



## RCRA FACILITY GROUNDWATER, LEACHATE AND GAS REPORTING FORM

This form must be used as a cover sheet for the notices and reports, identified below as required by: (1) a facility's RCRA interim status closure plan; (2) the RCRA interim status regulations; or (3) a facility's RCRA permit. All reports must be submitted to the Illinois EPA's Bureau of Land Permit Section. This form is for use by Hazardous Waste facilities only. Reporting for Solid Waste facilities should be submitted on a separate form. All reports submitted to the Illinois EPA's Bureau of Land Permit Section must contain an original, plus a minimum of two copies.

**Note:** This form is not to be used with permit or closure plan modification requests. The facility's approved permit or closure plan will state whether the document you are submitting is required as a report or a modification request.

Facility Name: WRB Refining LP - Wood River Refinery Site ID #: 1191150002  
Facility Address: 900 S. Central Ave; Roxana, IL 62084 Fed ID #: ILD 080 012 305

Check the appropriate heading. Only one heading may be checked for each corresponding submittal. Check the appropriate sub-heading, where applicable. Attach the original and all copies behind this form.

<input type="checkbox"/>	LPC-160 Forms		
	<u>Groundwater</u>		<u>Leachate</u>
<input type="checkbox"/>	Quarterly – Indicate one: 1 2 3 4	<input type="checkbox"/>	Quarterly – Indicate one: 1 2 3 4
	<input type="checkbox"/> Semi-Annual		<input type="checkbox"/> Semi-Annual
	<input type="checkbox"/> Annual		<input type="checkbox"/> Annual
	<input type="checkbox"/> Biennial		<input type="checkbox"/> Biennial

<input type="checkbox"/>	Groundwater Data (without LPC-160 Forms)
<input type="checkbox"/>	Quarterly – Indicate one: 1 2 3 4
<input type="checkbox"/>	Annual <input type="checkbox"/> Semi-Annual <input type="checkbox"/> Biennial

Well Construction Information

Well Construction Forms, Boring Logs and/or Abandonment Forms

Well Survey Data (e.g., Stick-up Elevation Data)

Notice of Statistically Significant Evidence of Groundwater Contamination (35 Ill. Adm. Code 724.198)

Notice of Exceedence of Groundwater Concentration Limit (35 Ill. Adm. Code 724.199(h))

Notice of Alternate Source or Error in Sampling Analysis or Evaluation of Groundwater (35 Ill. Adm. Code 724.199(i))

Gas Monitoring Reports

Other (identify) \_\_\_\_\_

FUGRO GEOSCIENCES, INC.

CPT No : ROST-04

JOB No : 04.1909-0044

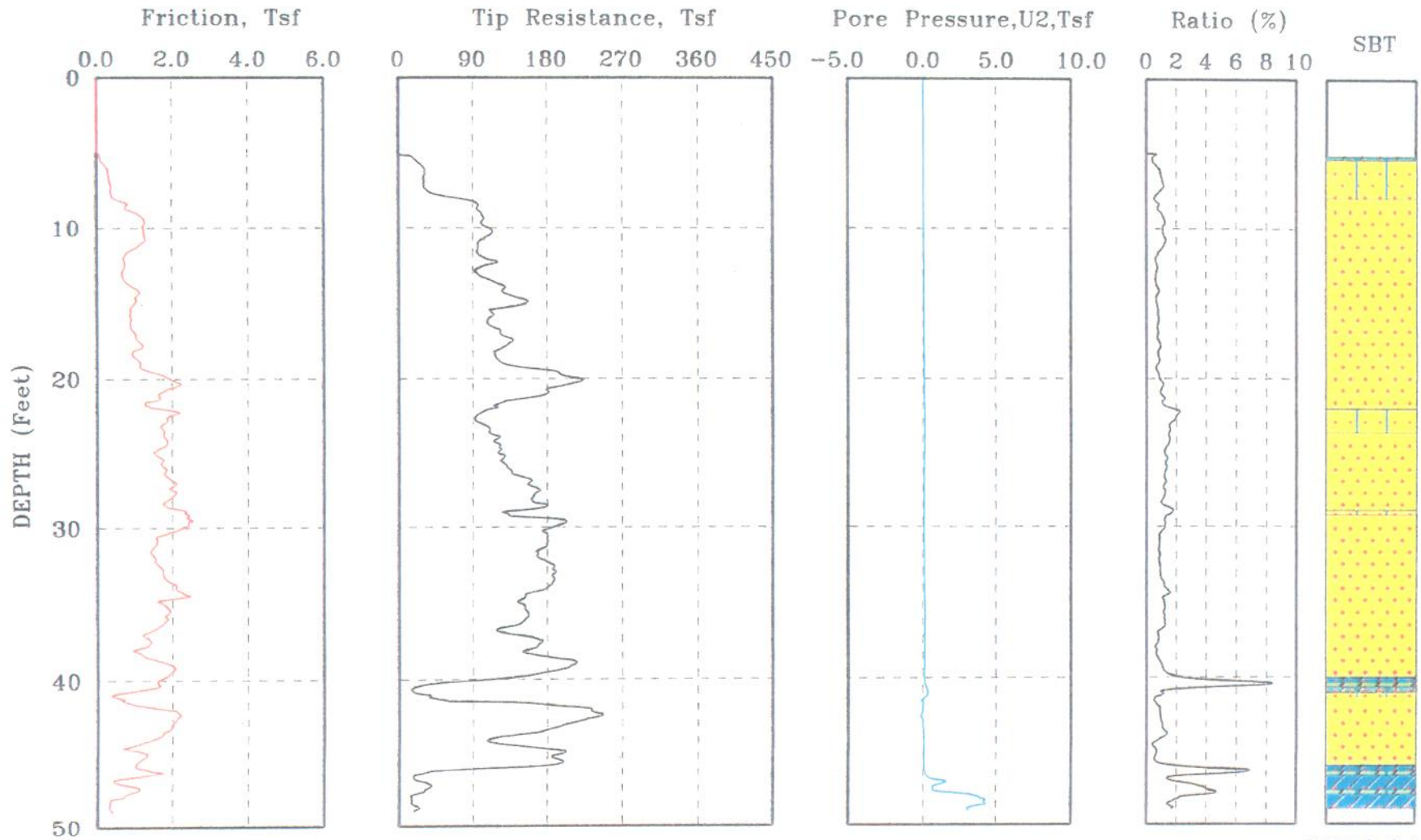
CONE No : F7.5CKE2HAW21344

SITE : Roxana, IL

CLIENT : URS Corporation

OPERATOR : DANIEL GARZA

DATE : 25-Aug-2009





# Illinois Environmental Protection Agency

# Well Completion Report

Site Number: 1191150002County: MadisonSite Name: ROST-4-PZ DelineationWell #: ROST-4-PZ

State \_\_\_\_\_

Plane Coordinate: X 795596.87 Y 232230.37 (or) Latitude: \_\_\_\_\_ Longitude: \_\_\_\_\_Borehole #: ROST-4-PZSurveyed by: Juneau Engineering & Surveying - Phil Huskey, PLSIL Registration #: 35-2659Drilling Contractor: Roberts Environmental Drilling, Inc.Driller: Pat SeymourConsulting Firm: URS CorporationGeologist: Neeta SatamDrilling Method: Hollow Stem AugerDrilling Fluid (Type): N/ALogged By: Neeta SatamDate Started: 3/30/11 Date Finished: 3/30/11Report Form Completed By: Wendy PenningtonDate: 5/2/11

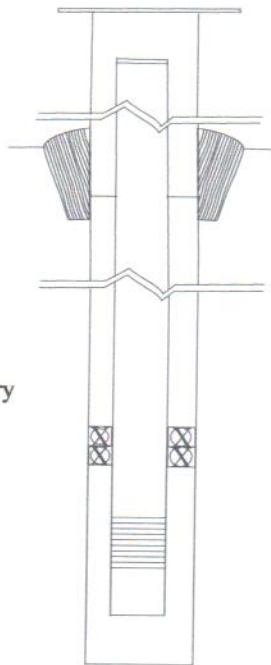
## ANNULAR SPACE DETAILS

Type of Surface Seal: ConcreteType of Annular Sealant: Cement-Bentonite GroutInstallation Method: TremieSetting Time: 1450Type of Bentonite Seal - - Granular, Pellet, Slurry  
(Choose One)Installation Method: PlacedSetting Time: 1405Type of Sand Pack: ANSI/NSF SandGrain Size: #10 (Sieve Size)Installation Method: PlacedType of Backfill Material: Native & Placed  
(if applicable)Installation Method: Cave-in & Placed

## WELL CONSTRUCTION MATERIAL

(Choose one type of material for each area)

Protective Casing	SS304, SS316, PTFE, PVC, or Other
Riser Pipe Above W.T.	SS304, SS316, PTFE, PVC, or Other
Riser Pipe Below W.T.	SS304, SS316, PTFE, PVC, or Other
Screen	SS304, SS316, PTFE, PVC, or Other



