phase I on Monday. A total of approximately 3,708 CY (loose) of LP soil was imported to the site this week from the Marcellus source. Parsons has imported approximately 169,822 CY (loose) of LP soil material to date. Parsons continues to receive low permeability soil material by the ton and is using a conversion factor of 1.6 Tons per LCY.
- Parsons placed engineered fill on the west and south berms Monday through Wednesday. Parsons imported approximately 1,682 CY of engineered fill from the Granby pit. Parsons continues to receive engineered fill material by the ton and is using a conversion factor of 1.6 Tons per LCY.
- Parsons performed gravel drainage layer placement Monday and Tuesday. Gravel importation was suspended as of Tuesday afternoon due to fines content of the material, pending discussions between NYSDEC, Parsons, and Honeywell. Parsons imported approximately 1,122 CY (loose) of gravel drainage layer material this week. A total of

18,117 LCY of gravel drainage layer material has been imported to date. Parsons continues to receive this material by the ton and is using a conversion factor of 1.5 Tons per LCY.

- Geosyntec conducted field density test (FDT) 3-226 through FDT 3-230 on Phase I west sump construction and FDT 3-231 through 3-235 on Phase I west slope construction. Geosyntec also performed FDT 1-167 through FDT 1-171 on west berm construction and FDT 1-172 through 1-181 on Phase II south berm construction. All FDTs met the minimum project requirements.

GEOSYNTHETICS:

- A total of approximately 196,801 SF of 60 mil thick HDPE liner was deployed this week. Total deployed to date is approximately 1,245,637 SF. Geomembrane deployment in Phase I is complete.
- Approximately 10,058 LF of fusion seaming was performed this week. A total of approximately 49,372 LF of fusion seaming has been performed to date.
- Approximately 55 additional repairs were completed this week, for a total of 323 to date.
- A total of 20 original destructive samples were collected this week, for a total of 112 original destructive samples to date.
- A total of 8 original destructive samples failed to date. Two additional samples were required to isolate the failing area this week. A total of 19 additional samples to isolate the failures have been collected to date.
- A total of 5 destructive samples from caps have been collected to date from cap repairs greater than 150-ft in length.
- Approximately 118,500 SF of 24 oz/sy non-woven geotextile was deployed this week, for a total of 664,540 SF to date.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: October 23, 2011

This report is written for the period of 17 to 23 October 2011. Geosyntec was on-site 5 days (129 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged between a low of 45°F and a high of 64°F during the hours worked. Approximately 0.45-in of precipitation was received onsite on Wednesday and Thursday. Representatives of Geosyntec and Parsons were on-site throughout the work week. Representatives of Chenango Contractors were on site Monday through Wednesday and Friday. A weekly construction meeting was held on Tuesday. A QA/QC operational meeting was held on Friday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Parsons labor personnel performed vegetation debris removal from the surface of the subgrade in the East sediment basin Monday through Friday.
- Parsons performed low-permeability (LP) soil placement in the Phase II area on Wednesday and Friday. A total of approximately 2,357 CY (loose) of low-permeability soil was imported to the site this week from the Marcellus borrow source. Parsons has imported approximately 172,179 CY (loose) of LP soil material to date. Parsons continues to receive LP soil material by the ton and is using a conversion factor of 1.6 Tons per LCY.
- Parsons performed engineered fill placement on Tuesday, importing approximately 647 CY (loose) of engineered fill from the Granby quarry. Parsons continues to receive engineered fill material by the ton and is using a conversion factor of 1.6 Tons per LCY.
- Importation of gravel drainage layer material is suspended. A total of approximately 18,117 CY (loose) of gravel drainage layer material has been placed in Phase I to date.
- Geosyntec conducted FDT 1-182 through FDT 1-189 on Phase II engineered fill berm material and all tests met or exceeded the minimum project requirements.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: October 23, 2011

GEOSYNTHETICS:

Phase I

- Geomembrane deployment is complete in Phase I primary liner system with 1,159,799 SF of panel placement recorded.
- Seaming of geomembrane panels in Phase I is complete. A total 56,990 LF of fusion seaming was recorded for Phase I.
- Approximately 112 additional repairs were completed this week, for a total of 435 to date.
- A total of 5 original destructive samples were collected this week. A total of 117 destructive samples were collected from Phase I geomembrane seams.
- Two original destructive samples were observed to fail laboratory testing this week. A total of 10 original destructive samples failed to date. Four additional samples were required to isolate the failing area this week. A total of 23 additional samples to isolate failures have been collected to date.
- One destructive sample was removed from a cap repair greater than 150-ft in length, for a total of 6 destructive samples from caps to date.
- Approximately 116,000 SF of 24 oz/sy non-woven geotextile was deployed this week, for a total of approximately 780,540 SF to date.

East Sediment Basin

- Geomembrane deployment was delayed due to wet site conditions.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: October 30, 2011

This report is written for the period of 24 to 30 October 2011. Geosyntec was on-site 5 days (134 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged between a low of 29°F and a high of 63°F during the hours worked. Approximately 1.25-in of precipitation was received onsite Monday through Thursday. Representatives of Geosyntec and Parsons were on-site throughout the work week. Representatives of Chenango Contractors were on site Monday through Wednesday and Friday. A weekly construction meeting was held on Tuesday. A QA/QC operational meeting was held on Friday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Parsons labor personnel performed vegetation debris removal from the surface of the subgrade in the West sediment basin Monday through Thursday.
- Parsons performed low-permeability (LP) soil placement in the Phase II area on Monday. A total of approximately 848 CY (loose) of LP soil was imported to the site this week from the Marcellus source. Parsons has imported approximately 173,027 CY (loose) of LP soil material to date. Parsons continues to receive LP soil material by the ton and is using a conversion factor of 1.6 tons per LCY.
- Parsons imported drainage gravel Monday through Thursday. Parsons imported approximately 2,508 of drainage gravel material this week. A total of 20,625 CY of drainage gravel has been placed in Phase I to date. Parsons continues to receive drainage layer material by the ton and is using a conversion factor of 1.5 tons per CY.. Geosyntec obtained drainage gravel sample GD-006 on Tuesday from imported material.

GEOSYNTHETICS:

- Approximately 9 additional repairs were completed this week in Phase I, for a total of 444 repairs to date.
- Approximately 271,900 SF of 24 oz/sy non-woven geotextile was deployed this week, for a total to date of 1,052,440 SF.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: November 6, 2011

This report is written for the period of 31 October to 6 November 2011. Geosyntec was on-site 5 days, Monday through Friday (139 days total to date), to provide CQA services during construction of the SCA. Temperatures generally ranged between a low of 32°F and a high of 72°F during the hours worked. Representatives of Geosyntec, Parsons, and Chenango were on-site throughout the work week. A weekly construction meeting was held on Tuesday, 01 November. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

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- Monitored and documented Parsons Construction operations for low-permeability (LP) soil placement in the Phase II areas on Monday through Friday.
- A total of approximately 6,153 CY (loose) of low-permeability soil was imported to the site this week from the Marcellus off-site borrow source. Parsons has imported approximately 180,417 CY (loose) of low-permeability soil material to date. Parsons continues to receive low permeability soil materials by the ton and is using a conversion factor of 1.6 Tons per CY
- Parsons also imported approximately 44 CY (loose) of gravel drainage layer material, however, at the State's request the material is to be screened and washed before being placed in Phase IA. No Drainage Rock placed this week.
- Parsons also imported 308 CY (loose) of bank run gravel material for use on the side slopes in the West Basin Parsons continues to receive Drainage Layer material by the ton and using a conversion factor of 1.8 Tons per CY.
- Parsons mobilized a screening plant to the site to process gravel drainage layer material with excessive fines. The unit was erected, trial processing occurred without a spray rack.
- Parsons also works removing gravel drainage layer material with excessive fines content from the Phase I area and stockpiled the material west of western perimeter access road for future processing.
- Parsons prepared subgrade in West Basin for installation of secondary geomembrane.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: November 6, 2011

GEOSYNTHETICS:

- A total of approximately 228,510 SF of 60 mil HDPE liner was deployed this week in the East Basin. Total deployed in the East basin is approximately 228,510 SF to date.
- Approximately 10,040 LF of fusion seaming was performed this week and to date. No extrusion seaming has been performed during the past week.
- A total of 19 original destructive samples were collected this week from the East Basin, all 19 destructive samples pass Project Requirements.
- Approximately 65,000 SF of 24 oz/sy non-woven geotextile was deployed in Phase I this week in and adjacent to the sump area.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: November 13, 2011

This report is written for the period of 7 November through 13 November 2011. Geosyntec was on-site 5 days (144 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged between a low of 32°F and a high of 69°F during the hours worked. Representatives of Geosyntec, Parsons, and Chenango Contractors were on-site throughout the work week. A weekly construction meeting was held on Tuesday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily.
- David Williams (Geosyntec) slipped and fell in in the West Basin while traversing the Solvay waste. No injury was incurred. Bill Moon (Parsons) was informed on the incident and the incident was discussed in the following safety meeting.

EARTHWORK:

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- Parsons performed low-permeability (LP) soil placement in the Phase II areas Monday through Wednesday and Friday. Weather and site conditions impacted LP soil activities Friday afternoon and placement activities ceased mid-day. A total of approximately 4,684 CY (loose) of LP soil was imported to the site this week from the Marcellus source. Parsons has imported approximately 185,101 CY (loose) of LP soil material to date. Parsons continues to receive low permeability soil materials by the ton and is using a conversion factor of 1.6 Tons per LCY.
- Parsons performed screening and washing of unsuitable gravel drainage layer material removed from Phase IA area and material stockpiled west of Western access at screening operation. Parsons also performed placement of the washed and screened materials in Phase IB.
- Parsons imported 3 loads of sand material for use as a grading layer along the slope in the West Basin.

GEOSYNTHETICS:

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: November 13, 2011

- Chenango continued work in the East and West Basins. A roofing paper was used under the geomembrane seams to help minimize Solvay waste from getting into the fusion welding process.
- Chenango completed repairs and nondestructive testing of secondary 60-mil thick liner in the East Basin.
- A total of approximately 109,184 SF of 60 mil HDPE geomembrane liner was deployed this week, and to date, in the West Basin. Approximately 5,945 LF of fusion seaming was performed this week and to date in the West Basin.
- A total of 14 original destructive samples were marked for the West Basin, however, none of the marked destructive samples have been removed.
- No additional Geosynthetic materials were delivered this week.
- Chenango installation of geotextile over 60-mil thick HDPE geomembrane in Phase IB is incomplete, pending sump area.
- Discussion of the exposed geotextile in Phase I at or near UV exposure limit continues with Parsons.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: November 20, 2011

This report is written for the period of 14 through 20 November 2011. Geosyntec was on-site 6 days (150 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged between a low of 31°F and a high of 67°F during the hours worked. Representatives of Geosyntec and Parsons were on-site throughout the work week. Representatives of Chenango Contractors were on site Monday and Tuesday. A weekly construction meeting was held on Tuesday. A QA/QC operational meeting was held Friday of this week. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Parsons continued processing of gravel drainage layer material to remove the excessive fines content of the material. Placement of the processed material continued in Phase IA and IB and the material was spread in a 1 foot thick lift over the in-place geotextile. Approximately 6,576 loose cyd (LCY) of screened and washed gravel drainage layer material was placed in Phase I this week, for a total to date of approximately 10,298 LCY.
- Parsons pumped stormwater from Phase IA and IB sumps, as well as low lying areas in Phase II.

GEOSYNTHETICS:

- Chenango worked in the West Basin completing nondestructive testing and repairs to secondary liner as weather conditions allowed.
- The geomembrane in Phase IA was cut to release water trapped beneath the liner system. Incomplete pipe boots are the suspected source of the water.
- Installation of geotextile in Phase IB sump is pending.
- Geosynthetic materials delivered this week were unloaded and stockpiled by Parsons. A total of 36 rolls (418,140 SF) of 60-mil thick geomembrane and 126 rolls (319,410 SF) of geocomposite (127 rolls less 1 roll, #0045391010022 rejected as a result of failed conformance sample and was marked “DO NOT USE”) for the East and West Basin see Geosynthetics Material Inventory Log.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: November 20, 2011

This report is written for the period of 21 through 27 November 2011. Geosyntec was on-site three days (153 days total to date) to provide CQA services during construction in the SCA. Temperatures generally ranged from a low of 28°F to a high of 44°F during the hours worked. Representatives of Geosyntec, Parsons, and Chenango were on-site throughout the work week. A weekly construction meeting was held on Tuesday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Parsons continuing to screen and wash gravel drainage layer material stockpiled just west of Western access road at screening operation. Crews placed processed material in Phase IA and IB in 1-ft thick lift over in place geotextile.
- Approximately 3,968 lcy of screened and washed gravel drainage material was placed in Phase I; approximately 16,926 lcy of washed and screened gravel drainage material placed to date.
- Parsons pumped ponded stormwater from Phase IA and IB sumps and low lying areas in Phase II.

GEOSYNTHETICS:

- Chenango worked in the West Basin completing nondestructive testing and repairs to secondary liner as weather conditions allowed. Repair geomembrane in east end of SCA after removal of trapped water. Complete pipe boot installation on SMS pipes.
- CCI installation of geotextile over 60-mil thick HDPE geomembrane in Phase IB is incomplete, pending sump area.
- Discuss options regarding expiration of the 30-day UV exposure limit for the installed geotextile. Geosyntec suggested covering or cutting and rolling geotextile portions that would reach the 30-day limit over the Thanksgiving Holiday. Parsons is currently working on a plan to address the concern.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: December 4, 2011

This report is written for the period of 28 November through 04 December 2011. Geosyntec was on-site five days (155 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged between a low of 30°F and a high of 69°F during the hours worked. Representatives of Geosyntec and Parsons were on-site throughout the work week. Representatives of Chenango Contractors were on site Friday. Representatives from THG Geophysical were on-site 30 November. A weekly construction meeting was held on Tuesday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Parsons continued screening and washing Gravel Drainage material stockpiled just west of western access road at screening operation. Placement of processed Gravel Drainage material in Phase IB was performed throughout the week. Parsons resumed importation of Gravel Drainage material from the Granby quarry on Thursday and Friday. Approximately 1,122 LCY of Gravel Drainage layer material was delivered from the offsite borrow area, then stockpiled for processing prior to placement in Phase IB, for total to date of approximately 21,747 LCY of Gravel Drainage material delivered to date.
- Parsons pumped ponded stormwater from Phase IA and IB sumps areas.

GEOSYNTHETICS:

- Chenango worked in the Phase IB deploying the lower sacrificial layer along the West side slope over the in place geotextile cushion layer.
- CCI installation of geotextile over 60-mil thick HDPE geomembrane in Phase IB is incomplete, pending sump area.
- TGH Geophysical performed electrical survey of western end.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: December 11, 2011

This report is written for the period of 5 December through 11 December 2011. Geosyntec was on-site 5 days (160 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged between a low of 28°F and a high of 71°F during the hours worked. Representatives of Geosyntec & Parsons were on-site throughout the work week. Representatives of Chenango Contractors were on site Thursday. A weekly construction meeting was held on Tuesday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Parsons continued screening and washing drainage gravel material.
- Parsons continued to pump ponding stormwater from Phase IA and IB sumps areas.
- Parsons continued placing screened and washed drainage gravel material in Phase IB in a single 1-ft thick lift over 24 oz/sy non-woven geotextile and the underlying 60-mil thick HDPE geomembrane. Approximately 3,850 LCY of drainage gravel was delivered from offsite borrow sources (Granby and Sennett Quarries). Material was then stockpiled for screening and washing before placement in the SCA.
- Geosyntec obtained one conformance sample (GD-012) of screened and washed drainage gravel from material being placed in Phase IB, samples being shipped to GeoTesting Express for testing.
- Parsons crew placed LP soil in anchor trenches along east access road, capping backfilled anchor trenches along eastern limits of Phase IA and placing only 1-ft of LP soil in the SMS East Basin anchor trench to properly anchor the geosynthetics, avoid de-watering of the trench and to minimize potential infiltration under liner.

