

Appendix K

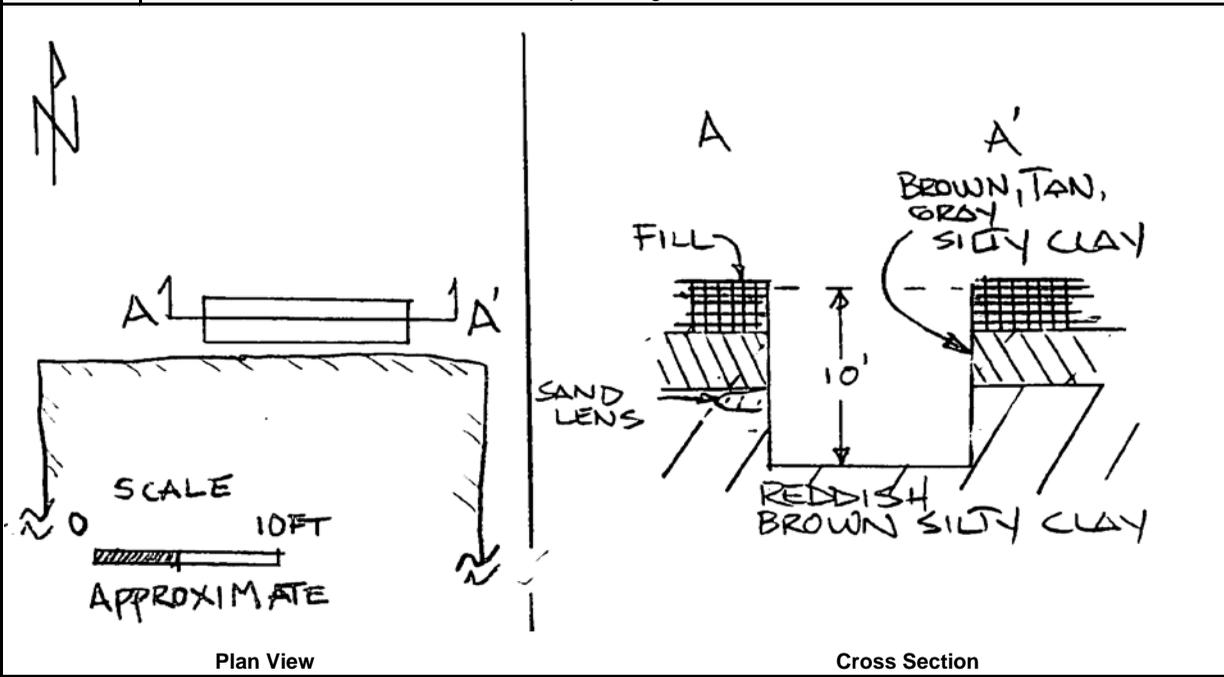
Investigative Excavation and Manhole Logs

URS Corporation

EXCAVATION LOG

PROJECT: Niagara Falls Storage Site (Lewiston, NY) BOP Field Investigation		EXCAVATION ID: IE-1
CLIENT/OWNER: USACE	JOB NUMBER: 11176781.00005	
DATE STARTED: 12/5/2012	URS GEOLOGIST: [REDACTED]	
DATE COMPLETED: 12/5/2012	URS HEALTH PHYSICIST: [REDACTED]	
CONTRACTOR: Russo Development	RUSSO OPERATOR & LABORER: [REDACTED]	
EQUIPMENT: John Deere 200 LC excavator, support truck and trailer, aluminum catwalk		
LOCATION: North side of former grit chamber, west-central portion of EU 11		
PURPOSE: Investigate possible contamination near grit chamber		
CORNER COORDINATES: (NE Cor.) N - 1171358.146, E - 1041306.307, Elev. 321.50; (SW Cor.) N - 1171354.757, E - 1041294.880, Elev. 320.83; (NW Cor.) N - 1171357.319, E - 1041294.792, Elev. 321.14; (SE Cor.) N - 1171355.683, E - 1041306.216, Elev. 321.11		
FINAL EXCAVATION DIMENSIONS: ~11' long x 2.2' wide x 10' deep		

DEPTH (FT)	VERTICAL PROFILE DESCRIPTION
1	0 - 1.3' below ground surface (bgs): FILL/REWORKED MATERIAL (ML/CL) - Dark brown loamy clay top soil, moist, many fine roots with trace gravel; 7" concrete lip of grit chamber on south side of excavation
	1.3' - 3.0' bgs: FILL - Red silty clay with trace to some angular to subangular F-C sand and gravel, granular texture (GC)
	3.0' - 3.5' bgs: Dark brown loamy clay (ML/CL) (buried top soil layer).
5	3.5'-6.0' bgs: Brown, yellowish brown, gray SILTY CLAY (CL), trace rounded gravel and cobbles, silty fine sand thin partings and lenses, moist, stiff, slightly plastic
	6.0'-8.0' bgs: Reddish brown SILTY CLAY (CL), 3 sand lenses (fine sand, trace medium-coarse sand and fine gravel) on west wall at 6.0'-7.5' bgs that seeped water
	8.0'-10.0' bgs: Reddish brown FINE SAND (SM), some silt & clay, trace coarse sand, gravel, & cobbles
10	moist Maximum depth 10' bgs



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PROJECT: Niagara Falls Storage Site (Lewiston, NY) BOP Field Investigation		EXCAVATION ID: IE-1
CLIENT/OWNER: USACE	JOB NUMBER: 11176781.00005	
DATE STARTED: 12/5/2012	URS GEOLOGIST:	
DATE COMPLETED: 12/5/2012	URS HEALTH PHYSICIST:	
CONTRACTOR: Russo Development	RUSSO OPERATOR & LABORER:	

COMMENTS: Trench was oriented in a east-west direction. The trench box was not used at this location.

An attempt was made to collect a groundwater sample from a sump dug in the bottom of the west end of IE-1 in the area of seepage from the sand lens between 6.0' - 7.5' bgs. However, the south excavation sidewall collapsed and a sample could not be collected.

PID readings on excavated soils were 0 ppm; no visual or olfactory signs of contamination.

Surface soil sample ID= IE1 TB1 0.0-5.5-0144

Sidewall soil sample ID= IE1 TB2 6.0-7.5-0146

Sidewall soil sample ID= IE1 TB3 3.0-3.5-0147

Bottom soil sample ID= IE1 TB4 9.5-10.0-0148

Soils from the excavation were stockpiled on plastic. Upon completion, the excavation was backfilled with the excavated soils in the order in which they were removed. The soils were placed back into the excavation in 1'-2' lifts and compacted with the excavator bucket.

The excavation and excavated soils were scanned with a 2" NaI detector. Radiation measurements were within expected (e.g., ambient) values.

INFORMATION FOR SAMPLES COLLECTED AT INVESTIGATIVE EXCAVATION IE-1

SAMPLE ID	COLLECTION DATE/TIME	SAMPLE DEPTH (feet bgs)	MATRIX	ANALYTICAL PARAMETERS	QA/QC	SAMPLE DESCRIPTION
IE1TB10.0-0.5-0144	12/5/2012 10:00	0.0 - 0.5	Soil	List 3	None	Surface soil sample at IE-1 (fill/regraded material): dark brown loamy clay topsoil (moist, friable, granular structure, many fine roots) with trace rounded gravel intermixed with a red silty clay with trace to some angular to subangular F-C sand and gravel (moist, medium dense, not plastic, breaks up to granular structure); PID = 0.0 ppm, no odor
IE1TB26.0-7.5-0146	12/5/2012 11:50	6.0 - 7.5	Soil	List 3	None	Soil sample from 3 sandy lens in west wall of IE-1 that appeared to be wet and produced a little water: wet brown fine sand with trace medium sand, rounded coarse sand, and silt; PID = 0.0 ppm, no odor
IE1TB33.0-3.5-0147	12/5/2012 12:05	3.0 - 3.5	Soil	List 3	None	Soil sample from west wall of IE-1 at interface between red fill and underlying former topsoil layer (highest rad. reading at IE-1): red silty clay with trace to some angular to subangular F-C sand and gravel (slightly moist, medium dense, not plastic, breaks up to granular structure) and dark brown clay loam (slightly moist, friable, granular structure, few fine roots) with trace gravel; PID = 0.0 ppm, no odor
IE1TB49.5-10.0-0148	12/5/2012 12:15	9.5 - 10.0	Soil	List 3	None	Bottom soil sample at west end of IE-1: moist to wet, brown to reddish brown silty clayey fine sand, trace medium and coarse sand and fine gravel (subrounded to rounded); PID = 0.0 ppm, no odor

Notes: List 3 Analytical Parameters =

TAL Metals; Total U; gamma spec/iso-U/iso-Th

**Project: Niagara Falls Storage Site
(Lewiston, NY) BOP Field Investigation**

Client: USACE

Excavation Contractor: Russo Development

**Job Number:
11176781.00005**

Photo No.
IE1-1

Date:
12/5/2012

Description:

A westward view from the east end of excavation IE-1 showing the interior of the excavation.



**EDGE OF CONCRETE RIM
AT NORTH END OF GRIT
CHAMBER**

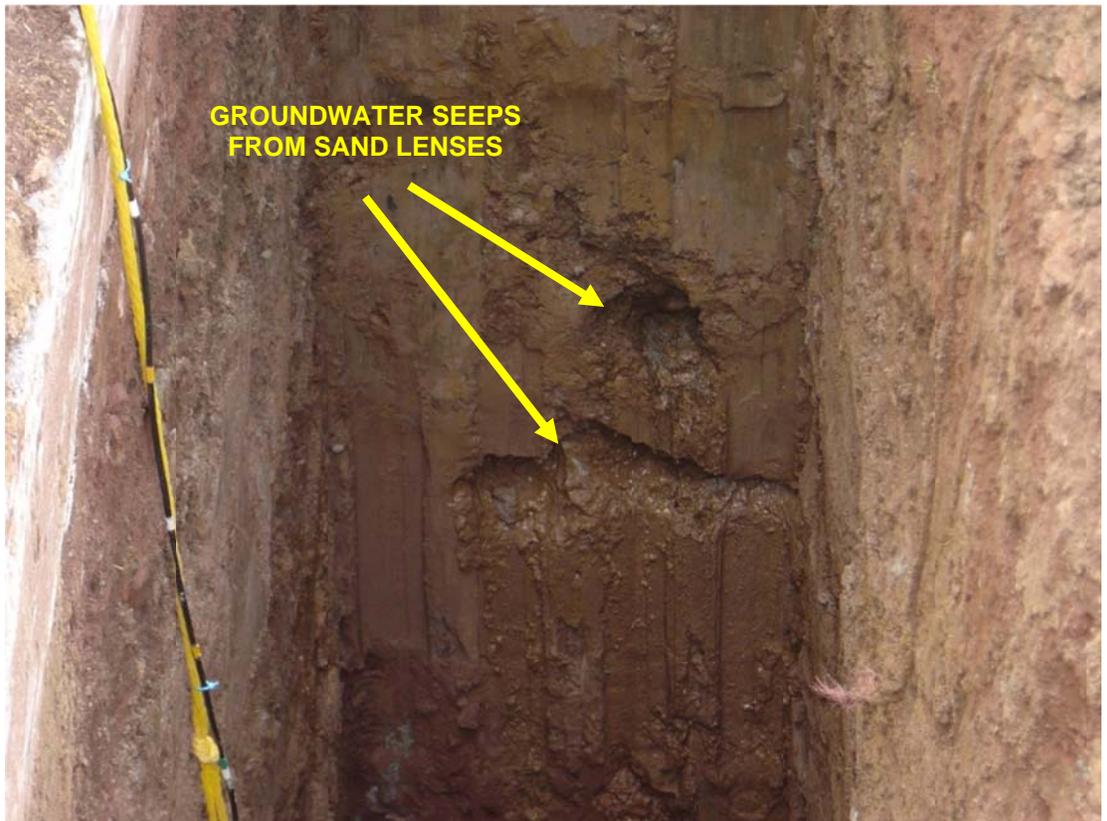
—————→ NORTH

Photo No.
IE1-2

Date:
12/5/2012

Description:

A westward view of the west wall of excavation IE-1 showing perched groundwater seeping from sand lenses located from ~ 6.0'-7.5' bgs; a soil sample (IE1TB26.0-7.5-0146) was collected from these sand lenses.



**GROUNDWATER SEEPS
FROM SAND LENSES**

**Project: Niagara Falls Storage Site
(Lewiston, NY) BOP Field Investigation**

Client: USACE

**Job Number:
11176781.00005**

Excavation Contractor: Russo Development

Photo No.
IE1-3

Date:
12/5/2012

Description:

A view of stockpiled reddish brown sandier soil encountered from ~8'-10' bgs at location IE-1. The soil was moist, but not saturated with groundwater.

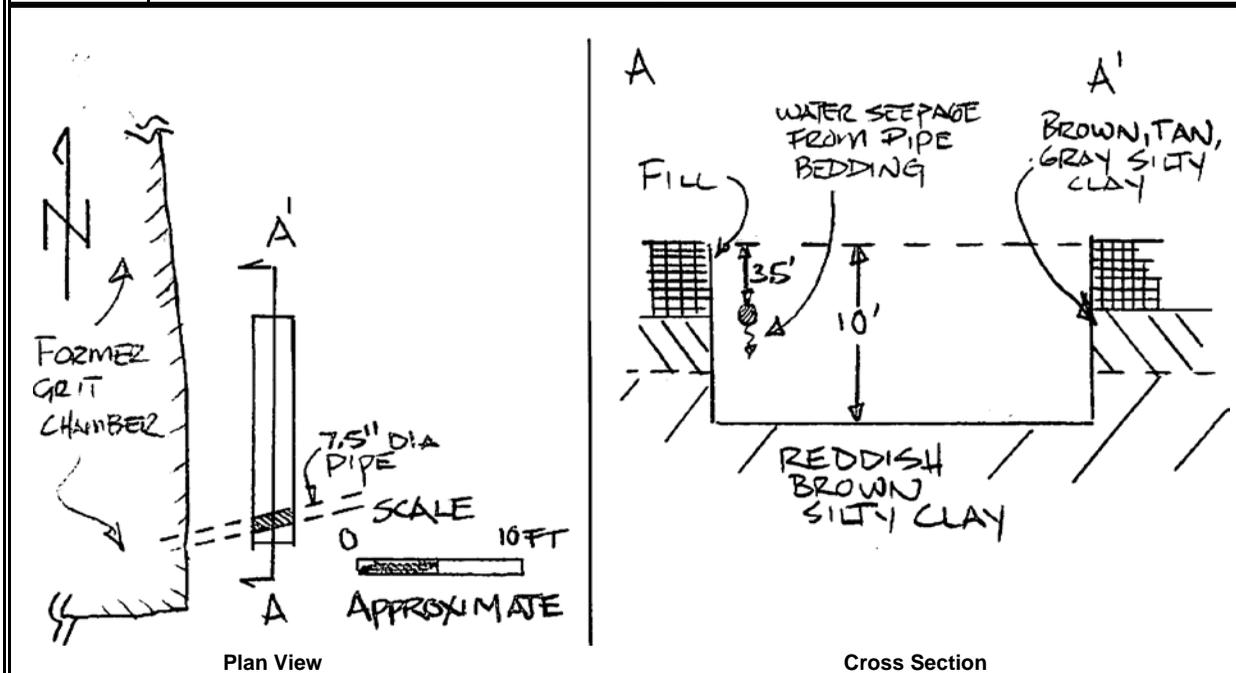


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EXCAVATION LOG

PROJECT: Niagara Falls Storage Site (Lewiston, NY) BOP Field Investigation		EXCAVATION ID: IE-2
CLIENT/OWNER: USACE	JOB NUMBER: 11176781.00005	
DATE STARTED: 12/5/2012	URS GEOLOGIST:	
DATE COMPLETED: 12/6/2012	URS HEALTH PHYSICIST:	
CONTRACTOR: Russo Development	RUSSO OPERATOR & LABORER:	
EQUIPMENT: John Deere 200 LC excavator, support truck and trailer, aluminum catwalk		
LOCATION: East side of former grit chamber, west-central portion of EU 11		
PURPOSE: Investigate possible contamination near grit chamber		
CORNER COORDINATES: (NW Cor.) N - 1171343.372, E - 1041320.791, Elev. 321.54; (NE Cor.) N-1171343.692, E - 1041322.952, Elev. 321.31; (SW Cor.) N - 1171329.956, E - 1041320.030, Elev. 320.95; (SE Cor.) N - 1171330.238, E - 1041322.453, Elev. 320.83		
FINAL EXCAVATION DIMENSIONS: ~13' long x 2.3' wide x 10' deep		

DEPTH (FT)	VERTICAL PROFILE DESCRIPTION
1	0 - 1.5' below ground surface (bgs): FILL/REWORKED MATERIAL (ML/CL) - Dark brown loamy clay top soil, moist, many fine roots with trace gravel; 8" concrete lip of grit chamber on west side of excavation
	1.5'-3.5' bgs: FILL - Red silty clay with trace to some angular to subangular F-C sand and gravel, granular texture, moist (GC)
	3.5'- 4.0' bgs: Dark brown loamy clay (ML/CL) (buried top soil layer). Found 7.5" OD pipe at 3.5' bgs in fine to coarse sand bedding; water flowed from bedding.
5	4.0'-7.0' bgs: Brown, yellowish brown, gray SILTY CLAY (CL), trace rounded gravel and cobbles, orange and gray mottles, trace yellowish brown silty fine sand partings, moist, stiff, slightly plastic
	7.0'-10.0' bgs: from 7.0'-8.0' bgs gradually grades to reddish brown SILTY CLAY (CL), trace rounded gravel, trace orange mottles and gray silty partings, moist, plastic, slightly sticky
10	Maximum depth 10' bgs.



