

Appendix D

Monitoring Well Construction Details, Monitoring Well Purge
Data and Soil Boring Logs

Monitoring Well Construction Logs



PROJECT NAME
LOOW

PERMIT NUMBER
NA

WELL DISTANCE FROM SOURCE
Unknown

WELL NUMBER
C3-WWTP-BP14

DATE INSTALLED (START)
10/22/09

DATE INSTALLED (COMPLETED)
10/22/09

WELL CONSTRUCTION DIAGRAM

TYPE OF PROTECTIVE COVER
STICK UP
FLUSH MOUNT

LOCATION OF WELL RELATIVE TO SOURCE
UP GRADIENT SIDE GRADIENT
DOWN GRADIENT UNKNOWN

WELL INSTALLED BY
Parrett Wolff
Mickey Marshal

USCS CLASSIFICATION OF SOIL NEAR SCREEN
GP GM GC GW
SW SP SM SC
ML MH CL CH

DRILLING METHOD USED
ROTARY
HOLLOW STEM
OTHER

DRILLING FLUID USED
WATER AIR
MUD NONE

RISER INTERVAL 0 TO 12 ft BGS

SCREEN INTERVAL 12 TO 22 ft BGS

ANNULAR SPACE SEAL 0 TO 8 ft BGS

BENTONITE SEAL 8 TO 10 ft BGS

SECONDARY FILTER NA TO NA ft BGS

PRIMARY FILTER 10 TO 22 ft BGS

WELL BOTTOM 22 ft BGS

FILTER PACK BOTTOM 22.5 ft BGS

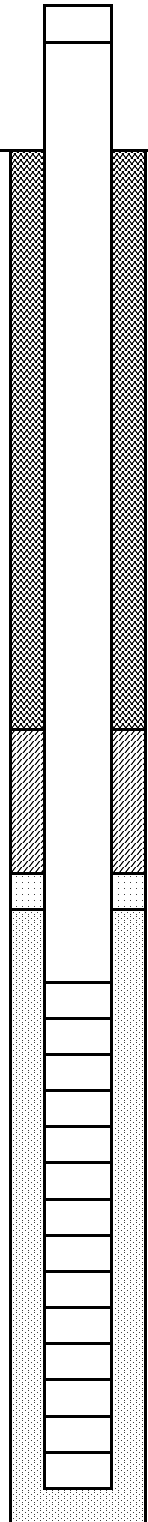
BOREHOLE BOTTOM 22.5 ft BGS

BOREHOLE DIAMETER 6.75 inches

ID WELL CASING 2 inches

WATER LEVEL AFTER COMPLETION 22.59 ft TOC

NOTES: Total Depth: 24.00 TOC



1 CAP AND LOCK YES NO
2 PROTECTIVE POSTS YES NO
3 PROTECTIVE CASING YES NO
INSIDE DIA 2 in
LENGTH 22.5 ft

4 ANNULAR SPACE SEAL
lb/gal GRANULAR BENTONITE
lb/gal BENTONITE SAND SLURRY
25 lb/gal BENTONITE SLURRY
BENTONITE - CEMENT GROUT
5 % BENTONITE

HOW INSTALLED
TREMIE
TREMIE PUMP
GRAVITY

5 CENTRALIZERS YES NO

6 BENTONITE SEAL GRANULES
PELLETS
Enviroplug Medium OTHER
1 bag/50lbs BAGS/SIZE

7 SECONDARY FILTER YES NO
BAGS/SIZE

8 FILTER PACK MATERIAL NAME/SIZE
Industrial Quartz
IIS Silica 9924
7/50lbs BAGS/SIZE

9 WELL CASING PVC SCHD 40
PVC SCHD 80
Diedrich OTHER

10 SCREEN MATERIAL: Diedrich
TYPE: FACTORY CUT
CONT. SLOT
MANUFACTURER Diedrich
SLOT SIZE 0.01 INCHES
SLOTTED LENGTH 10 FT

11 BACKFILL MATERIAL: (BELOW FILTER PK) NONE
 OTHER



PROJECT NAME
LOOW

PERMIT NUMBER
NA

WELL DISTANCE FROM SOURCE
Unknown

WELL NUMBER
C3-WWTP-BP15

DATE INSTALLED (START)
10/22/09

DATE INSTALLED (COMPLETED)
10/22/09

WELL CONSTRUCTION DIAGRAM

TYPE OF PROTECTIVE COVER
STICK UP
FLUSH MOUNT

LOCATION OF WELL RELATIVE TO SOURCE
UP GRADIENT SIDE GRADIENT
DOWN GRADIENT UNKNOWN

WELL INSTALLED BY
Parrett Wolff
Mickey Marshal

USCS CLASSIFICATION OF SOIL NEAR SCREEN
GP GM GC GW
SW SP SM SC
ML MH CL CH

DRILLING METHOD USED
ROTARY
HOLLOW STEM
OTHER

DRILLING FLUID USED
WATER AIR
MUD NONE

RISER INTERVAL 0 TO 12 ft BGS

SCREEN INTERVAL 12 TO 22.5 ft BGS

ANNULAR SPACE SEAL 0 TO 8 ft BGS

BENTONITE SEAL 8 TO 10 ft BGS

SECONDARY FILTER NA TO NA ft BGS

PRIMARY FILTER 10 TO 22.5 ft BGS

WELL BOTTOM 22.5 ft BGS

FILTER PACK BOTTOM 23 ft BGS

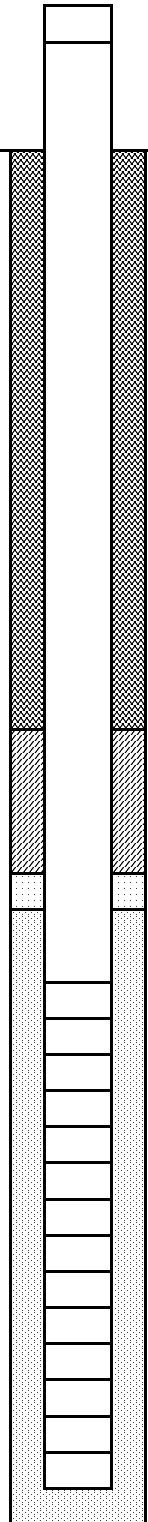
BOREHOLE BOTTOM 23 ft BGS

BOREHOLE DIAMETER 6.75 inches

ID WELL CASING 2 inches

WATER LEVEL AFTER COMPLETION 18.65 ft TOC

NOTES: Total Depth: 24.15 TOC



1 CAP AND LOCK YES NO
2 PROTECTIVE POSTS YES NO
3 PROTECTIVE CASING YES NO
INSIDE DIA 2 in
LENGTH 22.5 ft

4 ANNULAR SPACE SEAL
lb/gal GRANULAR BENTONITE
lb/gal BENTONITE SAND SLURRY
25 lb/gal BENTONITE SLURRY
BENTONITE - CEMENT GROUT
5 % BENTONITE

HOW INSTALLED
TREMIE
TREMIE PUMP
GRAVITY

5 CENTRALIZERS YES NO

6 BENTONITE SEAL GRANULES
PELLETS
Enviroplug Medium OTHER
1 bag/50lbs BAGS/SIZE

7 SECONDARY FILTER YES NO
BAGS/SIZE

8 FILTER PACK MATERIAL NAME/SIZE
Industrial Quartz
US Silica 9924
7/50lbs BAGS/SIZE

9 WELL CASING PVC SCHD 40
PVC SCHD 80
Diedrich OTHER

10 SCREEN MATERIAL: Diedrich
TYPE: FACTORY CUT
CONT. SLOT
MANUFACTURER Diedrich
SLOT SIZE 0.01 INCHES
SLOTTED LENGTH 10 FT

11 BACKFILL MATERIAL: (BELOW FILTER PK) NONE
 OTHER



PROJECT NAME
LOOW

PERMIT NUMBER
NA

WELL DISTANCE FROM SOURCE
Unknown

WELL NUMBER
C3-WWTP-BP16

DATE INSTALLED (START)
10/22/09

DATE INSTALLED (COMPLETED)
10/22/09

WELL CONSTRUCTION DIAGRAM

TYPE OF PROTECTIVE COVER
STICK UP
FLUSH MOUNT

LOCATION OF WELL RELATIVE TO SOURCE
UP GRADIENT SIDE GRADIENT
DOWN GRADIENT UNKNOWN

WELL INSTALLED BY
Parrett Wolff
Mickey Marshal

USCS CLASSIFICATION OF SOIL NEAR SCREEN
GP GM GC GW
SW SP SM SC
ML MH CL CH

DRILLING METHOD USED
ROTARY
HOLLOW STEM
OTHER

DRILLING FLUID USED
WATER MUD AIR NONE

RISER INTERVAL 0 TO 12 ft BGS

SCREEN INTERVAL 12 TO 22.5 ft BGS

ANNULAR SPACE SEAL 0 TO 8 ft BGS

BENTONITE SEAL 8 TO 10 ft BGS

SECONDARY FILTER NA TO NA ft BGS

PRIMARY FILTER 10 TO 22.5 ft BGS

WELL BOTTOM 22.5 ft BGS

FILTER PACK BOTTOM 23 ft BGS

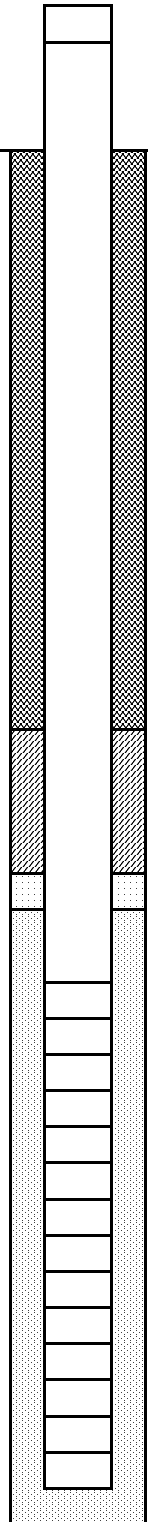
BOREHOLE BOTTOM 23 ft BGS

BOREHOLE DIAMETER 6.75 inches

ID WELL CASING 2 inches

WATER LEVEL AFTER COMPLETION 18.52 ft TOC

NOTES:



1 CAP AND LOCK YES NO
2 PROTECTIVE POSTS YES NO
3 PROTECTIVE CASING YES NO
INSIDE DIA 2 in
LENGTH 22.5 ft

4 ANNULAR SPACE SEAL
lb/gal GRANULAR BENTONITE
lb/gal BENTONITE SAND SLURRY
25 lb/gal BENTONITE SLURRY
BENTONITE - CEMENT GROUT
5 % BENTONITE
HOW INSTALLED
TREMIE
TREMIE PUMP
GRAVITY

5 CENTRALIZERS YES NO

6 BENTONITE SEAL GRANULES
PELLETS
Enviroplug Medium OTHER
1 bag/50lbs BAGS/SIZE

7 SECONDARY FILTER YES NO
BAGS/SIZE

8 FILTER PACK MATERIAL NAME/SIZE
Industrial Quartz
US Silica 9924
7/50lbs BAGS/SIZE

9 WELL CASING PVC SCHD 40
PVC SCHD 80
Diedrich OTHER

10 SCREEN MATERIAL: Diedrich
TYPE: FACTORY CUT
CONT. SLOT
MANUFACTURER Diedrich
SLOT SIZE 0.01 INCHES
SLOTTED LENGTH 10 FT