GEOSYNTHETICS:

- Chenango cut holes in geomembrane in eastern limit of Phase IA to allow ponding water under liner system to drain. Geosyntec continues monitoring of the area intermittently.
- Chenango plans to complete the installation of the 24 oz/sy non-woven geotextile through the Phase IB sump area.

Geosyntec consultants

PARSONS

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: December 11, 2011

- As discussed with the project team, an exposed geotextile sample was removed 6 December 2011 and forwarded to SGI Testing Services, Inc. along with samples of gravel and geomembrane. The geotextile was deployed 17 September 201 and will be used to re-run the hydrostatic puncture test that was performed as part of the design.

COPY TO: File PER: David Williams

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: December 18, 2011

This report is written for the period of 12 through 18 December 2011. Geosyntec was on-site 5 days (165 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged between a low of 33°F and a high of 49°F during the hours worked. Representatives of Geosyntec & Parsons were on-site throughout the work week. Representatives of Chenango Contractors were on site Tuesday and Wednesday. A weekly construction meeting was held on Tuesday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Parsons continued screening and washing of gravel drainage layer material stockpiled west of the Western access road.
- Parsons continued placement of screened and washed gravel drainage layer material in Phase IB in a single 1-ft thick lift over the 24 oz/sy non-woven geotextile and 60-mil thick HDPE geomembrane liner system.
- Approximately 1,782 LCY of gravel drainage layer material was delivered from the Granby quarry and stockpiled for later processing prior to placement in Phase IB.
- Parsons installed the initial sections of the risers in both Phase IA and IB sumps, however, connections are to be completed.
- Parsons continued pumping ponded stormwater from Phase IA and IB sump areas.

GEOSYNTHETICS:

- Chenango repaired holes previously cut in the Phase IA primary geomembrane following removal of the underlying water. Geosyntec is intermittently monitoring the area for water infiltration, however, no additional water has been observed.
- Two layers of 100-mil thick HDPE geomembrane were installed in the Phase IA and IB sumps as rubsheets.

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: December 23 ,2011

This report is written for the period of 19 through 25 December 2011. Geosyntec was on-site 5 days (170 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged between a low of 21°F and a high of 47°F during the hours worked. Representatives of Geosyntec & Parsons were on-site throughout the work week. Representatives of Chenango Contractors were on site throughout the work week, with the exception of Wednesday. A Weekly Progress Meeting was held Tuesday. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Parsons continued screening and washing gravel drainage layer material. Screened and washed gravel drainage layer material was placed as a single 1-ft thick lift over the 24 oz/sy non-woven geotextile and 60-mil thick geomembrane within Phase IB.
- Approximately 2,640 LCY of gravel drainage layer material was delivered from the Granby quarry. The material was stockpiled for screening and washing prior to placement in Phase IB.
- Parsons pumped ponded stormwater from Phase IA and IB sumps.

GEOSYNTHETICS:

- Chenango began installation of the rain flap for north berm of Phase I, however, weather delayed completion.

COPY TO: File PER: Aaron Reeder

WEEKLY FIELD REPORT

PROJECT: Onondaga Lake Bottom Subsite Construction

LOCATION: Camillus, NY PROJECT NO.: GJ4706 TASK NO.: 07

DESCRIPTION: Sediment Consolidation Area (SCA) – Phase I/Phase II WEEK ENDING: December 30 ,2011

This report is written for the period of 27 through 30 December 2011. Geosyntec was on-site 4 days (174 days total to date) to provide CQA services during construction of the SCA. Temperatures generally ranged between a low of 10°F and a high of 43°F during the hours worked. A holiday was observed Monday and a winter-shut occurred on 30 December 2011. Representatives of Geosyntec & Parsons were on-site throughout the remainder of the work week. An outline of work performed over this period is outlined below.

SAFETY:

- Safety meetings were held daily with no incidents being reported.

EARTHWORK:

- Parsons continues to import gravel drainage layer material from the Granby offsite source. Approximately 1,496 LCY of gravel drainage layer material was delivered this week. Imported material is being screened and washed prior to placement in Phase IB.
- Parsons continued screening and washing gravel drainage layer material.
- Placement of screened and washed gravel drainage layer material continued in Phase IB. The material was placed in a single 1-ft thick lift over the installed geosynthetics. A rectuangular area approximately 300-ft long and 200-ft wide, located between Grids G-6 and E-8, was left without gravel.
- Parsons continued pumping ponded stormwater from the Phase IA and IB sumps and will continue as needed through the winter-shut down.

GEOSYNTHETICS:

- No geosynthetics work was performed this week due to weather .

APPENDIX C

Analytical Summary of Results from Borrow Sources (provided by Parsons)

Analytical Method	Parameter Name	Units	Sample Type
5040532	ARSENIC	mg/kg	Surface soil
5040532	BORON	mg/kg	Surface soil
5040532	CADMIUM	mg/kg	Surface soil
5040532	CHROMIUM	mg/kg	Surface soil
5040532	COBALT	mg/kg	Surface soil
5040532	COPPER	mg/kg	Surface soil
5040532	MANGANESE	mg/kg	Surface soil
5040532	MOLYBDENUM	mg/kg	Surface soil
5040532	NICKEL	mg/kg	Surface soil
5040532	SELENIUM	mg/kg	Surface soil
5040532	ZINC	mg/kg	Surface soil
5047471	MERCURY	mg/kg	Surface soil
5040532	ALUMINIUM	mg/kg	Surface soil
5040532	ANTIMONY	mg/kg	Surface soil
5040532	ASH	mg/kg	Surface soil
5040532	BERYLLIUM	mg/kg	Surface soil
5040532	CALCIUM	mg/kg	Surface soil
5040532	IRON	mg/kg	Surface soil
5040532	LEAD	mg/kg	Surface soil
5040532	LITHIUM	mg/kg	Surface soil
5040532	MAGNESIUM	mg/kg	Surface soil
5040532	POTASSIUM	mg/kg	Surface soil
5040532	SILICON	mg/kg	Surface soil
5040532	SODIUM	mg/kg	Surface soil
5040532	STRONTIUM	mg/kg	Surface soil
5040532	TITANIUM	mg/kg	Surface soil
5040532	VANADIUM	mg/kg	Surface soil
5040532	ZIRCONIUM	mg/kg	Surface soil
5040532	ALPHA-ENDOSULFAN	mg/kg	Surface soil
5040532	BETA-ENDOSULFAN	mg/kg	Surface soil
5040532	DELTA-BHC	mg/kg	Surface soil
5040532	DIELDRIN	mg/kg	Surface soil
5040532	ENDOSULFAN I	mg/kg	Surface soil
5040532	ENDOSULFAN II	mg/kg	Surface soil
5040532	ENDOSULFAN SULFATE	mg/kg	Surface soil
5040532	ENDRIN	mg/kg	Surface soil
5040532	GAMMA-BHC (LINDANE)	mg/kg	Surface soil
5040532	HEPTACHLOR	mg/kg	Surface soil
5040532	AROCLOR 1242	mg/kg	Surface soil
5040532	AROCLOR 1221	mg/kg	Surface soil
5040532	AROCLOR 1232	mg/kg	Surface soil
5040532	AROCLOR 1242	mg/kg	Surface soil
5040532	AROCLOR 1248	mg/kg	Surface soil
5040532	AROCLOR 1254	mg/kg	Surface soil
5040532	AROCLOR 1260	mg/kg	Surface soil
5040532	AROCLOR 1262	mg/kg	Surface soil
5040532	AROCLOR 1268	mg/kg	Surface soil
5040532	2,4,5-TP (SILVEX)	mg/kg	Surface soil
5040532	2,4-DICHLOROPHENOXYACETIC ACID	mg/kg	Surface soil
5040532	4-CHLOROPHENOXYACETIC ACID	mg/kg	Surface soil
5040532	4-CHLOROPHENOXYBUTYRIC ACID	mg/kg	Surface soil
5040532	4-CHLOROPHENOXYPROPIONIC ACID	mg/kg	Surface soil
5040532	4-CHLOROPHENOXYVALERIC ACID	mg/kg	Surface soil
5040532	2,4-DICHLOROPHENOXYBUTYRIC ACID	mg/kg	Surface soil
5040532	2,4-DICHLOROPROPIONIC ACID	mg/kg	Surface soil
5040532	2,4-DICHLOROPHENOXYVALERIC ACID	mg/kg	Surface soil
5040532	2-METHYL-4-CHLOROPHENOXYACETIC ACID	mg/kg	Surface soil
5040532	2-METHYL-4-CHLOROPHENOXYBUTYRIC ACID	mg/kg	Surface soil
5040532	2-METHYL-4-CHLOROPHENOXYPROPIONIC ACID	mg/kg	Surface soil
5040532	2-METHYL-4-CHLOROPHENOXYVALERIC ACID	mg/kg	Surface soil
5040532	BENTAZONE	mg/kg	Surface soil
5040532	BUTYLBENZENE	mg/kg	Surface soil
5040532	CHLORIDAZON	mg/kg	Surface soil
5040532	CHLORMEQUAT	mg/kg	Surface soil
5040532	CHLORPICRIN	mg/kg	Surface soil
5040532	DIMETHOATE	mg/kg	Surface soil
5040532	ETHYLBENZENE	mg/kg	Surface soil
5040532	METHYL TERT-BUTYL ETHER	mg/kg	Surface soil
5040532	METHYLENE CHLORIDE	mg/kg	Surface soil
5040532	N-PROPYLBENZENE	mg/kg	Surface soil
5040532	NAPHTHALENE	mg/kg	Surface soil
5040532	SEC-BUTYLBENZENE	mg/kg	Surface soil
5040532	TERT-BUTYLBENZENE	mg/kg	Surface soil
5040532	TETRACHLOROETHENE	mg/kg	Surface soil
5040532	TOLUENE	mg/kg	Surface soil
5040532	TRANS-1,2-DICHLOROETHENE	mg/kg	Surface soil
5040532	TRICHLOROETHENE	mg/kg	Surface soil
5040532	VINYL CHLORIDE	mg/kg	Surface soil
5040532	XYLENES, TOTAL	mg/kg	Surface soil
5040532	1,2,4-TRICHLOROBENZENE	mg/kg	Surface soil
5040532	1,4-DICHLOROBENZENE	mg/kg	Surface soil
5040532	ACENAPHTHENE	mg/kg	Surface soil
5040532	ACENAPHTHYLENE	mg/kg	Surface soil
5040532	ANTHRACENE	mg/kg	Surface soil
5040532	BENZO(A)ANTHRACENE	mg/kg	Surface soil
5040532	BENZO(A)PYRENE	mg/kg	Surface soil
5040532	BENZO(B)FLUORANTHENE	mg/kg	Surface soil
5040532	BENZO(G,H,I)PERYLENE	mg/kg	Surface soil
5040532	BENZO(K)FLUORANTHENE	mg/kg	Surface soil
5040532	CHRYSENE	mg/kg	Surface soil
5040532	DIBENZ(A,H)ANTHRACENE	mg/kg	Surface soil
5040532	DIBENZOFURAN	mg/kg	Surface soil
5040532	FLUORANTHENE	mg/kg	Surface soil
5040532	HEXACHLOROBENZENE	mg/kg	Surface soil
5040532	INDENO(1,2,3-CD)PYRENE	mg/kg	Surface soil
5040532	NAPHTHALENE	mg/kg	Surface soil
5040532	PENTACHLOROPHENOL	mg/kg	Surface soil
5040532	PHENANTHRENE	mg/kg	Surface soil
5040532	PHENOL	mg/kg	Surface soil
5040532	PYRENE	mg/kg	Surface soil
5040532	CYANIDE	mg/kg	Surface soil

From:	Steele, David
To:	David Bonnett
Cc:	Hawley, Joshua
Subject:	FW: structural fill analytical test results
Date:	Friday, March 09, 2012 2:45:34 PM
Attachments:	SF analytical..xls

From: Tim Larson [mailto:tjlarson@gw.dec.state.ny.us]
Sent: Friday, June 24, 2011 2:25 PM
To: Steele, David
Cc: Robert Edwards; Steinhoff, Alan; Blue, Paul
Subject: Fwd: structural fill analytical test results

Dave,
As discussed below, and in this instance with the understanding that the material has already been placed, the five exceedances for Barium are acceptable and therefore the use of this material on-site is approved. In the future, please ensure that a similar request is made prior to placement of the material on-site. Please contact me if you would like to discuss this issue further.
Thank you,
Tim

>>> "Steele, David" <David.Steele@parsons.com> 6/7/2011 4:10 PM >>>
Hello Tim,

Specification Section 02200.1.05.E.1 states:

"These samples will be sent to an Analytical Chemistry Testing Laboratory (ACTL) selected by the Engineer. Each composite sample for each material shall be tested for the compounds in Table 375-6.8(b) "Restricted Use Soil Cleanup Objectives" in NYSDEC Subpart 375. All test results shall be below the Commercial cleanup objective concentrations provided in this table, with exceptions as allowed by NYSDEC, but in no case greater than Industrial Standards. Failure of a single compound test result shall mean that the entire material batch will be rejected unless specifically accepted on a test-by-test basis in writing by the Engineer."

To date, 52 samples of structural fill have been collected and tested. Forty of those samples met the Commercial cleanup objective concentrations. Seven of those samples exceeded the Commercial cleanup objective concentrations and fill borrow material represented by those samples was not imported. Five of those samples exceeded the Commercial cleanup objective concentrations for Barium but were under the Industrial cleanup objective concentrations for Barium. A summary of the analytical data is attached. These analytical results were orally discussed with NYSDEC and it is our understanding that use of this material was allowed by NYSDEC. Fill borrow material represented by these 5 samples was imported and used in the SCA berms.

Your response to this email is requested to provide documentation of NYSDEC's approval of this exception.