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EXCAVATION LOG

PROJECT: Niagara Falls Storage Site (Lewiston, NY) BOP Field Investigation		EXCAVATION ID: IE-2
CLIENT/OWNER: USACE	JOB NUMBER: 11176781.00005	
DATE STARTED: 12/5/2012	URS GEOLOGIST:	
DATE COMPLETED: 12/6/2012	URS HEALTH PHYSICIST:	
CONTRACTOR: Russo Development	RUSSO OPERATOR & LABORER:	

COMMENTS: Trench was oriented in a north-south direction. The trench box was not used at this location.

One 7.5" OD cast iron pipe crossed the trench in a southwest-northeast orientation.

Wet F-C sandy bedding around pipe.

PID readings on excavated soils were 0 ppm; no visual or olfactory signs of contamination.

The top of the pipe was encountered at ~3.5' below ground surface. A groundwater sample was collected from the bedding material under the pipe.

Soils from the excavation were stockpiled on plastic. Upon completion, the excavation was backfilled with the excavated soils in the order in which they were removed. The soils were placed back into the excavation in 1'-2' lifts and compacted with the excavator bucket.

Surface soil sample ID= IE1 TB1 0.0-0.5-0145

Soil sample from bedding beneath pipe ID= IE2 TB2 4.0-4.5-0149

Groundwater sample ID= IE2 GW 4.5-5.0-0150 (seepage from pipe bedding)

Sidewall soil sample ID= IE2 TB3 3.5-4.0-0152

Bottom soil sample ID= IE2 TB4 9.0-9.5-0151

The excavation and excavated soils were scanned with a 2" NaI detector. Radiation measurements were within expected (e.g., ambient) values.

INFORMATION FOR SAMPLES COLLECTED AT INVESTIGATIVE EXCAVATION IE-2

SAMPLE ID	COLLECTION DATE/TIME	SAMPLE DEPTH (feet bgs)	MATRIX	ANALYTICAL PARAMETERS	QA/QC	SAMPLE DESCRIPTION
IE2TB10.0-0.5-0145	12/5/2012 10:40	0.0 - 0.5	Soil	List 3	None	Surface soil sample at IE-2 (fill/regraded material): dark brown loamy clay topsoil (moist, friable, granular structure, many fine roots) with trace angular & rounded gravel intermixed with a red silty clay with trace to some angular to subangular F-C sand and gravel (moist, medium dense, not plastic, breaks up to granular structure); PID = 0.0 ppm, no odor
IE2TB24.0-4.5-0149	12/5/2012 14:15	4.0 - 4.5	Soil	List 3	None	Soil sample from bedding material beneath north side of pipe in IE2: wet gray fine to coarse sand with trace angular fine gravel; some rusty orangish grains; PID = 0.0 ppm, no odor
IE2TB33.5-4.0-0152	12/5/2012 15:55	3.5 - 4.0	Soil	List 3	None	Soil sample from north wall of IE-2 at interface between red fill and underlying former topsoil layer (highest rad. reading at IE-2): red silty clay with trace to some angular to subangular F-C sand and gravel (slightly moist, medium dense, not plastic, breaks up to granular structure) and dark brown clay loam (slightly moist, friable, granular structure, few fine roots) with trace gravel; PID = 0.0 ppm, no odor
IE2TB49.0-9.5-0151	12/5/2012 15:35	9.0 - 9.5	Soil	List 3	None	Bottom soil sample at north end of IE-2: moist reddish brown silty clay, trace rounded coarse sand and gravel, trace orange and gray mottles, plastic and slightly sticky; PID = 0.0 ppm, no odor
IE2GW4.5-5.0-0150 and IE2GW4.5-5.0F-0150	12/5/2012 14:30	4.5 - 5.0	Liquid	List 4	None	Liquid sample from bedding beneath pipe in IE2; unfiltered sample was very turbid brown; filtered sample was initially clear, then became brownish; no noticeable sheen or odor

Notes: List 3 Analytical Parameters =

TAL Metals; Total U; gamma spec/iso-U/iso-Th

List 4 Analytical Parameters =

Unfiltered: Anions; Alkalinity; TDS

Filtered: TAL Metals; Total U; Ra-226; Ra-228; iso-U/iso-Th

**Project: Niagara Falls Storage Site
(Lewiston, NY) BOP Field Investigation**

Client: USACE

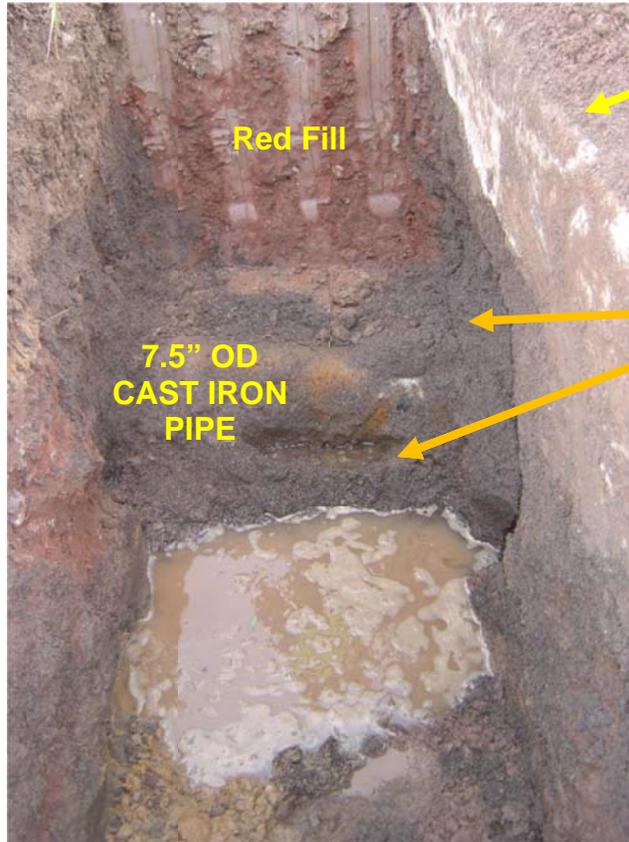
**Job Number:
11176781.00005**

Photo No.
IE2-1

Date:
12/5/2012

Description:

A southward view of the south end of excavation IE-2 (excavation depth is ~5' bgs at time of photo) showing the pipe connecting the concrete decontamination pad (to the east) to the grit chamber. The angular gray bedding around pipe was saturated and samples were collected from the pipe bedding (IE2TB24.0-4.5-0149) beneath the north side of the pipe and from the puddling water (IE2GW4.5-5.0-0150 and IE2GW4.5-5.0F-0150) that seeped out of the pipe bedding.



**EDGE OF CONCRETE RIM
AT EAST END OF GRIT
CHAMBER**

Red Fill

**Angular Gray Sandy
Bedding around pipe**

**7.5" OD
CAST IRON
PIPE**

↓
NORTH

Photo No.
IE2-2

Date:
12/5/2012

Description:

A southward view from the north end of excavation IE-2 showing the interior of the excavation.



Dark brown clay loam (fill)

Red Fill

**Pipe with angular
gray sandy bedding**

**Grayish brown to yellowish
brown to brown silty clay (a
6"-8" thick buried Dark brown
clay loam former topsoil layer
is visible in portions of the
excavation above this layer)**

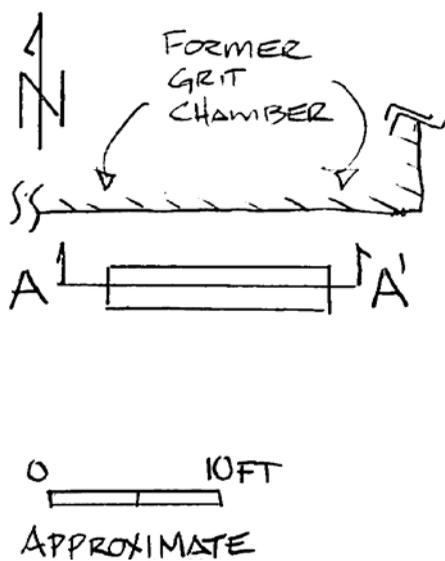
Reddish Brown Silty Clay

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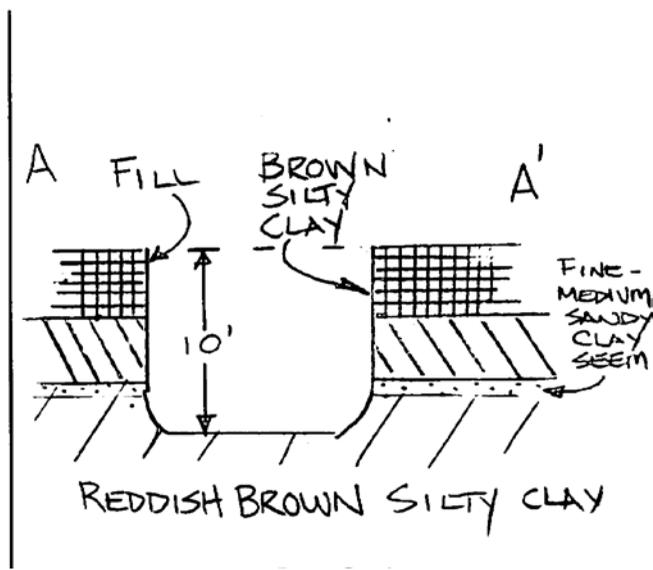
EXCAVATION LOG

PROJECT: Niagara Falls Storage Site (Lewiston, NY) BOP Field Investigation		EXCAVATION ID: IE-3
CLIENT/OWNER: USACE	JOB NUMBER: 11176781.00005	
DATE STARTED: 11/30/2012	URS GEOLOGIST: [REDACTED]	
DATE COMPLETED: 12/3/2012	URS HEALTH PHYSICIST: [REDACTED]	
CONTRACTOR: Russo Development	RUSSO OPERATOR & LABORER: [REDACTED]	
EQUIPMENT: John Deere 200 LC excavator, support truck and trailer, aluminum catwalk		
LOCATION: South side of former grit chamber, west-central portion of EU 11		
PURPOSE: Investigate possible contamination near grit chamber		
CORNER COORDINATES: (NW Cor.) N - 1171321.506, E - 1041296.028, Elev. 321.14; (NE Cor.) N - 1171322.546, E - 1041309.461, Elev. 321.81; (SW Cor.) N - 1171318.499, E - 1041296.051, Elev. 320.70; (SE Cor.) N - 1171320.409, E - 1041310.061, Elev. 321.69		
FINAL EXCAVATION DIMENSIONS: ~12.5' long x 2.3' wide x 10.2' deep		

DEPTH (FT)	VERTICAL PROFILE DESCRIPTION
1	0 - 1.8' below ground surface (bgs): FILL/REWORKED MATERIAL (SM/SW) - Angular fine to coarse SAND & angular fine gravel in a brown loamy clay matrix, moist, many fine roots, granular texture
	1.8' - 3.4' bgs: FILL - Red silty clay with trace to some angular to subangular F-C sand and gravel, granular texture, moist (GC)
	3.4' - 4.0' bgs: Dark brown loamy clay (ML/CL) (buried top soil layer)
5	4.0' - 8.0' bgs: Brown, yellowish brown, gray SILTY CLAY (CL), trace rounded gravel and orange and pink mottles, slightly moist, very stiff, slightly plastic from 7'-10' bgs: trace to some gray silty partings & yellowish brown F-M sandy partings or seams, moist but not wet
	8.0'-10.0' bgs: Reddish brown SILTY CLAY (CL), trace rounded gravel and cobbles, increase in moisture and plasticity, stiff. Some water seeps at bottom of excavation.
10	Maximum depth 10' bgs.



Plan View



Cross Section

URS Corporation

EXCAVATION LOG

PROJECT: Niagara Falls Storage Site (Lewiston, NY) BOP Field Investigation		EXCAVATION ID: IE-3
CLIENT/OWNER: USACE	JOB NUMBER: 11176781.00005	
DATE STARTED: 11/30/2012	URS GEOLOGIST:	
DATE COMPLETED: 12/3/2012	URS HEALTH PHYSICIST:	
CONTRACTOR: Russo Development	RUSSO OPERATOR & LABORER:	

COMMENTS: Trench was oriented in a east-west direction. The trench box was not used at this location.

Some groundwater seepage at the bottom of the excavation.

PID readings on excavated soils were 0 ppm; no visual or olfactory signs of contamination.

Soils from the excavation were stockpiled on plastic. Upon completion, the excavation was backfilled with the excavated soils in the order in which they were removed. The soils were placed back into the excavation in 1'-2' lifts and compacted with the excavator bucket.

Groundwater sample ID= IE3 GW 8.8-9.5-0127

Surface soil sample ID= IE3 TB1 0-0.5-0126

Sidewall soil sample ID= IE3 TB2 3.2-3.6-0129

Sidewall soil sample ID= IE3 TB3 3.2-3.6-0130

Bottom soil sample ID= IE3 TB4 10.2-10.6- 0128

The excavation and excavated soils were scanned with a 2" Nal detector. Radiation measurements were within expected (e.g., ambient) values.

INFORMATION FOR SAMPLES COLLECTED AT INVESTIGATIVE EXCAVATION IE-3

SAMPLE ID	COLLECTION DATE/TIME	SAMPLE DEPTH (feet bgs)	MATRIX	ANALYTICAL PARAMETERS	QA/QC	SAMPLE DESCRIPTION
IE3TB10.0-0.5-0126	11/30/2012 13:45	0.0 - 0.5	Soil	List 3	None	Surface soil sample at IE-3 (fill/regraded material): angular fine to coarse sand & angular fine gravel in a brown loamy clay matrix, (moist, medium dense, not plastic, breaks up to granular structure); PID = 0.0 ppm, no odor
IE3TB23.2-3.6-0129	12/3/2012 12:10	3.2 - 3.6	Soil	List 3	None	Soil sample from northwest corner of IE-3 at interface between red fill and underlying former topsoil layer (high rad. reading): red silty clay with trace to some angular to subangular F-C sand and gravel (slightly moist, medium dense, not plastic, breaks up to granular structure) and dark brown clay loam (slightly moist, friable, granular structure, few fine roots) with trace gravel; PID = 0.0 ppm, no odor
IE3TB33.2-3.6-0130	12/3/2012 12:25	3.2 - 3.6	Soil	List 3	None	Soil sample from east wall of IE-3 at interface between red fill and underlying former topsoil layer (high rad. reading): red silty clay with trace to some angular to subangular F-C sand and gravel (slightly moist, medium dense, not plastic, breaks up to granular structure) and dark brown clay loam (slightly moist, friable, granular structure, few fine roots) with trace gravel; PID = 0.0 ppm, no odor
IE3TB410.2-10.6-0128	12/3/2012 11:50	10.2 - 10.6	Soil	List 3	None	Bottom soil sample at east end of IE-3: reddish brown silty clay, trace subrounded coarse sand and fine gravel, trace grayish silty partings (moist, stiff, slightly plastic); PID = 0.0 ppm, no odor
IE3GW8.8-9.5-0127 IE3GW8.8-9.5F-0127 IE3GW8.8-9.5D-9110 IE3GW8.8-9.5DF-9110	12/3/2012 8:15	8.8 - 9.5	Liquid	List 4	Duplicate	Liquid sample from bottom of west wall of IE3 (probably a combination of precipitation and groundwater seepage); unfiltered and filtered samples were clear, no odor, no noticeable sheen