11 BACKFILL MATERIAL: (BELOW FILTER PK) NONE
 OTHER

Monitoring Well Purge Logs

LOW FLOW SAMPLING DATA SHEET

SITE: C3-WWTP (LOOW) **FIELD PERSONNEL:** Chris Scism
DATE: 11/12/09 Noelle Seay
WEATHER: ~24, Sunny



MONITORING WELL: BP14 **WELL DEPTH:** 23.85' **STICK-UP / FLUSH MOUNT**
WELL SIZE: 2 Inches **WELL VOLUME:** 2.27 GAL
 2 inch = 0.163 gal/ft 4 inch = 0.653 gal/ft

PID/FID READINGS **BACKGROUND:** 0 **PUMP INTAKE DEPTH:** 20 ft below TOC
BENEATH WELL CAP: 0 **DEPTH OF WATER BEFORE PUMP INSTALLATION:** 9.95' ft below TOC

TIME	PURGING	SAMPLING	pH (pH units)		SPECIFIC CONDUCTIVITY (mS/cm)		TURBIDITY (NTU)		DISSOLVED OXYGEN (mg/l)		TEMPERATURE (degrees C)		OXYGEN REDUX POTENTIAL (mv)		PUMPING RATE (ml/min)	DEPTH TO WATER (ft below toc)
			READING	CHANGE	READING	CHANGE	READING	CHANGE	READING	CHANGE	READING	CHANGE	READING	CHANGE		
			0900	X		6.82	NA	1.38	NA	122	NA	8.48	NA	12.4		
0905	X		7.21		1.46		136		8.08		12.0		172		100	14.68
0910	X		7.28		1.51		37.2		7.73		12.8		160		300	15.21
0915	X		7.25		1.55		37.1		7.66		12.9		156		175	15.57
0920	X		7.24		1.64		32.4		7.43		12.8		151		125	15.90
0925	X		7.23		1.71		28.3		7.31		12.4		149		100	16.14
0930		X	7.24		1.72		20.0		7.09		12.8		147		125	16.52
Stabilization			± 0.2		± 3%		± 10% or <10 NTU		± 10% or 0.2 mg/L		± 3%		± 20 mV			

COMMENTS: **GAL PURGED:** ~4 gal.

LOW FLOW SAMPLING DATA SHEET

SITE: C3-WWTP (LOOW) **FIELD PERSONNEL:** Chris Scism
DATE: 11/12/09 Noelle Seay
WEATHER: ~45 & Sunny



MONITORING WELL: BP15 **WELL DEPTH:** 24.03' **STICK-UP / FLUSH MOUNT**
WELL SIZE: 2 Inches **WELL VOLUME:** 2.99 GAL
 2 inch = 0.163 gal/ft 4 inch = 0.653 gal/ft

PID/FID READINGS **BACKGROUND:** 0 **PUMP INTAKE DEPTH:** 19' ft below TOC
BENEATH WELL CAP: 0 **DEPTH OF WATER BEFORE PUMP INSTALLATION:** 5.68 ft below TOC

TIME	PURGING	SAMPLING	pH (pH units)		SPECIFIC CONDUCTIVITY (mS/cm)		TURBIDITY (NTU)		DISSOLVED OXYGEN (mg/l)		TEMPERATURE (degrees C)		OXYGEN REDUX POTENTIAL (mv)		PUMPING RATE (ml/min)	DEPTH TO WATER (ft below toc)
			READING	CHANGE	READING	CHANGE	READING	CHANGE	READING	CHANGE	READING	CHANGE	READING	CHANGE		
			1050	X		7.48	NA	1.34	NA	81.1	NA	11.02	NA	12.7		
1055	X		7.44		1.33		81.9		10.52		12.6		177		550	7.80
1100	X		7.44		1.32		55.7		10.62		13.0		181		125	8.29
1105	X		7.46		1.32		25.2		10.66		13.0		184		375	9.54
1110	X		7.47		1.32		22.1		10.43		12.9		182		200	10.15
1115	X		7.47		1.32		20.6		10.57		13.1		181		400	11.44
1120		X	7.45		1.32		22.3		10.46		13.1		178		350	12.60
Stabilization			± 0.2		± 3%		± 10% or <10 NTU		± 10% or 0.2 mg/L		± 3%		± 20 mV			

COMMENTS: _____ **GAL PURGED:** ~4 gal

LOW FLOW SAMPLING DATA SHEET

SITE: C3-WWTP (LOOW) **FIELD PERSONNEL:** Chris Scism
DATE: 11/12/09 Noelle Seay
WEATHER: ~50 & Sunny



MONITORING WELL: BP16 **WELL DEPTH:** 23.92 **STICK-UP / FLUSH MOUNT**
WELL SIZE: 2 Inches **WELL VOLUME:** 3.14 GAL
 2 inch = 0.163 gal/ft 4 inch = 0.653 gal/ft

PID/FID READINGS **BACKGROUND:** 0 **PUMP INTAKE DEPTH:** 18.5 ft below TOC
BENEATH WELL CAP: 0 **DEPTH OF WATER BEFORE PUMP INSTALLATION:** 4.69 ft below TOC

TIME	PURGING	SAMPLING	pH (pH units)		SPECIFIC CONDUCTIVITY (mS/cm)		TURBIDITY (NTU)		DISSOLVED OXYGEN (mg/l)		TEMPERATURE (degrees C)		OXYGEN REDUX POTENTIAL (mv)		PUMPING RATE (ml/min)	DEPTH TO WATER (ft below toc)
			READING	CHANGE	READING	CHANGE	READING	CHANGE	READING	CHANGE	READING	CHANGE	READING	CHANGE		
1215	X		7.34	NA	2.44	NA	103	NA	9.00	NA	13.0	NA	164	NA	800	6.87
1220	X		7.12		2.43		72.0		6.97		13.2		164		600	8.51
1225	X		7.12		2.42		64.8		6.25		13.3		161		125	9.29
1230	X		7.17		2.40		59.9		6.00		13.3		156		150	10.75
1235	X		7.20		2.37		89.4		6.10		13.4		150		125	13.10
1240	X		7.24		2.34		97.5		6.13		13.4		147		100	14.53
1245		X	7.27		2.33		108		5.88		13.4		145		300	15.55
Stabilization			± 0.2		± 3%		± 10% or <10 NTU		± 10% or 0.2 mg/L		± 3%		± 20 mV			

COMMENTS: _____ **GAL PURGED:** ~4.5 gal

Soil Boring Logs



BORING LOG: C3-WWTP-04

SHEET 1 OF 1

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/10/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 11-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO FT BGS	
WELL DEPTH: NA	SCREEN INTERVAL NA TO FT BGS	
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	µr/Hr	RECOVERY	DROP-EX	INTERVAL
0-0.5	Gravel		2				
0.25-1.75	Brown SANDY SILT, Loose, Non-cohesive. Dry						
1.75-4	Light Brown SILTY CLAY, Tight, Cohesive, Dry.	SM	1	3	4 / 4	NA	0-4
		CL	1				
		CL	0				
		CL	0				
4-8	Brown SILTY CLAY, Tight, Cohesive, Dry. Some Light Grey Clay Seams, some Pebbles	CL	0	2	4 / 4	NA	4-8
		CL	0				
		CL	0				
		CL	0				
8-11	Brown SILTY CLAY, Tight, Cohesive, Dry. Some Light Grey Clay Seams, some Pebbles	CL	0	3	3 / 3	NA	8-11
		CL	0				
		CL	0				
12	REFUSAL at 11-ft BGS						
	Field designation: C3-WWTP-SO-BP04-0.5' @815 (TOC/pH)						
	Revised designation: C3-WWTP-SO-04-0.5						
	Field designation = C3-WWTP-SO-BP04-11'@825 (TOC/pH)						
14	Revised designation = C3-WWTP-SP-04-11						
	Note that this location was originally designated as C3-WWTP-04-*** in the FSP. Designation was changed in the field to BP4. The location targets a Phase I sampling location (04) that had reported elevated concentrations of volatile organic compounds.						



BORING LOG: C3-WWTP-BP03 (Western Drainage Ditch)

SHEET 1 OF 1

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/10/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 0.5-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO	FT BGS
WELL DEPTH: NA	SCREEN INTERVAL NA TO	FT BGS
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	µr/Hr	RECOVERY	DROP-EX	INTERVAL
0-2	0-0.5 SEDIMENT AND ORGANICS	PT	0	8	0.5 / 0.5	NA	0-0.5
2-4							
4-6	Field sample designation: C3-WWTP-SD-BPWDD0-0.5' @1320 (DUPLICATE 6) (terrestrial soil collected from within the Western Drainage Ditch) Revised sample designation: C3-WWTP-SO-BP03-0.5						
6-8							
8-10							
10-12							
12-14	Note: this is the location originally presented as BP03 in the FSP. Nomenclature "WDD0" was added at the request of the USACE. WDD0 = Western Drainage Ditch 0.						
14-16							
16-18							



BORING LOG:
C3-WWTP-BP04
 (Western Drainage Ditch)

SHEET 1 OF 1

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/10/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 0.5-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO FT BGS	
WELL DEPTH: NA	SCREEN INTERVAL NA TO FT BGS	
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	µr/Hr	RECOVERY	DROP-EX	INTERVAL
0-0.5	ORGANICS/SEDIMENT	PT	0				
2				7	0.5 / 0.5	NA	0-0.5
4	Field designation = C3-WWTP-SD-BPWDDE/F800-0.5' @1150 Revised designation = C3-WWTP-SO-BP04-0.5						
8	Note this corresponds to location BP04 from the FSP. "WWD" added at the requires of USACE.						
10							
12							
14							
16							
18							



BORING LOG: C3-WWTP-BP05

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/9/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 1.2-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO	FT BGS
WELL DEPTH: NA	SCREEN INTERVAL NA TO	FT BGS
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	µr/Hr	RECOVERY	DROP-EX	INTERVAL
0-0.5	Organics	PT	0	2	1.2 / 1.2	NA	0-1.2
0.5-1.2	GRAVEL (old Concrete)	GW	0				
2	Refusal due to old concrete/gravel base in sludge bed. Talked with USACE Representative and collected the 0-5' sample from locations throughout the sludge bed. These sub-sample were composited into a single sample for submittal to lab.						
4	C3-WWTP-SO-BP05-0.5' @1030						
6							
8							
10							
12							
14							
16							
18							



BORING LOG: C3-WWTP-BP06

SHEET 1 OF 1

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/20/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Hollow-Stem Auger / Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 1.2-FT DIAMETER 2-INCHES	RISER INTERVAL NA	TO FT BGS
WELL DEPTH: NA	SCREEN INTERVAL NA	TO FT BGS
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	µr/hr	RECOVERY	DROP-EX	INTERVAL
0-0.5	Grass and Organics		0				
0.5-1.2	GRAVEL (old Concrete)						
2	Refusal due to old concrete/gravel base in sludge bed. Talked with USACE Representative and collected the 0-5' sample from locations throughout the sludge bed	GW	0		2 / 2	NA	0-2
4	C3-WWTP-SO-BP6-0.5' @1745						
6							
8							
10							
12							
14							
16							
18							