				GP	RB	SF	SF	SF	SF	SF	SF	DG	LP	LP	SF did not use	SF did not use	SF	SF	LP	SF did not use
	drainage gravel	2		1								1								
	road base	1			1															
	structural fill	53				1	1	1	1	1	1						1	1		
	low permeability soil	4											1	1					1	
				GQ	GQ	9W	9W	OC	OC	OC	OC	SQ	SQ	BY	9W	9W	9W	9W	MC	9W
				SCA-0001-01	SCA-0001-02	SCA-0001-03	SCA-0001-04	SCA-0002-01	SCA-0002-02	SCA-0002-03	SCA-0002-04	SCA-0002-05	SCA-0003-01	SCA-0004-01	SCA-0005-01	SCA-0005-02	SCA-0005-03	SCA-0005-04	SCA-0006-01	SCA-0007-01
			Location	SCA-SP-G2GP001	SCA-SP-G2RB002	SCA-SP-9WSF003	SCA-SP-9WSF004	SCA-SP-OCSF001	SCA-SP-OCSF002	SCA-SP-OCSF005	SCA-SP-OCSF006	SCA-SP-SQDG002	SCA-SP-SQLP001	SCA-SP-BYLP002	SCA-SP-9WSF007	SCA-SP-9WSF008	SCA-SP-9WSF009	SCA-SP-9WSF010	SCA-SP-MCLP-003	SCA-SP-9WSF011
			Field Sample ID	SCA-0001-01	SCA-0001-02	SCA-0001-03	SCA-0001-04	SCA-0002-01	SCA-0002-02	SCA-0002-03	SCA-0002-04	SCA-0002-05	SCA-0003-01	SCA-0004-01	SCA-0005-01	SCA-0005-02	SCA-0005-03	SCA-0005-04	SCA-0006-01	SCA-0007-01
			Sample Date	7/19/2010	7/19/2010	7/19/2010	7/19/2010	7/28/2010	7/28/2010	7/28/2010	7/28/2010	7/28/2010	8/11/2010	9/1/2010	9/2/2010	9/2/2010	9/2/2010	9/2/2010	9/10/2010	9/20/2010
			Sample Delivery Group	C0G200480	C0G200480	C0G200480	C0G200480	C0G290540	C0G290540	C0G290540	C0G290540	C0G290540	C0H120543	C0I030417	C0I030575	C0I030575	C0I030575	C0I030575	C0I110440	C0I210477
			Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	SOIL	SOIL
			Sample Purpose	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample
			Sample Type	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil
Analytical	Parameter Name	Units	Restricted Use SCOs-Commercial																	
SW6010	ARSENIC	mg/kg	16	3	2.4	2.4	4.8	10.4	9.1	8.2	7.3	4.9	2.3	6.2	4.6	3.1	3.2	4.9	3.3	3.7
SW6010	BARIUM	mg/kg	400	40.4	46.5	24.8	34.9	[452] J	[413] J	[521] J	[624] J	29.2 J	136	40.1	37.5	33.7	35.4	55.3	72.4	35.4
SW6010	BERYLLIUM	mg/kg	590	0.18 J	0.21 J	0.17 J	0.3 J	0.77	0.74	0.5	0.51	0.18 J	0.2 J	0.36 J	0.4 J	0.28 J	0.37 J	0.52	0.49	0.33 J
SW6010	CADMIUM	mg/kg	9.3	0.026 U	0.026 U	0.042 J	0.062 J	0.027 U	0.026 U	0.026 U	0.027 U	0.025 U	0.21 J	0.12 J	0.17 J	0.14 J	0.22 J	0.26 J	0.16 J	0.19 J
SW6010	CHROMIUM	mg/kg	400	6.2	7.4	7.1	10.7	26.1	24.7	15.6	16.8	6.4	8.5	9.5	9.2	6.8	8.5	12.4	14.4	7.7
SW6010	COPPER	mg/kg	270	25.8 J	21.4 J	21.8 J	25.7 J	30.7	26.1	32.1	30.2	22.4	7.2	26.8	30.1	19.9	22.6	32	16.9	22.9
SW6010	LEAD	mg/kg	1000	3.2	2.9	15.4	13.9	52	45.6	21	19.9	7.8	7.3	10.8	9.3	7.9	25.1	13.4	6	8
SW6010	MANGANESE	mg/kg	10000	548	636	319	543	264	335	278	267	567	107	375	483	396	449	644	467	653
SW6010	NICKEL	mg/kg	310	11.6	13.5	11.3	17.7	70	68.3	53.9	57.1	10.6	9.4	13.3	13.1	10.2	12	16.1	18.7	9.2
SW6010	SELENIUM	mg/kg	1500	0.22 U	0.23 U	0.23 U	0.23 U	0.59	0.43 J	0.24 J	0.23 U	0.22 U	0.87	0.25 J	0.22 U	0.22 U	0.22 U	0.22 U	0.25 J	0.57 U
SW6010	SILVER	mg/kg	1500	0.062 U	0.064 U	0.064 U	0.063 U	0.065 U	0.063 U	0.063 U	0.065 U	0.061 U	0.066 U	0.25 J	0.18 J	0.092 J	0.14 J	0.17 J	0.14 J	0.16 J
SW6010	ZINC	mg/kg	10000	22.4 J	25.5 J	32.7 J	33.1 J	46.9	43.9	61	64.9	24.5	40.5	47.2 J	37.9 J	25.6 J	36.3 J	38.3 J	33.3	27.4
SW7471	MERCURY	mg/kg	2.8	0.024 J	0.021 J	0.037 J	0.03 J	0.071	0.057	0.04	0.04	0.017 J	0.018 J	0.012 U	0.011 J	0.012 U	0.018 J	0.011 U	0.02 J	0.013 J
SW8081	4,4'-DDD	ug/kg	92000	1.8 U	1.9 U	9.2 U	9.3 U	1.9 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	1.9 U	6.2 J	3.6 J	3.6 U	3.5 U	2 U	9.5 U
SW8081	4,4'-DDE	ug/kg	62000	1.8 U	1.9 U	9.2 U	9.3 U	1 J	0.46 J	1.8 U	1.9 U	1.8 U	1.9 U	1.9 U	3.5 U	3.6 U	3.6 U	3.5 U	2 U	9.5 U
SW8081	4,4'-DDT	ug/kg	47000	1.8 U	1.9 U	9.2 U	9.3 U	1.9 U	1.8 U	1.8 U	1.9 U	1.8 U	0.37 J	1.9 U	3.5 U	3.6 U	3.6 U	3.5 U	2 U	3.8 JN
SW8081	ALDRIN	ug/kg	680	1.8 U	1.9 U	9.2 U	9.3 U	0.47 JN	0.92 JN	1.8 U	1.9 U	1 JN	1.9 U	1.9 U	3.5 U	3.6 U	3.6 U	3.5 U	0.39 JN	9.5 U
SW8081	ALPHA-BHC	ug/kg	3400	1.8 U	1.9 U	9.2 U	9.3 U	1.9 U	1.8 U	0.57 JN	1.9 U	1.8 U	1.9 U	1.9 U	3.5 U	3.6 U	3.6 U	3.5 U	2 U	9.5 U
SW8081	ALPHA-CHLORDANE	ug/kg	24000	1.8 U	1.9 U	9.2 U	9.3 U	1.9 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	1.9 U	3.5 U	3.6 U	3.6 U	3.5 U	2 U	9.5 U
SW8081	BETA-BHC	ug/kg	3000	1.8 U	1.9 U	9.2 U	9.3 U	1.9 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	1.9 U	3.5 U	3.6 U	3.6 U	3.5 U	2 U	9.5 U
SW8081	DELTA-BHC	ug/kg	500000	1.8 U	1.9 U	9.2 U	9.3 U	1.9 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	1.9 U	8.1 JN	7.6 JN	1.5 JN	3.5 U	2 U	9.5 U
SW8081	DIELDRIN	ug/kg	1400	1.8 U	1.9 U	9.2 U	9.3 U	1.9 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	1.9 U	3.5 U	3.6 U	3.6 U	3.5 U	2 U	9.5 U
SW8081	ENDOSULFAN I	ug/kg	200000	1.8 U	1.9 U	9.2 U	9.3 U	1.9 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	1.9 U	3.5 U	3.6 U	3.6 U	3.5 U	2 U	9.5 U
SW8081	ENDOSULFAN II	ug/kg	200000	1.8 U	1.9 U	9.2 U	9.3 U	1.9 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	1.9 U	3.5 U	3.6 U	3.6 U	3.5 U	2 U	9.5 U
SW8081	ENDOSULFAN SULFATE	ug/kg	200000	1.8 U	1.9 U	9.2 U	9.3 U	1.9 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	1.9 U	3.5 U	3.6 U	3.6 U	3.5 U	2 U	9.5 U
SW8081	ENDRIN	ug/kg	89000	1.8 U	1.9 U	9.2 U	9.3 U	1.9 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 U	1.9 U	3.8 JN	3.4 JN	2.3 JN	3.5 U	2 U	9.5 U
SW8081	GAMMA-BHC (LINDANE)	ug/kg	9200	1.8 U	0.38 J	9.2 U	9.3 U	0.83 JN	0.71 JN	1.8 U	1.9 U	1.8 U	1.9 U	1.9 U	76 J	77 J	17	14 J	2.1 J	9.5 U
SW8081	HEPTACHLOR	ug/kg	15000	1.8 U	0.94 JN	9.2 U	9.3 U	1.9 U	1.8 U	1.8 U	1.9 U	1.8 U	1.9 UJ	1.9 U	13 JN	10 J	4.4 JN	3.2 JN	1.7 JN	9.5 U
SW8082	AROCLOR-1016	ug/kg	1000	18 U	18 U	18 U	18 U	18 U	18 U	18 U	19 U	17 U	19 U	19 U	17 U	18 U	18 U	17 U	20 U	19 U
SW8082	AROCLOR-1221	ug/kg	1000	18 U	18 U	18 U	18 U	18 U	18 U	18 U	19 U	17 U	19 U	19 U	17 U	18 U	18 U	17 U	20 U	19 U
SW8082	AROCLOR-1232	ug/kg	1000	18 U	18 U	18 U	18 U	18 U	18 U	18 U	19 U	17 U	19 U	19 U	17 U	18 U	18 U	17 U	20 U	19 U
SW8082	AROCLOR-1242	ug/kg	1000	18 U	18 U	18 U	18 U	18 U	18 U	18 U	19 U	17 U	19 U	19 U	17 U	18 U	18 U	17 U	20 U	19 U
SW8082	AROCLOR-1248	ug/kg	1000	18 U	18 U	18 U	18 U	18 U	18 U	18 U	19 U	17 U	19 U	19 U	17 U	18 U	18 U	17 U	20 U	19 U
SW8082	AROCLOR-1254	ug/kg	1000	18 U	18 U	18 U	18 U	18 U	18 U	18 U	19 U	17 U	19 U	19 U	17 U	18 U	18 U	17 U	20 U	19 U
SW8082	AROCLOR-1260	ug/kg	1000	18 U	18 U	18 U	18 U	18 U	18 U	18 U	19 U	17 U	19 U	19 U	17 U	18 U	18 U	17 U	20 U	19 U
SW8082	AROCLOR-1262	ug/kg	1000	18 U	18 U	18 U	18 U	18 U	18 U	18 U	19 U	17 U	19 U	19 U	17 U	18 U	18 U	17 U	20 U	19 U
SW8082	AROCLOR-1268	ug/kg	1000	18 U	18 U	18 U	18 U	18 U	18 U	18 U	19 U	17 U	19 U	19 U	17 U	18 U	18 U	17 U	20 U	19 U
SW8082	PCBS, Total	ug/kg	1000	18 U	18 U	18 U	18 U	18 U	18 U	18 U	19 U	17 U	19 U	19 U	17 U	18 U	18 U	17 U	20 U	19 U
SW8151	2,4,5-TP (SILVEX)	ug/kg	500000	22 U	22 U	22 U	22 U	22 U	22 U	22 U	22 U	21 U	23 U	22 U	21 U	22 U	21 U	21 U	24 U	23 U
SW8260	1,1,1-TRICHLOROETHANE	ug/kg	500000	5.4 U	5.5 U	5.5 U	5.5 U	5.6 U	5.4 U	5.4 U	5.6 U	5.2 U	5.7 U	5.6 U	5.2 U	5.4 U	5.3 U	5.2 U	5.9 U	5.7 U