Notes: List 3 Analytical Parameters =

TAL Metals; Total U; gamma spec/iso-U/iso-Th

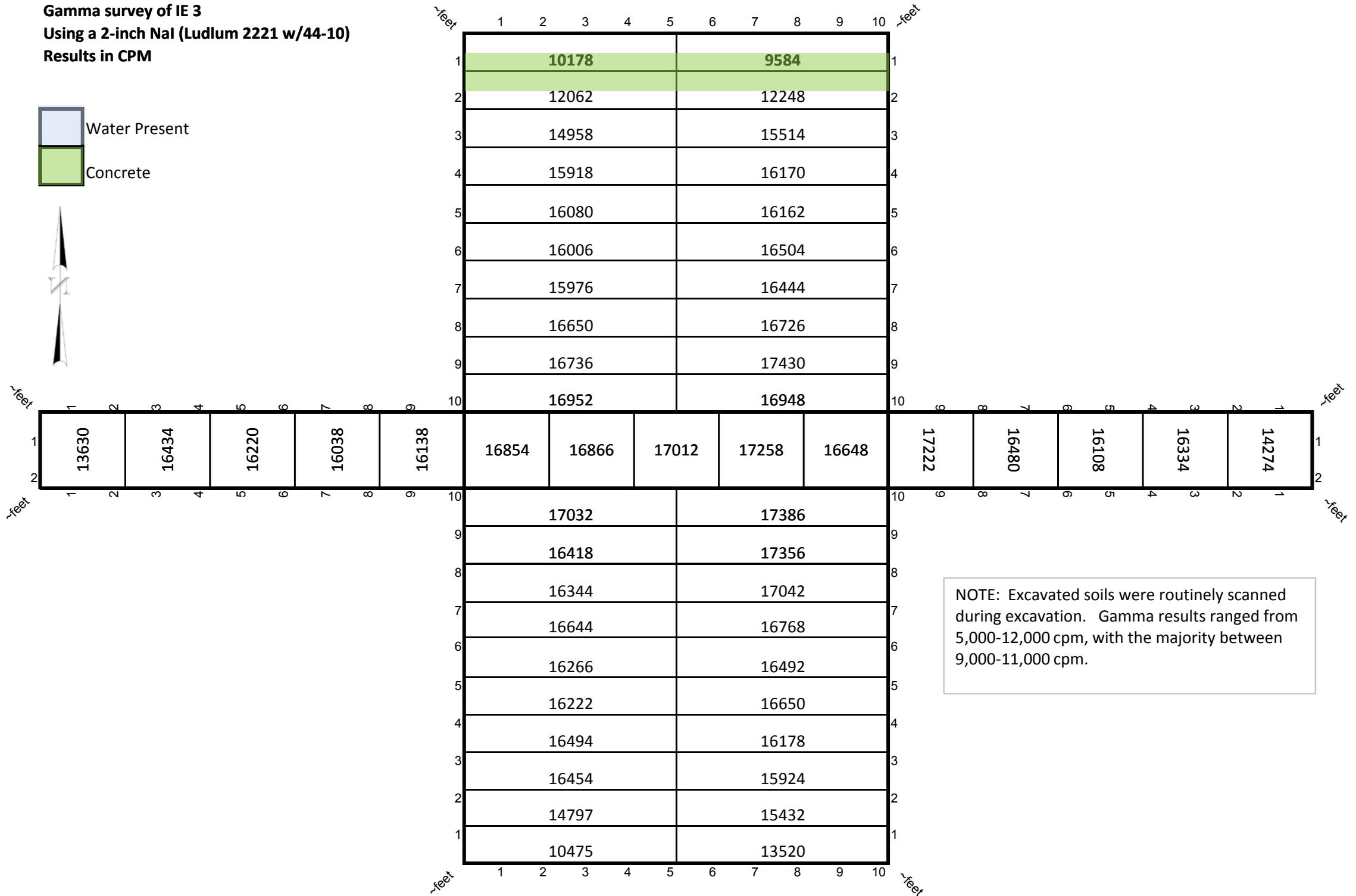
List 4 Analytical Parameters =

Unfiltered: Anions; Alkalinity; TDS

Filtered: TAL Metals; Total U; Ra-226; Ra-228; iso-U/iso-Th

**Gamma survey of IE 3
Using a 2-inch NaI (Ludlum 2221 w/44-10)
Results in CPM**


 Water Present
 Concrete



NOTE: Excavated soils were routinely scanned during excavation. Gamma results ranged from 5,000-12,000 cpm, with the majority between 9,000-11,000 cpm.

Project: Niagara Falls Storage Site
(Lewiston, NY) BOP Field Investigation

Client: USACE
Excavation Contractor: Russo Development

Job Number:
11176781.00005

Photo No.
IE3-1

Date:
11/30/12

Description:

A northeastward view of future IE-3 trench location while the surface radiation survey was being performed.

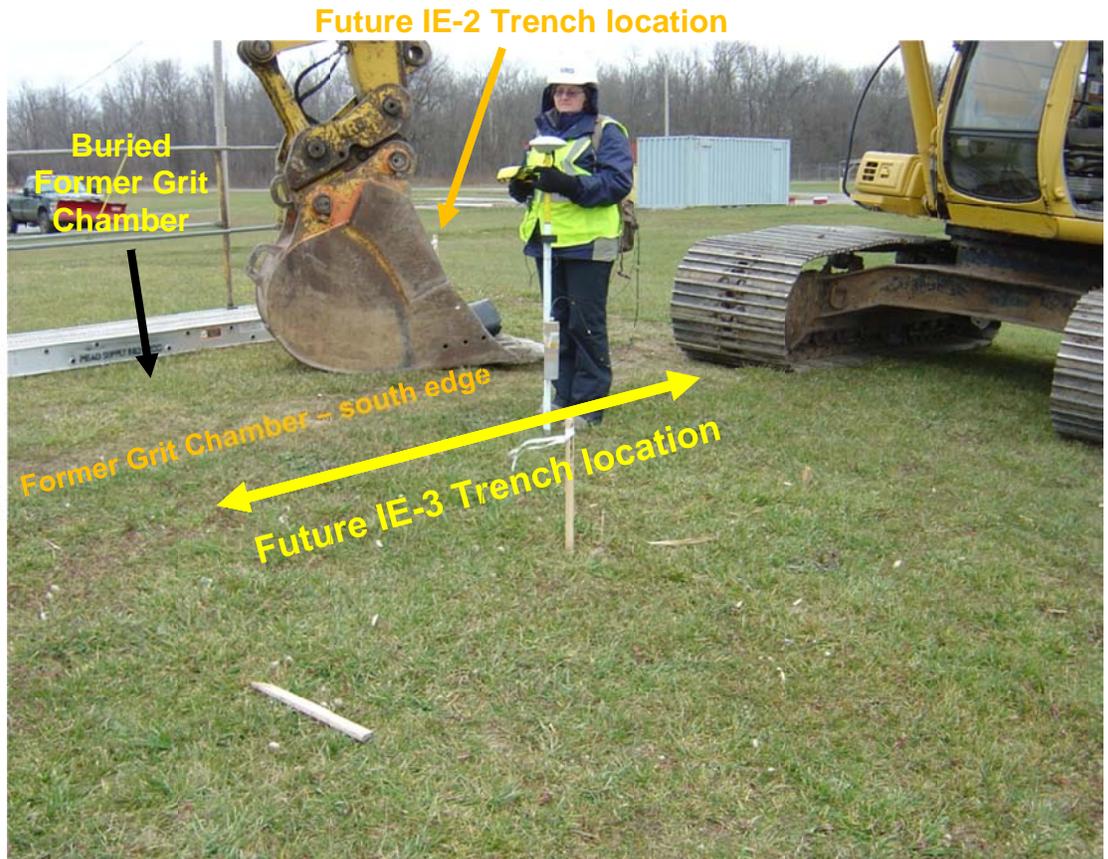
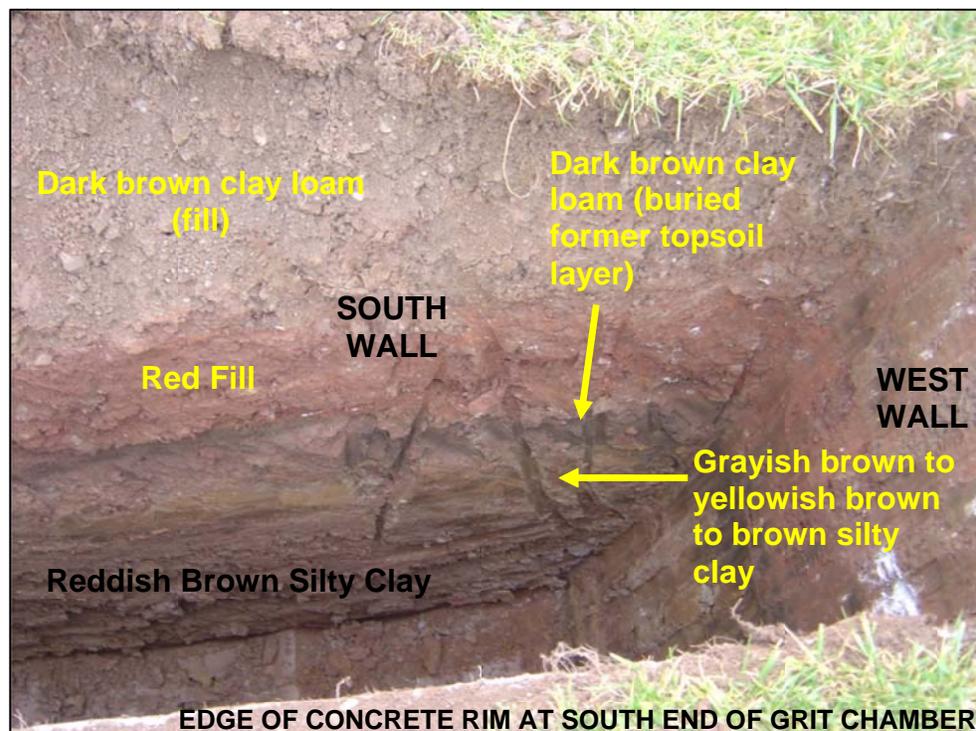


Photo No.
IE3-2

Date:
11/30/2012

Description:

A southward view of the soil section on the south and west walls of trench IE-1; maximum trench depth in photo is ~10' bgs.

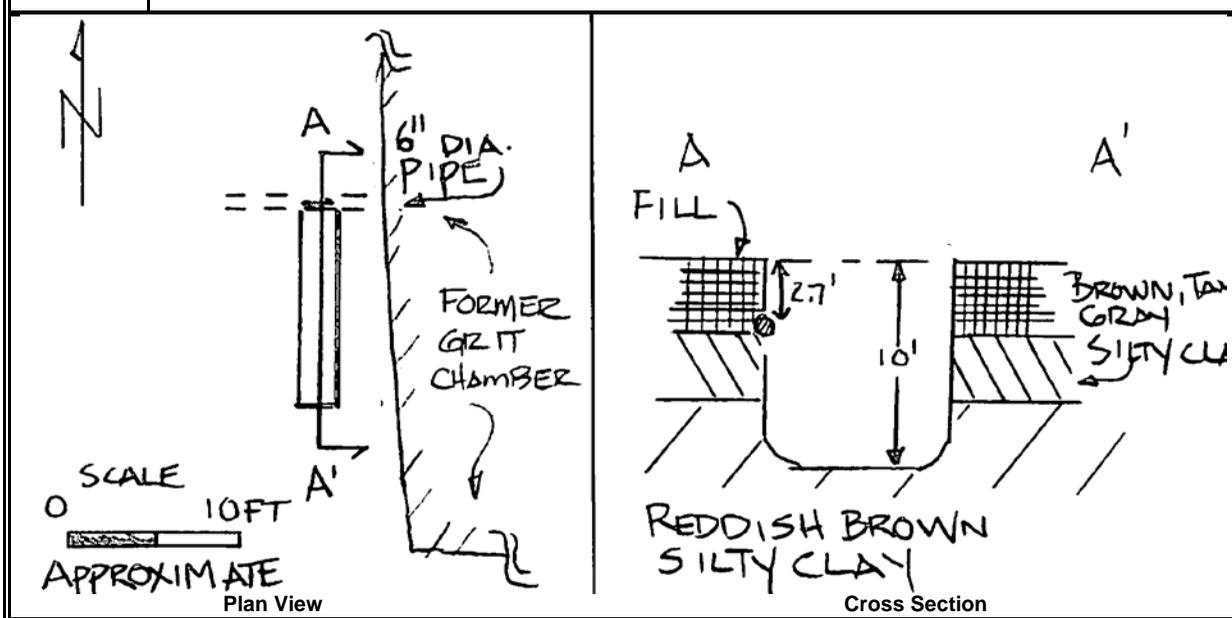


URS Corporation

EXCAVATION LOG

PROJECT: Niagara Falls Storage Site (Lewiston, NY) BOP Field Investigation		EXCAVATION ID: IE-4
CLIENT/OWNER: USACE	JOB NUMBER: 11176781.00005	
DATE STARTED: 12/3/2012	URS GEOLOGIST:	
DATE COMPLETED: 12/4/2012	URS HEALTH PHYSICIST:	
CONTRACTOR: Russo Development	RUSSO OPERATOR & LABORER:	
EQUIPMENT: John Deere 200 LC excavator, support truck and trailer, aluminum catwalk		
LOCATION: West side of former grit chamber, west-central portion of EU 11		
PURPOSE: Investigate possible contamination near grit chamber		
CORNER COORDINATES: (NW Cor.) N - 1171336.269, E - 1041272.101, Elev. 320.41; (NE Cor.) N - 1171336.449, E - 1041274.873, Elev. 321.23; (SW Cor.) N - 1171325.217, E - 1041273.483, Elev. 320.74; (SE Cor.) N - 1171325.532, E - 1041275.773, Elev. 320.80		
FINAL EXCAVATION DIMENSIONS: ~10.5' long x 2.2' wide x 10.5' deep		

DEPTH (FT)	VERTICAL PROFILE DESCRIPTION
1	0 - 1.5' below ground surface (bgs): FILL/REGRADED MATERIAL (ML/CL) - Dark brown loamy clay topsoil, moist, many fine roots, trace rounded gravel
	1.5' - 2.8' bgs: FILL - Red silty clay with trace to some angular to subangular F-C sand and gravel, granular texture, moist (GC)
	2' bgs: Found black crushed 55 gallon drum. No elevated Rad or PID readings.
	2.7' bgs: 6" OD pipe found in north end of excaaction. Water seeped from sandy backfill around pipe
	2.8' - 3.2' bgs: Dark brown loamy clay (ML/CL) (buried top soil layer)
5	3.2'-7.0' bgs: Brown, yellowish brown, gray, SILTY CLAY (CL), trace rounded gravel and cobbles, some orange and gray mottles, some gray to yellowish brown silty-fine sandy partings, slightly moist
	7.0'-10.5' bgs: Reddish brown SILTY CLAY (CL), trace rounded gravel, increase in moisture and plasticity, stiff. Some moist yellowish brown silty-fine sandy partings and seams up to 4" thick.
10	Maximum depth 10.5' bgs.



URS Corporation

EXCAVATION LOG

PROJECT: Niagara Falls Storage Site (Lewiston, NY) BOP Field Investigation		EXCAVATION ID: IE-4
CLIENT/OWNER: USACE	JOB NUMBER: 11176781.00005	
DATE STARTED: 12/3/2012	URS GEOLOGIST: [REDACTED] r	
DATE COMPLETED: 12/4/2012	URS HEALTH PHYSICIST: [REDACTED]	
CONTRACTOR: Russo Development	RUSSO OPERATOR & LABORER: [REDACTED]	

COMMENTS: Trench was oriented in a north-south direction. The trench box was not used at this location.

One 6" OD cast iron pipe crossed the trench in a east-west orientation.

The top of the pipe was encountered at 2.7' bgs in north end of excavation.

Sandy bedding material was present around the pipe. Water in bedding sand leaked into the excavation. No drop in water level observed in grit chamber lift station manhole.

PID readings on excavated soils were 0 ppm; no visual or olfactory signs of contamination.

Soils from the excavation were stockpiled on plastic. Upon completion, the excavation was backfilled with the excavated soils in the order in which they were removed. The soils were placed back into the excavation in 1'-2' lifts and compacted with the excavator bucket.

Groundwater sample ID= IE4 GW 4.0-4.5-0133 (seepage from pipe bedding; USACE took split sample)

Surface soil sample ID= IE4 TB1 0.0-0.5-0131

Soil sample ID= IE4 TB2 3.5-4.0 0132 (pipe bedding material)

Sidewall soil sample ID= IE4 TB3 2.8-3.2-0134

Bottom soil sample ID= IE4 TB4 10.0-10.5-0135

The excavation and excavated soils were scanned with a 2" Nal detector. Radiation measurements were within expected (e.g., ambient) values.