BORING LOG: C3-WWTP-BP07

SHEET 1 OF 1

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/8/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 11.8-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO FT BGS	
WELL DEPTH: NA	SCREEN INTERVAL NA TO FT BGS	
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	µr/hr	RECOVERY	DROP-EX	INTERVAL
0-0.5	Grass and Organics		0				
0.5-1.5	Grey SILTY CLAY, Tight, Cohesive, Dry		0				
1.5-2	Black SANDY SILT, with trace CLAY. Tight, Semi-Cohesive, Dry	CL	0				
2-2.5	Light Grey/Orange Brown Mottled SILTY CLAY, Tight, Cohesive, Dry.	ML	0	9	4 / 4	NA	0-4
2.5-4	Grey Brown CLAYEY SILT with trace SAND. Tight, Non-cohesive, Dry with some Angular Pebbles	ML	0				
4-4.7	Brown SILT with some CLAY. Tight, Semi-cohesive, Dry. Some Dolomite Rock Fragments.	CL	0				
4.7-7.8	Brown SILTY CLAY, Tight, Cohesive, Dry. Some Angular Pebbles.	CL	0				
7.8-8		CL	0	10	4 / 4	NA	4-8
8-8.9	Brown Grey SILTY CLAY, Tight, Cohesive, Dry. Some Angular Pebbles.	CL	0				
8.9-9		CL	0				
9-11.8	Grey Brown SILTY CLAY with Light Grey very Fine SANDY Seam (0.01" throughout). Tight, Cohesive, Dry, Very hard drilling.	CL	0	10	4 / 4	NA	8-11.8
11.8	REFUSAL at 11.8-ft BGS						
	C3-WWTP-SO-BP07-0.5' @850						
	C3-WWTP-SO-BP07-11.5' @900						
	Targeted aerial anomaly.						
14							
16							
18							



BORING LOG: C3-WWTP-BP08

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/8/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 11.5-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO FT BGS	
WELL DEPTH: NA	SCREEN INTERVAL NA TO FT BGS	
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	µr/hr	RECOVERY	DROP-EX	INTERVAL
0-0.5	Grass and Organics		0				
0.5-1	Light Brown Fine SANDY SILT, Loose, Non-Cohesive, Dry.						
1-2	Black SANDY SILT. Loose, Non-cohesive, Dry.						
2	2-2.5 Light Grey/Light Brown Mottled SILTY CLAY, Tight, Cohesive. Dry	ML	0	10	4 / 4	NEGATIVE	0-4
	2.5-4 Brown/Light Gray Mottled SILTY CLAY. Tight, Cohesive, Dry.	CL	0				
		CL	0				
4	4-8 Brown SILTY CLAY, Very Tight, Cohesive, Dry. Some Dolomite Rock Fragments.	CL	0	10	4 / 4	NEGATIVE	4-8
		CL	0				
		CL	0				
8	8-11.5 Brown SILTY CLAY, Tight, Cohesive, Small Light Grey Fine SANDY CLAY Seams. Dry	CL	0	10	3.5 / 3.5	NEGATIVE	8-11.5
		CL	0				
		CL	0				
12	12-16 Brown SILTY CLAY, Tight, Cohesive, Trace Angular Pebbles. Moist	CL	0	10	4 / 4	NEGATIVE	12-16
		CL	0				
		CL	0				
16	16-20 Light Grey FAT CLAY, Tight, Cohesive, Wet	CH	0	10	4 / 4	NEGATIVE	16-20
18	C3-WWTP-SO-BP08-0.5' @940	CH	0				
	C3-WWTP-SO-BP08-11' @945	CH	0				
	C3-WWTP-SO-PB08A-16' @1130 on 7/20/09 Targeted aerial anomaly.	CH	0				
20		CH	0				



BORING LOG: C3-WWTP-BP09

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/21/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Hollow-Stem Auger / Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 20-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO FT BGS	
WELL DEPTH: NA	SCREEN INTERVAL NA TO FT BGS	
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREEING RESULTS	µr/Hr	RECOVERY	DROP-EX	INTERVAL
0-0.25	ORGANICS		0				
0.25-4	Brown SANDY SILT, Trace CLAY. Tight, Non-Cohesive, Dry.	SM	0	8	4 / 4	NA	0-4
		SM	0				
		SM	0				
4-8	Brown SILTY CLAY with SAND. Tight, Cohesive, Dry	CL	0				
		CL	0	8	4 / 4	NA	4-8
6.5-6.6	Black Medium SAND. Loose, Non-cohesvie, Dry.	CL	0				
		CL	0				
8-12	Brown SILTY CLAY, Tight, Cohesive, Moist at 11-ft. Some Pebbles and Cobbles.	CL	0				
		CL	0	8	4 / 4	NA	8-12
		CL	0				
		CL	0				
12-16	Brown SILTY CLAY, Tight, Cohesive, Moist, Some Pebbles and Cobbles.	CL	0				
		CL	0	8	4 / 4	NA	12-16
		CL	0				
		CL	0				
16-20	Grey FAT CLAY, Tight, Cohesive, Wet.	CH	0				
		CH	0	7	4 / 4	NA	16-20
		CH	0				
	C3-WWTP-SO-BP09-0.5' @1010						
	C3-WWTP-SO-BP09-15' @1030						
	Targeted acid waste manhole						



BORING LOG:C3-WWTP-BP10

SHEET 1 OF 1

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/08/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 0.5-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO FT BGS	
WELL DEPTH: NA	SCREEN INTERVAL NA TO FT BGS	
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREEING RESULTS	µr/hr	RECOVERY	DROP-EX	INTERVAL
0-0.1	Topsoil and Organics						
0.1-0.5	Brown SILTY CLAY, with Trace SAND. Tight, Cohesive, Dry.	CL	0				
2				8	0.5 / 0.5	NA	0-0.5
4	BIASED SAMPLE. PCB'S ONLY C3-WWTP-SO-BP10-0.5' @1010						
6	Targeted former fenced area with what appeared to be transformers.						
8							
10							
12							
14							
16							
18							



BORING LOG: C3-WWTP-BP11

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/9/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 0.5-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO	FT BGS
WELL DEPTH: NA	SCREEN INTERVAL NA TO	FT BGS
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	μr/Hr	RECOVERY	DROP-EX	INTERVAL
0-0.25	GRASS and ORGANICS	SM	0	8	0.5 / 0.5	NA	0-0.5
0-.25-0.5	Black SANDY SILT, Loose, Non-Cohesive						
4	C3-WWTP-SO-BP11-0.5' @1750 Targeted base of pole that held transformers in the past.						
6							
8							
10							
12							
14							
16							
18							



BORING LOG: C3-WWTP-BP12

SHEET 1 OF 1

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/20/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Hollow-Stem Auger / Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 16-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO	FT BGS
WELL DEPTH: NA	SCREEN INTERVAL NA TO	FT BGS
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREEING RESULTS	µr/hr	RECOVERY	DROP-EX	INTERVAL
0-0.25	Grass and Organics		2.8				
0.25-3.75	Brown Medium SANDY SILT, Loose, Non-Cohesive. Some SANDSTONE Rock Fragments. Dry.	SM	2.1	6	4 / 4	NA	0-4
2		SM	1.7				
3.75-4	Grey Brown SILT, Tight, Semi-Cohesive. Dry	ML	0				
4	4-4.5 Grey Brown SILT, Tight, Semi-Cohesive, Dry.	ML	0				
4.5-7.25	Brown Very Fine SANDY SILT, Tight, Non-Cohesive, Wet.	SM	0	6	4 / 4	NA	4-8
6		SM	0				
7.25-8	Grey Brown SILT, Tight, Semi-Cohesive, Dry	ML	0				
8	8-8.25 Brown Very Fine SANDY SILT, Tight, Non-Cohesive, Wet. 8.25-12 Brown SILTY CLAY, Tight, Cohesive, Moist.	SM	0				
10		CL	0	5	4 / 4	NA	8-12
		CL	0				
		CL	0				
12	12-13 Brown SILTY CLAY, Tight, Cohesive, Moist.	CL	0				
13-16	Light Grey Fat CLAY, Tight, Cohesive, Wet	CH	0	5	4 / 4	NA	12-16
14		CH	0				
		CH	0				
16	C3-WWTP-SO-BP12-0.5' @ 1700 C3-WWTP-SO-BP12-13' @ 1720						
18	B12 was added at the request of USACE. It was placed between the northern slduge bed, Imhoff tank, and chlorine contact tank.						



BORING LOG: C3-WWTP-BP13

SHEET 1 OF 1

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/20/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 2-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO	FT BGS
WELL DEPTH: NA	SCREEN INTERVAL NA TO	FT BGS
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREEING RESULTS	µr/hr	RECOVERY	DROP-EX	INTERVAL
0-0.5	Grass Organics	PT	0				
0.5-1.2	GRAVEL (old Concrete)	GW	0				
2	Refusal due to old concrete/gravel base located between the Imhoff Tank and the Northern Sludge Bed. Tried 4 locations, and could not get passed 2-ft, all concrete fill. Abandoned location, did not collect a sample.				2 / 2	NA	0-2
4							
6							
8							
10							
12							
14							
16							
18							



BORING LOG: C3-WWTP-C(+50)300

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/10/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 11-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO	FT BGS
WELL DEPTH: NA	SCREEN INTERVAL NA TO	FT BGS
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	µr/Hr	RECOVERY	DROP-EX	INTERVAL
0-0.5	Grass and Organics		0				
0.5-1.5	Brown /Black SILTY SAND, Tight, Non-cohesive, Dry.						
1.5-4	Light Brown SILTY CLAY, Tight, Cohesive, Dry	SM	0	7	4 / 4	NA	0-4
		CL	0				
		CL	0				
4-8	Brown SILTY CLAY, Tight, Cohesive, Dry. Dolomite Rock at 4.1-ft	CL	0	7	4 / 4	NA	4-8
		CL	0				
		CL	0				
		CL	0				
8-11	Brown SILTY CLAY, Tight, Cohesive, Dry. Dolomite Rock Fragments throughout	CL	0	6	3 / 3	NA	8-11
		CL	0				
		CL	0				
12	REFUSAL at 11-ft BGS						
14	Original designation = C3-WWTP-SO-C/D300-0.5' @925 Revised designation = C3-WWTP-SO-C(+50)300-0.5 Original designation = C3-WWTP-SO-C/D300-11' @940 Revised designation = C3-WWTP-SO-C(+50)-11						
16							
18							



BORING LOG: C3-WWTP-D(+50)300

SHEET 1 OF 1

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/10/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 11.5-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO FT BGS	
WELL DEPTH: NA	SCREEN INTERVAL NA TO FT BGS	
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	μr/hr	RECOVERY	DROP-EX	INTERVAL
0-0.5	Grass and Organics		0				
0.5-1.25	Brown SANDY SILT, Loose, Non-cohesive, Dry.		0				
1.25-3.75	Brown SILTY CLAY, Tight, Cohesive, Dry. Some Dolomite Rock Fragments	SM	0	8	3.75 / 3.75	NA	0-4
2		CL	0				
4		CL	0				
4-8	Brown SILTY CLAY, Tight, Cohesive, Dry.	CL	0	8	4 / 4	NA	4-8
6		CL	0				
8		CL	0				
10		CL	0				
8-9.5	Brown SILTY CLAY, Tight, Cohesive, Dry	CL	0	7	3.5 / 3.5	NA	8-11.5
9.5-10	Brown SANDY SILT, Tight, Cohesive, Dry	SM	0				
10-11.5	Brown SILTY CLAY, Tight, Cohesive, Dry	CL	0				
12		CL	0				
12	REFUSAL at 11.5-ft BGS Field designation = C3-WWTP-SO-D/E300-0.5' @950 DUPLICATE SAMPLE 5 Revised designation = C3-WWTP-SO-D(+50)300-0.5						
14	Field designation = C3-WWTP-SO-D/E300-11.5' @1015 Revised designation = C3-WWTP-SO-D(+50)300-11.5						
16							
18							



BORING LOG:

C3-WWTP-E(+50)300

(Western Drainage Ditch)