SW8260	1,1-DICHLOROETHANE	ug/kg	240000	5.4 U	5.5 U	5.5 U	5.5 U	5.6 U	5.4 U	5.4 U	5.6 U	5.2 U	5.7 U	5.6 U	5.2 U	5.4 U	5.3 U	5.2 U	5.9 U	5.7 U
SW8260	1,1-DICHLOROETHENE	ug/kg	500000	5.4 U	5.5 U	5.5 U	5.5 U	5.6 U	5.4 U	5.4 U	5.6 U	5.2 U	5.7 U	5.6 U	5.2 U	5.4 U	5.3 U	5.2 U	5.9 U	5.7 U
SW8260	1,2,4-TRIMETHYLBENZENE	ug/kg	190000	5.4 U	5.5 U	5.5 U	5.5 U	5.6 U	5.4 U	5.4 U	5.6 U	5.2 U	5.7 U	5.6 U	5.2 U	5.4 U	5.3 U	5.2 U	5.9 U	5.7 U
SW8260	1,2-DICHLOROBENZENE	ug/kg	500000	5.4 U	5.5 U	5.5 U	5.5 U	5.6 U	5.4 U	5.4 U	5.6 U	5.2 U	5.7 U	5.6 U	5.2 U	5.4 U	5.3 U	5.2 U	5.9 U	5.7 U
SW8260	1,2-DICHLOROETHANE	ug/kg	30000	5.4 U	5.5 U	5.5 U	5.5 U	5.6 U	5.4 U	5.4 U	5.6 U	5.2 U	5.7 U	5.6 U	5.2 U	5.4 U	5.3 U	5.2 U	5.9 U	5.7 U
SW8260	1,3,5-TRIMETHYLBENZENE	ug/kg	190000	5.4 U	5.5 U	5.5 U	5.5 U	5.6 U	5.4 U	5.4 U	5.6 U	5.2 U	5.7 U	5.6 U	5.2 U	5.4 U	5.3 U	5.2 U	5.9 U	5.7 U
SW8260	1,3-DICHLOROBENZENE	ug/kg	280000	5.4 U	5.5 U	5.5 U	5.5 U	5.6 U	5.4 U	5.4 U	5.6 U	5.2 U	5.7 U	5.6 U	5.2 U	5.4 U	5.3 U	5.2 U	5.9 U	5.7 U
SW8260	1,4-DICHLOROBENZENE	ug/kg	130000	5.4 U	5.5 U	5.5 U	5.5 U	5.6 U	5.4 U	5.4 U	5.6 U	5.2 U	5.7 U	5.6 U	5.2 U	5.4 U	5.3 U	5.2 U	5.9 U	5.7 U
SW8260	1,4-DIOXANE	ug/kg	130000	1100 U	1100 U	1100 U	1100 U	1100 U	1100 U	1100 U	1100 U	1000 U	1100 U	1100 U	1000 UJ	1100 UJ	1100 UJ	1000 UJ	1200 U	1100 UJ
SW8260	2-BUTANONE	ug/kg	500000	5.4 U	5.5 U	5.5 U	5.5 U	5.6 U	5.4 U	5.4 U	5.6 U	5.2 U	5.7 U	5.6 UJ	5.2 UJ	5.4 UJ	5.3 UJ	5.2 UJ	5.9 U	5.7 U
SW8260	ACETONE	ug/kg	500000	22 U	22 U	22 U	22 U	22 U	22 U	8.9 J	22 U	21 U	23 U	22 UJ	21 UJ	22 UJ	21 UJ	21 UJ	24 U	23 U
SW8260	BENZENE	ug/kg	44000	5.4 U	5.5 U	5.5 U	5.5 U	5.6 U	5.4 U	5.4 U	5.6 U	5.2 U	5.7 U	5.6 U	5.2 U	5.4 U	5.3 U	5.2 U	5.9 U	5.7 U
SW8260	BUTYLBENZENE	ug/kg	500000	5.4 U	5.5 U	5.5 U	5.5 U	5.6 U	5.4 U	5.4 U	5.6 U	5.2 U	5.7 U	5.6 U	5.2 U	5.4 U	5.3 U	5.2 U	5.9 U	5.7 U
SW8260	CARBON TETRACHLORIDE	ug/kg	22000	5.4 U	5.5 U	5.5 U	5.5 U	5.6 U	5.4 U	5.4 U	5.6 U	5.2 U	5.7 U	5.6 U	5.2 U	5.4 U	5.3 U	5.2 U	5.9 U	5.7 U
SW8260	CHLOROBENZENE	ug/kg	500000	5.4 U	5.5 U	5.5 U	5.5 U	5.6 U	5.4 U	5.4 U	5.6 U	5.2 U	5.7 U	5.6 U	5.2 U	5.4 U	5.3 U	5.2 U	5.9 U	5.7 U
SW8260	CHLOROFORM	ug/kg	350000	5.4 U	5.5 U	5.5 U	5.5 U	5.6 U	5.4 U	5.4 U	5.6 U	5.2 U	5.7 U	5.6 U	5.2 U	5.4 U	5.3 U	5.2 U	5.9 U	5.7 U
SW8260	CIS-1,2-DICHLOROETHENE	ug/kg	500000	5.4 U	5.5 U	5.5 U	5.5 U	5.6 U	5.4 U	5.4 U	5.6 U	5.2 U	5.7 U	5.6 U	5.2 U	5.4 U	5.3 U	5.2 U	5.9 U	5.7 U
SW8260	ETHYLBENZENE	ug/kg	390000	5.4 U	5.5 U	5.5 U	5.5 U	5.6 U	5.4 U	5.4 U	5.6 U	5.2 U	5.7 U	5.6 U	5.2 U	5.4 U	5.3 U	5.2 U	5.9 U	5.7 U
SW8260	METHYL TERT-BUTYL ETHER	ug/kg	500000	5.4 U	5.5 U	5.5 U	5.5 U	5.6 U	5.4 U	5.4 U	5.6 U	5.2 U	5.7 U	5.6 U	5.2 U	5.4 U	5.3 U	5.2 U	5.9 U	5.7 UJ
SW8260	METHYLENE CHLORIDE	ug/kg	500000	5.4 U	5.5 U	5.5 U	5.5 U	8.6 U	9.4 U	7.7 U	7.8 U	6.7 U	4.4 J	5.6 U	5.2 U	5.4 U	5.3 U	5.2 U	5.9 U	5.7 U
SW8260	N-PROPYLBENZENE	ug/kg	500000	5.4 U	5.5 U	5.5 U	5.5 U	5.6 U	5.4 U	5.4 U	5.6 U	5.2 U	5.7 U	5.6 U	5.2 U	5.4 U	5.3 U	5.2 U	5.9 U	5.7 U
SW8260	NAPHTHALENE	ug/kg	500000																	
SW8260	SEC-BUTYLBENZENE	ug/kg	500000	5.4 U	5.5 U	5.5 U	5.5 U	5.6 U	5.4 U	5.4 U	5.6 U	5.2 U	5.7 U	5.6 U	5.2 U	5.4 U	5.3 U	5.2 U	5.9 U	5.7 U
SW8260	TERT-BUTYLBENZENE	ug/kg	500000	5.4 U	5.5 U	5.5 U	5.5 U	5.6 U	5.4 U	5.4 U	5.6 U	5.2 U	5.7 U	5.6 U	5.2 U	5.4 U	5.3 U	5.2 U	5.9 U	5.7 U
SW8260	TETRACHLOROETHENE	ug/kg	150000	5.4 U	5.5 U	5.5 U	5.5 U	5.6 U	5.4 U	5.4 U	5.6 U	5.2 U	5.7 U	5.6 U	5.2 U	5.4 U	5.3 U	5.2 U	5.9 U	5.7 U
SW8260	TOLUENE	ug/kg	500000	5.4 U	5.5 U	5.5 U	5.5 U	5.6 U	5.4 U	5.4 U	5.6 U	5.2 U	5.7 U	5.6 U	5.2 U	5.4 U	5.3 U	5.2 U	5.9 U	5.7 U
SW8260	TRANS-1,2-DICHLOROETHENE	ug/kg	500000	5.4 U	5.5 U	5.5 U	5.5 U	5.6 U	5.4 U	5.4 U	5.6 U	5.2 U	5.7 U	5.6 U	5.2 U	5.4 U	5.3 U	5.2 U	5.9 U	5.7 U
SW8260	TRICHLOROETHENE	ug/kg	200000	5.4 U	5.5 U	5.5 U	5.5 U	5.6 U	5.4 U	5.4 U	5.6 U	5.2 U	5.7 U	5.6 U	5.2 U	5.4 U	5.3 U	5.2 U	5.9 U	5.7 U
SW8260	VINYL CHLORIDE	ug/kg	13000	5.4 U	5.5 U	5.5 U	5.5 U	5.6 U	5.4 U	5.4 U	5.6 U	5.2 U	5.7 U	5.6 U	5.2 U	5.4 U	5.3 U	5.2 U	5.9 U	5.7 U
SW8260	XYLENES, TOTAL	ug/kg	500000	16.4 U	16.5 U	16.5 U	16.5 U	16.6 U	16.4 U	16.4 U	16.6 U	15.2 U	16.7 U	16.6 U	16 U	16 U	16 U	16 U	17.9 U	16.7 U
SW8270	2-METHYLPHENOL	ug/kg	500000	350 U	360 U	360 U	710 U	370 U	360 U	360 U	370 U	340 U	370 U	370 U	1700 U	3500 U	700 U	340 U	390 U	370 U
SW8270	3&4-METHYLPHENOL	ug/kg	null																	
SW8270	4-METHYLPHENOL	ug/kg	500000	350 U	360 U	360 U	710 U	370 U	360 U	360 U	370 U	340 U	370 U	370 U	1700 U	3500 U	700 U	340 U	390 U	370 U
SW8270	ACENAPHTHENE	ug/kg	500000	71 U	73 U	27 J	46 J	74 U	73 U	73 U	75 U	70 U	75 U	75 U	450	750	59 J	140	79 U	110
SW8270	ACENAPHTHYLENE	ug/kg	500000	71 U	73 U	42 J	99 J	74 U	73 U	73 U	75 U	70 U	75 U	75 U	420	710	150	360	79 U	160
SW8270	ANTHRACENE	ug/kg	500000	71 U	73 U	83	200	74 U	73 U	73 U	75 U	70 U	75 U	75 U	1300	2000	290	710	79 U	400
SW8270	BENZO(A)ANTHRACENE	ug/kg	5600	71 U	73 U	310	740	74 U	73 U	73 U	75 U	70 U	75 U	75 U	3000	4200	920	1000	79 U	1300
SW8270	BENZO(A)PYRENE	ug/kg	1000	71 U	73 U	300	680	74 U	73 U	73 U	75 U	70 U	75 U	75 U	[3200]	[4300]	900	990	79 U	[1100]
SW8270	BENZO(B)FLUORANTHENE	ug/kg	5600	71 U	73 U	470	1100	74 U	73 U	73 U	75 U	70 U	75 U	75 U	4200	[5700]	1300	1300	79 U	1500
SW8270	BENZO(G,H,I)PERYLENE	ug/kg	500000	71 U	73 U	260	540	74 U	73 U	73 U	75 U	70 U	75 U	75 U	1800	2400	560	530	79 U	640
SW8270	BENZO(K)FLUORANTHENE	ug/kg	56000	71 U	73 U	74 U	140 U	74 U	73 U	73 U	75 U	70 U	75 U	75 U	350 U	710 U	140 U	70 U	79 U	75 U
SW8270	CHRYSENE	ug/kg	56000	71 U	73 U	300	710	74 U	73 U	73 U	75 U	70 U	75 U	75 U	2900	4500	890	880	79 U	1000
SW8270	DIBENZO(A,H)ANTHRACENE	ug/kg	560	71 U	73 U	74 U	140 U	74 U	73 U	73 U	75 U	70 U	75 U	75 U	450	[680] J	130 J	160	79 U	220
SW8270	DIBENZOFURAN	ug/kg	350000	350 U	360 U	360 U	710 U	370 U	360 U	360 U	370 U	340 U	370 U	370 U	430 J	760 J	700 U	330 J	390 U	100 J
SW8270	FLUORANTHENE	ug/kg	500000	71 U	73 U	750	1600	74 U	73 U	73 U	75 U	70 U	75 U	75 U	9700	14000	2300	3000	79 U	2800
SW8270	FLUORENE	ug/kg	500000	71 U	73 U	48 J	110 J	74 U	73 U	73 U	75 U	70 U	75 U	75 U	860	1400	120 J	600	79 U	210
SW8270	HEXACHLOROBENZENE	ug/kg	6000	71 U	73 U	74 U	140 U	74 U	73 U	73 U	75 U	70 U	75 U	75 U	350 U	710 U	140 U	70 U	79 U	75 U
SW8270	INDENO(1,2,3-CD)PYRENE	ug/kg	5600	71 U	73 U	260	540	74 U	73 U	73 U	75 U	70 U	75 U	75 U	1500	2200	550	480	79 U	570
SW8270	NAPHTHALENE	ug/kg	500000	71 U	73 U	74 U	140 U	74 U	73 U	73 U	75 U	70 U	75 U	75 U	190 J	210 J	48 J	390	79 U	47 J
SW8270	PENTACHLOROPHENOL	ug/kg	6700	350 U	360 U	360 U	710 U	370 U	360 U	360 U	370 U	340 U	370 U	370 U	1700 U	3500 U	700 U	340 U	390 U	370 U
SW8270	PHENANTHRENE	ug/kg	500000	71 U	73 U	440	910	74 U	16 J	73 U	75 U	70 U	23 J	75 U	5800	8600	1000	2900	79 U	1400
SW8270	PHENOL	ug/kg	500000	71 U	73 U	74 U	140 U	74 U	73 U	73 U	75 U	70 U	75 U	75 U	350 U	710 U	140 U	70 U	79 U	75 U
SW8270	PYRENE	ug/kg	500000	71 U	73 U	580	1300	74 U	73 U	73 U	75 U	70 U	11 J	75 U	6400	8900	1600	1700	79 U	2500
SW9012	CYANIDE	mg/kg	27	0.54 U	0.55 U	0.55 U	0.55 U	0.56 U	0.54 U	0.54 U	0.56 U	0.52 U	0.69 J	0.11 U	0.19 J	0.1 U	0.1 U	0.1 U	0.11 U	0.11 U