INFORMATION FOR SAMPLES COLLECTED AT INVESTIGATIVE EXCAVATION IE-4

SAMPLE ID	COLLECTION DATE/TIME	SAMPLE DEPTH (feet bgs)	MATRIX	ANALYTICAL PARAMETERS	QA/QC	SAMPLE DESCRIPTION
IE4TB1.0-0.5-0131	12/3/2012 12:40	0.0 - 0.5	Soil	List 3	None	Surface soil sample at IE-4 (fill/regraded material): reddish brown silty clay (moist, sl. plastic, granular structure, many fine roots) with trace angular coarse sand and gravel ; PID = 0.0 ppm, no odor
IE4TB23.5-4.0-0132	12/3/2012 13:15	3.5 - 4.0	Soil	List 3	None	Soil sample from bedding material beneath south side of pipe in IE4: wet gray fine to coarse sand with trace angular fine gravel; some rusty orangish grains; PID = 0.0 ppm, no odor
IE4TB32.8-3.2-0134	12/3/2012 16:25	2.8 - 3.2	Soil	List 3	None	Soil sample from south wall of IE-4 at interface between red fill and underlying former topsoil layer (highest rad. reading at IE-4): red silty clay with trace to some angular to subangular F-C sand and gravel (slightly moist, medium dense, not plastic, breaks up to granular structure) and dark brown clay loam (slightly moist, friable, granular structure, few fine roots) with trace gravel; PID = 0.0 ppm, no odor
IE4TB410.0-10.5-0135	12/3/2012 16:30	10.0 - 10.5	Soil	List 3	None	Bottom soil sample at north end of IE-4 (2' south of pipe): moist, firm, plastic brown silty clay, some yellowish brown fine sand (seam), trace rounded gravel; PID = 0.0 ppm, no odor
IE4GW4.0-4.5-0133 and IE4GW4.0-4.5F-0133	12/3/2012 13:28	4.0 - 4.5	Liquid	List 4	None	Liquid sample from bedding beneath pipe in IE4; unfiltered sample was turbid brown; filtered sample was clear; no noticeable sheen or odor (USACE collected split sample)

Notes: List 3 Analytical Parameters =

TAL Metals; Total U; gamma spec/iso-U/iso-Th

List 4 Analytical Parameters =

Unfiltered: Anions; Alkalinity; TDS

Filtered: TAL Metals; Total U; Ra-226; Ra-228; iso-U/iso-Th

**Project: Niagara Falls Storage Site
(Lewiston, NY) BOP Field Investigation**

Client: USACE

Excavation Contractor: Russo Development

**Job Number:
11176781.00005**

Photo No.
IE4-1

Date:
12/3/2012

Description:

A southwestward view of features in the vicinity of excavation IE-4.

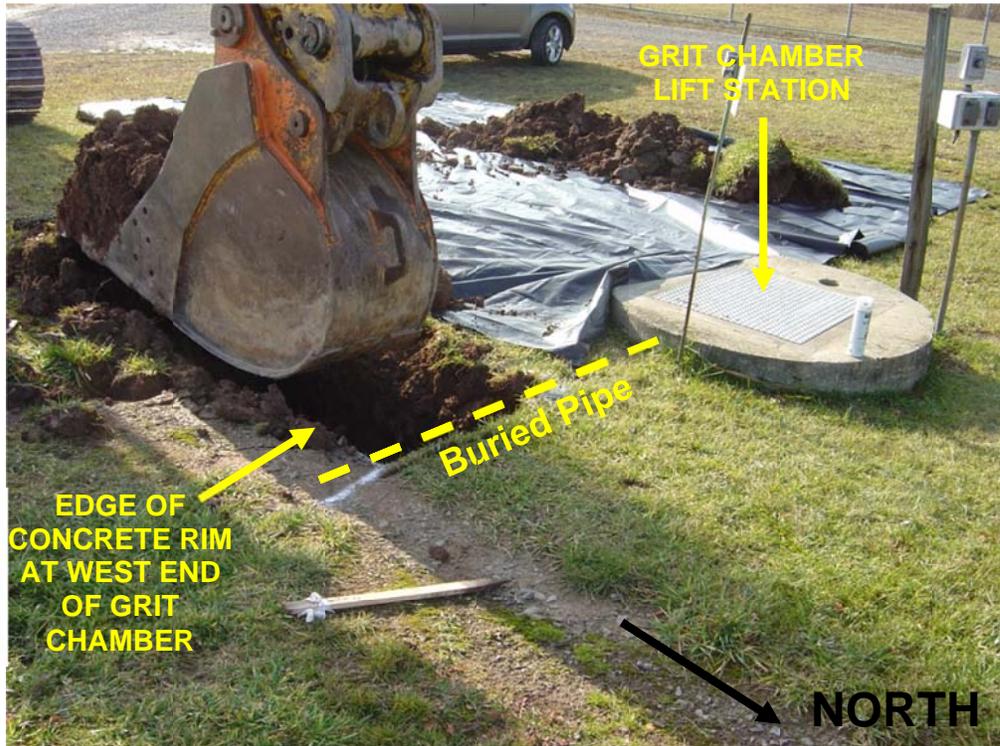


Photo No.
IE4-2

Date:
12/3/2012

Description:

A northwestward view of a crushed metal drum found at ~2' bgs while excavating trench IE-4. The drum appeared to be empty, soils surrounding the drums did not show any impacts (i.e., staining or odors), and radiation monitor and photoionization detector readings from the drum and surrounding soils were at background levels.



**Project: Niagara Falls Storage Site
(Lewiston, NY) BOP Field Investigation**

Client: USACE

Excavation Contractor: Russo Development

**Job Number:
11176781.00005**

Photo No.
IE4-3

Date:
12/3/2012

Description:

A northward view of the north end of excavation IE-4 (excavation depth is ~5' bgs at time of photo) showing the pipe connecting the grit pad lift station (to the west) to the grit chamber. The angular gray bedding around pipe was saturated and samples were collected from the pipe bedding (IE4TB23.5-4.0-0132) beneath the south side of the pipe and from the puddling water (IE4GW4.0-4.5-0133 and IE4GW4.0-4.5F-0133) that seeped out of the pipe bedding.

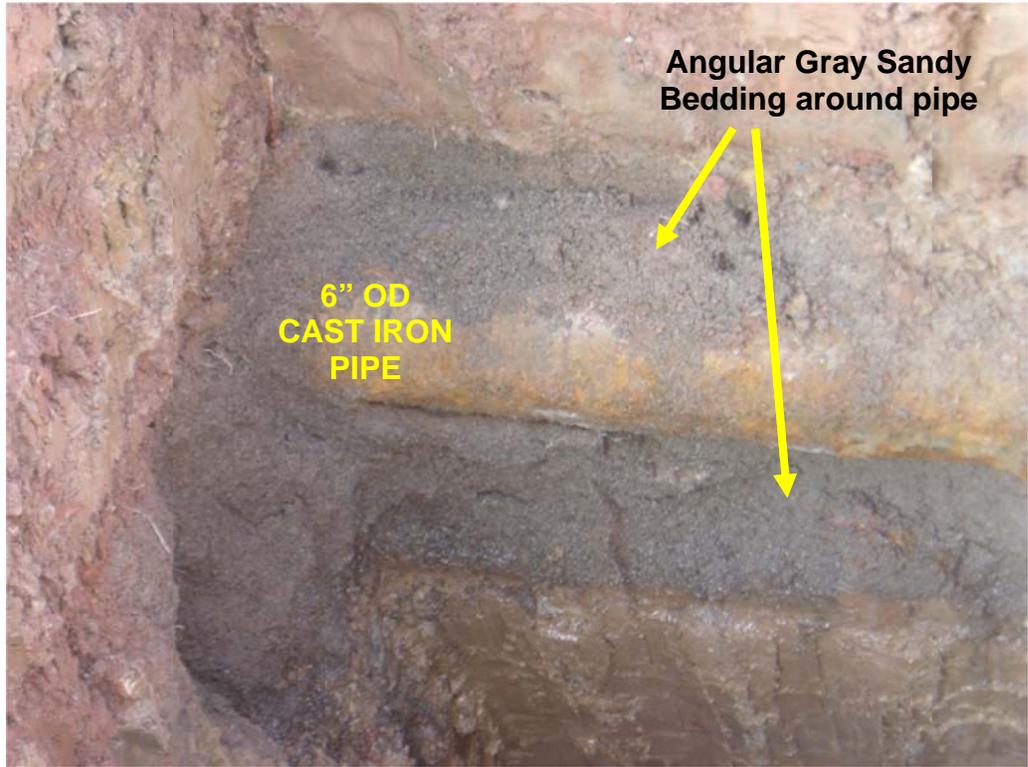


Photo No.
IE4-4

Date:
12/3/2012

Description:

A northward view from the south end of excavation IE-4 showing the interior of the excavation.



Project: Niagara Falls Storage Site
(Lewiston, NY) BOP Field Investigation

Client: USACE

Excavation Contractor: Russo Development

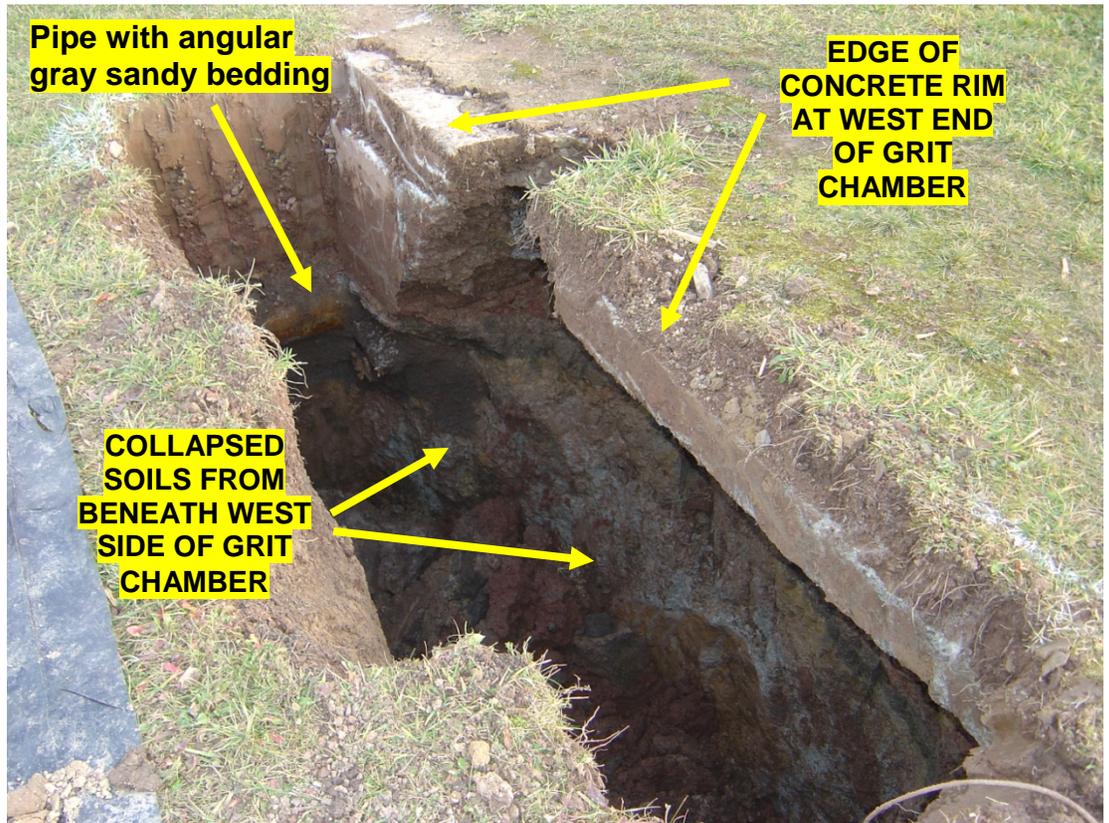
Job Number:
11176781.00005

Photo No.
IE4-5

Date:
12/4/2012

Description:

A north-northeastward view of the interior of excavation IE-4 after the east sidewall collapsed.

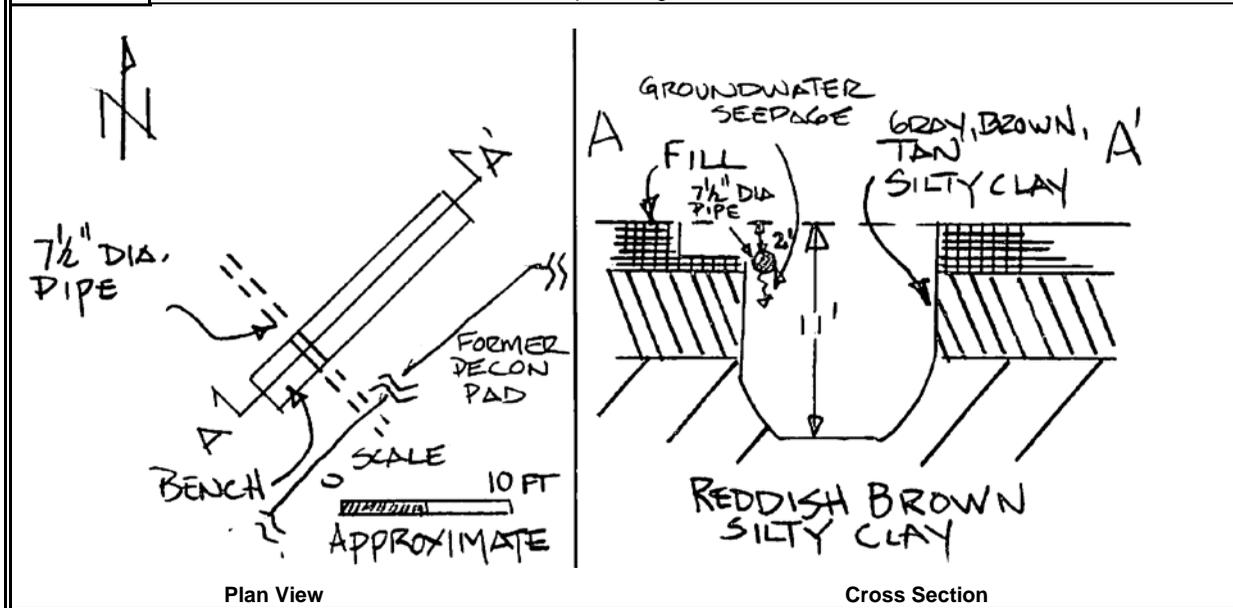


URS Corporation

EXCAVATION LOG

PROJECT: Niagara Falls Storage Site (Lewiston, NY) BOP Field Investigation		EXCAVATION ID: IE-5
CLIENT/OWNER: USACE	JOB NUMBER: 11176781.00005	
DATE STARTED: 12/3/2012	URS GEOLOGIST:	
DATE COMPLETED: 12/4/2012	URS HEALTH PHYSICIST:	
CONTRACTOR: Russo Development	RUSSO OPERATOR & LABORER:	
EQUIPMENT: John Deere 200 LC excavator, support truck and trailer, aluminum catwalk		
LOCATION: Northwest corner of former decon pad, west-central portion of EU 11		
PURPOSE: Investigate possible contamination near former decon pad		
CORNER COORDINATES: (NWCor.) N - 1171337.906, E - 1041362.577, Elev. 320.09; (NE Cor.) N - 1171306.534, E - 1041351.478, Elev. 320.36; (SW Cor.) N - 1171324.384, E - 1041356.116, Elev. 320.18; (SE Cor.) N - 1171323.642, E - 1041358.518, Elev. 320.19		
FINAL EXCAVATION DIMENSIONS: ~15' long x 2.2' wide x 11' deep		

DEPTH (FT)	VERTICAL PROFILE DESCRIPTION
1	0 - 0.6' below ground surface (bgs): FILL/REWORKED MATERIAL (ML/CL) - Dark brown loamy clay topsoil, moist, many fine roots, trace rounded gravel
	0.6' - 2.2' bgs: FILL - Red silty clay with some angular to subangular F-C sand and gravel, granular texture, moist (GC) 2.0' bgs: 7.5" OD pipe found in south end of excavation. Water seeped from sandy backfill around pipe
	2.2' - 3.0' bgs: FILL/REWORKED MATERIAL - Brown SILTY CLAY (CL) and discontinuous Dark brown loamy clay (ML/CL) (buried top soil layer - up to 6" thick)
5	3.0'-7.0' bgs: Brown, yellowish brown, gray, SILTY CLAY (CL), trace rounded gravel and cobbles, some orange and gray mottles, some yellowish brown silty-fine sandy partings, slightly moist
10	7.0'-11.0' bgs: Reddish brown SILTY CLAY (CL), moist, plastic, firm, trace rounded gravel and cobbles, gray silty partings.
	Maximum depth 11' bgs.