SHEET 1 OF 1

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/10/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 3.5-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO FT BGS	
WELL DEPTH: NA	SCREEN INTERVAL NA TO FT BGS	
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	µr/hr	RECOVERY	DROP-EX	INTERVAL
0	Located on the bank of the ditch next to the terrestrial sediment sample location. Ditch was approx. 8-ft deep. Drilled to 8-ft bgs and started at 0-ft bgs. 0-3.5 Brown SILTY CLAY, Tight, Cohesive, Damp. Grey SILTY CLAY Seams.	CL	0	7	3.5 / 3.5	NA	0-3.5
2		CL	0				
4		CL	0				
4	REFUSAL AT 3.5-ftBGS Field designation = C3-WWTP-SD-WDDE/F300-0.5' @1250 Revised designation = C3-WWTP-SO-E(+50)300-0.5						
6	Field designation = C3-WWTP-SO-WDDE/F300-3' @1305 Revised designation = C3-WWTP-SO-E(+50)300-3						
8							
10							
12							
14							
16							
18							



BORING LOG: C3-WWTP-F(+50)300

SHEET 1 OF 1

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/8/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 11-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO FT BGS	
WELL DEPTH: NA	SCREEN INTERVAL NA TO FT BGS	
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	μr/hr	RECOVERY	DROP-EX	INTERVAL
0-0.25	Grass and Organics		0				
0.25-4	Brown SILTY CLAY, Tight, Cohesive, Some smooth pebbles	CL	0	8	4 / 4	NA	0-4
		CL	0				
		CL	0				
		CL	0				
4-8	Brown SILTY CLAY Tight, Cohesive, Dry. Trace Gray Clay Seams, Some Pebbles	CL	0	8	4 / 4	NA	4-8
		CL	0				
		CL	0				
		CL	0				
8-10.75	Brown SILTY CLAY Tight, Cohesive, Dry. Trace Gray Clay Seams, Some Pebbles	CL	0	8	3 / 3	NA	8-11
		CL	0				
		SP	0				
10.75-11	Brown SAND with SILT, Tight, Non-cohesive. Wet						
12	REFUSAL at 11-ft BGS						
	Field designation = C3-WWTP-SO-F/G300-0.5' @1640.						
	Revised designation = C3-WWTP-SO-F(+50)300-0.5.						
	Field designation = C3-WWTP-SO-F/G300-11'@1700.						
14	Revised designation = C3-WWTP-SO-F(+50)300-11						
16							
18							



BORING LOG: C3-WWTP-C400

SHEET 1 OF 1

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/10/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 12-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO FT BGS	
WELL DEPTH: NA	SCREEN INTERVAL NA TO FT BGS	
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	μr/hr	RECOVERY	DROP-EX	INTERVAL
0-0.5	Grass and Organics		2				
0.5-4	Brown SILTY SAND. Loose, Non-cohesive, Moist at 3.5-ft						
2		SM	1	3	4 / 4	NA	0-4
		SM	1				
		SM	0				
4	4-4.75 Brown SILTY SAND. Loose, Non-cohesive, Perched water (possibly from the Imhoff Tank)						
	4.75-8 Brown SILTY CLAY, Tight, Cohesive, Moist.			2	4 / 4	NA	4-8
6		CL	0				
		CL	0				
		CL	0				
8	8-9.5 Brown SILTY CLAY, Tight, Cohesive, Moist.						
	9.5-12 Grey SILTY CLAY, Tight, Cohesive, Moist.			3	4 / 4	NA	8-12
10		CL	0				
		CL	0				
		CL	0				
12	REFUSAL at 12-ft BGS C3-WWTP-SO-C400-0.5' @720 C3-WWTP-SO-C400-12'@745						
14							
16							
18							



BORING LOG: C3-WWTP-C400A

SHEET 1 OF 1

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/20/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Hollow-Stem Auger / Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 16-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO FT BGS	
WELL DEPTH: NA	SCREEN INTERVAL NA TO FT BGS	
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	μr/hr	RECOVERY	DROP-EX	INTERVAL
0-0.5	Organics		0				
0.5-1	Brown SILTY CLAY, Tight, Cohesive, Dry						
1-1.25	Brown/Black SANDY SILT, Tight, Non-cohesive, Dry.						
1.25-4	Brown SILTY CLAY, Tight, Cohesive, Some Pebbles, Dry.	ML	0	7	4 / 4	NA	0-4
		CL	0				
		CL	0				
4-8	Brown SILTY CLAY, Tight, Cohesive, Dry. Some Pebbles. Light Grey SILTY CLAY Seams (0.01") throughout.	CL	0	8	4 / 4	NA	4-8
		CL	1				
		CL	1				
		CL	0				
8-12	Brown SILTY CLAY, Tight, Cohesive, Dry. Some Pebbles. Light Grey SILTY CLAY Seams (0.01") throughout. Some Red SANDSTONE Rock Fragments at 11.5-ft	CL	0	7	4 / 4	NA	8-12
		CL	0				
		CL	0				
		CL	0				
12-14	Brown SILTY CLAY, Tight, Cohesive, Dry. Some Pebbles. Light Grey SILTY CLAY Seams (0.01") throughout.	CL	0	8	4 / 4	NA	12-16
		CL	0				
14-16	Brown SILTY CLAY, Tight, Cohesive, Dry. Some Pebbles. Light Grey SILTY CLAY Seams (0.01") throughout. Wet at 14-ft	CL	0				
		CL	0				
16	C3-WWTP-SO-C400A-0.5' @ 1455 (TOC/pH). Duplicate 7 C3-WWTP-SO-C400A-14' @1535 (TOC/pH).						
18							



BORING LOG: C3-WWTP-D400

SHEET 1 OF 1

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/10/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 11.8-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO	FT BGS
WELL DEPTH: NA	SCREEN INTERVAL NA TO	FT BGS
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	µr/Hr	RECOVERY	DROP-EX	INTERVAL
0-0.25	Grass and Organics		0				
0.25-1.75	Brown SANDY SILT, Loose, Semi-cohesive. Dry						
1.75-4	Light Brown silty CLAY, Tight, Cohesive, Dry.	SM	0	3	4 / 4	NA	0-4
		CL	0				
		CL	0				
4-8	Brown SILTY CLAY, Tight, Cohesive, Dry. Some pebbles	CL	0	2	4 / 4	NA	4-8
		CL	0				
		CL	0				
		CL	0				
8-11.8	Light Grey/Brown SILTY CLAY, Tight, Cohesive, Moist. Some Cobbles at 10-ft	CL	0	5	3.8 / 3.8	NA	8-11.9
		CL	0				
		CL	0				
		CL	0				
12	REFUSAL at 11.8-ft BGS						
	C3-WWTP-SO-D400-0.5' @840						
	C3-WWTP-SO-D400-11.5'@855						
14	C3-WWTP-WW-RINSATE-3@900 COLLECTED OF MACRO CORE SHOE						
16							
18							



BORING LOG: C3-WWTP-E400

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/9/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 11-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO FT BGS	
WELL DEPTH: NA	SCREEN INTERVAL NA TO FT BGS	
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREEING RESULTS	µm/Hr	RECOVERY	DROP-EX	INTERVAL
0-0.5	Gravel and Topsoil		0				
0.5-4	Brown SILTY CLAY with SAND, Tight, Cohesive, Damp.						
1-4	Brown SILTY CLAY, Tight, Cohesive, Dry.	CL	0	9	4 / 4	NA	0-4
2		CL	0				
		CL	0				
		CL	0				
4	4-8 Brown SILTY CLAY, Tight, Cohesive, Dry. Trace Grey SILTY CLAY Seams.						
6		CL	0	8	4 / 4	NA	4-8
		CL	0				
		CL	0				
		CL	0				
8	8-11 Brown SILTY CLAY, Tight, Cohesive, Dry. Trace Grey SILTY CLAY Seams.						
10		CL	0	8	3 / 3	NA	8-11
		CL	0				
		CL	0				
12	REFUSAL at 11-ft BGS						
14	C3-WWTP-SO-E400-0.5' @1710 (Duplicate 4) C3-WWTP-SO-E400-11'@1730						
16							
18							



BORING LOG: C3-WWTP-F400

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/9/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 11.2-FT DIAMETER 2-INCHES	RISER INTERVAL NA	TO FT BGS
WELL DEPTH: NA	SCREEN INTERVAL NA	TO FT BGS
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREEING RESULTS	µm/Hr	RECOVERY	DROP-EX	INTERVAL
2	0-0.5 Grass and Organics 0.5-1 Brown SILTY CLAY with SAND, Tight, Cohesive, Dry.		2.7	7	3.75 / 4	NA	0-4
	1-4 Brown SILTY CLAY, Tight, Cohesive, Dry.	CL	1				
		CL	0				
		CL	0				
6	4-8 Brown SILTY CLAY, Tight, Cohesive, Dry (7-7.1 Fine Red Brown SAND, Loose, Non-cohesive, dry).	CL	m	7	4 / 4	NA	4-8
		CL	0				
		CL	0				
		CL	0				
10	8-11.2 Brown SILTY CLAY, Tight, Cohesive, Moist, Some Rounded Dolomite Cobbles	CL	0	7	3.2 / 3.2	NA	8-11.2
		CL	0				
		CL	0				
		CL	0				
12	REFUSAL at 11.2-ft BGS						
14	C3-WWTP-SO-F400-0.5' @745 C3-WWTP-SO-F400-11'@800						
16							
18							



BORING LOG: C3-WWTP-G400

SHEET 1 OF 1

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/8/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 11.5-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO FT BGS	
WELL DEPTH: NA	SCREEN INTERVAL NA TO FT BGS	
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	µr/hr	RECOVERY	DROP-EX	INTERVAL
0-0.25	Grass and Organics		4.5				
0.25-2	Brown SANDY SILT, Tight, Semi-cohesive, Dry						
2	2-4 Brown SILTY CLAY, Tight, Cohesive, Dry.	ML	2	7	4 / 4	NA	0-4
		CL	0				
		CL	0				
4	4-8 Brown SILTY CLAY Tight, Cohesive, Dry. Some Angular Pebbles	CL	0				
		CL	0				
6		CL	0	7	4 / 4	NA	4-8
		CL	0				
8	8-11 Brown SILTY CLAY, Tight, Cohesive, some rounded pebbles. Dry	CL	2				
		CL	2.5				
10		SP	2.5	8	3.5 / 3.5	NA	8-11.5
11-11.5	Brown Fine SAND, Loose, Non-Cohesive, Wet.						
12	REFUSAL at 11.5-ft BGS						
14	C3-WWTP-SO-G400-0.5' @1530 (TOC/pH) C3-WWTP-SO-G400-11'@1605 (TOC/pH)						
16							
18							



BORING LOG: C3-WWTP-D500

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/20/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Hollow-Stem Auger / Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 16-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO FT BGS	
WELL DEPTH: NA	SCREEN INTERVAL NA TO FT BGS	
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	μr/hr	RECOVERY	DROP-EX	INTERVAL
0-0.25	Grass and Organics		10.3				
0.25-1	Brown SANDY SILT, Loose, Non-Cohesive, Dry.						
1-1.25	Slag						
1.25-1.5	Red Brown Fine SAND, Loose, Non-Cohesive, Dry.	SM	23				
2	1.5-4 Brown SILTY CLAY, Tight, Cohesive, dry with some pebbles. Elevated organic vapor due to slag. Slag was not targeted for sample collection.	CL	14	6	4 / 4	NA	0-4
		CL	2.2				
4	4-8 Brown SILTY CLAY, Tight, Cohesive, Dry with some Cobbles	CL	0				
		CL	1.6				
6		CL	1.9	6	4 / 4	NA	4-8
		CL	0				
8	8-12 Brown SILTY CLAY, Tight, Cohesive, Dry with some Pebbles.	CL	0				
		CL	0				
10		CL	0	6	4 / 4	NA	8-12
		CL	0				
12	12-13 Brown SILTY CLAY, Tight, Cohesive, Dry with some Pebbles.	CL	0				
	13-16 Grey Brown Fat CLAY, Tight, Cohesive, Wet.	CH	0				
14		CH	0	5	4 / 4	NA	12-16
		CH	0				
16	C3-WWTP-SO-D500-0.5' @ 1630 C3-WWTP-SO-D500-14' @ 1645						
18							