Elevations (MSL)*	Depths (BGS)	(.01ft.)
442.76	0	Top of Protective Casing
442.13	0.63	Top of Riser Pipe
442.76	0	Ground Surface
441.26	1.50	Top of Annular Sealant
404.43	38.33	Static Water Level (After Completion)
412.76	30.00	Top of Seal
409.76	33.00	Top of Sand Pack
407.20	35.56	Top of Screen
397.20	45.56	Bottom of Screen
396.95	45.81	Bottom of Well
397.51	45.25	Bottom of Borehole

\* Referenced to a National Geodetic Datum

## CASING MEASUREMENTS

Diameter of Borehole (inches)	9
ID of Riser Pipe (inches)	2
Protective Casing Length (feet)	N/A
Riser Pipe Length (feet)	34.93
Bottom of Screen to End Cap (feet)	0.25
Screen Length (1" slot to last slot) (feet)	10
Total Length of Casing (feet)	45.18
Screen Slot Size **	0.010

\*\*Hand-Slotted Well Screens are Unacceptable

GROUNDWATER DEVELOPMENT/SAMPLING DATA SHEET

PROJECT NAME: Roxane Rost-4-PZ Delineation PROJECT NUMBER: 2562593  
 DATE: 4/13/11  
 WEATHER: 60°F. Sunny  
 FIELD PERSONNEL: N. Salam / Mike Eusemann  
 MONITORING WELL ID: ROST-4PZ

INITIAL DATA

Well Diameter: 2 in.  
 Total Depth of Well: 44.93 ft btoc  
 Depth to Water: 37.70 ft btoc  
 Height of Water Column: 7.23 ft  
 (0.163 gallons/ft for 2 inch well, 1.468 gallons/ft for 6-inch well)

Gallons/Lin.Ft: 0.163  
 Vol. Of Water Column: 1.17 gallons  
 Min. Purge Volume: 5.8 gallons (5 volumes)  
 Depth to Top of Screen: 34.93 ft btoc

Water Added during Drilling: — gallons  
 Water to be Removed: — gallons (5x added)  
 Ambient PID/FID Reading: 0 ppm  
 Wellbore PID/FID Reading: 0.0 ppm

PURGE DATA

Purge Method: Submersible Stable:  $\pm 0.2$   $\pm 1^\circ\text{C}$   $\pm 10\%$

Purge Volume (gals)	Time	Depth to Water (ft)	Color	Odor	pH	Temp (°C)	Cond. (µmhos/cm)	Turbidity (NTUs)	DO (mg/l)	ORP (mv)
20	1440	38.25	Cloudy	hydrocarbon	6.77	19.26	1219	34.0	2.76	-92
21	1442	↓	↓	↓	6.76	19.23	1210	19	3.36	-94
22	1446	↓	↓	↓	6.77	18.96	1210	67	2.74	-96
23	1448	↓	↓	↓	6.72	18.60	1216	8	1.58	-87
24	1450	↓	↓	↓	6.75	18.87	1212	34	3.60	-87

Start Time: 1440 1400 Purge Stop Time: 1450 Elapsed Time: 50  
 Average Purge Rate (gallons/min): 0.5 Well Volumes Purged: 2.9 Water Quality Meter ID: T-011900  
 Total Volume Purged: 24 gallons  
 Calibrated on: 4/13/11

SAMPLING DATA

Sampling Method:  
 Sample Date: N/A Sample Time: N/A Analysis: N/A

COMMENTS:

DTB = 44.93 ft btoc prior to development soft  
 DTB = 45.18 ft btoc after development hard

## LOG OF BORING ROST-4-PZ (A)

Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS	Starting Date: 3/29/11	Quadrangle
								Completion Date: 4/5/11	Sec: N/A T: N/A R: N/A
								Casing Elevation: 442.11	UTM (or State Plane) Coord
								Ground Elevation: 442.81	N: (X): 793696.80 E: (Y): 2322239.89
								DESCRIPTION	NOTES

5								Asphalt	Asphalt	Air knife completed to 10' bgs to clear utilities, lithology information gained via grab samples from hand augers periodically collected.
								FILL	Stiff, moist, brown, low plastic sandy clay FILL [FILL]	
10									With silt	
									Loose, dry, tan, fine grained SAND (SP)	
									Trace silt	
									Silt grades out	
15								ML	Very dense, moist, brown SILT (ML)	Sampled ROST-4-PZ (A)-11.5-12.5 at 0845 for VOCs and SVOCs
									Loose, dry, tan, fine grained SAND (SP)	
									Trace clayey silty seams	
20									Becomes moist, gray	

Completion Depth: 48.0 Ft bgs  
 Project No.: 21562593  
 Project Name: ROST-4-PZ Delineation  
 Drilling Contractor: Roberts Environmental Drilling Inc.  
 Driller Name: Pat Seymor  
 Drilling Method: Direct Push  
 Drill Rig Type: VTR 9700  
 Logged by: N. Satam  
 County: Madison  
 Site ID No.: 1191150002  
 Federal ID No.: ILD 080012305

Water Depth: 37.5 ft., After ATD hrs.  
 Water Depth: \_\_\_\_\_ ft., After \_\_\_\_\_ hrs.  
 Water level at time of drilling  
 Water level after drilling  
 ATD - At time of drilling  
 NE - None Encountered  
 NA - Not Applicable

Geoprobe  
 Air Knife/Hand Auger Sampler  
 Air Rotary  
 Sonic  
 Splitspoon Sampler  
 Hollow Stem Auger-  
 Soil samples not collected



USC based on field visual observations

URS (ENVIRON) LOG (EPA FORMAT) 21562593 (ROXANA ROST).GPJ\_URSSSTLEV.GDT 5/19/11

### LOG OF BORING ROST-4-PZ (A)

Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS	Starting Date: 3/29/11	Quadrangle
								Completion Date: 4/5/11	Sec: N/A T: N/A R: N/A
								Casing Elevation: 442.11	UTM (or State Plane) Coord
								Ground Elevation: 442.81	N: (X): 793696.80 E: (Y): 2322239.89

								DESCRIPTION	NOTES
30	48	34		15.8	[Symbol]	SP		Same: Loose, moist, gray, fine grained SAND (SP)	Sampled ROST-4 PZ-(A)-27-28 at 0915 for VOCs and SVOCs
				23.5	[Symbol]				
35	48	35		1.2	[Symbol]	ML		Medium dense, SILT (ML)	
				1.4	[Symbol]			Loose, moist, gray, fine grained SAND (SP)	
40	48	34		3.2	[Symbol]	SP		Trace orange banding 2" silt seam Becomes dark brown	
				3.8	[Symbol]				
45	48	35		3.0	[Symbol]	CL		1" black banding Becomes wet, medium grained	
				12.5	[Symbol]			Soft, low plastic, Silty CLAY (CL)	
48	48	46		4.0	[Symbol]	SM		Dense to soft, wet, fine grained Silty SAND (SM), some clay	
				4.2	[Symbol]			Clay grades out	
48	48	48		0.0	[Symbol]	CL		Soft, low plastic Silty CLAY (CL)	
				2.0	[Symbol]			Silt grades out	
								Bottom of boring at 48.0' bgs	

Completion Depth: 48.0 Ft bgs  
 Project No.: 21562593  
 Project Name: ROST-4-PZ Delineation  
 Drilling Contractor: Roberts Environmental Drilling Inc.  
 Driller Name: Pat Seymor  
 Drilling Method: Direct Push  
 Drill Rig Type: VTR 9700  
 Logged by: N. Satam  
 County: Madison  
 Site ID No.: 1191150002  
 Federal ID No.: ILD 080012305

Water Depth: 37.5 ft., After ATD hrs.  
 Water Depth: \_\_\_\_\_ ft., After \_\_\_\_\_ hrs.  
 Water level at time of drilling  
 Water level after drilling  
 ATD - At time of drilling  
 NE - None Encountered  
 NA - Not Applicable

Geoprobe  
 Air Knife/Hand Auger Sampler  
 Air Rotary  
 Sonic  
 Splitspoon Sampler  
 Hollow Stem Auger-  
 Soil samples not collected



USC based on field visual observations

URS (ENVIRON) LOG (EPA FORMAT) 21562593 (ROXANA ROST).GPJ URSSTLEV.GDT 5/19/11



Site Number: 1191150002

County: Madison

Site Name: ROST-4-PZ Delineation  
State

Well #: ROST-4-PZ(A)

Plane Coordinate: X <sup>793696.80</sup> Y <sup>2322239.89</sup> (or) Latitude: \_\_\_\_\_ Longitude: \_\_\_\_\_

Borehole #: ROST-4-PZ(A)

Surveyed by: Juneau Engineering & Surveying - Phil Huskey, PLS

IL Registration #: 35-2659

Drilling Contractor: Roberts Environmental Drilling, Inc.