URS Corporation

EXCAVATION LOG

PROJECT: Niagara Falls Storage Site (Lewiston, NY) BOP Field Investigation		EXCAVATION ID: IE-5
CLIENT/OWNER: USACE	JOB NUMBER: 11176781.00005	
DATE STARTED: 12/3/2012	URS GEOLOGIST:	
DATE COMPLETED: 12/4/2012	URS HEALTH PHYSICIST:	
CONTRACTOR: Russo Development	RUSSO OPERATOR & LABORER:	
COMMENTS:		
<p>Trench was oriented in a north-northeast/south-southwest direction. The trench box was not used at this location.</p> <p>One 7.5" OD cast iron pipe crossed the trench in a northwest-southeast orientation about 2 feet bgs.</p> <p>Sandy bedding was present around pipe. Water in the bedding seeped into the excavation. Some groundwater infiltration was noted.</p> <p>PID readings on excavated soils were 0 ppm; no visual or olfactory signs of contamination.</p> <p>Soils from the excavation were stockpiled on plastic. Upon completion, the excavation was backfilled with the excavated soils in the order in which they were removed. The soils were placed back into the excavation in 1'-2' lifts and compacted with the excavator bucket.</p> <p>Groundwater sample ID= IE5 GW 2.7-3.4-0155 (seepage from pipe bedding material)</p> <p>Surface soil sample ID= IE5 TB1 0.0-0.5-0153</p> <p>Sample of bedding material beneath pipe ID= IE5 TB2 2.7-3.2-0154</p> <p>Sidewall soil sample ID= IE5 TB3 2.0-2.4-0157</p> <p>Bottom soil sample ID= IE5 TB4 11.0-11.5-0158</p> <p>The excavation and excavated soils were scanned with a 2" NaI detector. Radiation measurements were within expected (e.g., ambient) values.</p>		
Page 2 of 2		

INFORMATION FOR SAMPLES COLLECTED AT INVESTIGATIVE EXCAVATION IE-5

SAMPLE ID	COLLECTION DATE/TIME	SAMPLE DEPTH (feet bgs)	MATRIX	ANALYTICAL PARAMETERS	QA/QC	SAMPLE DESCRIPTION
IE5TB10.0-0.5-0153	12/6/2012 8:50	0.0 - 0.5	Soil	List 3	None	Surface soil sample at IE-5 (fill/regraded material): dark brown loamy clay topsoil (moist, friable, granular structure, many fine roots), trace angular to rounded coarse sand and gravel (angular gray gravel content increased at 6" depth); PID = 0.0 ppm, no odor
IE5TB22.7-3.2-0154	12/6/2012 9:25	2.7 - 3.2	Soil	List 3	None	Soil sample from bedding material beneath north side of pipe in IE5: wet gray fine to coarse sand with trace angular fine gravel; some rusty orangish grains; PID = 0.0 ppm, no odor
IE5TB32.0-2.4-0157	12/6/2012 11:50	2.0 - 2.4	Soil	List 3	None	Soil sample from northwest corner of IE-5 at interface between red fill and underlying former topsoil layer (highest rad. reading at IE-1): red silty clay with some angular to subangular F-C gravel and trace F-C sand (slightly moist, dense, not plastic, breaks up to granular structure) and dark brown loamy clay (slightly moist, friable, granular structure) with trace gravel; PID = 0.0 ppm, no odor
IE5TB411.0-11.5-0158	12/6/2012 12:00	11.0 - 11.5	Soil	List 3	None	Bottom soil sample at center of IE-5: moist to wet, reddish brown silty clay, some rounded to subangular coarse sand and gravel; PID = 0.0 ppm, no odor
IE5GW2.7-3.4-0155 and IE5GW2.7-3.4F-0155	12/6/2012 9:45	2.7 - 3.4	Liquid	List 4	None	Liquid sample from bedding beneath pipe in IE5; unfiltered sample was turbid brown; filtered sample was clear; no noticeable sheen or odor

Notes: List 3 Analytical Parameters =

TAL Metals; Total U; gamma spec/iso-U/iso-Th

List 4 Analytical Parameters =

Unfiltered: Anions; Alkalinity; TDS

Filtered: TAL Metals; Total U; Ra-226; Ra-228; iso-U/iso-Th

**Project: Niagara Falls Storage Site
(Lewiston, NY) BOP Field Investigation**

Client: USACE

Excavation Contractor: Russo Development

**Job Number:
11176781.00005**

Photo No.
IE5-1

Date:
12/6/2012

Description:

A westward view of features in the vicinity of excavation IE-5.

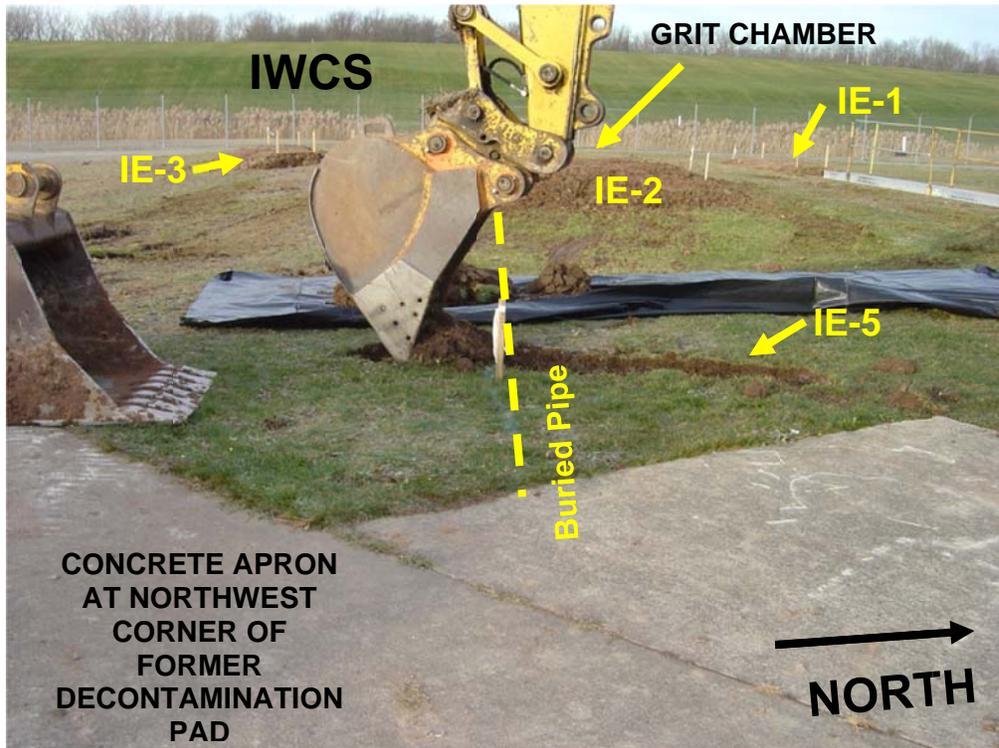
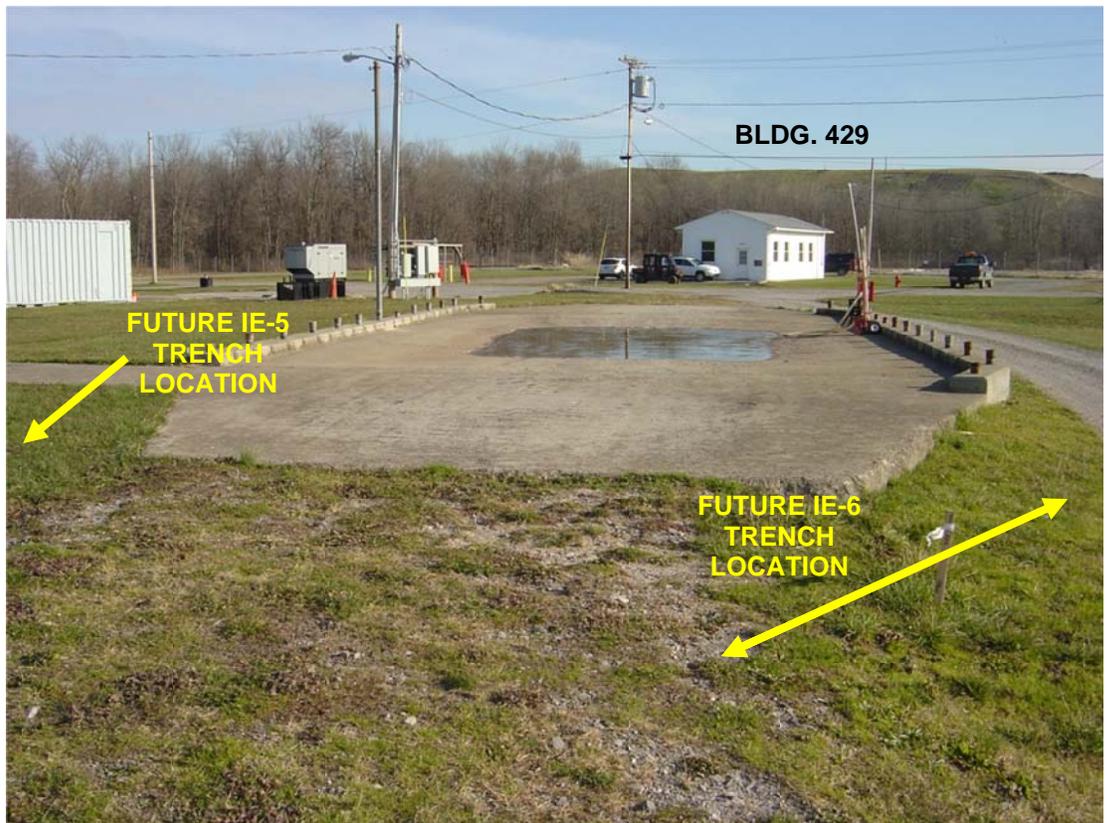


Photo No.
IE5-2

Date:
12/6/2012

Description:

An east-northeastward view of the former concrete decontamination pad and the approximate future locations of trenches IE-5 and IE-6. Modern Landfill is in the upper right background.



**Project: Niagara Falls Storage Site
(Lewiston, NY) BOP Field Investigation**

Client: USACE

Excavation Contractor: Russo Development

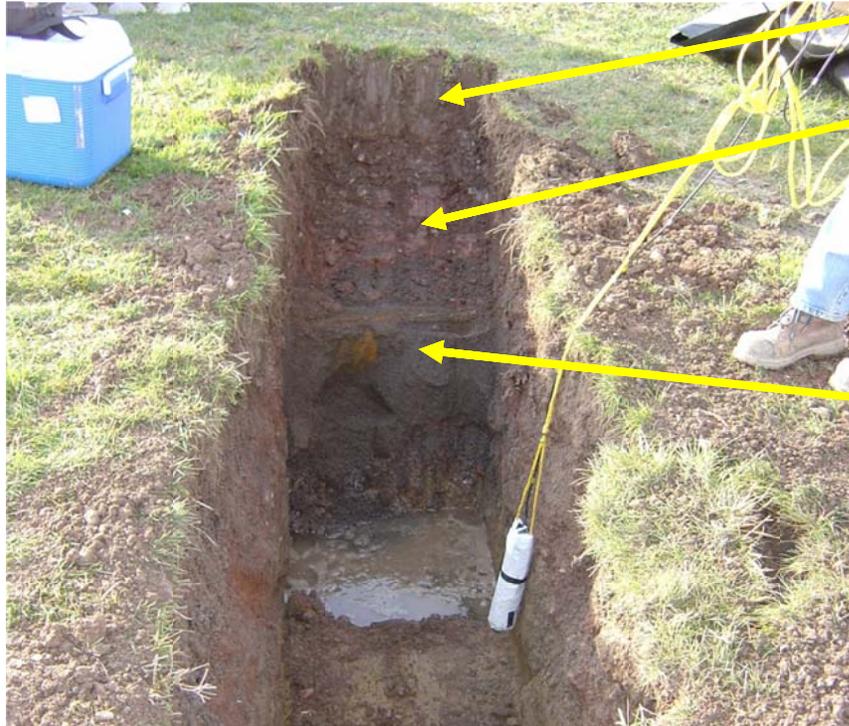
**Job Number:
11176781.00005**

Photo No.
IE5-3

Date:
12/6/2012

Description:

A south-southwestward view of the south end of excavation IE-5 (excavation depth is ~4.5' bgs at time of photo) showing the pipe connecting the former concrete decontamination pad (to the east) to the grit chamber. The angular gray bedding around pipe was saturated and samples were collected from the pipe bedding (IE5TB22.7-3.2-0154) beneath the north side of the pipe and from the puddled water (IE5GW2.7-3.4-0155 and IE5GW2.7-3.4F-0155) that seeped out of the pipe bedding (bottom center of photo).



**Dark brown
clay loam (fill)**

Red Fill

**7.5" OD Pipe
with angular
gray sandy
bedding**

Photo No.
IE5-4

Date:
12/6/2012

Description:

A northward view from the south end of excavation IE-4 showing the interior of the excavation.



Red Fill

**Grayish brown to yellowish
brown to brown silty clay (a
6"-8" thick buried Dark brown
clay loam former topsoil layer
is visible in portions of the
excavation above this layer)**

Reddish Brown Silty Clay

**Pipe with angular
gray sandy bedding**

Dark brown clay loam (fill)

Project: Niagara Falls Storage Site
(Lewiston, NY) BOP Field Investigation

Client: USACE

Job Number:
11176781.00005

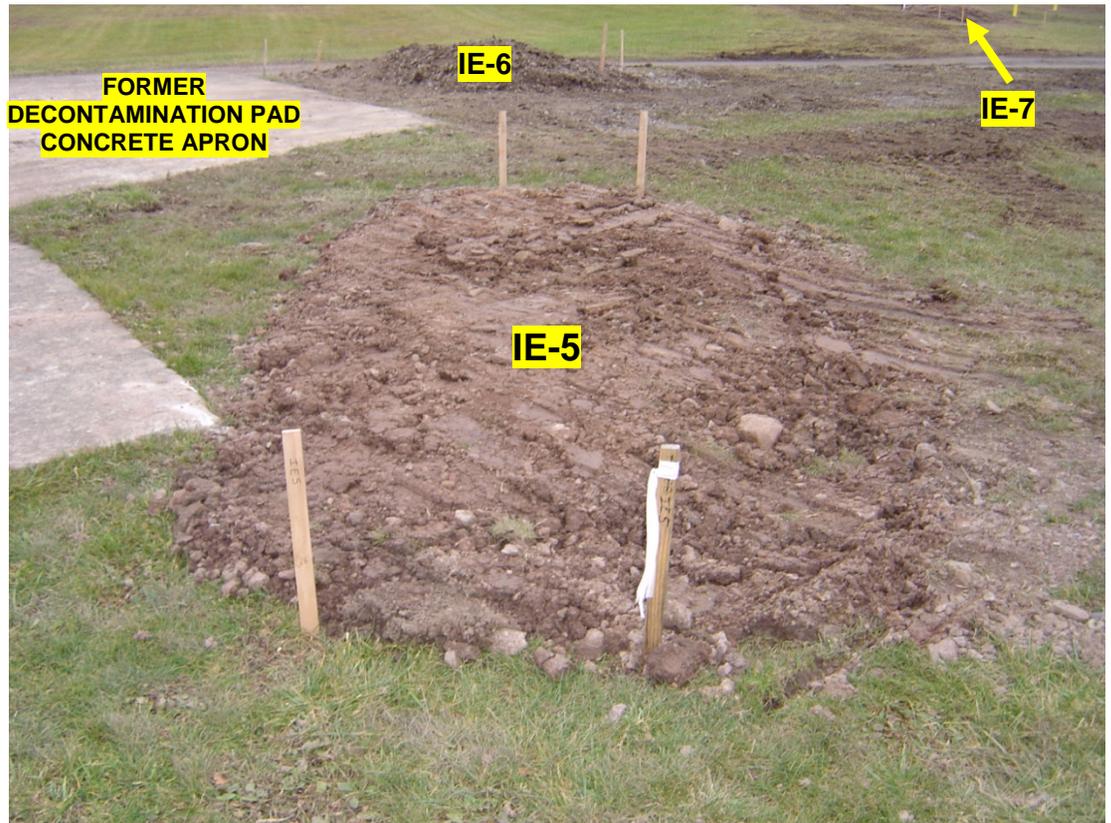
Excavation Contractor: Russo Development

Photo No.
IE5-5

Date:
12/17/2012

Description:

A south-southwestward view of backfilled excavation IE-5.