BORING LOG: C3-WWTP-E500

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/9/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 16-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO	FT BGS
WELL DEPTH: NA	SCREEN INTERVAL NA TO	FT BGS
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	µm/Hr	RECOVERY	DROP-EX	INTERVAL
0-0.5	Grass and Organics		0				
0.5-0.7	SANDSTONE Rock Fragments						
0.7-3	Brown SILTY CLAY, Tight, Cohesive, Dry. Some SANDSTONE Rock fragments and pebbles.	CL	0	7	3 / 4	NA	0-4
2		CL	0				
4		CL	0				
4-8	Brown SANDY SILT with CLAY, Loose, Semi-cohesive, very moist.	ML	0	7	4 / 4	NA	4-8
6		ML	0				
8		ML	0				
8-9.5	Brown SANDY SILT with CLAY, Loose, Semi-Cohesive, very moist.	ML	0	7	4 / 4	NA	8-12
9.5-10	Brown SILTY CLAY, Tight, Cohesive, Damp. (10.5-10.7) Black SANDY SILT lens. Loose, non-cohesive, wet.	ML	0				
10		CL	0				
12		CL	0				
12-16	Brown SILTY CLAY with trace SAND, Tight, Cohesive, moist. (12.5-12.8 Black SANDY SILT, Loose, non-cohesive, Moist)	CL	0	9	4 / 4	NA	12-16
14		CL	0				
16		CL	0				
16	REFUSAL at 16-ft BGS						
18	C3-WWTP-SO-E500-0.5' @1600 (MS/MSD) C3-WWTP-SO-E500-16' @1630						



BORING LOG: C3-WWTP-F500

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/9/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 14-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO FT BGS	
WELL DEPTH: NA	SCREEN INTERVAL NA TO FT BGS	
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREEING RESULTS	µr/Hr	RECOVERY	DROP-EX	INTERVAL
0-0.25	Grass and Organics		2.7				
0.25-2	Brown/Black SANDY SILT, Tight, Semi-cohesive, Dry.						
2	2-4 Brown SILTY CLAY Tight, Cohesive, Dry (3.5 1" Red Brown SAND Seem)	SM	1	7	4 / 4	NA	0-4
		CL	0				
		CL	0				
4	4-8 Brown SILTY CLAY, Tight, Cohesive, with some Light Grey SILTY CLAY Seams. Trace Sandstone Rock Fragments, Dry	CL	0	7	4 / 4	NA	4-8
		CL	0				
6		CL	0				
		CL	0				
8	8-12 Brown SILTY CLAY, Tight, Cohesive, Damp. Some Pebbles	CL	0	7	4 / 4	NA	8-12
		CL	0				
10		CL	0				
		CL	0				
12	12-13.6 Brown SILTY CLAY, Tight, Cohesvie, Moist	CL	0	8	1.6 / 1.6	NA	12 - 13.6
		CL	0				
14	REFUSAL at 13.6-ft BGS						
16	C3-WWTP-SO-F500-0.5' @830 (MS/MSD) C3-WWTP-SO-F500-13.5' @915						
18							



BORING LOG: C3-WWTP-C700

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/8/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 14.5-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO FT BGS	
WELL DEPTH: NA	SCREEN INTERVAL NA TO FT BGS	
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREEING RESULTS	µm/Hr	RECOVERY	DROP-EX	INTERVAL
0-0.25	Grass and Organics		0				
0.25-3	Brown SILTY CLAY with trace SAND, Tight, Cohesive, Moist @2.75-ft Some Dolomite/Sandstone Rock Fragments.						
2	Piece of Slag at 0.75-ft had high sulfur odor. May be responsible for elevated PID readings.	CL	268	8	3/4	NA	0-4
		CL	0				
		CL	0				
4	4-8 Grey Brown SILTY CLAY, Tight, Cohesive, Moist at 7.5-ft. Some Black Manganese Staining at 4.5-ft	CL	0				
6		CL	0	9	4/4	NA	4-8
		CL	0				
		CL	0				
8	8-12 Brown SILTY CLAY, Tight, Cohesive, Moist @8.5-ft. Dry 8.5-11-ft. 11-11.1 Small Gravel Interval, Wet. 11.1-12 Dry.	CL	0				
10		CL	0	9	4/4	NA	8-12
		CL	0				
		CL	0				
12	12-14.5 Brown SILTY CLAY, Tight, Cohesive, Damp.	CL	0				
14		CL	0	9	2.5 / 2.5	NA	12-14.5
16	REFUSAL at 14.5-ft BGS C3-WWTP-SO-C700-0.5' @1050 C3-WWTP-SO-C700-14' @1130						
18							



BORING LOG: C3-WWTP-G500

SHEET 1 OF 1

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/8/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 12-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO FT BGS	
WELL DEPTH: NA	SCREEN INTERVAL NA TO FT BGS	
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	μr/hr	RECOVERY	DROP-EX	INTERVAL
0-0.25	Grass and Organics		11.2				
0.25-2	Brown SANDY SILT, Tight, Semi-cohesive, Moist						
2	2-4 Brown SILTY CLAY with some Light Brown SANDY SILT, Tight, Cohesive, Moist.	ML	2.3	7	4 / 4	NA	0-4
		ML	0.7				
		CL	0				
4	4-4.5 Brown SILTY CLAY with some Light Brown SANDY SILT, Tight, Cohesive. Moist	CL	0				
	4.5-6.5 Brown SANDY SILT with Trace CLAY. Loose, Semi-cohesive, Moist to Wet	ML	0				
6	6.5-7 Brown SILTY CLAY, Tight, Cohesive, Moist	GP	0	8	4 / 4	NA	4-8
	7-7.25 Medium Brown Sand and GRAVEL. Subangular. Wet Loose, Non-cohesive.	CL	0				
8	8-8.25 Brown Medium SAND. Wet, with trace Gravel.	SW	0				
	8.25-10 Brown SILTY CLAY, Tight, Cohesive, Moist.	CL	0				
10	10-12 Grey/Brown SILTY CLAY, Tight, Cohesive, Moist.	CL	0	8	4 / 4	NA	8-12
		CL	0				
12	REFUSAL at 12-ft BGS						
	C3-WWTP-SO-G500-0.5' @1430 DUPLICATE SAMPLE 01						
	C3-WWTP-SO-G500-7'@1510						
14							
16							
18							



BORING LOG: C3-WWTP-B(+50)500

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/10/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 16-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO	FT BGS
WELL DEPTH: NA	SCREEN INTERVAL NA TO	FT BGS
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	µm/hr	RECOVERY	DROP-EX	INTERVAL
2	0-0.25 Grass and Organics		0	9	4 / 4	NA	0-4
	0.25-4 Brown SILTY CLAY, Tight, Cohesive, Dry (1.5-1.75 Slag)	CL	0				
		CL	0				
		CL	0				
6	4-8 Brown SILTY CLAY, Tight, Dry, Some pebbles. Trace Light Grey SILTY CLAY Seams.	CL	0	9	4 / 4	NA	4-8
		CL	0				
		CL	0				
		CL	0				
10	8-11 Brown SILTY CLAY, Tight, Dry, Some pebbles. Trace Light Grey SILTY CLAY Seams.	CL	0	9	4 / 4	NA	8-12
		CL	0				
		CL	0				
		CH	0				
14	11-12 Grey FAT CLAY, Tight, Cohesive, Very Moist.	CH	0	9	4 / 4	NA	12-16
	12-15.5 Grey FAT CLAY, Tight, Cohesive, Very Moist.	CH	0				
		CH	0				
		CH	0				
16	15.5-15.6 Dolomite Rock Fragments						
	15.6-16 Red Brown SANDY SILT, Tight, Non-Cohesive, Moist.	SM	0				
18	Field designation: C3-WWTP-SO-B/C500-0.5' @1105 Revised designation = C3-WWTP-SO-B(+50)500-0.5 Field designation: C3-WWTP-SO-B/C500-10.5' @1120 Revised designation = C3-WWTP-SO-B(+50)500-10.5 Field designation: C3-WWTP-SO-B/C500-15' @1440 (sampled on 7/20/09) Revised designation = C3-WWTP-SO-B(+50)500-15						



BORING LOG: B/C600

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/8/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 15.8-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO	FT BGS
WELL DEPTH: NA	SCREEN INTERVAL NA TO	FT BGS
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	µr/hr	RECOVERY	DROP-EX	INTERVAL																																																																																																						
2	0-2 Brown SANDY SILT with CLAY, Tight, Semi-cohesive, Dry. Some Wood at 1-ft.	ML	0	7	4 / 4	NA	0-4																																																																																																						
		ML	0					4	2-4 Brown SILTY CLAY, Tight, Cohesive, Dry, some small oval pebbles	CL	0	9	4 / 4	NA	4-8	CL	0	6	4-8 Brown/Light Grey SILTY CLAY, with Trace SAND. Tight, Cohesive, Moist. Weathered petroleum odors at 6-ft bgs.	CL	0	10	4 / 4	NA	8-12	CL	80	CL	285	CL	410	10	8-12 Brown SILTY CLAY, Tight, Cohesive, Moist @ 11.5-ft bgs. Some Angular pebbles. Trace Mottled Grey SILTY CLAY.	CL	44	8	4 / 4	NA	12-15.8	CL	205	CL	12	CL	54	14	12-15.8 Brown SILTY CLAY, Tight, cohesive, moist. Small Oval Pebbles	CL	0	8	4 / 4	NA	12-15.8	CL	2.1	CL	0	CL	2.6	16	REFUSAL at 15.8-ft BGS								Field designation: C3-WWTP-SO-B/C600-0.5' @1200.								Revised = C3-WWTP-SO-B(+50)600-0.5					NA			Field designation: C3-WWTP-SO-B/C600-8'@1230.								Revised = C3-WWTP-SO-B(+50)600-8							18	C3-WWTP-WW-RINSATE 1 @1245 (off of sampling pan)								
4	2-4 Brown SILTY CLAY, Tight, Cohesive, Dry, some small oval pebbles	CL	0	9	4 / 4	NA	4-8																																																																																																						
		CL	0					6	4-8 Brown/Light Grey SILTY CLAY, with Trace SAND. Tight, Cohesive, Moist. Weathered petroleum odors at 6-ft bgs.	CL	0	10	4 / 4	NA	8-12	CL	80			CL	285					CL	410	10	8-12 Brown SILTY CLAY, Tight, Cohesive, Moist @ 11.5-ft bgs. Some Angular pebbles. Trace Mottled Grey SILTY CLAY.	CL	44			8	4 / 4					NA	12-15.8	CL	205	CL	12			CL	54					14	12-15.8 Brown SILTY CLAY, Tight, cohesive, moist. Small Oval Pebbles	CL	0	8	4 / 4	NA	12-15.8	CL	2.1	CL	0	CL	2.6	16	REFUSAL at 15.8-ft BGS								Field designation: C3-WWTP-SO-B/C600-0.5' @1200.								Revised = C3-WWTP-SO-B(+50)600-0.5					NA			Field designation: C3-WWTP-SO-B/C600-8'@1230.								Revised = C3-WWTP-SO-B(+50)600-8							18	C3-WWTP-WW-RINSATE 1 @1245 (off of sampling pan)
6	4-8 Brown/Light Grey SILTY CLAY, with Trace SAND. Tight, Cohesive, Moist. Weathered petroleum odors at 6-ft bgs.	CL	0	10	4 / 4	NA	8-12																																																																																																						
		CL	80																																																																																																										
		CL	285																																																																																																										
		CL	410																																																																																																										
10	8-12 Brown SILTY CLAY, Tight, Cohesive, Moist @ 11.5-ft bgs. Some Angular pebbles. Trace Mottled Grey SILTY CLAY.	CL	44	8	4 / 4	NA	12-15.8																																																																																																						
		CL	205																																																																																																										
		CL	12																																																																																																										
		CL	54																																																																																																										
14	12-15.8 Brown SILTY CLAY, Tight, cohesive, moist. Small Oval Pebbles	CL	0	8	4 / 4	NA	12-15.8																																																																																																						
		CL	2.1																																																																																																										
		CL	0																																																																																																										
		CL	2.6																																																																																																										
16	REFUSAL at 15.8-ft BGS																																																																																																												
	Field designation: C3-WWTP-SO-B/C600-0.5' @1200.																																																																																																												
	Revised = C3-WWTP-SO-B(+50)600-0.5					NA																																																																																																							
	Field designation: C3-WWTP-SO-B/C600-8'@1230.																																																																																																												
	Revised = C3-WWTP-SO-B(+50)600-8																																																																																																												
18	C3-WWTP-WW-RINSATE 1 @1245 (off of sampling pan)																																																																																																												