	SF did not use	SF did not use	SF	SF	SF	SF	SF did not use	SF did not use	SF	SF	SF	SF	SF	SF	SF	SF	SF
drainage gravel																	
road base																	
structural fill			1	1	1	1			1	1	1	1	1	1	1	1	1
low permeability soil																	
	9W	9W	PP	PP	HP	HP	9W	9W	9W	9W	GQ	GQ	GQ	GQ	GQ	GQ	GQ
	SCA-0007-02	SCA-0007-03	SCA-0008-01	SCA-0008-02	SCA-0008-03	SCA-0008-04	SCA-0009-01	SCA-0009-02	SCA-0009-03	SCA-0009-04	SCA-0010-01	SCA-0010-02	SCA-0010-03	SCA-0010-04	SCA-0010-05	SCA-0010-06	SCA-0010-07
Location	SCA-SP-9WSF012	SCA-SP-9WSF013	SCA-SP-PPSF014	SCA-SP-PPSF015	SCA-SP-HPSF016	SCA-SP-HPSF017	SCA-SP-9WSF018	SCA-SP-9WSF019	SCA-SP-9WSF020	SCA-SP-9WSF021	SCA-SP-GQSF022	SCA-SP-GQSF023	SCA-SP-GQSF024	SCA-SP-GQSF025	SCA-SP-GQSF026	SCA-SP-GQSF027	SCA-SP-GQSF028
Field Sample ID	SCA-0007-02	SCA-0007-03	SCA-0008-01	SCA-0008-02	SCA-0008-03	SCA-0008-04	SCA-0009-01	SCA-0009-02	SCA-0009-03	SCA-0009-04	SCA-0010-01	SCA-0010-02	SCA-0010-03	SCA-0010-04	SCA-0010-05	SCA-0010-06	SCA-0010-07
Sample Date	9/20/2010	9/20/2010	9/23/2010	9/23/2010	9/23/2010	9/23/2010	9/29/2010	9/29/2010	9/29/2010	9/29/2010	10/20/2010	10/20/2010	10/20/2010	10/20/2010	10/20/2010	10/20/2010	10/20/2010
Sample Delivery Group	C0I210477	C0I210477	C0I250473	C0I250473	C0I250473	C0I250473	C0J020450	C0J020450	C0J020450	C0J020450	C0J220550	C0J220550	C0J220550	C0J220550	C0J220550	C0J220550	C0J220550
Matrix	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Purpose	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample
Sample Type	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil
Parameter Name																	
ARSENIC	4.9	5.7	1.6	1.8	0.92 J	1.4	4.2	4.1	5.2	3.8	3	2.4	2.6	2.7	2.4	3.8	2.8
BARIUM	43.6	44.8	26.8	42.5	49.3	31.3	35.6	38.3	38.2	35.9	37.7	41.6	39.9	41.9	38.3	48.6	39.4
BERYLLIUM	0.39 J	0.58	0.27 J	0.28 J	0.22 J	0.21 J	0.42 J	0.43 J	0.43 J	0.37 J	0.18 J	0.18 J	0.19 J	0.19 J	0.19 J	0.21 J	0.21 J
CADMIUM	0.21 J	0.28 J	0.079 J	0.088 J	0.03 J	0.093 J	0.027 U	0.027 U	0.059 J	0.027 U	0.072 J	0.072 J	0.071 J	0.077 J	0.071 J	0.081 J	0.074 J
CHROMIUM	9.6	15.3	5.6	6	4	4.5	8.6	9.3	8.9	7	5.9	6.5	6.8	7.1	6	7.1	6.4
COPPER	29.9	36.9	10.6	10.8	4.6	5.2	26.7	25.6	29.3	54.5	20.2	18.3	19.1	18.9	19.6	28.2	21.4
LEAD	7.7	8.3	2.4	2.4	1.1	1.4	8.1	8.3	9.8	5.1	2.5	2.7	3	2.7	2.7	3.2	2.9
MANGANESE	604	556	351	405	248	423	532	522	599	451	618	679	600	703	798	927	618
NICKEL	12.5	19.9	6.3	6.9	4.8	4.8	11	11.4	11.9	10.1	11.9	12.4	12.4	12	11.5	12.3	12.5
SELENIUM	0.39 J	0.55 U	0.26 U	0.23 U	0.22 U	0.24 U	0.23 U	0.23 U	0.23 U	0.23 U	0.2 U	0.35 J	0.16 U	0.18 J	0.2 U	0.19 U	0.21 U
SILVER	0.19 J	0.17 J	0.11 U	0.11 J	0.099 J	0.11 J	0.12 J	0.11 J	0.16 J	0.12 J	0.055 U	0.051 U	0.044 U	0.052 U	0.055 U	0.053 U	0.059 U
ZINC	33.9	40.3	19	17.1	11	12.7	30.5	30	36.7	27.2	21.5	23.1	22.7	26.8	20.4	25.1	23.2
MERCURY	0.014 J	0.017 J	0.014 U	0.012 U	0.012 U	0.012 U	0.025 J	0.022 J	0.014 J	0.017 J	0.02 J	0.02 J	0.023 J	0.025 J	0.018 J	0.022 J	0.022 J
4,4'-DDD	9.6 U	9.3 U	2.2 U	1.8 U	1.8 U	1.9 U	4.6	4.4 J	4.4 J	3.7	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
4,4'-DDE	9.6 U	9.3 U	2.2 U	1.8 U	1.8 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
4,4'-DDT	3.1 JN	4.6 JN	2.2 U	1.8 U	1.8 U	1.9 U	5.4	3.6	5.2	4.6	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
ALDRIN	9.6 U	9.3 U	2.2 U	1.8 U	1.8 U	1.9 U	3.8	1.9 U	1.9 U	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
ALPHA-BHC	9.6 U	9.3 U	2.2 U	1.8 U	1.8 U	1.9 U	1.9 U	4 J	1.9 U	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
ALPHA-CHLORDANE	9.6 U	9.3 U	2.2 U	1.8 U	1.8 U	1.9 U	1.9 U	1.8 J	2.5	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
BETA-BHC	9.6 U	9.3 U	2.2 U	1.8 U	1.8 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
DELTA-BHC	9.6 U	9.3 U	2.2 U	1.8 U	1.8 U	1.9 U	2.4 J	3.4	2.2 J	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
DIELDRIN	9.6 U	9.3 U	2.2 U	1.8 U	1.8 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
ENDOSULFAN I	9.6 U	9.3 U	2.2 U	1.8 U	1.8 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
ENDOSULFAN II	9.6 U	9.3 U	2.2 U	1.8 U	1.8 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
ENDOSULFAN SULFATE	9.6 U	9.3 U	2.2 U	1.8 U	1.8 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
ENDRIN	9.6 U	9.3 U	2.2 U	1.8 U	1.8 U	1.9 U	7.7	10	5.9	4.8 J	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
GAMMA-BHC (LINDANE)	9.6 U	9.3 U	2.2 U	1.8 U	1.8 U	1.9 U	2.1	2.3	1.5 J	2.8 J	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
HEPTACHLOR	9.6 U	9.3 U	2.2 U	1.8 U	1.8 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
AROCLOR-1016	19 U	18 U	21 U	18 U	18 U	19 U	19 U	19 U	18 U	19 U	18 U	18 U	18 U	18 U	18 U	18 U	17 U
AROCLOR-1221	19 U	18 U	21 U	18 U	18 U	19 U	19 U	19 U	18 U	19 U	18 U	18 U	18 U	18 U	18 U	18 U	17 U
AROCLOR-1232	19 U	18 U	21 U	18 U	18 U	19 U	19 U	19 U	18 U	19 U	18 U	18 U	18 U	18 U	18 U	18 U	17 U
AROCLOR-1242	19 U	18 U	21 U	18 U	18 U	19 U	19 U	19 U	18 U	19 U	18 U	18 U	18 U	18 U	18 U	18 U	17 U
AROCLOR-1248	19 U	18 U	21 U	18 U	18 U	19 U	19 U	19 U	18 U	19 U	18 U	18 U	18 U	18 U	18 U	18 U	17 U
AROCLOR-1254	19 U	18 U	21 U	18 U	18 U	19 U	19 U	19 U	18 U	19 U	18 U	18 U	18 U	18 U	18 U	18 U	17 U
AROCLOR-1260	19 U	18 UJ	21 U	18 U	18 U	19 U	19 U	19 U	77	19 U	18 U	18 U	18 U	18 U	18 U	18 U	17 U
AROCLOR-1262	19 U	18 U	21 U	18 U	18 U	19 U	19 U	19 U	18 U	19 U	18 U	18 U	18 U	18 U	18 U	18 U	17 U
AROCLOR-1268	19 U	18 U	21 U	18 U	18 U	19 U	19 U	19 U	18 U	19 U	18 U	18 U	18 U	18 U	18 U	18 U	17 U
PCBS, Total	19 U	18 U	21 U	18 U	18 U	19 U	19 U	19 U	77	19 U	18 U	18 U	18 U	18 U	18 U	18 U	17 U
2,4,5-TP (SILVEX)	23 U	22 U	26 U	22 U	21 U	23 U	23 U	22 U	22 U	23 U	21 U	21 U	21 U	21 U	21 U	22 U	21 U
1,1,1-TRICHLOROETHANE	5.7 U	5.5 U	6.4 U	5.4 U	5.3 U	5.7 U	5.7 U	5.6 U	5.6 U	5.6 U	5.3 U	5.3 U	5.4 U	5.4 U	5.3 U	5.4 U	5.3 U
1,1-DICHLOROETHANE	5.7 U	5.5 U	6.4 U	5.4 U	5.3 U	5.7 U	5.7 U	5.6 U	5.6 U	5.6 U	5.3 U	5.3 U	5.4 U	5.4 U	5.3 U	5.4 U	5.3 U
1,1-DICHLOROETHENE	5.7 U	5.5 U	6.4 U	5.4 U	5.3 U	5.7 U	5.7 U	5.6 U	5.6 U	5.6 U	5.3 U	5.3 U	5.4 U	5.4 U	5.3 U	5.4 U	5.3 U
1,2,4-TRIMETHYLBENZENE	5.7 U	5.5 U	6.4 U	5.4 U	5.3 U	5.7 U	5.7 U	5.6 U	5.6 U	5.6 U	5.3 U	5.3 U	5.4 U	5.4 U	5.3 U	5.4 U	5.3 U
1,2-DICHLOROBENZENE	5.7 U	5.5 U	6.4 U	5.4 U	5.3 U	5.7 U	5.7 U	5.6 U	5.6 U	5.6 U	5.3 U	5.3 U	5.4 U	5.4 U	5.3 U	5.4 U	5.3 U
1,2-DICHLOROETHANE	5.7 U	5.5 U	6.4 UJ	5.4 UJ	5.3 UJ	5.7 UJ	5.7 UJ	5.6 UJ	5.6 UJ	5.6 UJ	5.3 U	5.3 U	5.4 U	5.4 U	5.3 U	5.4 U	5.3 U
1,3,5-TRIMETHYLBENZENE	5.7 U	5.5 U	6.4 U	5.4 U	5.3 U	5.7 U	5.7 U	5.6 U	5.6 U	5.6 U	5.3 U	5.3 U	5.4 U	5.4 U	5.3 U	5.4 U	5.3 U
1,3-DICHLOROBENZENE	5.7 U	5.5 U	6.4 U	5.4 U	5.3 U	5.7 U	5.7 U	5.6 U	5.6 U	5.6 U	5.3 U	5.3 U	5.4 U	5.4 U	5.3 U	5.4 U	5.3 U
1,4-DICHLOROBENZENE	5.7 U	5.5 U	6.4 U	5.4 U	5.3 U	5.7 U	5.7 U	5.6 U	5.6 U	5.6 U	5.3 U	5.3 U	5.4 U	5.4 U	5.3 U	5.4 U	5.3 U
1,4-DIOXANE	1100 UJ	1100 UJ	1300 UJ	1100 UJ	1100 UJ	1100 UJ	1100 UJ	1100 UJ	1100 UJ	1100 UJ	1100 U	1100 U	1100 U	1100 U	1100 U	1100 U	1100 U
2-BUTANONE	5.7 U	5.5 U	6.4 U	5.4 U	5.3 U	5.7 U	5.7 UJ	5.6 UJ	5.6 UJ	5.6 UJ	5.3 U	5.3 U	5.4 U	5.4 U	5.3 U	5.4 U	5.3 U
ACETONE	23 U	22 U	26 U	22 U	21 U	23 U	23 UJ	22 UJ	22 UJ	23 UJ	21 U	21 U	21 U	21 U	21 U	22 U	21 U
BENZENE	5.7 U	5.5 U	6.4 U	5.4 U	5.3 U	5.7 U	5.7 U	5.6 U	5.6 U	5.6 U	5.3 U	5.3 U	5.4 U	5.4 U	5.3 U	5.4 U	5.3 U
BUTYLBENZENE	5.7 U	5.5 U	6.4 U	5.4 U	5.3 U	5.7 U	5.7 U	5.6 U	5.6 U	5.6 U	5.3 U	5.3 U	5.4 U	5.4 U	5.3 U	5.4 U	5.3 U
CARBON TETRACHLORIDE	5.7 U	5.5 U	6.4 U	5.4 U	5.3 U	5.7 U	5.7 U	5.6 U	5.6 U	5.6 U	5.3 U	5.3 U	5.4 U	5.4 U	5.3 U	5.4 U	5.3 U
CHLOROBENZENE	5.7 U	5.5 U	6.4 U	5.4 U	5.3 U	5.7 U	5.7 U	5.6 U	5.6 U	5.6 U	5.3 U	5.3 U	5.4 U	5.4 U	5.3 U	5.4 U	5.3 U
CHLOROFORM	5.7 U	5.5 U	6.4 U	5.4 U	5.3 U	5.7 U	5.7 U	5.6 U	5.6 U	5.6 U	5.3 U	5.3 U	5.4 U	5.4 U	5.3 U	5.4 U	5.3 U
CIS-1,2-DICHLOROETHENE	5.7 U	5.5 U	6.4 U	5.4 U	5.3 U	5.7 U	5.7 U	5.6 U	5.6 U	5.6 U	5.3 U	5.3 U	5.4 U	5.4 U	5.3 U	5.4 U	5.3 U
ETHYLBENZENE	5.7 U	5.5 U	6.4 U	5.4 U	5.3 U	5.7 U	5.7 U	5.6 U	5.6 U	5.6 U	5.3 U	5.3 U	5.4 U	5.4 U	5.3 U	5.4 U	5.3 U
METHYL TERT-BUTYL ETHER	5.7 UJ	5.5 UJ	6.4 U	5.4 U	5.3 U	5.7 U	5.7 U	5.6 U	5.6 U	5.6 U	5.3 U	5.3 U	5.4 U	5.4 U	5.3 U	5.4 U	5.3 U
METHYLENE CHLORIDE	5.7 U	5.5 U	6.4 U	5.4 U	5.3 U	5.7 U	5.7 U	5.6 U	5.6 U	5.6 U	5.3 U	5.3 U	5.4 U	5.4 U	5.3 U	5.4 U	5.3 U
N-PROPYLBENZENE	5.7 U	5.5 U	6.4 U	5.4 U	5.3 U	5.7 U	5.7 U	5.6 U	5.6 U	5.6 U	5.3 U	5.3 U	5.4 U	5.4 U	5.3 U	5.4 U	5.3 U
NAPHTHALENE																	
SEC-BUTYLBENZENE	5.7 U	5.5 U	6.4 U	5.4 U	5.3 U	5.7 U	5.7 U	5.6 U	5.6 U	5.6 U	5.3 U	5.3 U	5.4 U	5.4 U	5.3 U	5.4 U	5.3 U
TERT-BUTYLBENZENE	5.7 U	5.5 U	6.4 U	5.4 U	5.3 U	5.7 U	5.7 U	5.6 U	5.6 U	5.6 U	5.3 U	5.3 U	5.4 U	5.4 U	5.3 U	5.4 U	5.3 U
TETRACHLOROETHENE	5.7 U	5.5 U	6.4 U	5.4 U	5.3 U	5.7 U	5.7 U	5.6 U	5.6 U	5.6 U	5.3 U	5.3 U	5.4 U	5.4 U	5.3 U	5.4 U	5.3 U
TOLUENE	5.7 U	5.5 U	6.4 U	5.4 U	5.3 U	5.7 U	5.7 U	5.6 U	5.6 U	5.6 U	5.3 U	5.3 U	5.4 U	5.4 U	5.3 U	5.4 U	5.3 U
TRANS-1,2-DICHLOROETHENE	5.7 U	5.5 U	6.4 U	5.4 U	5.3 U	5.7 U	5.7 U	5.6 U	5.6 U	5.6 U	5.3 U	5.3 U	5.4 U	5.4 U	5.3 U	5.4 U	5.3 U
TRICHLOROETHENE	5.7 U	5.5 U	6.4 U	5.4 U	5.3 U	5.7 U	5.7 U	5.6 U	5.6 U	5.6 U	5.3 U	5.3 U	5.4 U	5.4 U	5.3 U	5.4 U	5.3 U
VINYL CHLORIDE	5.7 U	5.5 U	6.4 U	5.4 U	5.3 U	5.7 U	5.7 U	5.6 U	5.6 U	5.6 U	5.3 U	5.3 U	5.4 U	5.4 U	5.3 U	5.4 U	5.3 U
XYLENES, TOTAL	16.7 U	16.5 U	19 U	16 U	16 U	17 U	17 U	17 U	17 U	17 U	16 U	16 U	16 U	16 U	16 U	16 U	16 U
2-METHYLPHENOL	1100 U	360 U	420 U	360 U	350 U	380 U	750 U	730 U	360 U	370 U	350 U	350 U	350 U	350 U	350 U	350 U	350 U
3&4-METHYLPHENOL																	
4-METHYLPHENOL	1100 U	360 U	420 U	360 U	350 U	380 U	750 U	730 U	360 U	370 U	350 U	350 U	350 U	350 U	350 U	350 U	350 U
ACENAPHTHENE	380	100	86 U	72 U	71 U	77 U	160	290	63 J	21 J	72 U	71 U	70 U	72 U	71 U	71 U	70 U
ACENAPHTHYLENE	750	160	86 U	72 U	71 U	77 U	88 J	370	47 J	15 J	72 U	71 U	70 U	72 U	71 U	71 U	70 U
ANTHRACENE	1500	370	86 U	72 U	71 U	77 U	440	990	180	55 J	7.1 J	71 U	70 U	72 U	71 U	71 U	70 U
BENZO(A)ANTHRACENE	2800	1200	86 U	72 U	71 U	77 U	1500	2700	730	210	72 U	71 U	70 U	72 U	71 U	71 U	70 U
BENZO(A)PYRENE	[2800]	[1200]	86 U	72 U	71 U	77 U	[1300]	[2400]	680	170	72 U	71 U	70 U	72 U	71 U	71 U	70 U
BENZO(B)FLUORANTHENE	3700	1700	86 U	72 U	71 U	77 U	1100	1900	630	140	72 UJ	71 UJ	70 UJ	72 UJ	71 UJ	71 UJ	70 UJ
BENZO(G,H,I)PERYLENE	1700	780	86 U	72 U	71 U	77 U	850	1900	400	110	72 U	71 U	70 U	72 U	71 U	71 U	70 U
BENZO(K)FLUORANTHENE	230 U	73 U	86 U	72 U	71 U	77 U	430	910	310	120	72 U	71 U	70 U	72 U	71 U	71 U	70 U
CHRYSENE	2700	1200	86 U	72 U	71 U	77 U	1400	2000	650	150	72 U	71 U	70 U	72 U	71 U	71 U	70 U
DIBENZO(A,H)ANTHRACENE	[610]	220	86 U	72 U	71 U	77 U	190	420	74 U	75 U	72 U	71 U	70 U	72 U	71 U	71 U	70 U
DIBENZOFURAN	460 J	78 J	420 U	360 U	350 U	380 U	120 J	270 J	43 J	370 U	350 U	350 U	350 U	350 U	350 U	350 U	350 U
FLUORANTHENE	6900	2700	86 U	72 U	71 U	77 U	2800	5400	1400	370	11 J	71 U	70 U	72 U	71 U	71 U	70 U
FLUORENE	890	170	86 U	72 U	71 U	77 U	240	540	90	27 J	72 U	71 U	70 U	72 U	71 U	71 U	70 U
HEXACHLOROBENZENE	230 U	73 U	86 U	72 U	71 U	77 U	150 U	150 U	74 U	75 U	72 UJ	71 UJ	70 UJ	72 UJ	71 UJ	71 UJ	70 UJ
INDENO(1,2,3-CD)PYRENE	1500	680	86 U	72 U	71 U	77 U	660	1500	310	92	72 U	71 U	70 U	72 U	71 U	71 U	70 U
NAPHTHALENE	470	55 J	86 U	72 U	71 U	77 U	87 J	190	26 J	21 J	72 U	71 U	70 U	72 U	71 U	71 U	70 U
PENTACHLOROPHENOL	1100 U	360 U	420 U	360 U	350 U	380 U	750 U	730 U	360 U	370 U	350 U	350 U	350 U	350 U	350 U	350 U	350 U
PHENANTHRENE	5400	1400	86 U	72 U	71 U	77 U	1800	3700	680	200	11 J	71 U	70 U	72 U	71 U	71 U	70 U
PHENOL	230 U	73 U	47 J	72 U	23 J	26 J	150 U	150 U	74 U	75 U	72 U	71 U	70 U	72 U	71 U	71 U	70 U
PYRENE	6200 J	2600	86 U	72 U	71 U	77 U	3200	4900	1400	370	72 U	71 U	70 U	72 U	71 U	71 U	70 U
CYANIDE	0.11 U	0.11 U	0.12 U	0.11 U	0.58	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.1 U	0.1 U	0.1 U	0.1 J	0.1 U	0.1 U	0.1 J