Driller: Pat Seymour

Consulting Firm: URS Corporation

Geologist: Neeta Satam

Drilling Method: Hollow Stem Auger

Drilling Fluid (Type): N/A

Logged By: Neeta Satam

Date Started: 4/5/11 Date Finished: 4/5/11

Report Form Completed By: Wendy Pennington

Date: 5/2/11

ANNULAR SPACE DETAILS

Type of Surface Seal: Concrete

Type of Annular Sealant: Cement-Bentonite Grout

Installation Method: Tremie

Setting Time: 1430

Type of Bentonite Seal - - Granular, Pellet, Slurry  
(Choose One)

Installation Method: Placed

Setting Time: 1330

Type of Sand Pack: ANSI/NSF Sand

Grain Size: #10 (Sieve Size)

Installation Method: Placed

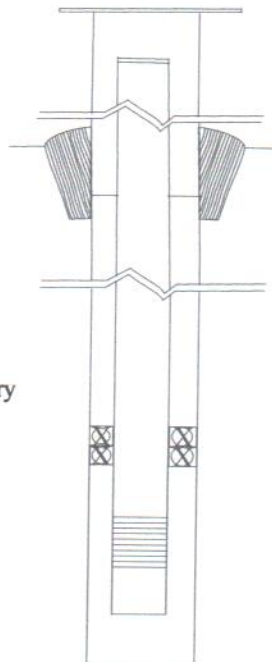
Type of Backfill Material: Native & Placed  
(if applicable)

Installation Method: Cave-in & Placed

WELL CONSTRUCTION MATERIAL

(Choose one type of material for each area)

Protective Casing	SS304, SS316, PTFE, PVC, or Other
Riser Pipe Above W.T.	SS304, SS316, PTFE, PVC, or Other
Riser Pipe Below W.T.	SS304, SS316, PTFE, PVC, or Other
Screen	SS304, SS316, PTFE, PVC, or Other



Elevations (MSL)*	Depths (BGS)	(.01ft.)
442.81	0	Top of Protective Casing
442.11	0.70	Top of Riser Pipe
442.81	0	Ground Surface
441.31	1.50	Top of Annular Sealant
404.69	38.12	Static Water Level (After Completion)
412.81	30.00	Top of Seal
409.81	33.00	Top of Sand Pack
407.34	35.47	Top of Screen
397.34	45.47	Bottom of Screen
397.09	45.72	Bottom of Well
396.81	46.00	Bottom of Borehole

\* Referenced to a National Geodetic Datum

CASING MEASUREMENTS

Diameter of Borehole (inches)	9
ID of Riser Pipe (inches)	2
Protective Casing Length (feet)	N/A
Riser Pipe Length (feet)	34.77
Bottom of Screen to End Cap (feet)	0.25
Screen Length (1 <sup>st</sup> slot to last slot) (feet)	10
Total Length of Casing (feet)	45.02
Screen Slot Size **	0.010

\*\*Hand-Slotted Well Screens are Unacceptable

GROUNDWATER DEVELOPMENT/SAMPLING DATA SHEET

PROJECT NAME: Roxana ROST-4-PZ Delineation PROJECT NUMBER: 21562593  
 DATE: 4/12/11 4/12/11  
 WEATHER: \_\_\_\_\_  
 FIELD PERSONNEL: N. Salerni  
 MONITORING WELL ID: ROST-4PZ(A)

INITIAL DATA

Well Diameter: 2 in.  
 Total Depth of Well: 44.35 ft btoe  
 Depth to Water: 37.42 ft btoe  
 Height of Water Column: 6.93 ft  
 (0.163 gallons/ft for 2 inch well, 1.468 gallons/ft for 6-inch well)  
 Gallons/Lin.Ft: 0.163  
 Vol. Of Water Column: 1.129 gallons  
 Min. Purge Volume: 5.6 gallons (5 volumes)  
 Depth to Top of Screen: 34.42 ft btoe  
 Water Added during Drilling: none gallons  
 Water to be Removed: - gallons (5x added)  
 Ambient PID/FID Reading: 7.0 ppm  
 Wellbore PID/FID Reading: 0.0 ppm

PURGE DATA

Purge Method: Submersible pump Stable: ±0.2 ±1°C ±10%

Purge Volume (gals)	Time	Depth to Water (ft)	Color	Odor	pH	Temp (°C)	Cond. (µmhos/cm)	Turbidity (NTUs)	DO (mg/l)	ORP (mv)
5/55	1520	37.92	cloudy	hydrocarbon	6.93	18.70	859	-18.9	1.98	-100
5/56	1521	37.92	↓	↓	6.99	17.49	858	-35	2.96	-95
5/57	1522	37.92	↓	↓	6.95	17.24	857	-19	3.05	-99
5/58	1523	37.92	↓	↓	6.98	17.33	852	-35	4.07	-95
5/59	1524	37.92	↓	↓	6.97	17.47	855	-24	2.04	-100

Start Time: 1410 Purge Stop Time: 1520 Elapsed Time: 60 Total Volume Purged: 60 gallons  
 Average Purge Rate (gallons/min): 60 Well Volumes Purged: 60 Water Quality Meter ID: 72019500 Calibrated on: 4/12/11

SAMPLING DATA

Sampling Method: \_\_\_\_\_  
 Sample Date: N/A Sample Time: N/A Analysis: N/A

COMMENTS:

DTB = 44.35 ft btoe prior to development (Soft)  
 DTB = 45.02 ft btoe after development (hard)

Turbidity sensor not properly functioning. Water visually sediment free at end of development.



## LOG OF BORING ROST-4-PZ (B)

Starting Date: 3/29/11 Completion Date: 4/6/11 Casing Elevation: 442.38 Ground Elevation: 442.72	Quadrangle Sec: N/A T: N/A R: N/A UTM (or State Plane) Coord N: (X):793647.01 E: (Y):2322241.07
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Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
							ASPHALT	Asphalt	Air knife completed to 10' bgs to clear utilities, lithology information gained via grab samples from hand augers periodically collected.
				0.2			FILL	Medium stiff, moist, brown, low plastic sandy clay FILL with silt [FILL]	
				0.2					
5				0.2				Medium dense, dry, tan, fine grained SAND (SP)	Sampled ROST-4-PZ(B)-10-11 at 0930 for VOCs and SVOCs
				0.3					
				0.2					
				0.1					
10	24	24		0.5			SP	Becomes moist	
				0.3					
15	48	36		0.2					
				0.3				Trace black banding	
				1.3					
20	48	37		1.2				Becomes dry	
				1.8					
				1.5			SM	Dense, moist, gray Silty SAND (SM)	

Completion Depth: 48.0 Ft bgs  
 Project No.: 21562593  
 Project Name: ROST-4-PZ Delineation  
 Drilling Contractor: Roberts Environmental Drilling Inc.  
 Driller Name: Pat Seymor  
 Drilling Method: Direct Push  
 Drill Rig Type: VTR 9700  
 Logged by: N. Satam  
 County: Madison  
 Site ID No.: 1191150002  
 Federal ID No.: ILD 080012305

Water Depth: 37 ft., After ATD hrs.  
 Water Depth: \_\_\_\_\_ ft., After \_\_\_\_\_ hrs.  
 Water level at time of drilling  
 Water level after drilling  
 ATD - At time of drilling  
 NE - None Encountered  
 NA - Not Applicable

Geoprobe  
 Air Knife/Hand Auger Sampler  
 Air Rotary  
 Sonic  
 Splitspoon Sampler  
 Hollow Stem Auger-  
 Soil samples not collected



USC based on field visual observations

URS (ENVIRON) LOG (EPA FORMAT) 21562593 (ROXANA ROST).GPJ\_URSSSTLEV.GDT 5/19/11

**LOG OF BORING  
ROST-4-PZ (B)**

Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS	Starting	Quadrangle
								Date: 3/29/11	Sec: N/A
								Completion	T: N/A
								Date: 4/6/11	R: N/A
								Casing Elevation: 442.38	UTM (or State Plane) Coord
								Ground Elevation: 442.72	N: (X):793647.01
									E: (Y):2322241.07

DESCRIPTION								NOTES	
	48	35		1.7			SM	Same: Dense, moist, gray Silty SAND (SM)	Sampled ROST-4-PZ(B)-28-29 at 1000 for VOCs and SVOCs
				3.5			SM		
30	48	34		4.5			SP	Medium dense, dry, tan, fine grained SAND (SP)	Sampled ROST-4-PZ(B)-36-37 at 1030 for VOCs and SVOCs
				1.6			SM	Dense, moist, gray, Silty SAND (SM)	
	48	36		2.3			SP	Medium dense, dry, tan fine grained SAND (SP)	Sampled ROST-4-PZ(B)-36-37 at 1030 for VOCs and SVOCs
35				2.8			SP	Becomes moist, gray, very fine grained	
	48	34		3.5			SP	Becomes wet 3" medium to coarse grained seam	
				5.5			SP		
40	48	48		15.5			CL	Soft, low plastic, Silty CLAY (CL)	
				6.5			ML	Dense SILT (ML)	
				247			SM	Silty SAND (SM)	
45	48	48		15.8			SM		
								Bottom of boring at 48.0' bgs	

Completion Depth: 48.0 Ft bgs  
 Project No.: 21562593  
 Project Name: ROST-4-PZ Delineation  
 Drilling Contractor: Roberts Environmental Drilling Inc.  
 Driller Name: Pat Seymor  
 Drilling Method: Direct Push  
 Drill Rig Type: VTR 9700  
 Logged by: N. Satam  
 County: Madison  
 Site ID No.: 1191150002  
 Federal ID No.: ILD 080012305

Water Depth: 37 ft., After ATD hrs.  
 Water Depth: \_\_\_\_\_ ft., After \_\_\_\_\_ hrs.  
 Water level at time of drilling  
 Water level after drilling  
 ATD - At time of drilling  
 NE - None Encountered  
 NA - Not Applicable

Geoprobe  
 Air Knife/Hand Auger Sampler  
 Air Rotary  
 Sonic  
 Splitspoon Sampler  
 Hollow Stem Auger-  
 Soil samples not collected



USC based on field visual observations

URS (ENVI/RO) LOG (EPA FORMAT) 2:1562593 (ROXANA ROST).GPJ URSSTLEV.GDT 5/19/11



Site Number: 1191150002

County: Madison

Site Name: ROST-4-PZ Delineation  
State

Well #: ROST-4-PZ(B)

Plane Coordinate: X <sup>793647.01</sup> Y <sup>2322241.07</sup> (or) Latitude: \_\_\_\_\_ Longitude: \_\_\_\_\_

Borehole #: ROST-4-PZ(B)

Surveyed by: Juneau Engineering & Surveying - Phil Huskey, PLS

IL Registration #: 35-2659

Drilling Contractor: Roberts Environmental Drilling, Inc.