BORING LOG: C3-WWTP-C(+50)600

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/8/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 15-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO FT BGS	
WELL DEPTH: NA	SCREEN INTERVAL NA TO FT BGS	
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREEING RESULTS	µr/Hr	RECOVERY	DROP-EX	INTERVAL
0-2	Gravel (Old Roadway)	GW	0				
2-3.5	Brown SILTY CLAY, Tight, Cohesive, Dry.	ML	0	9	4 / 4	NA	0-4
3.5-3.7	Fine Brown SAND with Trace SILT, Loose, Non-cohesive. Dry.	ML	1.4				
3.7-4	Brown SILTY CLAY, Tight, Cohesive, Dry. Some Dolomite Rock Fragments	SP/CL	0.3				
4-8	Brown SILTY CLAY, Tight, Cohesive, Dry. Some Dolomite Rock Fragments	CL	0	9	4 / 4	NA	4-8
6		CL	0				
		CL	0				
		CL	0				
8-9	Brown SILTY CLAY, Tight, Cohesive, Dry. Some Dolomite Rock Fragments.	CL	0	9	4 / 4	NA	8-12
9-11	Brown SAND with some SILT and CLAY. Wet @9'	SP	0				
11-12	Brown SILTY CLAY, Tight, Cohesive, Dry.	SP	0				
		CL	0				
12-15	Brown Grey SILTY CLAY, Tight, Cohesive, Moist.	CL	0	9	3 / 3	NA	12-15
14		CL	0				
		CL	0				
16	REFUSAL at 15-ft BGS Field designation = C3-WWTP-SO-C/D600-0.5' @1340. Revised designation = C3-WWTP-SO-C(+50)600-0.5. Field designation = C3-WWTP-SO-C/D600-8.5' @1400.						
18	Revised designation = C3-WWTP-SO-C(+50)600-8.5.						



BORING LOG: C3-WWTP-D(+50)600

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/21/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Hollow-Stem Auger / Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 16-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO FT BGS	
WELL DEPTH: NA	SCREEN INTERVAL NA TO FT BGS	
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	µr/Hr	RECOVERY	DROP-EX	INTERVAL
0-2	GRAVEL		0				
2	2-3 Grey SILTY CLAY, Tight, Cohesive, Dry	GW	0	8	3 / 4	NA	0-4
		CL	0				
		CL	0				
4-6	Grey SILTY CLAY, Tight, Cohesive, Moist	CL	0				
		CL	0				
6-6.1	SAND and GRAVEL, Wet.			9	4 / 4	NA	4-8
6.1-8	Grey Brown SILTY CLAY, Tight, Cohesive, Moist	CL	0				
		CL	0				
8-12	Grey Brown SILTY CLAY, Tight, Cohesive, Moist	CL	0				
		CL	0				
		CL	0	9	4 / 4	NA	8-12
		CL	0				
12-15	Grey Brown SILTY CLAY, Tight, Cohesive, Moist	CL	0				
		CL	0				
		CL	0	9	4 / 4	NA	12-16
		CL	0				
15-16	Grey FAT CLAY Tight, Cohesive, Wet.	CH	0				
16	Field designation = C3-WWTP-SO-D/E600-0.5' @ 1110 (TOC/pH)						
	Revised designation = C3-WWTP-SO-D(+50)600-0.5						
18	Field designation = C3-WWTP-SO-D/E600-15' @ 1130 (TOC/pH)						
	Revised designation = C3-WWTP-SO-D(+50)600-15						
20							



BORING LOG: C3-WWTP-E(+50)600 (Western Drainage Ditch)

SHEET 1 OF 1

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/10/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 7-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO FT BGS	
WELL DEPTH: NA	SCREEN INTERVAL NA TO FT BGS	
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREEING RESULTS	µr/Hr	RECOVERY	DROP-EX	INTERVAL
0-1	Located on the bank of the ditch next to the Sed. Ditch was approx. 8-ft deep. Drilled to 8-ft bgs and started at 0-ft bgs.		0				
0-1	Brown SANDY SILT with some CLAY. Tight, Semi-cohesive, moist.	SM	0	7	4 / 4	NA	0-4
1-4	Brown SILTY CLAY, Tight, Cohesive, Damp.	ML	0				
		ML	0				
		ML	0				
4-7	Brown SILTY CLAY, Tight, Cohesive, Moist.	CL	0	7	3 / 3	NA	4-7
		CL	0				
		CL	0				
8	REFUSAL at 7-ft BGS						
	Field sample designation: C3-WWTP-SD-WDDE/F-0.5' @1215.						
	Revised designation: C3-WWTP-SO-E(+50)600-0.5 (collected from terrestrial sediment in ditch)						
10	Field designation: C3-WWTP-SO-WDDE/F-7' @1240.						
	Revised designation: C3-WWTP-SO-E(+50)600-7 (adjacent to ditch)						
12							
14							
16							
18							



BORING LOG: C3-WWTP-F(+50)600

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/9/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 11.5-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO FT BGS	
WELL DEPTH: NA	SCREEN INTERVAL NA TO FT BGS	
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	µm/Hr	RECOVERY	DROP-EX	INTERVAL
2	0-0.25 Grass and Organics 0.25-1 Brown/Black SANDY SILT, with Trace CLAY. Tight, Semi-cohesive. Dry 1-4 Brown SILTY CLAY, Tight, Cohesive, Damp		0	7	4 / 4	NA	0-4
		ML	0				
		CL	0				
		CL	0				
4	4-8 Brown SILTY CLAY Tight, Cohesive, Damp. (4.2-4.3 Coarse SAND Seem) Some Dolomite Rock Fragments and Slag. Elevated organic vapor due to slag. Slag was not targeted for sample collection.	CL	1.6	8	4 / 4	NA	4-8
		CL	2.9				
		CL	1.8				
		CL	1				
8	8-11.5 Brown SILTY CLAY, Tight, Cohesive, Some Angular Pebbles	CL	0	6	3.5 / 3.5	NA	8-11.5
		CL	0				
		CL	0				
12	REFUSAL at 11.5-ft BGS Field designation: C3-WWTP-SO-F/G600-0.5' @1035. Revised designation = C3-WWTP-SO-F(+50)600-0.5 Field designation C3-WWTP-SO-F/G600-6' @1045.						
14	Revised designation = C3-WWTP-SO-F(+50)600-6						
16							
18							

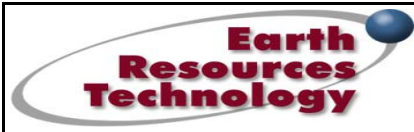


BORING LOG: C

3-WWTP-D700

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/21/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Hollow-Stem Auger / Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 20-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO FT BGS	
WELL DEPTH: NA	SCREEN INTERVAL NA TO FT BGS	
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	µr/hr	RECOVERY	DROP-EX	INTERVAL
2	0-0.25 GRASS and ORGANICS 0.25-4 Brown SANDY SILT, Trace CLAY. Tight, Non-Cohesive, some Cobbles Dry.		0	8	4 / 4	NA	0-4
		SM	3.3				
		SM	3.7				
		SM	0				
6	4-8 Brown SILTY CLAY, Tight, Cohesive, with light grey CLAY seems. Dry with some Cobbles	CL	1.8	9	4 / 4	NA	4-8
		CL	3				
		CL	1.5				
		CL	1.1				
10	8-12 Brown SILTY CLAY, Tight, Cohesive, with Light Grey CLAY Seems. Dry with some Cobbles. Some Dolomite Rock Fragments at 11-ft	CL	0	8	4 / 4	NA	8-12
		CL	0				
		CL	0				
		CL	0				
14	12-16 Brown SILTY CLAY, Tight, Cohesive, with Light Grey CLAY Seems. Dry with some Cobbles. Trace SAND at 15.5-ft. Wet at 15-ft	CL	0	9	4 / 4	NA	12-16
		CL	0				
		CL	0				
		CL	0				
18	16-20 Grey Brown SILTY CLAY with trace Pebbles, Tight, Cohesive, Wet. Some SAND at 19.5-ft C3-WWTP-SO-D700-0.5' @855 (MS/MSD) C3-WWTP-SO-D700-15' @940	CL	0	9	4 / 4	NA	16-20
		CL	0				
		CL	0				
		CL	0				



BORING LOG: C3-WWTP-E700

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/21/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Hollow-Stem Auger / Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 20-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO FT BGS	
WELL DEPTH: NA	SCREEN INTERVAL NA TO FT BGS	
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	µr/hr	RECOVERY	DROP-EX	INTERVAL
0-2	0-0.25 ORGANICS 0.25-4 Brown SANDY SILT, Trace CLAY. Some Brick present. Tight, Non-Cohesive, Dry.		0	9	4 / 4	NA	0-4
		SM	0				
		SM	0				
		SM	0				
4-6	4-8 Brown SANDY SILT, Trace CLAY. Some Brick present. Tight, Non-Cohesive, Dry.	SM	0	7	4 / 4	NA	4-8
		SM	0				
		SM	0				
		SM	0				
8-10	8-10 Brown SANDY SILT, Trace CLAY, Tight, Non-Cohesive, Dry.	SM	0	7	4 / 4	NA	8-12
		SM	0				
		CL	0				
		CL	0				
12-16	12-16 Brown SILTY CLAY, Tight, Cohesive, Moist with some Pebbles. Some DOLOMITE Rock Fragements at 15-ft.	CL	0	7	4 / 4	NA	12-16
		CL	0				
		CL	0				
		CL	0				
16-20	16-17 Brown SILTY CLAY, Tight, Cohesive, Moist with some Pebbles. 17-19 Grey FAT CLAY, Tight, Cohesive, Wet. C3-WWTP-SO-E700-0.5' @1040 C3-WWTP-SO-E700-16' @1055	CL		6	4 / 4	NA	16-20
		CH					
		CH					