	SF	LP	SF	SF	SF	SF	SF	SF	SF	SF	SF	SF	SF	SF	SF	SF	SF
drainage gravel																	
road base																	
structural fill	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
low permeability soil		1															
	GQ	BC	SQ	SQ	SQ	SQ	SQ	SQ	SQ	SQ	SQ	SQ	SQ	SQ	SQ	SQ	SQ
	SCA-0010-08	SCA-0011-01	SCA-0012-01	SCA-0012-02	SCA-0012-03	SCA-0012-04	SCA-0012-05	SCA-0012-06	SCA-0012-07	SCA-0012-08	SCA-0012-09	SCA-0012-10	SCA-0012-11	SCA-0012-12	SCA-0012-13	SCA-0012-14	SCA-0012-15
Location	SCA-SP-GQSF029	SCA-SP-BCLP-004	SCA-SP-SQSF030	SCA-SP-SQSF031	SCA-SP-SQSF032	SCA-SP-SQSF033	SCA-SP-SQSF034	SCA-SP-SQSF035	SCA-SP-SQSF036	SCA-SP-SQSF037	SCA-SP-SQSF038	SCA-SP-SQSF039	SCA-SP-SQSF040	SCA-SP-SQSF041	SCA-SP-SQSF042	SCA-SP-SQSF043	SCA-SP-SQSF044
Field Sample ID	SCA-0010-08	SCA-0011-01	SCA-0012-01	SCA-0012-02	SCA-0012-03	SCA-0012-04	SCA-0012-05	SCA-0012-06	SCA-0012-07	SCA-0012-08	SCA-0012-09	SCA-0012-10	SCA-0012-11	SCA-0012-12	SCA-0012-13	SCA-0012-14	SCA-0012-15
Sample Date	10/20/2010	12/20/2010	3/15/2011	3/15/2011	3/15/2011	3/15/2011	3/15/2011	3/15/2011	3/15/2011	3/15/2011	3/15/2011	3/15/2011	3/15/2011	3/15/2011	3/15/2011	3/15/2011	3/15/2011
Sample Delivery Group	C0J220550	C0L220504	JA70542	JA70542	JA70542	JA70542	JA70542	JA70542	JA70542	JA70542	JA70542	JA70542	JA70542	JA70542	JA70542	JA70542	JA70542
Matrix	SOIL	SOIL	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample Purpose	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample
Sample Type	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil
Parameter Name																	
ARSENIC	2.2	3.2	5.9 J	8.7 J	5.4 J	4.4 J	6.4 J	4.7 J	4.9 J	5.3 J	4.8 J	5.9 J	5.8 J	5.6 J	4.7 J	5.9 J	5.3 J
BARIUM	51.5	110	35.5	38.2	34.9	25.1	40.9	26.8	28.8	31.1	25.9	32.7	34	31.8	26.3	32.4	31.9
BERYLLIUM	0.15 J	0.86	0.3	0.41	0.39	0.31	0.52	0.28	0.31	0.36	0.25	0.39	0.41	0.38	0.24	0.43	0.38
CADMIUM	0.07 J	0.029 U	0.16 J	0.24 J	0.14 J	0.13 J	0.18 J	0.12 J	0.13 J	0.13 J	0.12 J	0.15 J	0.16 J	0.15 J	0.15 J	0.13 J	0.12 J
CHROMIUM	5.8	19.1	10.8 J	15.6 J	14.6 J	13.1 J	19.1 J	11.6 J	13.2 J	14.8 J	11 J	16.1 J	16.6 J	13.8 J	8.9 J	16.4 J	13.7 J
COPPER	16.9	15.1	26.5	40.1	32.8	26	36.6	25.8	25.2	28.3	24.6	30.7	29.5	28.5	22.3	27.2	27.6
LEAD	3.2	6.8	9	13.8	9.8	7.9	11.4	7.9	9.2	9.5	7.6	9.4	10	9.5	8.8	9.6	8.8
MANGANESE	792	694	576 J	990 J	584 J	573 J	774 J	616 J	580 J	583 J	568 J	606 J	641 J	552 J	607 J	581 J	593 J
NICKEL	9.8	21	13.6	23.3	18.8	16.1	22.5	14	14.7	17.4	13.4	18.8	19.1	16.9	12.7	19.8	18.1
SELENIUM	0.21 U	0.25 U	0.36 J	0.32 U	0.31 U	0.31 U	0.32 U	0.32 U	0.32 U	0.31 U	0.3 U	0.31 U	0.31 U	0.3 U	0.31 U	0.32 U	0.3 U
SILVER	0.058 U	0.069 U	0.08 U	0.082 U	0.081 U	0.08 U	0.082 U	0.082 U	0.082 U	0.08 U	0.076 U	0.08 U	0.08 U	0.079 U	0.08 U	0.083 U	0.078 U
ZINC	20.2	41.4	27.6 J	40.3 J	31.9 J	28.7 J	41.1 J	29.2 J	27.4 J	34.5 J	27.7 J	34.7 J	32.4 J	31.1 J	26.3 J	31 J	30.7 J
MERCURY	0.021 J	0.014 U	0.037	0.044	0.067	0.043	0.051	0.042	0.044	0.042	0.029 J	0.044	0.05	0.052	0.04	0.041	0.057
4,4'-DDD	1.8 U	2.1 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.3 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.3 U
4,4'-DDE	1.8 U	2.1 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.3 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.3 U
4,4'-DDT	1.8 U	2.1 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.3 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.3 U
ALDRIN	1.8 U	2.1 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.3 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.3 U
ALPHA-BHC	1.8 U	2.1 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.3 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.3 U
ALPHA-CHLORDANE	1.8 U	2.1 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.3 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.3 U
BETA-BHC	1.8 U	2.1 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.3 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.3 U
DELTA-BHC	1.8 U	2.1 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.3 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.3 U
DIELDRIN	1.8 U	2.1 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.3 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.3 U
ENDOSULFAN I	1.8 U	2.1 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.3 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.3 U
ENDOSULFAN II	1.8 U	2.1 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.3 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.3 U
ENDOSULFAN SULFATE	1.8 U	2.1 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.3 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.3 U
ENDRIN	1.8 U	2.1 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.3 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.3 U
GAMMA-BHC (LINDANE)	1.8 U	2.1 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.3 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.3 U
HEPTACHLOR	1.8 U	2.1 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.3 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.3 U
AROCLOR-1016	18 U	21 U	35 U	34 U	35 U	35 U	35 U	34 U	35 U	34 U	33 U	34 U	35 U	35 U	35 U	35 U	33 U
AROCLOR-1221	18 U	21 U	35 U	34 U	35 U	35 U	35 U	34 U	35 U	34 U	33 U	34 U	35 U	35 U	35 U	35 U	33 U
AROCLOR-1232	18 U	21 U	35 U	34 U	35 U	35 U	35 U	34 U	35 U	34 U	33 U	34 U	35 U	35 U	35 U	35 U	33 U
AROCLOR-1242	18 U	21 U	35 U	34 U	35 U	35 U	35 U	34 U	35 U	34 U	33 U	34 U	35 U	35 U	35 U	35 U	33 U
AROCLOR-1248	18 U	21 U	35 U	34 U	35 U	35 U	35 U	34 U	35 U	34 U	33 U	34 U	35 U	35 U	35 U	35 U	33 U
AROCLOR-1254	18 U	21 U	35 U	34 U	35 U	35 U	35 U	34 U	35 U	34 U	33 U	34 U	35 U	35 U	35 U	35 U	33 U
AROCLOR-1260	18 U	21 U	35 U	34 U	35 U	35 U	35 U	34 U	35 U	34 U	33 U	34 U	35 U	35 U	35 U	35 U	33 U
AROCLOR-1262	18 U	21 U	35 U	34 U	35 U	35 U	35 U	34 U	35 U	34 U	33 U	34 U	35 U	35 U	35 U	35 U	33 U
AROCLOR-1268	18 U	21 U	35 U	34 U	35 U	35 U	35 U	34 U	35 U	34 U	33 U	34 U	35 U	35 U	35 U	35 U	33 U
PCBS, Total	18 U	21 U	35 U	34 U	35 U	35 U	35 U	34 U	35 U	34 U	33 U	34 U	35 U	35 U	35 U	35 U	33 U
2,4,5-TP (SILVEX)	21 U	25 U	3.4 U	3.3 U	3.4 U	3.4 U	3.4 U	3.3 U	3.4 U	3.3 U	3.2 U	3.3 U	3.4 U	3.4 U	3.4 U	3.4 U	3.3 U
1,1,1-TRICHLOROETHANE	5.4 U	6.2 U	6.1 U	6.3 U	6.2 U	6.1 U	6.5 U	6.4 U	6.2 U	6.1 U	6.3 U	5.9 U	6.5 U	6.5 U	6.1 U	6.1 U	6.1 U
1,1-DICHLOROETHANE	5.4 U	6.2 U	6.1 U	6.3 U	6.2 U	6.1 U	6.5 U	6.4 U	6.2 U	6.1 U	6.3 U	5.9 U	6.5 U	6.5 U	6.1 U	6.1 U	6.1 U
1,1-DICHLOROETHENE	5.4 U	6.2 U	6.1 U	6.3 U	6.2 U	6.1 U	6.5 U	6.4 U	6.2 U	6.1 U	6.3 U	5.9 U	6.5 U	6.5 U	6.1 U	6.1 U	6.1 U
1,2,4-TRIMETHYLBENZENE	5.4 U	6.2 U	6.1 U	6.3 U	6.2 U	6.1 U	6.5 U	6.4 U	6.2 U	6.1 U	6.3 U	5.9 U	6.5 U	6.5 U	6.1 U	6.1 U	6.1 U
1,2-DICHLOROBENZENE	5.4 U	6.2 U	6.1 U	6.3 U	6.2 U	6.1 U	6.5 U	6.4 U	6.2 U	6.1 U	6.3 U	5.9 U	6.5 U	6.5 U	6.1 U	6.1 U	6.1 U
1,2-DICHLOROETHANE	5.4 U	6.2 U	1.2 U	1.3 U	1.2 U	1.2 U	1.3 U	1.3 U	1.2 U	1.2 U	1.3 U	1.2 U	1.3 U	1.3 U	1.2 U	1.2 U	1.2 U
1,3,5-TRIMETHYLBENZENE	5.4 U	6.2 U	6.1 U	6.3 U	6.2 U	6.1 U	6.5 U	6.4 U	6.2 U	6.1 U	6.3 U	5.9 U	6.5 U	6.5 U	6.1 U	6.1 U	6.1 U
1,3-DICHLOROBENZENE	5.4 U	6.2 U	6.1 U	6.3 U	6.2 U	6.1 U	6.5 U	6.4 U	6.2 U	6.1 U	6.3 U	5.9 U	6.5 U	6.5 U	6.1 U	6.1 U	6.1 U
1,4-DICHLOROBENZENE	5.4 U	6.2 U	6.1 U	6.3 U	6.2 U	6.1 U	6.5 U	6.4 U	6.2 U	6.1 U	6.3 U	5.9 U	6.5 U	6.5 U	6.1 U	6.1 U	6.1 U
1,4-DIOXANE	1100 U	1200 U	150 U	160 U	150 U	150 U	160 U	160 U	150 U	150 U	160 U	150 U	160 U	160 U	150 U	150 U	150 U
2-BUTANONE	5.4 U	6.2 U	12 UJ	13 UJ	12 UJ	12 U	13 U	13 U	12 U	12 U	13 U	12 U	13 U	13 U	12 U	12 U	12 U
ACETONE	21 U	25 U	12 U	13 U	12 U	12 UJ	13 UJ	13 UJ	12 UJ	12 UJ	13 UJ	12 UJ	13 UJ	13 UJ	12 UJ	12 UJ	12 UJ
BENZENE	5.4 U	6.2 U	1.2 U	1.3 U	1.2 U	1.2 U	1.3 U	1.3 U	1.2 U	1.2 U	1.3 U	1.2 U	1.3 U	1.3 U	1.2 U	1.2 U	1.2 U
BUTYLBENZENE	5.4 U	6.2 U	6.1 U	6.3 U	6.2 U	6.1 U	6.5 U	6.4 U	6.2 U	6.1 U	6.3 U	5.9 U	6.5 U	6.5 U	6.1 U	6.1 U	6.1 U
CARBON TETRACHLORIDE	5.4 U	6.2 U	6.1 U	6.3 U	6.2 U	6.1 U	6.5 U	6.4 U	6.2 U	6.1 U	6.3 U	5.9 U	6.5 U	6.5 U	6.1 U	6.1 U	6.1 U
CHLOROBENZENE	5.4 U	6.2 U	6.1 U	6.3 U	6.2 U	6.1 U	6.5 U	6.4 U	6.2 U	6.1 U	6.3 U	5.9 U	6.5 U	6.5 U	6.1 U	6.1 U	6.1 U
CHLOROFORM	5.4 U	6.2 U	6.1 U	6.3 U	6.2 U	6.1 U	6.5 U	6.4 U	6.2 U	6.1 U	6.3 U	5.9 U	6.5 U	6.5 U	6.1 U	6.1 U	6.1 U
CIS-1,2-DICHLOROETHENE	5.4 U	6.2 U	6.1 U	6.3 U	6.2 U	6.1 U	6.5 U	6.4 U	6.2 U	6.1 U	6.3 U	5.9 U	6.5 U	6.5 U	6.1 U	6.1 U	6.1 U
ETHYLBENZENE	5.4 U	6.2 U	1.2 U	1.3 U	1.2 U	1.2 U	1.3 U	1.3 U	1.2 U	1.2 U	1.3 U	1.2 U	1.3 U	1.3 U	1.2 U	1.2 U	1.2 U
METHYL TERT-BUTYL ETHER	5.4 U	6.2 U	1.2 U	1.3 U	1.2 U	1.2 U	1.3 U	1.3 U	1.2 U	1.2 U	1.3 U	1.2 U	1.3 U	1.3 U	1.2 U	1.2 U	1.2 U
METHYLENE CHLORIDE	5.4 U	1.3 J	6.1 U	6.3 U	6.2 U	6.1 U	6.5 U	6.4 U	6.2 U	6.1 U	6.3 U	5.9 U	6.5 U	6.5 U	6.1 U	6.1 U	6.1 U
N-PROPYLBENZENE	5.4 U	6.2 U	6.1 U	6.3 U	6.2 U	6.1 U	6.5 U	6.4 U	6.2 U	6.1 U	6.3 U	5.9 U	6.5 U	6.5 U	6.1 U	6.1 U	6.1 U
NAPHTHALENE			6.1 U	6.3 U	6.2 U	6.1 U	6.5 U	6.4 U	6.2 U	6.1 U	6.3 U	5.9 U	6.5 U	6.5 U	6.1 U	6.1 U	6.1 U
SEC-BUTYLBENZENE	5.4 U	6.2 U	6.1 U	6.3 U	6.2 U	6.1 U	6.5 U	6.4 U	6.2 U	6.1 U	6.3 U	5.9 U	6.5 U	6.5 U	6.1 U	6.1 U	6.1 U
TERT-BUTYLBENZENE	5.4 U	6.2 U	6.1 U	6.3 U	6.2 U	6.1 U	6.5 U	6.4 U	6.2 U	6.1 U	6.3 U	5.9 U	6.5 U	6.5 U	6.1 U	6.1 U	6.1 U
TETRACHLOROETHENE	5.4 U	6.2 U	6.1 U	6.3 U	6.2 U	6.1 U	6.5 U	6.4 U	6.2 U	6.1 U	6.3 U	5.9 U	6.5 U	6.5 U	6.1 U	6.1 U	6.1 U
TOLUENE	5.4 U	6.2 U	1.2 U	1.3 U	1.2 U	1.2 U	1.3 U	1.3 U	1.2 U	1.2 U	1.3 U	1.2 U	1.3 U	1.3 U	1.2 U	1.2 U	1.2 U
TRANS-1,2-DICHLOROETHENE	5.4 U	6.2 U	6.1 U	6.3 U	6.2 U	6.1 U	6.5 U	6.4 U	6.2 U	6.1 U	6.3 U	5.9 U	6.5 U	6.5 U	6.1 U	6.1 U	6.1 U
TRICHLOROETHENE	5.4 U	6.2 U	6.1 U	6.3 U	6.2 U	6.1 U	6.5 U	6.4 U	6.2 U	6.1 U	6.3 U	5.9 U	6.5 U	6.5 U	6.1 U	6.1 U	6.1 U
VINYL CHLORIDE	5.4 U	6.2 U	6.1 U	6.3 U	6.2 U	6.1 U	6.5 U	6.4 U	6.2 U	6.1 U	6.3 U	5.9 U	6.5 U	6.5 U	6.1 U	6.1 U	6.1 U
XYLENES, TOTAL	16 U	19 U	2.5 U	2.5 U	2.5 U	2.5 U	2.6 U	2.6 U	2.5 U	2.4 U	2.5 U	2.4 U	2.6 U	2.6 U	2.4 U	2.4 U	2.4 U
2-METHYLPHENOL	350 U	410 U	69 U	67 U	68 U	67 U	68 U	66 U	68 U	66 U	65 U	66 U	67 U	67 U	67 U	68 U	65 U
3&4-METHYLPHENOL			69 U	67 U	68 U	67 U	68 U	66 U	68 U	66 U	65 U	66 U	67 U	67 U	67 U	68 U	65 U
4-METHYLPHENOL	350 U	410 U															
ACENAPHTHENE	72 U	83 U	34 U	33 U	34 U	33 U	34 U	33 U	34 U	33 U	32 U	33 U	34 U	34 U	33 U	34 U	33 U
ACENAPHTHYLENE	72 U	83 U	34 U	33 U	34 U	33 U	34 U	33 U	34 U	33 U	32 U	33 U	34 U	34 U	33 U	34 U	33 U
ANTHRACENE	72 U	83 U	34 U	33 U	34 U	33 U	34 U	33 U	34 U	33 U	32 U	33 U	34 U	34 U	33 U	34 U	33 U
BENZO(A)ANTHRACENE	72 U	83 U	34 U	33 U	34 U	33 U	34 U	33 U	34 U	33 U	32 U	33 U	34 U	34 U	33 U	34 U	33 U
BENZO(A)PYRENE	72 U	83 U	34 U	33 U	34 U	33 U	34 U	33 U	34 U	33 U	32 U	33 U	34 U	34 U	33 U	34 U	33 U
BENZO(B)FLUORANTHENE	72 UJ	83 U	34 U	33 U	34 U	33 U	34 U	33 U	34 U	33 U	32 U	33 U	34 U	34 U	33 U	34 U	33 U
BENZO(G,H,I)PERYLENE	72 U	83 U	34 U	33 U	34 U	33 U	34 U	33 U	34 U	33 U	32 U	33 U	34 U	34 U	33 U	34 U	33 U
BENZO(K)FLUORANTHENE	72 U	83 U	34 U	33 U	34 U	33 U	34 U	33 U	34 U	33 U	32 U	33 U	34 U	34 U	33 U	34 U	33 U
CHRYSENE	72 U	83 U	34 U	33 U	34 U	33 U	34 U	33 U	34 U	33 U	32 U	33 U	34 U	34 U	33 U	34 U	33 U
DIBENZO(A,H)ANTHRACENE	72 U	83 U	34 U	33 U	34 U	33 U	34 U	33 U	34 U	33 U	32 U	33 U	34 U	34 U	33 U	34 U	33 U
DIBENZOFURAN	350 U	410 U	69 U	67 U	68 U	67 U	68 U	66 U	68 U	66 U	65 U	66 U	67 U	67 U	67 U	68 U	65 U
FLUORANTHENE	72 U	83 U	34 U	19.4 J	34 U	33 U	34 U	33 U	34 U	14.1 J	32 U	33 U	34 U	34 U	33 U	34 U	16.7 J
FLUORENE	72 U	83 U	34 U	33 U	34 U	33 U	34 U	33 U	34 U	33 U	32 U	33 U	34 U	34 U	33 U	34 U	33 U
HEXACHLOROBENZENE	72 UJ	83 U	69 U	67 U	68 U	67 U	68 U	66 U	68 U	66 U	65 U	66 U	67 U	67 U	67 U	68 U	65 U
INDENO(1,2,3-CD)PYRENE	72 U	83 U	34 U	33 U	34 U	33 U	34 U	33 U	34 U	33 U	32 U	33 U	34 U	34 U	33 U	34 U	33 U
NAPHTHALENE	72 U	83 U	34 U	33 U	34 U	33 U	34 U	33 U	34 U	33 U	32 U	33 U	34 U	34 U	33 U	34 U	33 U
PENTACHLOROPHENOL	350 U	410 U	340 U	330 U	340 U	330 U	340 U	330 U	340 U	330 U	320 U	330 U	340 U	340 U	330 U	340 U	330 U
PHENANTHRENE	72 U	83 U	34 U	33 U	34 U	33 U	34 U	33 U	34 U	33 U	32 U	33 U	34 U	34 U	33 U	34 U	33 U
PHENOL	72 U	83 U	69 U	67 U	68 U	67 U	68 U	66 U	68 U	66 U	65 U	66 U	67 U	67 U	67 U	68 U	65 U
PYRENE	72 U	83 U	34 U	16.7 J	34 U	33 U	34 U	33 U	34 U	13.6 J	32 U	33 U	34 U	34 U	33 U	34 U	16.9 J
CYANIDE	0.1 U	0.12 U	0.087 J	0.064 J	0.22 J	0.095 J	0.12 J	0.055 J	0.26 U	0.12 J	0.12 J	0.12 J	0.15 J	0.24 J	0.19 J	0.23 J	0.14 J