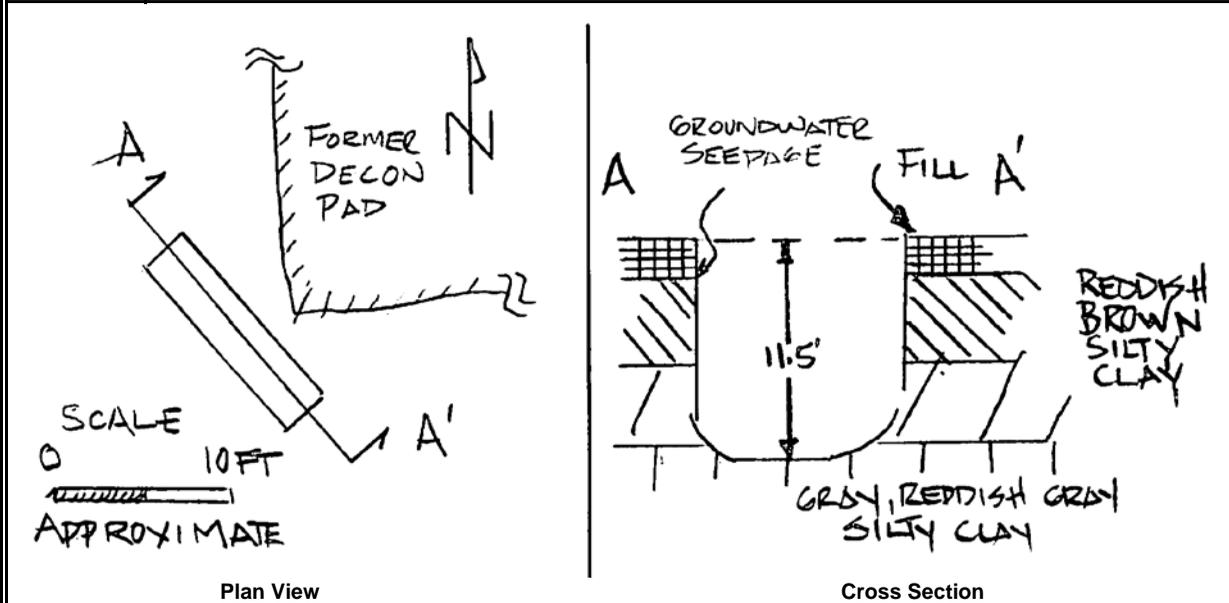


URS Corporation

EXCAVATION LOG

PROJECT: Niagara Falls Storage Site (Lewiston, NY) BOP Field Investigation		EXCAVATION ID: IE-6
CLIENT/OWNER: USACE	JOB NUMBER: 11176781.00005	
DATE STARTED: 12/6/2012	URS GEOLOGIST: [REDACTED]	
DATE COMPLETED: 12/6/2012	URS HEALTH PHYSICIST: [REDACTED]	
CONTRACTOR: Russo Development	RUSSO OPERATOR & LABORER: [REDACTED]	
EQUIPMENT: John Deere 200 LC excavator, support truck and trailer, aluminum catwalk		
LOCATION: Southwest corner of former decon pad, west-central portion of EU 11		
PURPOSE: Investigate possible contamination near former decon pad		
CORNER COORDINATES: (NW Cor.) N - 1171306.534, E - 1041351.478, Elev. 320.36; (NE Cor.) N - 1171297.975, E - 1041362.112, Elev. 319.30; (SW Cor.) N - 1171304.093, E - 1041350.085, Elev. 319.89; (SE Cor.) N - 1171296.024, E - 1041360.104, Elev. 319.03;		
FINAL EXCAVATION DIMENSIONS: ~12' long x 2.7' wide x 11.5' deep		

DEPTH (FT)	VERTICAL PROFILE DESCRIPTION
1	0 - 1.0' below ground surface (bgs): FILL - Gray fine sand to coarse gravel (#3 crusher run) (underlain by geotextile fabric in NW end of excavation), moist to wet
	1.0' - 2.0' bgs: FILL - Red silty clay with some angular to subangular F-C sand and gravel, granular texture, moist to wet (GC)
	2.0'-2.7' bgs: Dark brown loamy clay (ML/CL) (buried top soil layer), moist; some lenses of dry, compact black silt, trace clay (ML)
5	2.7'-6.5' bgs: Brown, yellowish brown, gray SILTY CLAY (CL), trace rounded gravel and cobbles, some orange and gray mottles, some yellowish brown silty-fine sandy partings and lenses to 3" thick, slightly moist.
	6.5'-11.0' bgs: Reddish brown SILTY CLAY (CL), slightly moist, very stiff, trace rounded gravel and cobbles, gray silty partings.
10	
	11.0'-11.5' bgs: Brownish gray to pinkish gray SILTY CLAY (CH), moist, very plastic, sticky.



URS Corporation

EXCAVATION LOG

PROJECT: Niagara Falls Storage Site (Lewiston, NY) BOP Field Investigation		EXCAVATION ID: IE-6
CLIENT/OWNER: USACE	JOB NUMBER: 11176781.00005	
DATE STARTED: 12/6/2012	URS GEOLOGIST:	
DATE COMPLETED: 12/6/2012	URS HEALTH PHYSICIST:	
CONTRACTOR: Russo Development	RUSSO OPERATOR & LABORER:	
<p>COMMENTS: Trench was oriented in a northwest-southeast direction. The trench box was not used at this location.</p> <p>PID readings on excavated soils were 0 ppm; no visual or olfactory signs of contamination.</p> <p>Soils from the excavation were stockpiled on plastic. Upon completion, the excavation was backfilled with the excavated soils in the order in which they were removed. The soils were placed back into the excavation in 1'-2' lifts and compacted with the excavator bucket.</p> <p>Groundwater sample ID= IE6 GW 11.0-11.5-0162 (mainly seepage from 0-2' depth material) NOTE - limited volume collected due to trench sidewall collapse during sampling</p> <p>Surface soil sample ID= IE6TB1 0.0-0.5-0156</p> <p>Sidewall soil sample ID= IE6 TB2 2.5-3.0-0159 (USACE took split sample)</p> <p>Sidewall soil sample ID= IE6 TB3 6.0-8.0-0161</p> <p>Bottom soil sample ID= IE6 TB4 11.5-12.0-0160</p> <p>The excavation and excavated soils were scanned with a 2" NaI detector. Radiation measurements were within expected (e.g., ambient) values.</p>		
		Page 2 of 2

INFORMATION FOR SAMPLES COLLECTED AT INVESTIGATIVE EXCAVATION IE-6

SAMPLE ID	COLLECTION DATE/TIME	SAMPLE DEPTH (feet bgs)	MATRIX	ANALYTICAL PARAMETERS	QA/QC	SAMPLE DESCRIPTION
IE6TB10.0-0.5-0156	12/6/2012 11:40	0.0 - 0.5	Soil	List 3	None	Surface soil sample at IE-6 (fill/regraded material): rounded to angular gray F-C sand and gravel mix in a dark brown clay loam matrix (moist, friable, granular structure, many fine roots); PID = 0.0 ppm, no odor
IE6TB22.5-3.0-0159	12/6/2012 14:13	2.5 - 3.0	Soil	List 3	None	Soil sample from black silt lens in northeast corner of IE-6: moist (due to drainage from overlying wet layers), matte black silt, trace clay, slightly sticky but not plastic; PID = 0.0 ppm, no odor (USACE collected split sample)
IE6TB36.0-8.0-0161	12/6/2012 14:55	6.0 - 8.0	Soil	List 3	None	Soil sample from northeast corner of IE-6 (highest rad. reading at IE-6): reddish brown silty clay with trace rounded gravel and orange and gray mottles (slightly moist, stiff, slightly plastic); PID = 0.0 ppm, no odor
IE6TB411.5-12.0-0160	12/6/2012 14:30	11.5 - 12.0	Soil	List 3	None	Bottom soil sample from IE-6: brownish gray to pinkish gray silty clay (very moist, sticky, extremely plastic) trace angular fine gravel; PID = 0.0 ppm, no odor
IE6GW11.0-11.5-0162 and IE6GW11.0-11.5F-0162	12/6/2012 15:15	11.0 - 11.5	Liquid	List 4	None	Liquid sample from bottom of IE6, mainly seepage from 0-2' bgs material into excavation; unfiltered sample was turbid brown; filtered sample was light brown; no noticeable sheen or odor

Notes: List 3 Analytical Parameters =

TAL Metals; Total U; gamma spec/iso-U/iso-Th

List 4 Analytical Parameters =

Unfiltered: Anions; Alkalinity; TDS

Filtered: TAL Metals; Total U; Ra-226; Ra-228; iso-U/iso-Th

Project: Niagara Falls Storage Site
(Lewiston, NY) BOP Field Investigation

Client: USACE
Excavation Contractor: Russo Development

Job Number:
11176781.00005

Photo No.
IE6-1

Date:
12/6/12

Description:

A northward view of the IE-6 trench excavation showing a section across the former gravel access ramp to southwest end of decontamination pad.

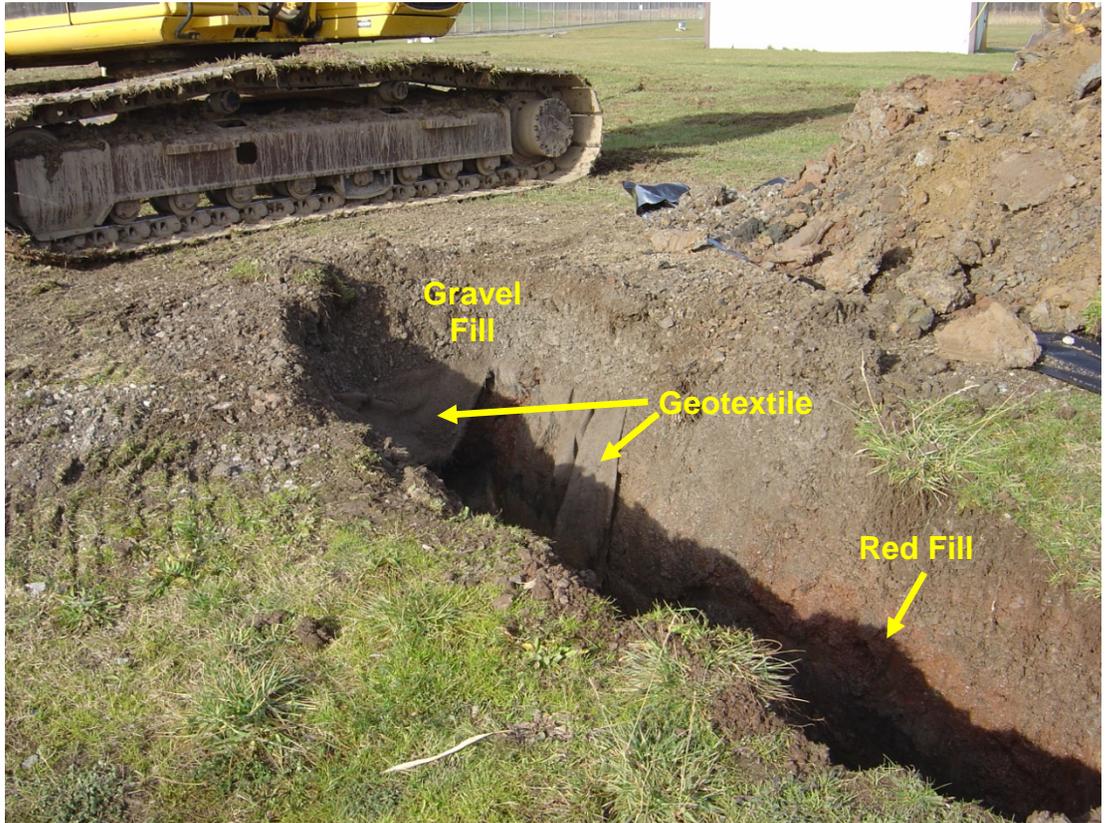


Photo No.
IE6-2

Date:
12/6/2012

Description:

A northward view of backfilled excavation IE-6.



URS Corporation

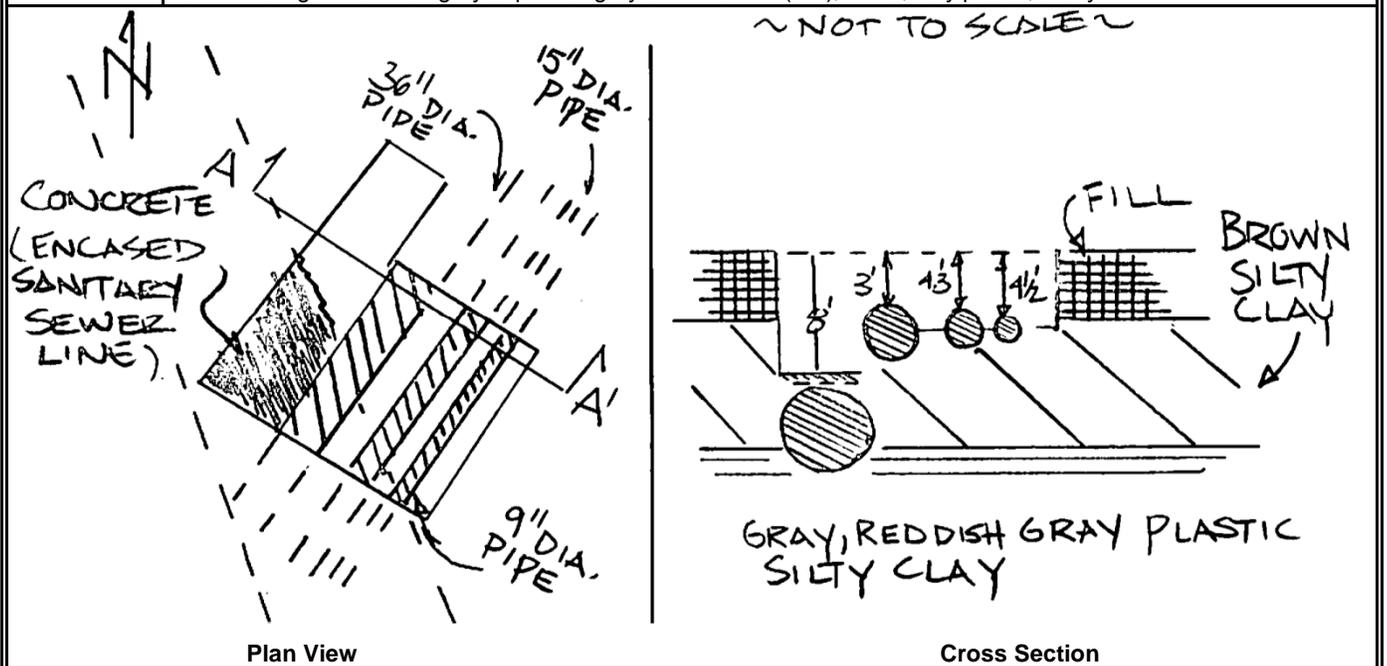
EXCAVATION LOG

PROJECT: Niagara Falls Storage Site (Lewiston, NY) BOP Field Investigation		EXCAVATION ID: IE-7
CLIENT/OWNER: USACE	JOB NUMBER: 11176781.00005	
DATE STARTED: 12/4/2012	URS GEOLOGIST:	
DATE COMPLETED: 12/4/2012	URS HEALTH PHYSICIST:	
CONTRACTOR: Russo Development	RUSSO OPERATOR & LABORER:	
EQUIPMENT: John Deere 200 LC excavator, support truck and trailer, aluminum catwalk		
LOCATION: East-northeast of well OW11B, near water and sanitary sewer lines, west-central portion of EU 11		
CORNER COORDINATES: N - 1171238.916, E - 1041287.289, Elev. 317.44; N - 1171244.267, E - 1041299.691, Elev. 317.81; N - 1171240.955, E - 1041300.863, Elev. 317.86; N - 1171233.750, E - 1041295.891, Elev. 318.99; N - 1171224.681, E - 1041295.000, Elev. 317.50; N - 1171223.535, E - 1041284.284, Elev. 316.87		
FINAL EXCAVATION DIMENSIONS: ~16' long x 14' wide x 11' deep		

DEPTH (FT)	VERTICAL PROFILE DESCRIPTION
1	0 - 1.5' below ground surface (bgs): FILL/REWORKED MATERIAL (ML/CL) - Dark brown loamy clay topsoil, moist, many fine roots, trace rounded gravel

	1.5'-3.0' bgs: FILL - Red silty clay with some angular to subangular F-C sand and gravel, granular texture, moist to wet (GC), mainly at the south and east ends of IE7

	3.0'-10.5' bgs: Brown to reddish brown SILTY CLAY (CL), moist, firm, plastic, some orange and gray mottles, some yellowish brown silty-fine sandy partings.
5	Three pipelines running NE-SW found between 3' to 4.5' bgs.
	Concrete-encased sanitary sewer running NNE-SSW found at 8' bgs on north end of excavation. Groundwater seeped in from surrounding soils along top of concrete-encased sewer pipeline.
10	
	10.5'-11.0' bgs: Brownish gray to pinkish gray SILTY CLAY (CH), moist, very plastic, sticky.



URS Corporation

EXCAVATION LOG

PROJECT: Niagara Falls Storage Site (Lewiston, NY) BOP Field Investigation		EXCAVATION ID: IE-7
CLIENT/OWNER: USACE	JOB NUMBER: 11176781.00005	
DATE STARTED: 12/4/2012	URS GEOLOGIST:	
DATE COMPLETED: 12/4/2012	URS HEALTH PHYSICIST:	
CONTRACTOR: Russo Development	RUSSO OPERATOR & LABORER:	

COMMENTS: Trench was oriented in a northeast-southwest direction. The trench box was not used at this location.

PID readings on excavated soils were 0 ppm; no visual or olfactory signs of contamination.

9", 15", and 36" OD cast iron pipelines, all trending northeast to southwest, were encountered at depths of 4.3', 4.5', and 3' bgs, respectively. Collected a sample of water seeping in between 9" and 15" pipes. Utilities maps indicate only two water lines in this area.

A north-northeast/south-southwest trending concrete encased sewer line was encountered at a depth of 8' bgs in the north end of the excavation running beneath three pipelines. A small amount of water seepage was observed coming from the top of the concrete encasement (not enough to sample). Utility maps show this sewer line.

Soils from the excavation were stockpiled on plastic. Upon completion, the excavation was backfilled with the excavated soils in the order in which they were removed. The soils were placed back into the excavation in 1'-2' lifts and compacted with the excavator bucket.

Groundwater sample ID= IE7 GW 5.0-6.0-0137

Surface soil sample ID= IE7 TB1 0.0-0.5-0125

Soil sample beneath 36" pipe bell ID= IE7 TB2 4.5-5.0-0138

Sidewall soil sample above sewer line ID= IE7 TB3 7.5-8.5-0139

Bottom soil sample beneath sewer line ID= IE7 TB4 9.0-9.5-0136

The excavation and excavated soils were scanned with a 2" NaI detector. Radiation measurements were within expected (e.g., ambient) values.