Driller: Pat Seymour

Consulting Firm: URS Corporation

Geologist: Neeta Satam

Drilling Method: Hollow Stem Auger

Drilling Fluid (Type): N/A

Logged By: Neeta Satam

Date Started: 4/6/11 Date Finished: 4/6/11

Report Form Completed By: Wendy Pennington

Date: 5/2/11

ANNULAR SPACE DETAILS

Type of Surface Seal: Concrete

Type of Annular Sealant: Cement-Bentonite Grout

Installation Method: Tremie

Setting Time: 1525

Type of Bentonite Seal - - Granular, Pellet, Slurry  
(Choose One)

Installation Method: Placed

Setting Time: 1425

Type of Sand Pack: ANSI/NSF Sand

Grain Size: #10 (Sieve Size)

Installation Method: Placed

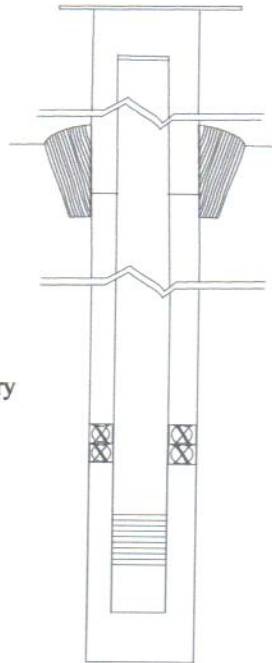
Type of Backfill Material: Native & Placed  
(if applicable)

Installation Method: Cave-in & Placed

WELL CONSTRUCTION MATERIAL

(Choose one type of material for each area)

Protective Casing	SS304, SS316, PTFE, PVC, or Other
Riser Pipe Above W.T.	SS304, SS316, PTFE, PVC, or Other
Riser Pipe Below W.T.	SS304, SS316, PTFE, PVC, or Other
Screen	SS304, SS316, PTFE, PVC, or Other



Elevations (MSL)*	Depths (BGS)	(.01ft.)
442.72	0	Top of Protective Casing
442.38	0.34	Top of Riser Pipe
442.72	0	Ground Surface
441.22	1.50	Top of Annular Sealant
404.53	38.19	Static Water Level (After Completion)
412.72	30.00	Top of Seal
409.72	33.00	Top of Sand Pack
407.33	35.39	Top of Screen
397.33	45.39	Bottom of Screen
397.08	45.64	Bottom of Well
396.72	46.00	Bottom of Borehole

\* Referenced to a National Geodetic Datum

CASING MEASUREMENTS

Diameter of Borehole (inches)	9
ID of Riser Pipe (inches)	2
Protective Casing Length (feet)	N/A
Riser Pipe Length (feet)	35.05
Bottom of Screen to End Cap (feet)	0.25
Screen Length (1" slot to last slot) (feet)	10
Total Length of Casing (feet)	45.30
Screen Slot Size **	0.010

\*\*Hand-Slotted Well Screens are Unacceptable

GROUNDWATER DEVELOPMENT/SAMPLING DATA SHEET

PROJECT NAME: Roxana ROST-4-PZ Delineation PROJECT NUMBER: 21862690  
 DATE: 4/13/11  
 WEATHER: 26° F Sunny  
 FIELD PERSONNEL: M. E. Weisman  
 MONITORING WELL ID: ROST-AP2(B) M. Salim

INITIAL DATA

Well Diameter: 2 in.  
 Total Depth of Well: 45.15 ft btoc  
 Depth to Water: 37.85 ft btoc  
 Height of Water Column: 7.3 ft  
 (0.163 gallons/ft for 2 inch well, 1.468 gallons/ft for 6-inch well)

Gallons/Lin.Ft: \_\_\_\_\_  
 Vol. Of Water Column: 1.989 gallons  
 Min. Purge Volume: 5.9 gallons (5 volumes)  
 Depth to Top of Screen: 35.15 ft btoc

Water Added during Drilling: \_\_\_\_\_ gallons  
 Water to be Removed: \_\_\_\_\_ gallons (5x added)  
 Ambient PID/FID Reading: 0.0 ppm  
 Wellbore PID/FID Reading: 0.1 ppm

PURGE DATA

Purge Method: Submersible Stable:  $\pm 0.2$   $\pm 1\%$   $\pm 10\%$

Purge Volume (gals)	Time	Depth to Water (ft)	Color	Odor	pH	Temp (°C)	Cond. (µmhos/cm)	Turbidity (NTUs)	DO (mg/l)	ORP (mv)
60	1110	37.85	cloudy	hydrocarbon	6.78	22.46	976	4.5	-0.12	-97
61	1112	37.85	↓	↓	6.80	21.99	961	2.1	-0.01	-99
62	1114	37.85	↓	↓	6.83	21.48	956	2.9.0	-0.05	-95
63	1116	37.85	↓	↓	6.83	21.30	946	12.0	-0.29	-98
64	1118	37.85	↓	↓	6.85	21.25	943	10.0	-0.62	-94

Start Time: 0900 Purge Stop Time: 1120 Elapsed Time: 1:20 mi  
 Average Purge Rate (gallons/min): 0.5 gal/min Well Volumes Purged: 60 Water Quality Meter ID: T1011 9500 Total Volume Purged: 62 gallons  
 Calibrated on: 4/13/11

SAMPLING DATA

Sampling Method: \_\_\_\_\_  
 Sample Date: N/A Sample Time: N/A Analysis: N/A

COMMENTS:

DTB = 45.15 ft btoc prior to development (soft bottom)  
 DTB = 45.30 ft btoc after development (hard)

## LOG OF BORING ROST-4-PZ (C)

Starting Date: 3/28/11 Completion Date: 4/8/11 Casing Elevation: 443.00 Ground Elevation: 443.30	Quadrangle Sec: N/A T: N/A R: N/A UTM (or State Plane) Coord N: (X):793600.60 E: (Y):2322118.61
---	---

Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
				0.0	●	▨	FILL	Asphalt and Fill Medium dense, moist, brown, clayey silt FILL [FILL]	Air knife completed to 10' bgs to clear utilities, lithology information gained via grab samples from hand augers periodically collected.
				0.0	●	▨	SM	Dense, dry, tan, fine grained, Silty SAND (SM)	
5				0.1	●	▨	SM		
				0.0	●	▨	SM		
				0.0	●	▨	SM		
				0.0	●	▨	SM		
				0.0	●	▨	SM		
				0.0	●	▨	SM		
				0.0	●	▨	SM		
10	24	24		5.6	▲	▨	SP	Dense, dry, tan, fine grained SAND (SP)	
				12.5	▲	▨	SP		Sampled ROST-4-PZ (C)-11-12 at 0830 for VOCs and SVOCs
				9.2	▲	▨	SP		
15	48	38		9.6	▲	▨	SP		
				10.6	▲	▨	SP		
				5.5	▲	▨	SP	Becomes gray	
20				12.5	▲	▨	SP	2" soft, wet, tan, clay seam	
				12.8	▲	▨	SP	Becomes dense, moist 1" black banding	

Completion Depth: 48.0 Ft bgs  
 Project No.: 21562593  
 Project Name: ROST-4-PZ Delineation  
 Drilling Contractor: Roberts Environmental Drilling Inc.  
 Driller Name: Pat Seymor  
 Drilling Method: Direct Push  
 Drill Rig Type: VTR 9700  
 Logged by: N. Satam  
 County: Madison  
 Site ID No.: 1191150002  
 Federal ID No.: ILD 080012305

Water Depth: 37.5 ft., After ATD hrs.  
 Water Depth: \_\_\_\_\_ ft., After \_\_\_\_\_ hrs.  
 Water level at time of drilling  
 Water level after drilling  
 ATD - At time of drilling  
 NE - None Encountered  
 NA - Not Applicable