	SF	SF	SF	SF	SF	SF	SF	SF	SF	SF	LP did not use material	SF	SF	SF	SF	SF	SF
drainage gravel																	
road base																	
structural fill	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1
low permeability soil																	
	GQ	GQ	GQ	GQ	GQ	GQ	GQ	GQ	GQ	GQ	Caughdenoy Rd	GQ	GQ	GQ	GQ	GQ	GQ
	SCA-0013-01	SCA-0013-02	SCA-0013-03	SCA-0013-04	SCA-0013-05	SCA-0013-06	SCA-0013-07	SCA-0013-08									
Location	SCA-SP-GQSF045	SCA-SP-GQSF046	SCA-SP-GQSF047	SCA-SP-GQSF048	SCA-SP-GQSF049	SCA-SP-GQSF050	SCA-SP-GQSF051	SCA-SP-GQSF052	SCA-SP-GQSF053	SCA-SP-GQSF054	SCA-CP-LP055	SCA-SP-GQ-SF057	SCA-SP-GQ-SF058	SCA-SP-GQ-SF059	SCA-SP-GQ-SF060	SCA-SP-GQ-SF061	SCA-SP-GQ-SF062
Field Sample ID	SCA-0013-01	SCA-0013-02	SCA-0013-03	SCA-0013-04	SCA-0013-05	SCA-0013-06	SCA-0013-07	SCA-0013-08	SCA-0014-01	SCA-0015-01	SCA-0016-01	SCA-0018-01	SCA-0018-02	SCA-0018-03	SCA-0019-01	SCA-0020-01	SCA-0021-01
Sample Date	4/8/2011	4/8/2011	4/8/2011	4/8/2011	4/8/2011	4/8/2011	4/8/2011	4/8/2011	7/22/2011	8/16/2011	8/26/2011	10/7/2011	10/7/2011	10/7/2011	10/18/2011	10/18/2011	10/18/2011
Sample Delivery Group	JA72830	JA72830	JA72830	JA72830	JA72830	JA72830	JA72830	JA72830	JA81759	JA83998	JA84807	JA88620	JA88620	JA88620	JA89671	JA89671	JA89671
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	SOIL	Soil	Soil	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Purpose	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample	Regular sample
Sample Type	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil	Surface soil
Parameter Name																	
ARSENIC	2.7	3.3	3.9	3.8	2.7	4	4.2	3.7	3.5	2.6	3.4	2.7 J	3.8 J	2.8 J	2.9	3.3	3.3
BARIUM	55.2	78	69.3	67.6	52.5	80.4	[489]	72.5	54.5	39	53.1	44.7	62.4	44.5	46.3	43.3	44.5
BERYLLIUM	0.15 J	0.19 J	0.17 J	0.022 J	0.11 J	0.14 J	0.2 J	0.16 J	0.27	0.22	0.36	0.23	0.29	0.23 J	0.23	0.23	0.24
CADMIUM	0.053 J	0.036 U	0.056 J	0.044 J	0.036 U	0.065 J	0.035 U	0.035 U	0.088 J	0.056 J	0.18 J	0.076 J	0.14 J	0.061 J	0.11 J	0.088 J	0.11 J
CHROMIUM	8.5	11.7	10.8	9.6	8.4	11.1	10.3	10.4	8.8	6.6	11.6	7.6 J	10.1 J	7.9 J	7.6	8	7.7
COPPER	21.6	23.5	27.5	25.4	18.6	26.1	38.2	29.3	23.3	17.4	13.4	23.6	25	19.5	22	21.8	24
LEAD	3.5	3.6	4.3	4.7	3.4	7.2	5.6	4.8	4.4	2.3	6	2.7	4.5	2.9	3.1	3	3.7
MANGANESE	716	845	878	874	689	908	805	977	734	601	452	670 J	1180 J	656 J	681	617	648
NICKEL	11.7	13.1	12.5	11.8	13	12.4	13.7	13.3	11.9	9.3	13.2	11.1	11.8	9.3	9.9	11.7	9.9
SELENIUM	0.28 U	0.28 U	0.3 U	0.29 U	0.28 U	0.29 U	0.27 U	0.27 U	0.26 U	1.3 J	0.52 J	0.29 U	0.28 U	0.32 U	0.29 U	0.29 U	0.28 U
SILVER	0.085 J	0.074 U	0.11 J	0.18 J	0.16 J	0.075 U	0.071 U	0.14 J	0.59	0.12 J	0.079 U	0.075 U	0.072 U	0.084 U	0.076 U	0.076 U	0.072 U
ZINC	25.7	28.4	28.8	29.8	26.9	31.8	29.8	29.6	27.6	19.7	30.6	26.2 J	27.7 J	22.8 J	24.2	26.6	23.1
MERCURY	0.015 U	0.013 U	0.015 U	0.014 U	0.013 U	0.015 U	0.015 U	0.013 U	0.018 J	0.034 J	0.015 U	0.013 U	0.022 J	0.015 U	0.013 U	0.014 U	0.012 U
4,4'-DDD	1.3 U	1.2 U	1.3 U	1.3 U	1.2 U	1.3 U	1.2 U	1.2 U	1.1 U	0.66 U	0.7 U	0.68 U	0.64 UJ	0.71 U	0.64 U	0.67 U	0.64 U
4,4'-DDE	1.3 U	1.2 U	1.3 U	1.3 U	1.2 U	1.3 U	1.2 U	1.2 U	1.1 U	0.66 U	0.7 U	0.68 U	0.64 UJ	0.71 U	0.64 U	0.67 U	0.64 U
4,4'-DDT	1.3 U	1.2 U	1.3 U	1.3 U	1.2 U	1.3 U	1.2 U	1.2 U	1.1 U	0.66 U	0.7 U	0.68 U	0.64 UJ	0.71 U	0.64 U	0.67 U	0.64 U
ALDRIN	1.3 U	1.2 U	1.3 U	1.3 U	1.2 U	1.3 U	1.2 U	1.2 U	1.1 U	0.66 U	0.7 U	0.68 U	0.64 UJ	0.71 U	0.64 U	0.67 U	0.64 U
ALPHA-BHC	1.3 U	1.2 U	1.3 U	1.3 U	1.2 U	1.3 U	1.2 U	1.2 U	1.1 U	0.66 U	0.7 U	0.68 U	0.64 UJ	0.71 U	0.64 U	0.67 U	0.64 U
ALPHA-CHLORDANE	1.3 U	1.2 U	1.3 U	1.3 U	1.2 U	1.3 U	1.2 U	1.2 U	1.1 U	0.66 U	0.7 U	0.68 U	0.64 UJ	0.71 U	0.64 U	0.67 U	0.64 U
BETA-BHC	1.3 U	1.2 U	1.3 U	1.3 U	1.2 U	1.3 U	1.2 U	1.2 U	1.1 U	0.66 U	0.7 U	0.68 U	0.64 UJ	0.71 U	0.64 U	0.67 U	0.64 U
DELTA-BHC	1.3 U	1.2 U	1.3 U	1.3 U	1.2 U	1.3 U	1.2 U	1.2 U	1.1 U	0.66 U	0.7 U	0.68 U	0.64 UJ	0.71 U	0.64 U	0.67 U	0.64 U
DIELDRIN	1.3 U	1.2 U	1.3 U	1.3 U	1.2 U	1.3 U	1.2 U	1.2 U	1.1 U	0.66 U	0.7 U	0.68 U	0.64 UJ	0.71 U	0.64 U	0.67 U	0.64 U
ENDOSULFAN I	1.3 U	1.2 U	1.3 U	1.3 U	1.2 U	1.3 U	1.2 U	1.2 U	1.1 U	0.66 U	0.7 U	0.68 U	0.64 UJ	0.71 U	0.64 U	0.67 U	0.64 U
ENDOSULFAN II	1.3 U	1.2 U	1.3 U	1.3 U	1.2 U	1.3 U	1.2 U	1.2 U	1.1 U	0.66 U	0.7 U	0.68 U	0.64 UJ	0.71 U	0.64 U	0.67 U	0.64 U
ENDOSULFAN SULFATE	1.3 U	1.2 U	1.3 U	1.3 U	1.2 U	1.3 U	1.2 U	1.2 U	1.1 U	0.66 U	0.7 U	0.68 U	0.64 UJ	0.71 U	0.64 U	0.67 U	0.64 U
ENDRIN	1.3 U	1.2 U	1.3 U	1.3 U	1.2 U	1.3 U	1.2 U	1.2 U	1.1 U	0.66 U	0.7 U	0.68 U	0.64 UJ	0.71 U	0.64 U	0.67 U	0.64 U
GAMMA-BHC (LINDANE)	1.3 U	1.2 U	1.3 U	1.3 U	1.2 U	1.3 U	1.2 U	1.2 U	1.1 U	0.66 U	0.7 U	0.68 U	0.64 UJ	0.71 U	0.64 U	0.67 U	0.64 U
HEPTACHLOR	1.3 U	1.2 U	1.3 U	1.3 U	1.2 U	1.3 U	1.2 U	1.2 U	1.1 U	0.66 U	0.7 U	0.68 U	0.64 UJ	0.71 U	0.64 U	0.67 U	0.64 U
AROCLOR-1016	31 U	31 U	32 U	32 U	31 U	33 U	31 U	30 U	28 U	33 U	35 U	34 U	32 U	35 U	32 U	33 U	32 U
AROCLOR-1221	31 U	31 U	32 U	32 U	31 U	33 U	31 U	30 U	28 U	33 U	35 U	34 U	32 U	35 U	32 U	33 U	32 U
AROCLOR-1232	31 U	31 U	32 U	32 U	31 U	33 U	31 U	30 U	28 U	33 U	35 U	34 U	32 U	35 U	32 U	33 U	32 U
AROCLOR-1242	31 U	31 U	32 U	32 U	31 U	33 U	31 U	30 U	28 U	33 U	35 U	34 U	32 U	35 U	32 U	33 U	32 U
AROCLOR-1248	31 U	31 U	32 U	32 U	31 U	33 U	31 U	30 U	28 U	33 U	35 U	34 U	32 U	35 U	32 U	33 U	32 U
AROCLOR-1254	31 U	31 U	32 U	32 U	31 U	33 U	31 U	30 U	28 U	33 U	35 U	34 U	32 U	35 U	32 U	33 U	32 U
AROCLOR-1260	31 U	31 U	32 U	32 U	31 U	33 U	31 U	30 U	28 U	33 U	35 U	34 U	32 U	35 U	32 U	33 U	32 U
AROCLOR-1262	31 U	31 U	32 U	32 U	31 U	33 U	31 U	30 U	28 U	33 U	35 U	34 U	32 U	35 U	32 U	33 U	32 U
AROCLOR-1268	31 U	31 U	32 U	32 U	31 U	33 U	31 U	30 U	28 U	33 U	35 U	34 U	32 U	35 U	32 U	33 U	32 U
PCBS, Total	31 U	31 U	32 U	32 U	31 U	33 U	31 U	30 U	28 U	33 U	35 U	34 U	32 U	35 U	32 U	33 U	32 U
2,4,5-TP (SILVEX)	3.1 U	3 U	3.1 U	3.1 U	3 U	3.2 U	3 U	3.4 U	2.9 U	3.2 U	3.5 U	3.3 U	3.1 U	3.4 U	3.1 U	3.2 U	3.1 U
1,1,1-TRICHLOROETHANE	3.2 U	5.2 U	5.7 U	4.5 U	4.8 U	4.6 U	3.8 U	3.7 U	5.4 U	6.2 U	6.6 U	5.8 U	5.7 U	6 U	5.9 U	5.9 U	6 U