INFORMATION FOR SAMPLES COLLECTED AT INVESTIGATIVE EXCAVATION IE-7

SAMPLE ID	COLLECTION DATE/TIME	SAMPLE DEPTH (feet bgs)	MATRIX	ANALYTICAL PARAMETERS	QA/QC	SAMPLE DESCRIPTION
IE7TB10.0-0.5-0125	11/30/2012 11:15	0.0 - 0.5	Soil	List 3	MS/MSD	Surface soil sample at IE-7 (fill/regraded material): top 2" was dark brown clay loam (moist, friable, granular structure, many fine roots) with trace rounded and angular gravel, then from 2"-6" bgs brown silty clay with gray and orange mottles (moist, stiff, blocky structure) intermixed with a red silty clay with trace to some angular to subangular F-C sand and gravel (moist, medium dense, not plastic, breaks up to granular structure); PID = 0.0 ppm, no odor
IE7TB24.5-5.0-0138	12/4/2012 13:10	4.5 - 5.0	Soil	List 3	None	Per USACE, soil sample collected beneath bell in 36" OD pipe at northern end of IE-7: brown silty clay, trace yellowish brown silty fine sand partings and rounded gravel, some orange mottles (moist, plastic, very stiff) ; PID = 0.0 ppm, no odor
IE7TB37.5-8.0-0139	12/4/2012 13:20	7.5 - 8.0	Soil	List 3	None	Soil sample from westernmost corner just above concrete encased sewer line in IE-7 (minimal water seepage on top of concrete): brown silty clay, trace rounded gravel, some orange mottles (moist, plastic, very stiff) ; PID = 0.0 ppm, no odor
IE7TB49.0-9.5-0136 and IE7TB49.0-9.5D-9112	12/4/2012 10:15	9.0 - 9.5	Soil	List 3	Duplicate	Per USACE, bottom soil sample beneath sanitary sewer concrete encasement at north end of IE-7: brown to reddish brown silty clay, trace rounded gravel and orange mottles (moist, plastic, sticky, stiff) ; PID = 0.0 ppm, no odor
IE7GW5.0-6.0-0137 and IE7GW5.0-6.0F-0137	12/4/2012 12:30	5.0 - 6.0	Liquid	List 4	None	Liquid sample from sump dug between 9" and 15" OD pipes to collect seepage in IE7; unfiltered sample was slightly brown; filtered sample was clear; no noticeable sheen or odor

Notes: List 3 Analytical Parameters =

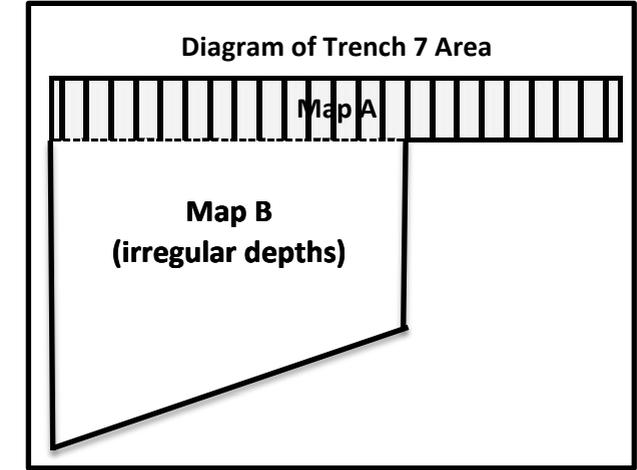
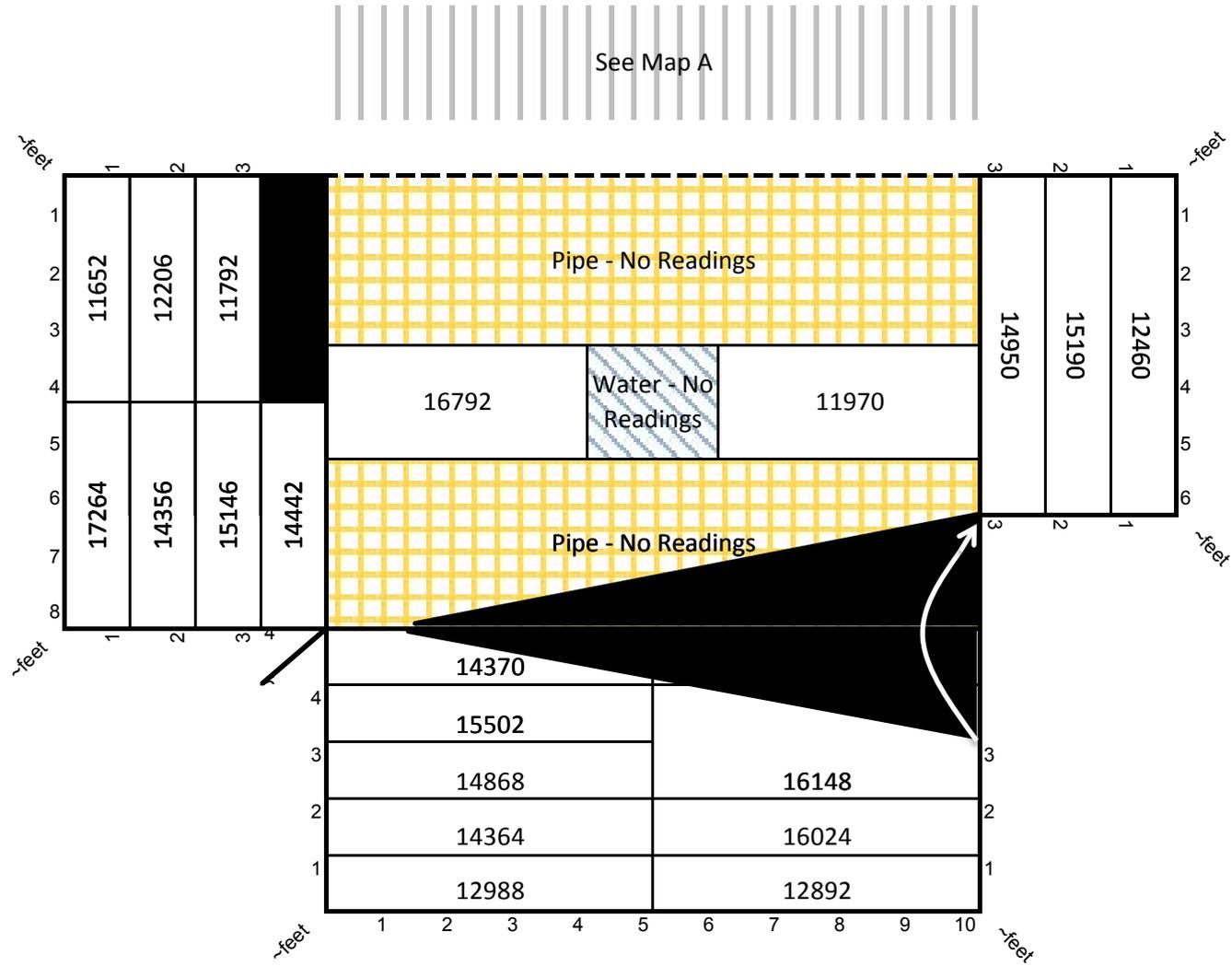
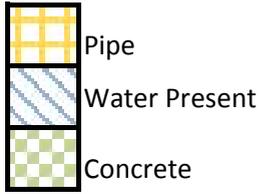
TAL Metals; Total U; gamma spec/iso-U/iso-Th

List 4 Analytical Parameters =

Unfiltered: Anions; Alkalinity; TDS

Filtered: TAL Metals; Total U; Ra-226; Ra-228; iso-U/iso-Th

Gamma survey of IE 7 - Map B
Using 2-inch NaI (Ludlum 2221 w/44-10)
Results in CPM



NOTE: Excavated soils were routinely scanned during excavation. Gamma results ranged from 9,000-15,000 cpm, with the majority between 10,000-12,000 cpm.

**Project: Niagara Falls Storage Site
(Lewiston, NY) BOP Field Investigation**

Client: USACE

Excavation Contractor: Russo Development

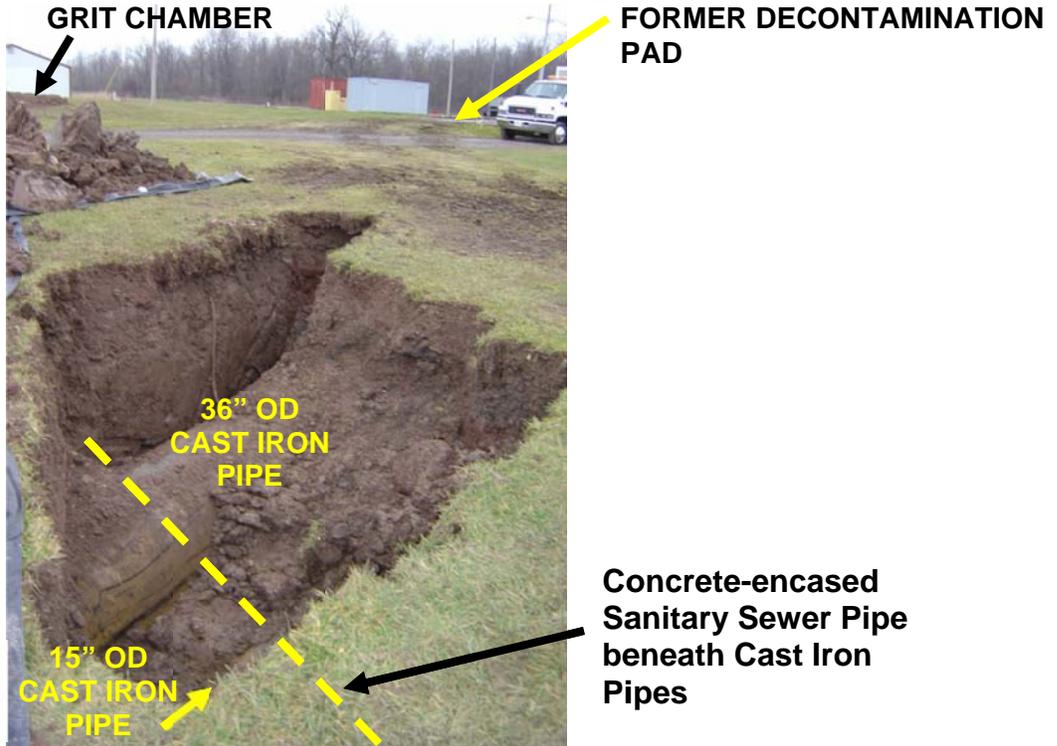
**Job Number:
11176781.00005**

**Photo No.
IE7-1**

**Date:
12/4/2012**

Description:

A north-northeastward view of features in the vicinity of excavation IE-7.



**Photo No.
IE7-2**

**Date:
12/4/2012**

Description:

An northeastward view of the cast iron pipes encountered in excavation IE-7. A water sample (IE7GW5.0-6.0-0137 and IE7GW5.0-6.0F-0137) was collected from an area of groundwater seepage between the 9\" and 15\" OD cast iron pipes.



**Project: Niagara Falls Storage Site
(Lewiston, NY) BOP Field Investigation**

Client: USACE

**Job Number:
11176781.00005**

Excavation Contractor: Russo Development

**Photo No.
IE7-3**

**Date:
12/4/2012**

Description:

A south-southwestward view from the northeast corner of excavation IE-7 (top of concrete-encased sewer pipe is ~8' bgs) showing the relationship of the 3 cast iron water pipes (southwest-northeast orientation) and the underlying concrete-encased sanitary sewer line (north-south orientation). The soil section encountered in the excavation is also labeled.



Dark brown clay loam (fill)

Red Fill

9" OD CAST IRON PIPE

15" OD CAST IRON PIPE

36" OD CAST IRON PIPE

Grayish brown to yellowish brown to brown silty clay

Concrete-encased Sanitary Sewer Pipe

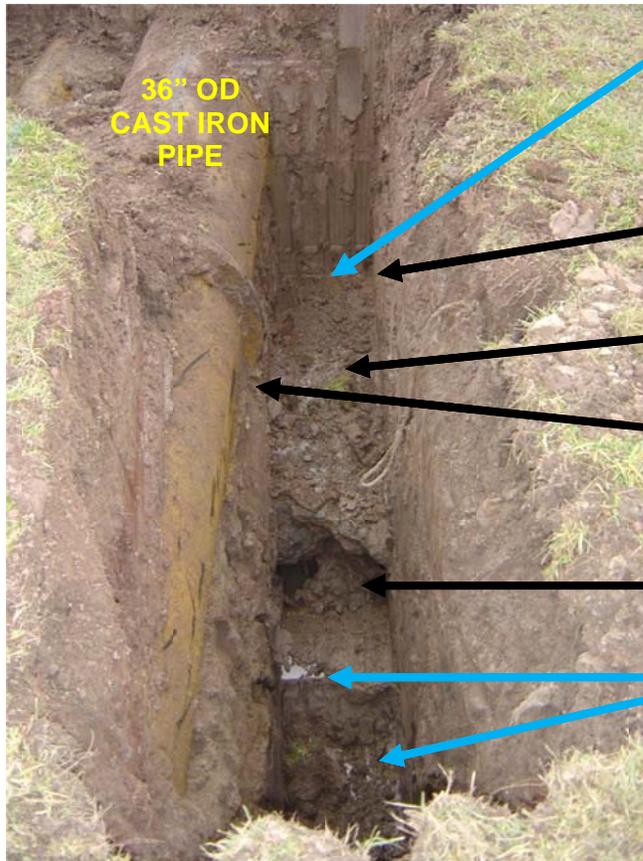
Reddish Brown Silty Clay

**Photo No.
IE7-4**

**Date:
12/4/2012**

Description:

A southwestward view from the northeast corner of excavation IE-7 showing the subsurface soil sample locations and groundwater seep locations around the concrete-encased sanitary sewer line. The groundwater seeps in the vicinity of the concrete-encased sanitary sewer line did not produce enough volume to sample.



36" OD
CAST IRON
PIPE

Groundwater seep

Soil sample location
IE7TB37.5-8.0-0139

Concrete-encased
Sanitary Sewer Pipe

Soil sample location
IE7TB24.5-5.0-0138

Soil sample location
IE7TB49.0-9.5-0136

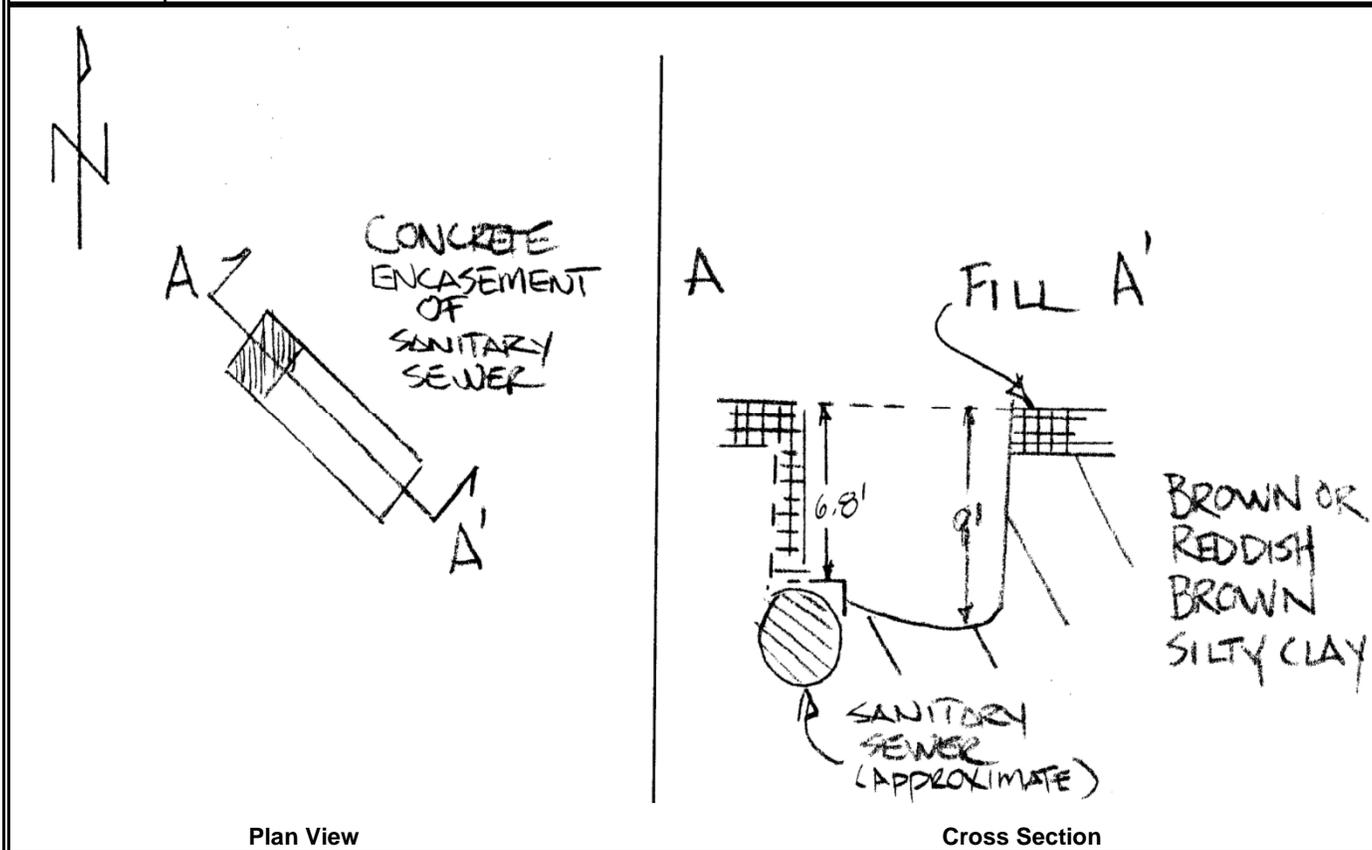
Groundwater seeps

URS Corporation

EXCAVATION LOG

PROJECT: Niagara Falls Storage Site (Lewiston, NY) BOP Field Investigation		EXCAVATION ID: IE-8
CLIENT/OWNER: USACE	JOB NUMBER: 11176781.00005	
DATE STARTED: 12/4/2012	URS GEOLOGIST:	
DATE COMPLETED: 12/5/2012	URS HEALTH PHYSICIST:	
CONTRACTOR: Russo Development	RUSSO OPERATOR & LABORER:	
EQUIPMENT: John Deere 200 LC excavator, support truck and trailer, aluminum catwalk		
LOCATION: Southeast of well OW11B near sanitary sewer line, west-central portion of EU 11		
CORNER COORDINATES: N - 1171171.945, E - 1041262.172, Elev. 316.51; N - 1171169.734, E - 1041261.448, Elev. 316.43; N - 1171165.640, E - 1041270.945, Elev. 317.35; N - 1171168.225, E - 1041272.040, Elev. 317.49		
FINAL EXCAVATION DIMENSIONS: ~10' long x 3' wide x 9' deep		