BORING LOG: C3-WWTP-F700

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/9/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 11.9-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO	FT BGS
WELL DEPTH: NA	SCREEN INTERVAL NA TO	FT BGS
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREEING RESULTS	µm/Hr	RECOVERY	DROP-EX	INTERVAL
0-0.25	Grass and Organics		0				
0.25-3	Brown/Black SANDY SILT, with Trace CLAY. Loose, Non-cohesive. Dry	ML	0	6	4 / 4	NA	0-4
2		ML	0				
3-4	Brown SILTY CLAY, Tight, Cohesive, Dry	ML	0				
4	4-8 Brown SILTY CLAY, Tight, Cohesive with some Pebbles, Dry	CL	0	8	4 / 4	NA	4-8
6		CL	0				
		CL	0				
		CL	0				
8	8-11.9 Brown SILTY CLAY, Tight, Cohesive, Moist. Some Grey Dolomite Rock Fragemnets	CL	0	8	4 / 4	NA	8-11.9
10		CL	0				
		CL	0				
		CL	0				
12	REFUSAL at 11.9-ft BGS						
14	C3-WWTP-SO-F700-0.5' @1115 (TOC/pH)						
	C3-WWTP-SO-F700-12' @1125 (TOC/pH)						
16							
18							



BORING LOG: C3-WWTP-G700

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/9/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 12-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO	FT BGS
WELL DEPTH: NA	SCREEN INTERVAL NA TO	FT BGS
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREEING RESULTS	µm/Hr	RECOVERY	DROP-EX	INTERVAL
0-0.5	Grass and Organics		0				
0.5-1.5	Brown/Black SANDY SILT, tight, Semi-cohesive. Dry		0	6	4 / 4	NA	0-4
1.5-4		ML	0				
2		CL	0				
4	Brown SILTY CLAY, Tight, Cohesive, Dry	CL	0	8	3.5 / 4	NA	4-8
6		CL	0				
8		CL	0				
10		CL	0				
12	Grey Brown SILTY CLAY, Tight, Cohesive, Moist (11-ft 1" Black SANDY SILT, Wet).	CL	0	8	3.5 / 4	NA	8-12
14		CL	0				
16		ML	0				
18		CL	0				
12	REFUSAL at 12-ft BGS						
14	C3-WWTP-SO-G700-0.5' @930						
14	C3-WWTP-SO-G700-12' @1005						



BORING LOG: C3-TNT-B0

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/20/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Hollow-Stem Auger / Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 20-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO	FT BGS
WELL DEPTH: NA	SCREEN INTERVAL NA TO	FT BGS
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	µf/Hr	RECOVERY	DROP-EX	INTERVAL
0-0.25	Grass and Organics		5.8				
0.25-3	Brown SANDY SILT, Tight, Non-Cohesive, Damp.						
2		SM	2.2	8	3 / 4	NEGATIVE	0-4
		SM	0				
4	Hit Refusal between 4 and 6 foot and 6 different locations. Moved to the Northwest of the former Mixing tank area.	SW	0	7	4 / 4	NEGATIVE	4-8
4-4.25	Light Brown Fine to Medium SAND, Loose, Non-Cohesive.	CL	0				
4.25-8	Brown SILTY CLAY, Tight, Cohesive, Dry with some Cobbles.	CL	0				
		CL	0				
8	8-12 Brown SILTY CLAY, Tight, Cohesive, Dry with some Cobbles.	CL	0	6	4 / 4	NEGATIVE	8-12
		CL	0				
10		CL	0				
		CL	0				
12	12-15.5 Brown SILTY CLAY, Tight, Cohesive, Dry with some Cobbles.	CL	0	6	4 / 4	NEGATIVE	12-16
		CL	0				
14		CL	0				
		CH	0				
16	Field designation = C3-WWTP-SO-TNTB0-0.5' @735 Revised designation = C3-TNT-SO-TNTB0-0.5						
18	Field designation = C3-WWTP-SO-TNTB0-16' @1230 Revised designation = C3-TNT-SO-TNTB0-16						
	This location is on the TNT waste line systematic grid						
20							



BORING LOG: C3-TNT-D0

PROJECT NAME: Lake Ontario Ordance Works	PROJECT NUMBER: 3047-	DATE: 7/20/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Hollow-Stem Auger / Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 20-FT DIAMETER 2-INCHES	RISER INTERVAL NA	TO FT BGS
WELL DEPTH: NA	SCREEN INTERVAL NA	TO FT BGS
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	µr/hr	RECOVERY	DROP-EX	INTERVAL
0-0.25	Grass and Organics		5.7				
0.25-3	Brown SANDY SILT, Tight, Semi-Cohesive, Damp.						
2		SM	2.4	7	3 / 4	NEGATIVE	0-4
		SM	2				
4		SM					
4-5	Brown SANDY SILT with some CLAY, Tight, Semi-Cohesive, Moist. Wet at 5-ft (ontop of old concrete at 5-ft, moved to the SE outside of former mixing tank area)	SM	3	7	3 / 4	NEGATIVE	4-8
5-6	Brown SILTY CLAY, Tight, Cohesive, Moist.	CL	0				
6		SM	0				
6-7	Dark Grey SANDY SILT, Tight, Non-Cohesive, Moist.						
8							
8-12	Brown SILTY CLAY, Tight, Cohesive, Some Pebbles. Moist.	CL	0	7	4 / 4	NEGATIVE	8-12
		CL	0				
10		CL	1				
12		CL	0				
12-14	Brown SILTY CLAY, Tight, Cohesive, Some Pebbles, Moist.	CL	0	7	4 / 4	NEGATIVE	12-16
		CL	0				
14		CH	0				
14-16	Grey SILTY CLAY (Fat), Tight, Cohesive, Wet	CH	0				
16							
16-20	Grey SILTY CLAY (Fat), Tight, Cohesive, Wet Field designation = C3-WWTP-SO-TNTD0-0.5' @ 825 Revised designation = C3-TNT-SO-D0-0.5	CH	0	7	4 / 4	NEGATIVE	16-20
18		CH	0				
	Field designation = C3-WWTP-SO-TNTD0-14' @ 1410 Revised designation = C3-TNT-SO-TNTD0-14	CH	0				
20		CH	0				



BORING LOG: C3-TNT-B200

SHEET 1 OF 1

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/20/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolf Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Hollow-Stem Auger / Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 16-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO FT BGS	
WELL DEPTH: NA	SCREEN INTERVAL NA TO FT BGS	
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	μr/hr	RECOVERY	DROP-EX	INTERVAL
0-0.25	Grass and Organics		0				
0.25-1.25	Brown SILTY CLAY, Tight, Cohesive, some Dolomite Rock Fragments, Dry.	CL	1.1				
1.25-2.5	Brown/Grey Mottled SANDY SILT. Loose, Non-cohesive, Moist.	SM	0	8	3 / 4	NEGATIVE	0-4
2.5-4	Brown Very Fine SAND with some silt. Loose, Non-cohesive, Very Moist to Wet.	SM	0				
4-5.25	Brown Very Fine SAND with some SILT. Loose, Non-cohesive, Very Moist to Wet. Slag.	SM	4.5				
5.25-8	Brown SILT with some CLAY. Tight, Semi-cohesive, Dry with trace SAND. Elevated organic vapor due to slag. Slag was not targeted for sample collection.	ML	2.2	8	4 / 4	NEGATIVE	4-8
8-11.75	Brown SILT with some CLAY, Tight, Semi-cohesive, dry with trace SAND and some Pebbles/Cobbles.	ML	0				
11.75-12	Medium to Coarse Brown SAND. Loose, Non-cohesive, Moist.	ML	0	8	4 / 4	NEGATIVE	8-12
12-12.25	Medium to Coarse Brown SAND, Loose, Non-cohesive, Wet.	SW	0				
12.25-16	Grey Brown FAT CLAY, Tight, Cohesive, Wet	CH	0				
16-18	Field designation = C3-WWTP-SO-TNTB200-0.5' @920 Revised designation = C3-TNT-SO-B200-0.5						
18-20	Field designation = C3-WWTP-SO-TNTB200-12' @945 Revised designation = C3-TNT-SO-B200-12						



BORING LOG: C3-TNT-D200

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/20/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Hollow-Stem Auger / Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 20-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO FT BGS	
WELL DEPTH: NA	SCREEN INTERVAL NA TO FT BGS	
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	µr/Hr	RECOVERY	DROP-EX	INTERVAL
2	0-0.25 Grass and Organics 0.25-4 Brown SANDY SILT with some CLAY. Tight, Semi-Cohesive, Dry.		2.1	8	4 / 4	NEGATIVE	0-4
		SM	2.8				
		SM	1.1				
		SM	0				
6	4-8 Brown SANDY SILT with some CLAY and cobbles. Tight, Non-Cohesive. Dry 6-6.1 Light Brown Fine SAND seem.	SM	0	7	4 / 4	NEGATIVE	4-8
		SM	0				
		SM	0				
		SM	0				
10	8-12 Brown SILTY CLAY, Tight, Cohesive, Moist at 10-ft with some Cobbles.	CL	0	7	4 / 4	NEGATIVE	8-12
		CL	0				
		CL	0				
		CL	0				
14	12-16 Brown SILTY CLAY, with cobbles. Tight, Cohesive, Moist. Some Dolomite Rocks at 13-ft.	CL	0	7	4 / 4	NEGATIVE	12-16
		CL	0				
		CL	0				
		CL	0				
18	16-18 Brown SILTY CLAY with Cobbles. Tight, Cohesive, Moist. 18-20 Grey Brown Fat CLAY. Tigth, Cohesive, Moist. Field designation = C3-WWTP-SO-TNTD200-0.5' @840 Revised designation = C3-TNT-D200-0.5 Field designation = C3-WWTP-SO-TNTD200-18' @905 Revised designation = C3-TNT-SO-D200-18	CL	0	8	4 / 4	NEGATIVE	16-20
		CL	0				
		CH	0				
		CH	0				



BORING LOG: C3-TNT-B510

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/9/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 15-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO FT BGS	
WELL DEPTH: NA	SCREEN INTERVAL NA TO FT BGS	
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	µr/Hr	RECOVERY	DROP-EX	INTERVAL
0-0.25	Grass and Organics		0				
0.25-1.5	Brown sandy SILT with some clay Tight, Semi-cohesive, dry						
1.5-3.5	Brown silty CLAY, Tight, Cohesive, some dolomite rocks, dry.	ML	0	10	3.5 / 4	NEGATIVE	0-4
		CL	0				
		CL	0				
4-8	Brown silty CLAY, Tight, Cohesive, Dry. Some Dolomite Rock Fragments	CL	0	10	4 / 4	NEGATIVE	4-8
		CL	0				
		CL	0				
8-12	Brown silty CLAY, Tight, Cohesive, Moist @11-ft bgs Some sandstone rock fragments @9.5-ft	CL	0	10	4 / 4	NEGATIVE	8-12
		CL	0				
		CL	0				
		CL	0				
12-15	Grey Brown silty CLAY, Tight, Cohesive, Moist	CL	0	10	3 / 3	NEGATIVE	12-15
		CL	0				
		CL	0				
16-20	Grey Brown FAT CLAY, Tight, Cohesive, Wet. 18.5-18.7 Grey/Brown SAND. Loose, Non-cohesive, Wet. REFUSAL at 15-ft BGS Field designation = C3-WWTP-SO-B510-0.5' @ 1400 Revised designation = C3-TNT-SO-B510-0.5 Field designation = C3-WWTP-SO-B510-14' @ 1425 Revised designation = C3-TNT-SO-B510-14 Field designation = C3-WWTP-SO-B510-19' @ 1040 (Sampled on 7/20/09) Revised designation = C3-TNT-SO-B510-19 This location was not originally listed in the FSP. It is located on the TNT waste line systematic grid.	CH	0	10	4 / 4	NEGATIVE	16-20
		CH	0				
		CH	0				
		CH	0				