- Geoprobe
- Air Knife/Hand Auger Sampler
- Air Rotary
- Sonic
- Splitspoon Sampler
- Hollow Stem Auger- Soil samples not collected



USC based on field visual observations

URS (ENVI/RO) LOG (EPA FORMAT) 21562593 (ROXANA ROST).GPJ URSSTLEV.GDT 5/19/11

**LOG OF BORING  
ROST-4-PZ (C)**

Starting Date: 3/28/11  
 Completion Date: 4/8/11  
 Casing Elevation: 443.00  
 Ground Elevation: 443.30  
 Quadrangle Sec: N/A  
 T: N/A  
 R: N/A  
 UTM (or State Plane) Coord  
 N: (X):793600.60  
 E: (Y):2322118.61

Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	
								DESCRIPTION	NOTES
30	48	38		20.4			SP	Same: Dense, moist, gray, fine grained SAND (SP)	Sampled ROST-4-PZ (C)-25-26 at 0930 for VOCs and SVOCs
				32				8" soft, wet, tan, clay seam	
	48	40		34					
35	48	40		5.4			SP	Becomes loose, tan	Sampled ROST-4-PZ (C)-36-37 at 1000 for VOCs and SVOCs
				35					
	48	36		9.7				Becomes medium dense, wet 1" black banding	
40	48	48		45			SP	2" dark gray banding	Hydrocarbon odor
				23					
	48	48		132			CL	Soft, wet, gray, low plastic, Silty CLAY (CL)	
45	48	48		350			SP	Medium dense, wet, tan, fine grained SAND (SP)	
				1065					
								Bottom of boring at 48.0' bgs	

Completion Depth: 48.0 Ft bgs  
 Project No.: 21562593  
 Project Name: ROST-4-PZ Delineation  
 Drilling Contractor: Roberts Environmental Drilling Inc.  
 Driller Name: Pat Seymor  
 Drilling Method: Direct Push  
 Drill Rig Type: VTR 9700  
 Logged by: N. Satam  
 County: Madison  
 Site ID No.: 1191150002  
 Federal ID No.: ILD 080012305

Water Depth: 37.5 ft., After ATD hrs.  
 Water Depth: \_\_\_\_\_ ft., After \_\_\_\_\_ hrs.  
 Water level at time of drilling  
 Water level after drilling  
 ATD - At time of drilling  
 NE - None Encountered  
 NA - Not Applicable

Geoprobe  
 Air Knife/Hand Auger Sampler  
 Air Rotary  
 Sonic  
 Splitspoon Sampler  
 Hollow Stem Auger-  
 Soil samples not collected



USC based on field visual observations

URS (ENVIRON) LOG (EPA FORMAT) 21562593 (ROXANA ROST).GPJ URSSTLEV.GDT 5/19/11



Site Number: 1191150002

County: Madison

Site Name: ROST-4-PZ Delineation  
State

Well #: ROST-4-PZ(C)

Plane Coordinate: X 793600.60 Y 2322118.61 (or) Latitude: 0 0 Longitude: 0 0

Borehole #: ROST-4-PZ(C)

Surveyed by: Juneau Engineering & Surveying - Phil Huskey, PLS

IL Registration #: 35-2659

Drilling Contractor: Roberts Environmental Drilling, Inc.

Driller: Pat Seymour

Consulting Firm: URS Corporation

Geologist: Neeta Satam

Drilling Method: Hollow Stem Auger

Drilling Fluid (Type): N/A

Logged By: Neeta Satam

Date Started: 4/8/11 Date Finished: 4/8/11

Report Form Completed By: Wendy Pennington

Date: 5/2/11

ANNULAR SPACE DETAILS

Type of Surface Seal: Concrete

Type of Annular Sealant: Cement-Bentonite Grout

Installation Method: Tremie

Setting Time: 1410

Type of Bentonite Seal - - Granular, Pellet, Slurry (Choose One)

Installation Method: Placed

Setting Time: 1145

Type of Sand Pack: ANSI/NSF Sand

Grain Size: #10 (Sieve Size)

Installation Method: Placed

Type of Backfill Material: Native & Placed (if applicable)

Installation Method: Cave-in & Placed

WELL CONSTRUCTION MATERIAL

(Choose one type of material for each area)

Table with 2 columns: Material Type and Material Specification (e.g., Protective Casing: SS304, SS316, PTFE, PVC, or Other)

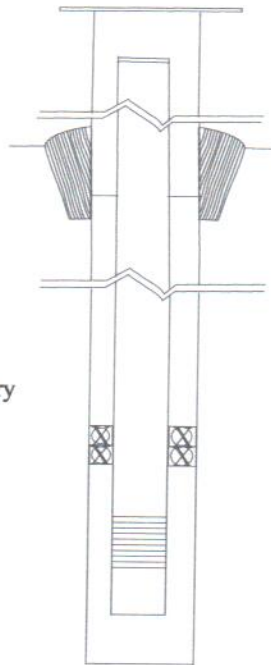


Table with 4 columns: Elevations (MSL)\*, Depths (BGS), (.01ft.), and Description (e.g., Top of Protective Casing, Ground Surface, Static Water Level)

\* Referenced to a National Geodetic Datum

CASING MEASUREMENTS

Table with 2 columns: Measurement (e.g., Diameter of Borehole, Riser Pipe Length) and Value

\*\*Hand-Slotted Well Screens are Unacceptable

GROUNDWATER DEVELOPMENT/SAMPLING DATA SHEET

PROJECT NAME: Roxana ROST-4-PZ Delineation PROJECT NUMBER: 21562593  
 DATE: 4/13/11  
 WEATHER: 76° F. Sunny  
 FIELD PERSONNEL: N. Saloom  
 MONITORING WELL ID: M ROST-4PZ-C

INITIAL DATA

Well Diameter: 2 in.  
 Total Depth of Well: 45.0 ft btoc  
 Depth to Water: 38.51 ft btoc  
 Height of Water Column: 6.49 ft  
 (0.163 gallons/ft for 2 inch well, 1.468 gallons/ft for 6-inch well)

Gallons/Lin.Ft: -  
 Vol. Of Water Column: 1.05 gallons  
 Min. Purge Volume: 5.28 gallons (5 volumes)  
 Depth to Top of Screen: 35 ft btoc

Water Added during Drilling: - gallons  
 Water to be Removed: - gallons (5x added)  
 Ambient PID/FID Reading: 0.0 ppm  
 Wellbore PID/FID Reading: 0.5 ppm

PURGE DATA

Purge Method: Submersible Pump Stable:  $\pm 0.2$   $\pm 1^\circ C$   $\pm 10\%$

Purge Volume (gals)	Time	Depth to Water (ft)	Color	Odor	pH	Temp (°C)	Cond. (µmhos/cm)	Turbidity (NTUs)	DO (mg/l)	ORP (mv)
1624	1618	38.60	cloudy	hydrocarbon	6.88	18.23	1152	-39	0.95	-102
1626	1620	38.60	↓	↓	6.83	18.10	1165	-44	1.74	-99
1628	1622	38.60	↓	↓	6.90	18.01	1163	-46	3.50	-101
1630	1624	38.60	↓	↓	6.91	18.06	1167	-28	3.43	-97

Start Time: 1345 / 1600 Purge Stop Time: 1450 / 1630  
 Average Purge Rate (gallons/min): 65 / gallon Well Volumes Purged: 60  
 Elapsed Time: 60 min Total Volume Purged: \_\_\_\_\_ gallon  
 Water Quality Meter ID: Trod 9.100 Calibrated on: 4/13/11

SAMPLING DATA

Sampling Method: \_\_\_\_\_  
 Sample Date: N/A Sample Time: N/A Analysis: N/A

COMMENTS:

DTB = 45.0 ft btoc prior to development (soft)  
 DTB = 45.20 ft btoc after development (hard)









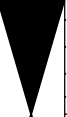



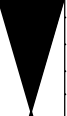



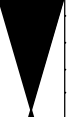



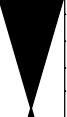





Stopped pump @ 1450 - Empty tank  
Return and start purge @ 1600

Turbidity sensor not functioning properly.  
Water visually sediment free at end of development.



## LOG OF BORING ROST-4-PZ (D)

Starting Date: 3/28/11 Completion Date: 4/7/11 Casing Elevation: 442.98 Ground Elevation: 443.31	Quadrangle Sec: N/A T: N/A R: N/A UTM (or State Plane) Coord N: (X):793597.03 E: (Y):2322180.17
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Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
				0.0			ASPHALT	Asphalt and fill	Air knife completed to 10' bgs to clear utilities, lithology information gained via grab samples from hand augers periodically collected.
				0.1			FILL	Medium dense, moist, brown clayey silt FILL [FILL]	
5				0.0			SM	Dense, dry, brown, fine grained Silty SAND (SM)	
10	48	36		4.9			SP	Dense to medium dense, dry, tan, fine grained SAND (SP)	Sampled ROST-4-PZ (D)-10-11 at 0900 for VOCs and VOCs
				3.2				Becomes very fine grained	
15	48	37		3.0				Becomes fine grained	
				12.5					
				6.0					
20	48	36		9.5				4" Soft, wet, low plastic Clay seam	
				6.2				Becomes moist, gray, very fine grained	
								Becomes tan, fine grained	
								Becomes gray, very fine grained	
								Becomes very dense	

Completion Depth: 48.0 Ft bgs  
 Project No.: 21562593  
 Project Name: ROST-4-PZ Delineation  
 Drilling Contractor: Roberts Environmental Drilling Inc.  
 Driller Name: Pat Seymor  
 Drilling Method: Direct Push  
 Drill Rig Type: VTR 9700  
 Logged by: N. Satam  
 County: Madison  
 Site ID No.: 1191150002  
 Federal ID No.: ILD 080012305

Water Depth: 37.75 ft., After ATD hrs.  
 Water Depth: \_\_\_\_\_ ft., After \_\_\_\_\_ hrs.