1,1-DICHLOROETHANE	3.2 U	5.2 U	5.7 U	4.5 U	4.8 U	4.6 U	3.8 U	3.7 U	5.4 U	6.2 U	6.6 U	5.8 U	5.7 U	6 U	5.9 U	5.9 U	6 U
1,1-DICHLOROETHENE	3.2 U	5.2 U	5.7 U	4.5 U	4.8 U	4.6 U	3.8 U	3.7 U	5.4 U	6.2 U	6.6 U	5.8 U	5.7 U	6 U	5.9 U	5.9 U	6 U
1,2,4-TRIMETHYLBENZENE	3.2 U	5.2 U	5.7 U	4.5 U	4.8 U	4.6 U	3.8 U	3.7 U	5.4 U	6.2 U	6.6 U	5.8 U	5.7 U	6 U	5.9 U	5.9 U	6 U
1,2-DICHLOROBENZENE	3.2 U	5.2 U	5.7 U	4.5 U	4.8 U	4.6 U	3.8 U	3.7 U	5.4 U	6.2 U	6.6 U	5.8 U	5.7 U	6 U	5.9 U	5.9 U	6 U
1,2-DICHLOROETHANE	0.64 U	1 U	1.1 U	0.9 U	0.96 U	0.92 U	0.76 U	0.75 U	1.1 U	1.2 UJ	1.3 U	1.2 U	1.1 U	1.2 U	1.2 U	1.2 U	1.2 U
1,3,5-TRIMETHYLBENZENE	3.2 U	5.2 U	5.7 U	4.5 U	4.8 U	4.6 U	3.8 U	3.7 U	5.4 U	6.2 U	6.6 U	5.8 U	5.7 U	6 U	5.9 U	0.26 J	6 U
1,3-DICHLOROBENZENE	3.2 U	5.2 U	5.7 U	4.5 U	4.8 U	4.6 U	3.8 U	3.7 U	5.4 U	6.2 U	6.6 U	5.8 U	5.7 U	6 U	5.9 U	5.9 U	6 U
1,4-DICHLOROBENZENE	3.2 U	5.2 U	5.7 U	4.5 U	4.8 U	4.6 U	3.8 U	3.7 U	5.4 U	6.2 U	6.6 U	5.8 U	5.7 U	6 U	5.9 U	5.9 U	6 U
1,4-DIOXANE	81 UJ	130 UJ	140 UJ	110 UJ	120 UJ	120 UJ	95 UJ	93 UJ	130 U	160 U	160 U	140 U	140 U	150 U	150 U	150 U	150 U
2-BUTANONE	6.4 U	10 U	11 U	9 U	9.6 U	9.2 U	7.6 U	7.5 U	11 UJ	12 U	13 UJ	12 U	11 U	12 U	12 UJ	12 UJ	12 UJ
ACETONE	6.4 U	10 U	11 U	9 U	9.6 U	9.2 U	7.6 U	7.5 U	11 U	12 U	13 U	12 UJ	11 UJ	12 UJ	12 UJ	12 UJ	12 U
BENZENE	0.64 U	1 U	1.1 U	0.9 U	0.96 U	0.92 U	0.76 U	0.75 U	1.1 U	1.2 U	1.3 U	1.2 U	1.1 U	1.2 U	1.2 U	1.2 U	1.2 U
BUTYLBENZENE	3.2 U	5.2 U	5.7 U	4.5 U	4.8 U	4.6 U	3.8 U	3.7 U	5.4 U	6.2 U	6.6 U	5.8 U	5.7 U	6 U	5.9 U	5.9 U	6 U
CARBON TETRACHLORIDE	3.2 U	5.2 U	5.7 U	4.5 U	4.8 U	4.6 U	3.8 U	3.7 U	5.4 U	6.2 U	6.6 U	5.8 U	5.7 U	6 U	5.9 U	5.9 U	6 U
CHLOROBENZENE	3.2 U	5.2 U	5.7 U	4.5 U	4.8 U	4.6 U	3.8 U	3.7 U	5.4 U	6.2 U	6.6 U	0.58 J	0.55 J	6 U	5.9 U	5.9 U	6 U
CHLOROFORM	3.2 U	5.2 U	5.7 U	4.5 U	4.8 U	4.6 U	3.8 U	3.7 U	5.4 U	6.2 U	6.6 U	5.8 U	5.7 U	6 U	5.9 U	5.9 U	6 U
CIS-1,2-DICHLOROETHENE	3.2 U	5.2 U	5.7 U	4.5 U	4.8 U	4.6 U	3.8 U	3.7 U	5.4 U	6.2 U	6.6 U	5.8 U	5.7 U	6 U	5.9 U	5.9 U	6 U
ETHYLBENZENE	0.64 U	1 U	1.1 U	0.9 U	0.96 U	0.92 U	0.76 U	0.75 U	1.1 U	1.2 U	1.3 U	1.2 U	0.24 J	1.2 U	0.24 J	0.24 J	1.2 U
METHYL TERT-BUTYL ETHER	0.64 U	1 U	1.1 U	0.9 U	0.96 U	0.92 U	0.76 U	0.75 U	1.1 U	1.2 U	1.3 U	1.2 U	1.1 U	1.2 U	1.2 U	0.41 J	1.2 U
METHYLENE CHLORIDE	3.2 U	5.2 U	5.7 U	4.5 U	4.8 U	4.6 U	1.8 J	1.9 J	5.4 U	6.2 U	6.6 U	5.8 U	5.7 U	6 U	5.9 U	5.9 U	6 UJ
N-PROPYLBENZENE	3.2 U	5.2 U	5.7 U	4.5 U	4.8 U	4.6 U	3.8 U	3.7 U	5.4 U	6.2 U	6.6 U	5.8 U	5.7 U	6 U	5.9 U	5.9 U	6 U
NAPHTHALENE	3.2 U	5.2 U	5.7 U	4.5 U	4.8 U	4.6 U	3.8 U	3.7 U	5.4 U	6.2 U	6.6 U	5.8 U	5.7 U	6 U	5.9 U	5.9 U	6 U
SEC-BUTYLBENZENE	3.2 U	5.2 U	5.7 U	4.5 U	4.8 U	4.6 U	3.8 U	3.7 U	5.4 U	6.2 U	6.6 U	5.8 U	5.7 U	6 U	5.9 U	5.9 U	6 U
TERT-BUTYLBENZENE	3.2 U	5.2 U	5.7 U	4.5 U	4.8 U	4.6 U	3.8 U	3.7 U	5.4 U	6.2 U	6.6 U	5.8 U	5.7 U	6 U	5.9 U	5.9 U	6 U
TETRACHLOROETHENE	3.2 U	5.2 U	5.7 U	4.5 U	4.8 U	4.6 U	3.8 U	3.7 U	5.4 U	6.2 U	6.6 U	5.8 U	5.7 U	6 U	5.9 U	5.9 U	6 U
TOLUENE	0.64 U	1 U	1.1 U	0.9 U	0.96 U	0.92 U	0.76 U	0.75 U	1.1 U	1.2 U	1.3 U	1.2 U	1.1 U	1.2 U	1.2 U	1.2 U	1.2 U
TRANS-1,2-DICHLOROETHENE	3.2 U	5.2 U	5.7 U	4.5 U	4.8 U	4.6 U	3.8 U	3.7 U	5.4 U	6.2 U	6.6 U	5.8 U	5.7 U	6 U	5.9 U	5.9 U	6 U
TRICHLOROETHENE	3.2 U	5.2 U	5.7 U	4.5 U	4.8 U	4.6 U	3.8 U	3.7 U	5.4 U	6.2 U	6.6 U	5.8 U	5.7 U	6 U	5.9 U	5.9 U	6 U
VINYL CHLORIDE	3.2 U	5.2 U	5.7 U	4.5 U	4.8 U	4.6 U	3.8 U	3.7 U	5.4 U	6.2 U	6.6 U	5.8 U	5.7 U	6 U	5.9 U	5.9 U	6 U
XYLENES, TOTAL	1.3 U	2.1 U	2.3 U	1.8 U	1.9 U	1.8 U	1.5 U	1.5 U	1.1 U	1.2 U	1.3 U	1.2 U	1.3	1.2 U	1.5	0.97 J	1.2 U
2-METHYLPHENOL	61 U	60 U	62 U	62 U	60 U	64 U	61 U	59 U	57 U	64 U	69 U	66 U	61 U	68 U	62 U	65 U	62 U
3&4-METHYLPHENOL	61 U	60 U	62 U	62 U	60 U	64 U	61 U	59 U	57 U	64 U	69 U	66 U	61 U	68 U	62 U	65 U	62 U
4-METHYLPHENOL																	
ACENAPHTHENE	31 U	30 U	31 U	31 U	30 U	32 U	30 U	29 U	29 U	32 U	35 U	33 U	31 U	34 U	31 U	32 U	31 U
ACENAPHTHYLENE	31 U	30 U	31 U	31 U	30 U	32 U	30 U	29 U	29 U	32 U	35 U	33 U	31 U	34 U	31 U	32 U	31 U
ANTHRACENE	31 U	30 U	31 U	31 U	30 U	32 U	30 U	29 U	29 U	32 U	35 U	33 U	20.7 J	34 U	31 U	32 U	31 U
BENZO(A)ANTHRACENE	31 U	30 U	31 U	31 U	30 U	32 U	30 U	23.5 J	29 U	32 U	35 U	33 U	20.3 J	34 U	31 U	32 U	31 U
BENZO(A)PYRENE	31 U	30 U	31 U	31 U	30 U	32 U	30 U	19.2 J	29 U	32 U	35 U	33 U	31 U	34 U	31 U	32 U	31 U
BENZO(B)FLUORANTHENE	31 U	30 U	31 U	31 U	30 U	32 U	30 U	87.7	29 U	32 U	35 U	33 U	31 U	34 U	31 U	32 U	31 U
BENZO(G,H,I)PERYLENE	31 U	30 U	31 U	31 U	30 U	32 U	30 U	22.3 J	29 U	32 U	35 U	33 U	31 U	34 U	31 U	32 U	31 U
BENZO(K)FLUORANTHENE	31 U	30 U	31 U	31 U	30 U	32 U	30 U	21.6 J	29 U	32 U	35 U	33 U	31 U	34 U	31 U	32 U	31 U
CHRYSENE	31 U	30 U	31 U	31 U	30 U	32 U	30 U	21.6 J	29 U	32 U	35 U	33 U	18.1 J	34 U	31 U	32 U	31 U
DIBENZO(A,H)ANTHRACENE	31 U	30 U	31 U	31 U	30 U	32 U	30 U	22.1 J	29 U	32 U	35 U	33 U	31 U	34 U	31 U	32 U	31 U
DIBENZOFURAN	61 U	60 U	62 U	62 U	60 U	64 U	61 U	59 U	57 U	64 U	69 U	66 U	61 U	68 U	62 U	65 U	62 U
FLUORANTHENE	31 U	30 U	31 U	31 U	30 U	32 U	30 U	19 J	29 U	32 U	35 U	33 U	45.3	34 U	31 U	32 U	31 U
FLUORENE	31 U	30 U	31 U	31 U	30 U	32 U	30 U	29 U	29 U	32 U	35 U	33 U	31 U	34 U	31 U	32 U	31 U
HEXACHLOROBENZENE	61 U	60 U	62 U	62 U	60 U	64 U	61 U	13.8 J	57 U	64 U	69 U	66 U	61 U	68 U	62 U	65 U	62 U
INDENO(1,2,3-CD)PYRENE	31 U	30 U	31 U	31 U	30 U	32 U	30 U	21.4 J	29 U	32 U	35 U	33 U	31 U	34 U	31 U	32 U	31 U
NAPHTHALENE	31 U	30 U	31 U	31 U	30 U	32 U	30 U	29 U	29 U	32 U	35 U	33 U	31 U	34 U	31 U	32 U	31 U
PENTACHLOROPHENOL	310 UJ	300 UJ	310 UJ	310 UJ	300 UJ	320 UJ	300 UJ	290 UJ	290 U	320 U	350 U	330 U	310 U	340 U	310 U	320 U	310 U
PHENANTHRENE	31 U	30 U	31 U	31 U	30 U	32 U	30 U	29 U	29 U	32 U	35 U	33 U	56.6	34 U	31 U	32 U	31 U
PHENOL	61 U	60 U	62 U	62 U	60 U	64 U	61 U	59 U	57 U	64 U	69 U	66 U	61 U	68 U	62 U	65 U	62 U
PYRENE	31 U	30 U	31 U	31 U	30 U	32 U	30 U	24 J	29 U	32 U	35 U	33 U	35.7	34 U	31 U	32 U	31 U
CYANIDE	0.062 J	0.028 U	0.064 J	0.059 J	0.057 J	0.074 J	0.065 J	0.068 J	0.093 J	0.03 U	0.18 J	0.13 U	0.11 U	0.14 U	0.11 U	0.13 U	0.11 U