DEPTH (FT)	VERTICAL PROFILE DESCRIPTION
1	0 - 1.5' below ground surface (bgs): FILL/REWORKED MATERIAL (ML/CL) - Dark brown, loamy clay topsoil, trace rounded gravel and cobbles, moist, many fine roots, granular texture
	1.5'-9.0' bgs: Brown or reddish brown SILTY CLAY (CL), trace rounded gravel and cobbles, moist, firm, plastic, some orange and gray mottles, some yellowish brown silty-fine sandy partings
5	
	6.8' bgs: Concrete-encased sanitary sewer line encountered at north end of excavation. Some groundwater seeped into excavation from surrounding soils along the top of concrete-encased sewer pipeline.
9	Maximum depth 9.0' bgs



Plan View

Cross Section

URS Corporation

EXCAVATION LOG

PROJECT: Niagara Falls Storage Site (Lewiston, NY) BOP Field Investigation		EXCAVATION ID: IE-8
CLIENT/OWNER: USACE	JOB NUMBER: 11176781.00005	
DATE STARTED: 12/4/2012	URS GEOLOGIST:	
DATE COMPLETED: 12/5/2012	URS HEALTH PHYSICIST:	
CONTRACTOR: Russo Development	RUSSO OPERATOR & LABORER:	

COMMENTS:

Trench was oriented in a west-northwest/east--southeast direction. The trench box was not used at this location.

PID readings on excavated soils were 0 ppm; no visual or olfactory signs of contamination.

A north-northeast/south-southwest trending concrete encased sewer line was encountered at a depth of 7' bgs in the northwest end of the excavation. Water seepage was observed coming from the top of the concrete encasement. Utility maps show this sewer line.

Soils from the excavation were stockpiled on plastic. Upon completion, the excavation was backfilled with the excavated soils in the order in which they were removed. The soils were placed back into the excavation in 1'-2' lifts and compacted with the excavator bucket.

Groundwater sample ID= IE8 GW 8.0-9.0-0141

Surface soil sample ID= IE8 TB1 0.0-0.5-0124

Sidewall soil sample ID= IE8 TB2 3.0-3.5 0142

Sidewall soil sample above sewer line ID= IE8 TB3 6.5-7.0 0143

Bottom soil sample beneath sewer line ID= IE8 TB4 8.0-9.0 0140

The excavation and excavated soils were scanned with a 2" NaI detector. Radiation measurements were within expected (e.g., ambient) values.

INFORMATION FOR SAMPLES COLLECTED AT INVESTIGATIVE EXCAVATION IE-8

SAMPLE ID	COLLECTION DATE/TIME	SAMPLE DEPTH (feet bgs)	MATRIX	ANALYTICAL PARAMETERS	QA/QC	SAMPLE DESCRIPTION
IE8TB10.0-0.5-0124 and IE8TB10.0-0.5D-9107	11/30/2012 10:55	0.0 - 0.5	Soil	List 3	Duplicate	Surface soil sample at IE-8 (fill/regraded material): dark brown clay loam (slightly moist, friable, granular structure, many fine roots) with trace to some angular gravel and grayish white slag pieces (vesicular appearance); PID = 0.0 ppm, no odor
IE8TB23.0-3.5-0142	12/4/2012 16:10	3.0 - 3.5	Soil	List 3	None	Soil sample from west wall of IE-8 near northwest corner (highest rad. reading): reddish brown silty clay, trace subrounded coarse sand and fine gravel, trace grayish silty partings (slightly moist, very stiff, slightly plastic); PID = 0.0 ppm, no odor
IE8TB36.5-7.0-0143	12/4/2012 16:20	6.5 - 7.0	Soil	List 3	None	Soil sample from above concrete encased sewer line at northwest end of IE-8 (significant water seepage on top of concrete): reddish brown silty clay, trace subrounded coarse sand and fine gravel, trace grayish silty partings (very moist to wet, medium stiff, very plastic); PID = 0.0 ppm, no odor
IE8TB48.0-9.0-0140	12/4/2012 13:52	8.0 - 9.0	Soil	List 3	None	Bottom soil sample beneath east side of sanitary sewer concrete encasement at west end of IE-8: reddish brown silty clay, trace orange mottles, yellowish brown silty fine sand partings, and rounded coarse sand and gravel (moist, plastic, stiff) ; PID = 0.0 ppm, no odor
IE8GW8.0-9.0-0141 and IE8GW8.0-9.0F-0141	12/4/2012 14:50	8.0 - 9.0	Liquid	List 4	MS/MSD	Liquid sample from seepage into IE8 from along top of concrete encasement; unfiltered sample was slightly brown; filtered sample was clear; no noticeable sheen or odor

Notes: List 3 Analytical Parameters =

TAL Metals; Total U; gamma spec/iso-U/iso-Th

List 4 Analytical Parameters =

Unfiltered: Anions; Alkalinity; TDS

Filtered: TAL Metals; Total U; Ra-226; Ra-228; iso-U/iso-Th

**Project: Niagara Falls Storage Site
(Lewiston, NY) BOP Field Investigation**

Client: USACE

Excavation Contractor: Russo Development

**Job Number:
11176781.00005**

Photo No.
IE8-1

Date:
12/4/12

Description:

A southwestward view of the bottom of excavation IE-8 showing the concrete-encased sanitary sewer line (north-south orientation) and water that seeped into the excavation from around the sewer line (water sample IE8GW8.0-9.0-0141).

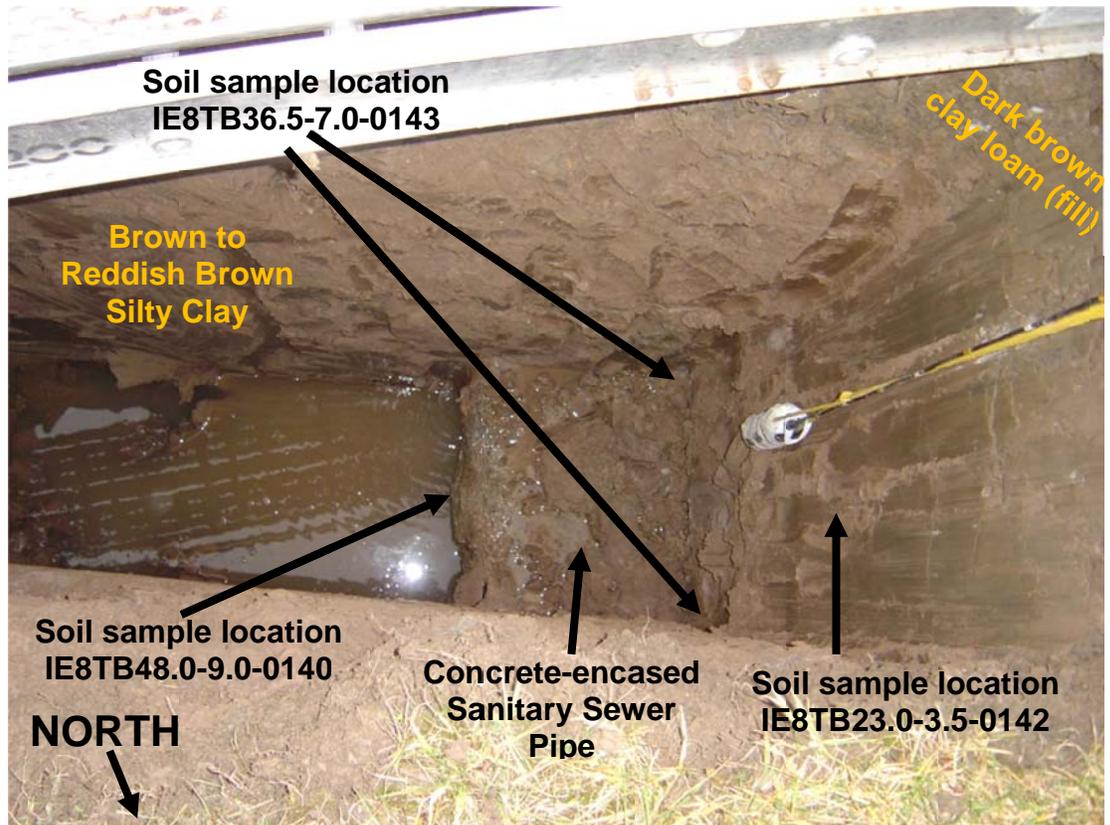


Photo No.
IE6-2

Date:
12/5/2012

Description:

A southeastward view from the west end of excavation IE-8. The excavation had filled with water to ~3' bgs overnight and required pumping prior to backfilling.



INFORMATION FOR SAMPLES COLLECTED AT MANHOLE 08 & MANHOLE 41

SAMPLE ID	COLLECTION DATE/TIME	SAMPLE DEPTH (feet bgs)	MATRIX	ANALYTICAL PARAMETERS	QA/QC	SAMPLE DESCRIPTION
MH08SED9.4-9.8-0164 and MH08SED9.4-9.8D-9116	12/7/2012 14:45	9.4 - 9.8	Sediment	List 1	Duplicate	Sediment sample from bottom of Manhole 08: Light to dark gray to black silt, trace clay and fine sand size sediment, wet, slight decaying organic material odor (i.e., methane/H2S)
MH08MH6.2-0163 and MH08MH6.2F-0163	12/7/2012 14:00	6.2	Liquid	List 2	None	Liquid sample from Manhole 08 (depth to water in manhole was ~4.2'bgs); unfiltered sample was clear; filtered sample was clear; no noticeable sheen or odor
MH41SED5.6-6.0-0113	11/15/2012 14:30	6.5 - 7.0 (depths in sample ID were incorrect)	Sediment	List 1	None	Sediment sample from bottom of Manhole 41: saturated brown organic detritus (decayed leaves, branches, acorns), brick fragments, silty loam soil (material probably fell into manhole from surface since manhole lid was ajar upon dicoverry); PID = 0.0 ppm, no odor
MH41MH4.0-4.5-0112 and MH41MH4.0-4.5F-0112	11/15/2012 12:15	4.0 - 4.5	Liquid	List 2	MS/MSD	Liquid sample from Manhole 08 (depth to water in manhole was ~2.5'bgs); unfiltered sample was clear; filtered sample was clear; no noticeable sheen or odor

Notes: List 1 Analytical Parameters =

VOCs; SVOCs; Pesticides; PCBs; TAL Metals; Total U; gamma spec/iso-U/iso-Th

List 2 Analytical Parameters =

Unfiltered: VOCs; SVOCs; Pesticides; PCBs; TAL Metals; Total U; Anions; Alkalinity; TDS; Ra-226; Ra-228; iso-U/iso-Th
 Filtered: TAL Metals; Total U; Ra-226; Ra-228; iso-U/iso-Th

Project: Niagara Falls Storage Site
(Lewiston, NY) BOP Field Investigation

Client: USACE
Excavation Contractor: Russo Development

Job Number:
11176781.00004

Photo No.
MH08-1

Date:
12/7/2012

Description:

A south-southeastward view from the northwest side of Manhole 08.

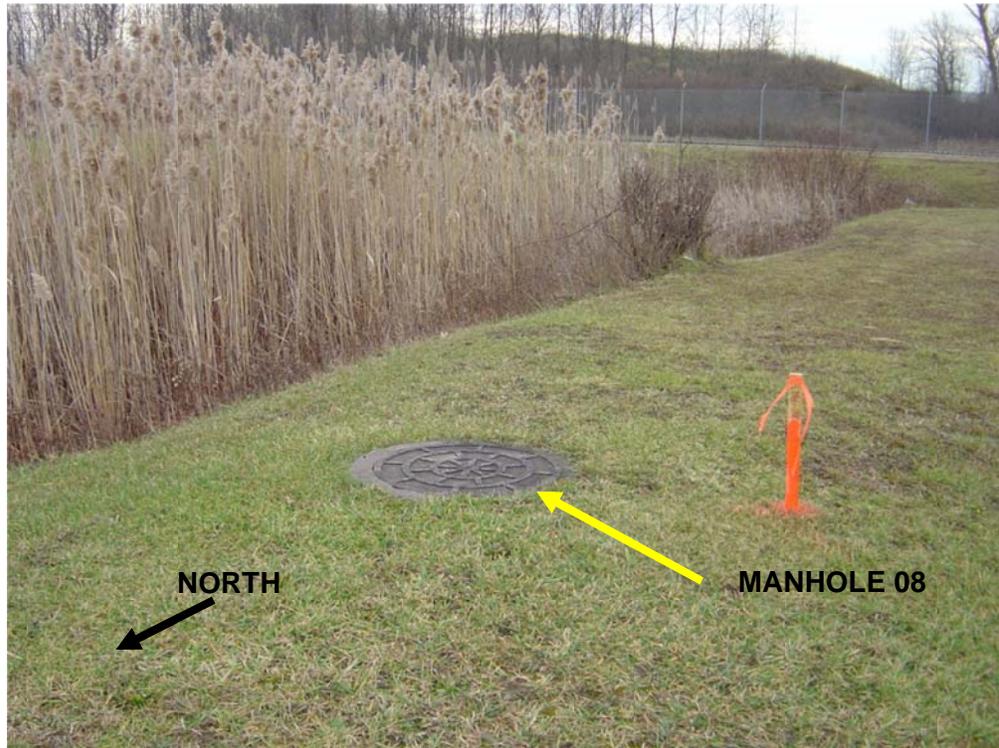


Photo No.
MH08-2

Date:
12/7/2012

Description:

A view of the interior of Manhole 08 prior to decommissioning.



**Project: Niagara Falls Storage Site
(Lewiston, NY) BOP Field Investigation**

Client: USACE

**Job Number:
11176781.00004**

Excavation Contractor: Russo Development

Photo No.
MH08-3

Date:
12/14/2012

Description:

A northeastward view of Manhole 08 after being filled with concrete/bentonite mixture (decommissioning completed). Manhole lid was replaced after photo.



Project: Niagara Falls Storage Site
(Lewiston, NY) BOP Field Investigation

Client: USACE
Excavation Contractor: Russo Development

Job Number:
11176781.00004

Photo No.
MH41-1

Date:
11/8/2012

Description:

A southwestward view of Manhole 41 taken from the west side of Castle Garden Road.



Photo No.
MH41-2

Date:
11/15/2012

Description:

A view of the interior of Manhole 41 prior to decommissioning.



Project: Niagara Falls Storage Site
(Lewiston, NY) BOP Field Investigation

Client: USACE
Excavation Contractor: Russo Development

Job Number:
11176781.00004

Photo No.
MH41-3

Date:
11/16/2012

Description:

A view of sediment recovered from the bottom of Manhole 41 (on black plastic in bottom left corner of photo).



Photo No.
PE6-4

Date:
11/16/2012

Description:

A southeastward view of the initial filling of Manhole 41 with ~1.5 cubic yards of concrete/bentonite mixture to prevent liquid migration through the manhole. An electric vibrator was used to distribute the concrete/bentonite mixture into the pipes entering the base of the manhole. Top of concrete was brought up to ~3.3' bgs.



Project: Niagara Falls Storage Site
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Client: USACE
Excavation Contractor: Russo Development

Job Number:
11176781.00004

Photo No.
MH41-5

Date:
11/19/2012

Description:

A view of the interior of Manhole 41 after the initial concrete/bentonite mixture filling had settled and partially cured.



Photo No.
MH41-6

Date:
11/19/2012

Description:

A southwestward view of Manhole 41 after being filled to the surface with additional concrete/bentonite mixture (decommissioning completed).