Water level at time of drilling  
 Water level after drilling  
 ATD - At time of drilling  
 NE - None Encountered  
 NA - Not Applicable

- Geoprobe
- Air Knife/Hand Auger Sampler
- Air Rotary
- Sonic
- Splitspoon Sampler
- Hollow Stem Auger- Soil samples not collected



USC based on field visual observations

**LOG OF BORING  
ROST-4-PZ (D)**

Starting Date: 3/28/11  
 Completion Date: 4/7/11  
 Casing Elevation: 442.98  
 Ground Elevation: 443.31

Quadrangle Sec: N/A  
 T: N/A  
 R: N/A  
 UTM (or State Plane) Coord  
 N: (X):793597.03  
 E: (Y):2322180.17

Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS	LOG OF BORING ROST-4-PZ (D)	
								DESCRIPTION	NOTES
30	48	46		12.0				Same: Very dense, moist, gray, very fine grained SAND (SP)	Sampled ROST-4-PZ (D)-28-29 at 1000 for VOCs and SVOCs
				10.7					
35	48	44		12.7			SP		Sampled ROST-4-PZ (D)-36-37 and duplicate sample at 1030 for VOCs and SVOCs
				5.2					
				2.7				3" soft, wet, tan low plastic clay seam	
	48	36		7.0				Becomes medium dense, tan, fine grained	
40	48	36		12.0			SP	1" soft, wet low plastic Clay seam	▽
				7.4				Becomes wet, trace black banding Becomes medium to fine grained	
	48	48		14.0				Soft, wet, gray-brown, low plastic, Silty CLAY (CL)	
45	48	46		520			SP	Medium dense, wet, brown, fine grained SAND (SP)	Hydrocarbon odor
				540					
								Bottom of boring at 48.0' bgs	

Completion Depth: 48.0 Ft bgs  
 Project No.: 21562593  
 Project Name: ROST-4-PZ Delineation  
 Drilling Contractor: Roberts Environmental Drilling Inc.  
 Driller Name: Pat Seymor  
 Drilling Method: Direct Push  
 Drill Rig Type: VTR 9700  
 Logged by: N. Satam  
 County: Madison  
 Site ID No.: 1191150002  
 Federal ID No.: ILD 080012305

Water Depth: 37.75 ft., After ATD hrs.  
 Water Depth: \_\_\_\_\_ ft., After \_\_\_\_\_ hrs.  
 ▽ Water level at time of drilling  
 ▼ Water level after drilling  
 ATD - At time of drilling  
 NE - None Encountered  
 NA - Not Applicable

- Geoprobe
- Air Knife/Hand Auger Sampler
- Air Rotary
- Sonic
- Splitspoon Sampler
- Hollow Stem Auger- Soil samples not collected



USC based on field visual observations

URS (ENVI/RO) LOG (EPA FORMAT) 21562593 (ROXANA ROST).GPJ URSSTLEV.GDT 5/19/11



# Illinois Environmental Protection Agency

# Well Completion Report

Site Number: 1191150002County: MadisonSite Name: ROST-4-PZ DelineationWell #: ROST-4-PZ(D)

State \_\_\_\_\_

Plane Coordinate: X 793597.03 Y 2322180.17 (or) Latitude: \_\_\_\_\_ Longitude: \_\_\_\_\_Borehole #: ROST-4-PZ(D)Surveyed by: Juneau Engineering & Surveying - Phil Huskey, PLSIL Registration #: 35-2659Drilling Contractor: Roberts Environmental Drilling, Inc.Driller: Pat SeymourConsulting Firm: URS CorporationGeologist: Neeta SatamDrilling Method: Hollow Stem AugerDrilling Fluid (Type): N/ALogged By: Neeta SatamDate Started: 4/7/11 Date Finished: 4/7/11Report Form Completed By: Wendy PenningtonDate: 5/2/11

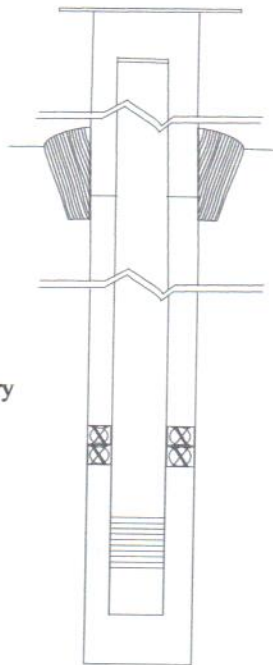
## ANNULAR SPACE DETAILS

Type of Surface Seal: ConcreteType of Annular Sealant: Cement-Bentonite GroutInstallation Method: TremieSetting Time: 1515Type of Bentonite Seal - - Granular, Pellet, Slurry  
(Choose One)Installation Method: PlacedSetting Time: 1355Type of Sand Pack: ANSI/NSF SandGrain Size: #10 (Sieve Size)Installation Method: PlacedType of Backfill Material: Native & Placed  
(if applicable)Installation Method: Cave-in & Placed

## WELL CONSTRUCTION MATERIAL

(Choose one type of material for each area)

Protective Casing	SS304, SS316, PTFE, PVC, or Other
Riser Pipe Above W.T.	SS304, SS316, PTFE, PVC, or Other
Riser Pipe Below W.T.	SS304, SS316, PTFE, PVC, or Other
Screen	SS304, SS316, PTFE, PVC, or Other



Elevations (MSL)*	Depths (BGS)	(.01ft.)
443.31	0	Top of Protective Casing
442.98	0.33	Top of Riser Pipe
443.31	0	Ground Surface
441.81	1.50	Top of Annular Sealant
404.44	38.87	Static Water Level (After Completion)
413.31	30.00	Top of Seal
410.31	33.00	Top of Sand Pack
408.01	35.30	Top of Screen
398.01	45.30	Bottom of Screen
397.76	45.55	Bottom of Well
397.31	46.00	Bottom of Borehole

\* Referenced to a National Geodetic Datum

## CASING MEASUREMENTS

Diameter of Borehole (inches)	9
ID of Riser Pipe (inches)	2
Protective Casing Length (feet)	N/A
Riser Pipe Length (feet)	34.97
Bottom of Screen to End Cap (feet)	0.25
Screen Length (1" slot to last slot) (feet)	10
Total Length of Casing (feet)	45.22
Screen Slot Size **	0.010

\*\*Hand-Slotted Well Screens are Unacceptable

GROUNDWATER DEVELOPMENT/SAMPLING DATA SHEET

PROJECT NAME: Roxana ROST-4-P2 Delineation PROJECT NUMBER: 21562593  
 DATE: 11/2/11  
 WEATHER: 76° F, Sun  
 FIELD PERSONNEL: Mike Emswiler / N. Salam  
 MONITORING WELL ID: ROST-4P2(D)

INITIAL DATA

Well Diameter: 2 in.  
 Total Depth of Well: 45.15 ft btoc  
 Depth to Water: 38.54 ft btoc  
 Height of Water Column: 6.61 ft  
 (0.163 gallons/ft for 2 inch well, 1.468 gallons/ft for 6-inch well)

Gallons/Lin.Ft: 1.07 0.163  
 Vol. Of Water Column: 1.07 gallons  
 Min. Purge Volume: 5.28 gallons (5 volumes)  
 Depth to Top of Screen: 35.15 ft btoc

Water Added during Drilling: - gallons  
 Water to be Removed: 4.2 gallons (5x added)  
 Ambient PID/FID Reading: 0 ppm  
 Wellbore PID/FID Reading: 1.1 ppm

PURGE DATA

Purge Method: Submersible Pump Stable:  $\pm 0.2$   $\pm 1^\circ\text{C}$   $\pm 10\%$

Purge Volume (gals)	Time	Depth to Water (ft)	Color	Odor	pH	Temp (°C)	Cond. (µmhos/cm)	Turbidity (NTUs)	DO (mg/l)	ORP (mv)
50	1200	40.05	clear	Hydrocarbon	6.86	16.99	1445	43	-0.03	-108
51	1201	40.05	clear	hydrocarbon	6.85	16.98	1400	46	1.33	104
52	1202	40.05	clear	hydrocarbon	6.84	16.80	1298	38	3.87	-80
53	1203	40.05	clear	"	6.90	16.82	1390	45	4.01	-83
54	1204	40.05	clear	"	6.84	16.92	1380	43	3.92	-85

Start Time: 120110 Purge Stop Time: 1210 Elapsed Time: 50 55 Total Volume Purged: 55 gallon  
 Average Purge Rate (gallons/min): 1 Well Volumes Purged: 5 Water Quality Meter ID: Troll 9500 Calibrated on: 11/2/11

SAMPLING DATA

Sampling Method:  
 Sample Date: N/A Sample Time: N/A Analysis: N/A

COMMENTS:

DTB = 45.15 ft btoc prior to development Sep  
 DTB = 45.22 ft btoc after development Rand

Turbidity sensor not functioning properly. Water visually sediment free at end of development.