BORING LOG: C3-TNT-D510

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/9/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 14-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO FT BGS	
WELL DEPTH: NA	SCREEN INTERVAL NA TO FT BGS	
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREEING RESULTS	µr/Hr	RECOVERY	DROP-EX	INTERVAL
0-0.25	Grass and Organics		0				
0.25-1	Brown sandy SILT with some clay, Tight, Semi-Cohesive, Dry		0				
1-4	Brown silty CLAY, Tight, Cohesive, Dry.	ML	0	10	4 / 4	NEGATIVE	0-4
		ML	0				
		ML	0				
4-8	Brown silty CLAY, Tight, Cohesive, Damp. Some Cobbles and Pebbles	CL	0	11	4 / 4	NEGATIVE	4-8
		CL	0				
		CL	0				
		CL	0				
8-11	Grey Brown silty CLAY. Tight, Cohesive, Dry. Some Small Pebbles.	CL	0	10	3 / 3	NEGATIVE	8-11
		CL	0				
		CL	0				
11-14	Brown Grey silty CLAY, Tight, Cohesive, Damp. Some small pebbles	CL	0	10	3 / 3	NEGATIVE	11-14
		CL	0				
		CL	0				
14	REFUSAL at 14-ft BGS						
	Field designation = C3-WWTP-SO-D510-0.5' @1440 (DUPLICATE #3)						
	Revised designation = C3-TNT-SO-D510-0.5						
	Field designation = C3-WWTP-SO-D510-14' @1505						
	Note that this is a separate location from D500. This location is along the TNT waste line systematic grid.						
18							



BORING LOG: C3-TNT-C640

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/9/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 14-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO FT BGS	
WELL DEPTH: NA	SCREEN INTERVAL NA TO FT BGS	
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREENING RESULTS	µp/HR	RECOVERY	DROP-EX	INTERVAL
0-2	0-0.25 Grass and Organics 0.25-3 Brown sandy SILT, Tight, Non-cohesive, Dry.		0	9	3 / 4	NEGATIVE	0-4
		ML	0				
		ML	0				
			0				
4-8	4-8 Brown silty CLAY, Tight, Cohesive, Damp. Large quantity of Pebbles	CL	0	8	4 / 4	NEGATIVE	4-8
		CL	0				
		CL	0				
		CL	0				
8-12	8-12 Brown silty CLAY, Tight, Cohesive, Damp. Some Oval Pebbles/Cobbles	CL	0	8	4 / 4	NEGATIVE	8-12
		CL	0				
		CL	0				
		CL	0				
12-16	12-16 Brown silty CLAY, Tight, Cohesive with some Cobbles, Moist	CL	0	7	4 / 4	NEGATIVE	12-16
		CL	0				
		CL	0				
		CL	0				
16-20	16-20 Brown silty CLAY, Tight, Cohesive, with some Cobbles. Field designation = C3-WWTP-SO-C640-0.5' @1245 Revised designation = C3-TNT-SO-C640-0.5 Field designation = C3-WWTP-SO-C640-14' @1310 Revised designation = C3-TNT-SO-C640-14 C3-WWTP-WW-RINSATE-2 @1320 FROM MACROCORE SHOE Field designation = C3-WWTP-SO-C640-20' @820 (DUPLICATE 8) Revised designation = C3-TNT-SO-C640-20 This location was not originally listed in the FSP. This location is on the TNT waste line systematic grid.	CL	0	8	4 / 4	NEGATIVE	16-20
		CL	0				
		CL	0				
		CL	0				



BORING LOG: C3-TNT-E640

PROJECT NAME: Lake Ontario Ordnance Works	PROJECT NUMBER: 3047-	DATE: 7/9/09
LOCATION: Niagara County	ADDRESS:	
DRILLING CONTRACTOR: Parratt-Wolff Inc.	DRILLER: Micky Marshall	
DRILL RIG TYPE: Tractor Mounted Geoprobe	DRILLING METHOD: Direct Push	
DRILLING FLUID: NA	SAMPLE METHOD: 4-ft Macro Core	
BORING: 14.5-FT DIAMETER 2-INCHES	RISER INTERVAL NA TO FT BGS	
WELL DEPTH: NA	SCREEN INTERVAL NA TO FT BGS	
WELL DIAMETER: NA	GEOLOGIST: Joe Von Uderitz	

DEPTH	Geologic Description	USCS	FIELD SCREEING RESULTS	µr/Hr	RECOVERY	DROP-EX	INTERVAL
0-0.5	Grass and Organics		0				
0.5-1	Brown SILTY CLAY, Tight, Cohesive, Dry						
1-4	Brown SANDY SILT, Tight, Semi-Cohesive, Dry	CL	0	9	4 / 4	NEGATIVE	0-4
2		ML	0				
		ML	0				
		ML	0				
4-6.5	Brown SANDY SILT, Tight, Semi-Cohesive, Dry	ML	0	8	4 / 4	NEGATIVE	4-8
6		ML	0				
		CL	0				
		CL	0				
6.5-8	Brown SILTY CLAY Tight, Cohesive, Moist. Some Dolomite Rock Fragments, Pebbles						
8-12	Brown SILTY CLAY Tight, Cohesive, Damp.	CL	0	8	4 / 4	NEGATIVE	8-12
10		CL	0				
		CL	0				
		CL	0				
12-14.5	Brown SILTY CLAY, Tight, Cohesive, Damp. Trace Pebbles.	CL	0	8	2.5 / 2.5	NEGATIVE	12-14.5
14		CL	0				
16	REFUSAL at 14.5-ft BGS Field designation = C3-WWTP-SO-E640-0.5' @1145 (DUPLICATE #2) Revised designation = C3-TNT-SO-E640-0.5 Field designation = C3-WWTP-SO-E640-14' @1220 Revised designation = C3-TNT-SO-E640-14						
18	This location was not originally listed in the FSP. This location is on the TNT waste line systematic grid.						

Appendix E

Investigative Derived Waste Transportation and Bills of Lading



Modern Disposal Services, Inc.
 4746 Model City Rd
 Model City, NY 14107-0209
 1-800-662-0012 (716) 754-8226 Fax (716) 754-8964



DO NOT STAPLE BARCODE

SERVICE SITE: 38867.001
 EARTH RESOURCES TECHNOLOGY
 LOOW SITE - ENERGY DEPT
 PLETCHER RD
 MODEL CITY

TIME IN:

TIME OUT:

Contact: SEAN CARNEY
 Phone : 301/323-1444

COMMODITY: SS

CONTAINER SIZE: 0.00

TRANSACTION TYPE: SUPERSUCKER

SERVICE CODE: SUPERSUCKER
 JOE # 2010015
 DERDA, CASSIK, KING

NOTES:

TRANSACTION #: TK-4770306-000

DATE: 02/23/10

ROUTE: X013

TRUCK #:

PREPARED BY: gabe

DUMP SITE: ENVIRONMENTAL &
 INDU

CONTAINER # IN: _____

CONTAINER # OUT: _____

 DRIVER SIGNATURE

 CUSTOMER SIGNATURE

*****PLEASE NOTE INDEMNIFICATION AGREEMENT*****

The Customer agrees to indemnify, defend and hold harmless the Contractor against all claims, damages, suits, judgments, penalties, fines and other liability or injury or death to persons or loss or damage to property arising out of the Customer's use, operation or possession of the equipment or arising out of the Customer's breach of any warranty created hereunder by the Customer. The Customer shall not overload the equipment nor use it for incineration purposes or make alterations without the contractor's written approval.



Modern Disposal Services, Inc.
 4746 Model City Rd
 Model City, NY 14107-0209
 1-800-662-0012 (716) 754-8226 Fax (716) 754-8964

TRANSACTION #: TK-4770306-000

DATE: 02/23/10

SERVICE SITE: 38867.001
 EARTH RESOURCES TECHNOLOGY
 LOOW SITE - ENERGY DEPT
 PLETCHER RD
 MODEL CITY

COMMODITY:

CONTAINER SIZE: 0.00

TRANSACTION TYPE: SUPERSUCKER

SERVICE CODE: SUPERSUCKER
 JOB # 2010015
 DERDA, CASSIK, KING

Modern Corporation
INDUSTRIAL SERVICES
DAILY WORKSHEET



4746 Model City Road
 P.O. Box 209
 Model City, New York 14107-0209
 (716) 754-8226 - (800)-662-0012
 FAX (716) 754-8964

Employee/Name	Time In	Time Out	Lunch	Hours	Job Name: <i>Earth Resources</i>
<i>Dardo</i>					
MA L...					Job Location: <i>Loon site</i>
<i>COSIK</i>					<i>Wether Rd Model City NY</i>
<i>Kino</i>					Job Description: <i>Drum pickup</i>
					Phone #: <i>(301) 323-1444</i>
					Cust. #: <i>38867.001</i>
					PO #:
					Contact: <i>Sean Carney</i>
					Job # <i>EP 2000 254</i> <i>2010015</i>
					Date: <i>2/11/10</i> <i>2/22/10</i>

Equipment:	Hrs. Run	Hrs. Down	Hrs. Portal	Total Hrs.	
VAC#					
VAC#					
VAC#					
High Pressure #					
Drum Crusher					
Service Vehicle					Confined Space Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
H/P 3500					
Monitor					MODERN
Sweeper					SIGNATURE:
<i>Lift gate Towel</i>					CUSTOMER
					SIGNATURE:

Materials: Description	Quantity	Unit of Measure		
6" Flex Hose				
4" Flex Hose				
Papermit				
<i>MCOE 100127B - (water)</i>				
EICS Approval Number: <i>MCOE 100127A</i>			EICS Signature	

Print or type form designed for use on elite (12-pitch) typewriter.

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. *N/A* Manifest Doc. No. *20001* 2. Page 1 of 1

3. Generator's Name and Mailing Address *US Army Corp of Eng
1776 Niagara St
Buffalo, NY*

4. Generator's Phone *716 879-4272*

5. Transporter 1 Company Name *Lewiston Trucking* 6. US EPA ID Number *9A159* A. Transporter's Phone *716-754-8226*

7. Transporter 2 Company Name 8. US EPA ID Number B. Transporter's Phone

9. Designated Facility Name and Site Address *ETCS 8335 Quarry Rd
Niagara Falls, NY* 10. US EPA ID Number *19.29.30.0.012/02* C. Facility's Phone *716-298-5298*

11. Waste Shipping Name and Description	12. Containers		13. Total Quantity	14. Unit Wt/Vol
	No.	Type		
a. <i>Ground water - MCOE 100127A</i>				
b. <i>Soil MCOE 100127B</i>	<i>8</i>	<i>Dr</i>	<i>8</i>	
c.				
d.				

D. Additional Descriptions for Materials Listed Above *Non-Haz soil samples* E. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

16. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Printed/Typed Name *X W. Dennis Rimmer* Sign *[Redacted]* *STCE* Month Day Year *12 23 10*

17. Transporter 1 Acknowledgement of Receipt of Materials Printed/Typed Name *Joshua Dorda* Month Day Year *12 23 10*

18. Transporter 2 Acknowledgement of Receipt of Materials Printed/Typed Name Signature Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of waste materials covered by this manifest as noted in Item 10.

Printed/Typed Name *Linda Faust* Month Day Year *02 23 10*

GENERATOR TRANSPORTER FACILITY