## LOG OF BORING ROST-4-PZ (E)

Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS	Starting Date: 3/28/11	Quadrangle
								Completion Date: 4/11/11	Sec: N/A T: N/A R: N/A
								Casing Elevation: 441.96	UTM (or State Plane) Coord
								Ground Elevation: 442.50	N: (X):793545.64 E: (Y):2322242.87

Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
						ASPHALT		Asphalt and Fill	Air knife completed to 10' bgs to clear utilities, lithology information gained via grab samples from hand augers periodically collected.
						FILL		Medium dense, moist, brown, clayey silt FILL [FILL]	
5							SM	Medium dense, moist, brown, Silty SAND (SM)	
10	24	20		1.4			SP	Medium dense, moist, tan, fine grained SAND (SP)	Sampled ROST-4-PZ (E)-10.5-11.5 at 0930 for VOCs and SVOCs
				0.6					
15	48	38		0.8					
				1.0					
				125					
	48	36		242				4" wet clay seam	Sampled ROST-4-PZ (E)-17-18 at 1000 for VOCs and SVOCs
								1" wet clay seam	
20								Becomes gray	
	48	42		68					
				62					
				4.3					

Completion Depth: 48.0 Ft bgs  
 Project No.: 21562593  
 Project Name: ROST-4-PZ Delineation  
 Drilling Contractor: Roberts Environmental Drilling Inc.  
 Driller Name: Pat Seymor  
 Drilling Method: Direct Push  
 Drill Rig Type: VTR 9700  
 Logged by: N. Satam  
 County: Madison  
 Site ID No.: 1191150002  
 Federal ID No.: ILD 080012305

Water Depth: 38 ft., After ATD hrs.  
 Water Depth: \_\_\_\_\_ ft., After \_\_\_\_\_ hrs.  
 Water level at time of drilling  
 Water level after drilling  
 ATD - At time of drilling  
 NE - None Encountered  
 NA - Not Applicable

Geoprobe  
 Air Knife/Hand Auger Sampler  
 Air Rotary  
 Sonic  
 Splitspoon Sampler  
 Hollow Stem Auger-  
 Soil samples not collected



USC based on field visual observations

URS (ENVI/IRON) LOG (EPA FORMAT) 2:1562593 (ROXANA ROST).GPJ URSSTLEV.GDT 5/19/11

**LOG OF BORING  
ROST-4-PZ (E)**

Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS	Starting	Quadrangle
								Date: 3/28/11	Sec: N/A
								Completion	T: N/A
								Date: 4/11/11	R: N/A
								Casing Elevation: 441.96	UTM (or State Plane) Coord
								Ground Elevation: 442.50	N: (X):793545.64
									E: (Y):2322242.87

DESCRIPTION								NOTES	
30	48	44		8			SP	Same: Medium dense, moist, gray, fine grained SAND (SP)	Sampled ROST-4-PZ (E)-27-28 at 1030 for VOCs and SVOCs
				12				1" Clay seam	
35	48	36		14			SP	Becomes wet Becomes fine to medium grained	
				12					
40	48	36		6.8			SP	Becomes wet Becomes fine to medium grained	
				8.2					
45	48	32		7.5			SP	Becomes wet Becomes fine to medium grained	
				40					
45	48	48		43			SP	Medium dense, wet, gray, fine grained SAND (SP)	
				615					
				615			CL	Soft, wet, gray, low plastic CLAY (CL)	Hydrocarbon odor
				750			SP	Medium dense, wet, gray, fine grained SAND (SP)	
				716			SP	Medium dense, wet, gray, fine grained SAND (SP)	
								Bottom of boring at 48.0' bgs	

Completion Depth: 48.0 Ft bgs  
 Project No.: 21562593  
 Project Name: ROST-4-PZ Delineation  
 Drilling Contractor: Roberts Environmental Drilling Inc.  
 Driller Name: Pat Seymor  
 Drilling Method: Direct Push  
 Drill Rig Type: VTR 9700  
 Logged by: N. Satam  
 County: Madison  
 Site ID No.: 1191150002  
 Federal ID No.: ILD 080012305

Water Depth: 38 ft., After ATD hrs.  
 Water Depth: \_\_\_\_\_ ft., After \_\_\_\_\_ hrs.  
 Water level at time of drilling  
 Water level after drilling  
 ATD - At time of drilling  
 NE - None Encountered  
 NA - Not Applicable

Geoprobe  
 Air Knife/Hand Auger Sampler  
 Air Rotary  
 Sonic  
 Splitspoon Sampler  
 Hollow Stem Auger-  
 Soil samples not collected



USC based on field visual observations

URS (ENVI/RO) LOG (EPA FORMAT) 21562593 (ROXANA ROST).GPJ URSSTLEV.GDT 5/19/11



Site Number: 1191150002

County: Madison

Site Name: ROST-4-PZ Delineation  
State

Well #: ROST-4-PZ(E)

Plane Coordinate: X 793545.64 Y 2322242.87 (or) Latitude: 0 0 Longitude: 0 0

Borehole #: ROST-4-PZ(E)

Surveyed by: Juneau Engineering & Surveying - Phil Huskey, PLS

IL Registration #: 35-2659

Drilling Contractor: Roberts Environmental Drilling, Inc.

Driller: Pat Seymour

Consulting Firm: URS Corporation

Geologist: Neeta Satam

Drilling Method: Hollow Stem Auger

Drilling Fluid (Type): N/A

Logged By: Neeta Satam

Date Started: 4/1/11 Date Finished: 4/1/11

Report Form Completed By: Wendy Pennington

Date: 5/2/11

ANNULAR SPACE DETAILS

Type of Surface Seal: Concrete

Type of Annular Sealant: Cement-Bentonite Grout

Installation Method: Tremie

Setting Time: 1510

Type of Bentonite Seal - - Granular, Pellet, Slurry (Choose One)

Installation Method: Placed

Setting Time: 1415

Type of Sand Pack: ANSI/NSF Sand

Grain Size: #10 (Sieve Size)

Installation Method: Placed

Type of Backfill Material: Native & Placed (if applicable)

Installation Method: Cave-in & Placed

WELL CONSTRUCTION MATERIAL

(Choose one type of material for each area)

Table with 2 columns: Material Type and Material Options (SS304, SS316, PTFE, PVC, or Other)

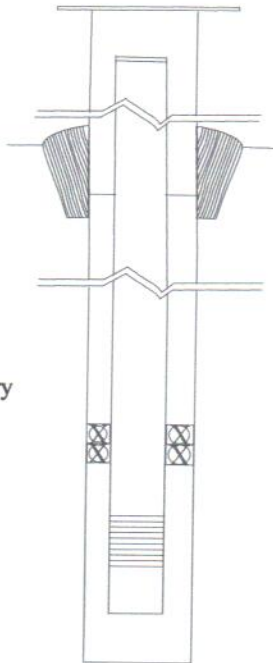


Table with 4 columns: Elevations (MSL)\*, Depths (BGS), (.01ft.), and Description of well components.

\* Referenced to a National Geodetic Datum

CASING MEASUREMENTS

Table with 2 columns: Measurement and Value (e.g., Diameter of Borehole: 9 inches)

\*\*Hand-Slotted Well Screens are Unacceptable

NOTE: This monitoring well not yet developed due to presence of free product.

## LOG OF BORING ROST-4-PZ (F)

Starting Date: 3/29/11 Completion Date: 4/4/11 Casing Elevation: 442.12 Ground Elevation: 442.36	Quadrangle Sec: N/A T: N/A R: N/A UTM (or State Plane) Coord N: (X):793495.81 E: (Y):2322244.34
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Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES	
				0.0	●	[Hatched]	ASPHALT	Asphalt	Air knife completed to 10' bgs to clear utilities, lithology information gained via grab samples from hand augers periodically collected.	
				0.2	●	[Diagonal]	FILL	Stiff, dry, brown-gray [FILL] Medium stiff, moist, brown sandy clay FILL [FILL]		
				0.2	●	[Vertical]	SM	Medium dense, moist to dry, brown fine grained Silty SAND (SM)		
5				2.4	●	[Dotted]	SP	Medium dense, moist to dry, gray brown, fine grained SAND (SP)		
				1.3	●	[Dotted]	SP	Medium dense, moist to dry, gray brown, fine grained SAND (SP)		
				44.8	●	[Dotted]	SP	Medium dense, moist to dry, gray brown, fine grained SAND (SP)		
				35.1	●	[Dotted]	SP	Medium dense, moist to dry, gray brown, fine grained SAND (SP)		
10				1.2	●	[Horizontal]	ML	Medium dense, moist, tan SILT (ML)		Sampled ROST-4-PZ (F)-11-12 at 0945 for VOCs and SVOCs
	24	22		2.2	●	[Dotted]	SP	Medium dense, moist, gray, fine grained SAND (SP)		
				0.8	●	[Dotted]	SP	Medium dense, moist, gray, fine grained SAND (SP)		
15				5.2	●	[Diagonal]	CL	Wet, low plastic Silty CLAY (CL)		
	48	37		345	●	[Diagonal]	CL	Wet, low plastic Silty CLAY (CL)		
				310	●	[Dotted]	SP	Medium dense, moist, tan, fine grained SAND (SP)		
				950	●	[Horizontal]	ML	Very dense, moist, gray SILT (ML)	Sampled ROST-4-PZ (F)-21-22 at 1045 for VOCs and SVOCs	
20				1350	●	[Diagonal]	CL	Soft, wet, gray, low plastic Silty CLAY (CL)		
	48	46		52	●	[Horizontal]	ML	Very dense, moist, gray SILT (ML)		
					●	[Horizontal]	ML	Very dense, moist, gray SILT (ML)		

Completion Depth: 48.0 Ft bgs  
 Project No.: 21562593  
 Project Name: ROST-4-PZ Delineation  
 Drilling Contractor: Roberts Environmental Drilling Inc.  
 Driller Name: Pat Seymor  
 Drilling Method: Direct Push  
 Drill Rig Type: VTR 9700  
 Logged by: N. Satam  
 County: Madison  
 Site ID No.: 1191150002  
 Federal ID No.: ILD 080012305

Water Depth: 37.5 ft., After ATD hrs.  
 Water Depth: \_\_\_\_\_ ft., After \_\_\_\_\_ hrs.  
 Water level at time of drilling  
 Water level after drilling  
 ATD - At time of drilling  
 NE - None Encountered  
 NA - Not Applicable

Geoprobe  
 Air Knife/Hand Auger Sampler  
 Air Rotary  
 Sonic  
 Splitspoon Sampler  
 Hollow Stem Auger- Soil samples not collected



USC based on field visual observations

URS (ENVIRON) LOG (EPA FORMAT) 21562593 (ROXANA ROST).GPJ\_URSSITLEV.GDT 5/19/11



### LOG OF BORING ROST-4-PZ (F)

Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS	Starting Date: 3/29/11	Quadrangle
								Completion Date: 4/4/11	Sec: N/A T: N/A R: N/A
								Casing Elevation: 442.12	UTM (or State Plane) Coord
								Ground Elevation: 442.36	N: (X):793495.81 E: (Y):2322244.34

								DESCRIPTION	NOTES
30	48	44		10.5	[Symbol]	ML	Same: Very dense, moist, gray SILT (ML) Becomes dry, tan	Sampled ROST-4-PZ (F)-36.5-37.5 at 1145 for VOCs and SVOCs 	
				20	[Symbol]	SP	Very dense, moist, fine grained SAND (SP)		
35	48	40		15	[Symbol]	SP	Becomes medium dense		
				539	[Symbol]	ML	Very dense, wet, gray SILT (ML)		
40	48	36		35	[Symbol]	ML	Medium dense, moist, tan, fine grained SAND (SP)		
				85	[Symbol]	SP	Rusty banding Becomes wet Black banding		
45	48	44		72	[Symbol]	SP	Becomes medium grained, trace coarse grained		
				35	[Symbol]	ML	Wet, gray, Clayey SILT (ML)		
48	48	48		650	[Symbol]	ML	2" silty sand seam		
				42	[Symbol]	ML	3" silty clay seam		
45	48	48		890	[Symbol]	SP	Dense, wet, brown, fine grained SAND (SP)		
				150	[Symbol]	SP			
								Bottom of boring at 48.0' bgs	

Completion Depth: 48.0 Ft bgs  
 Project No.: 21562593  
 Project Name: ROST-4-PZ Delineation  
 Drilling Contractor: Roberts Environmental Drilling Inc.  
 Driller Name: Pat Seymor  
 Drilling Method: Direct Push  
 Drill Rig Type: VTR 9700  
 Logged by: N. Satam  
 County: Madison  
 Site ID No.: 1191150002  
 Federal ID No.: ILD 080012305

Water Depth: 37.5 ft., After ATD hrs.  
 Water Depth: \_\_\_\_\_ ft., After \_\_\_\_\_ hrs.  
 Water level at time of drilling  
 Water level after drilling  
 ATD - At time of drilling  
 NE - None Encountered  
 NA - Not Applicable

Geoprobe  
 Air Knife/Hand Auger Sampler  
 Air Rotary  
 Sonic  
 Splitspoon Sampler  
 Hollow Stem Auger-  
 Soil samples not collected



USC based on field visual observations

URS (ENVI/RO) LOG (EPA FORMAT) 21562593 (ROXANA ROST).GPJ URSSTLEV.GDT 5/19/11



# Illinois Environmental Protection Agency

# Well Completion Report

Site Number: 1191150002County: MadisonSite Name: ROST-4-PZ DelineationWell #: ROST-4-PZ(F)

State \_\_\_\_\_

Plane Coordinate: X 793495.81 Y 232244.34 (or) Latitude: \_\_\_\_\_ Longitude: \_\_\_\_\_Borehole #: ROST-4-PZ(F)Surveyed by: Juneau Engineering & Surveying - Phil Huskey, PLSIL Registration #: 35-2659Drilling Contractor: Roberts Environmental Drilling, Inc.Driller: Pat SeymourConsulting Firm: URS CorporationGeologist: Neeta SatamDrilling Method: Hollow Stem AugerDrilling Fluid (Type): N/ALogged By: Neeta SatamDate Started: 4/4/11 Date Finished: 4/4/11

Report Form

Completed By: Wendy PenningtonDate: 5/2/11

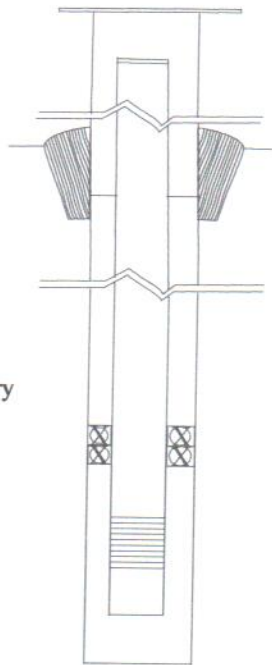
## ANNULAR SPACE DETAILS

Type of Surface Seal: ConcreteType of Annular Sealant: Cement-Bentonite GroutInstallation Method: TremieSetting Time: 1605Type of Bentonite Seal - - Granular, Pellet, Slurry  
(Choose One)Installation Method: PlacedSetting Time: 1455Type of Sand Pack: ANSI/NSF SandGrain Size: #10 (Sieve Size)Installation Method: PlacedType of Backfill Material: Native & Placed  
(if applicable)Installation Method: Cave-in & Placed

## WELL CONSTRUCTION MATERIAL

(Choose one type of material for each area)

Protective Casing	SS304, SS316, PTFE, PVC, or Other
Riser Pipe Above W.T.	SS304, SS316, PTFE, PVC, or Other
Riser Pipe Below W.T.	SS304, SS316, PTFE, PVC, or Other
Screen	SS304, SS316, PTFE, PVC, or Other



Elevations (MSL)*	Depths (BGS)	(.01ft.)
442.36	0	Top of Protective Casing
442.12	0.24	Top of Riser Pipe
442.36	0	Ground Surface
440.86	1.50	Top of Annular Sealant
404.44	37.92	Static Water Level (After Completion)
412.36	30.00	Top of Seal
409.59	32.77	Top of Sand Pack
407.59	34.77	Top of Screen
397.59	44.77	Bottom of Screen
397.34	45.02	Bottom of Well
396.36	46.00	Bottom of Borehole

\* Referenced to a National Geodetic Datum

## CASING MEASUREMENTS

Diameter of Borehole (inches)	9
ID of Riser Pipe (inches)	2
Protective Casing Length (feet)	N/A
Riser Pipe Length (feet)	34.53
Bottom of Screen to End Cap (feet)	0.25
Screen Length (1" slot to last slot) (feet)	10
Total Length of Casing (feet)	44.78
Screen Slot Size **	0.010

\*\*Hand-Slotted Well Screens are Unacceptable

GROUNDWATER DEVELOPMENT/SAMPLING DATA SHEET

PROJECT NAME: Roxanna ROST-4-P2 Delineation PROJECT NUMBER: 21562593  
 DATE: 4-15-11  
 WEATHER: Cloudy  
 FIELD PERSONNEL: B. Exceen, M. Ewersmann  
 MONITORING WELL ID: ROST-4-P2 (F)

INITIAL DATA

Well Diameter: 2 in.  
 Total Depth of Well: 44.26 ft btoc  
 Depth to Water: 37.65 ft btoc  
 Height of Water Column: 6.59 ft  
 (0.163 gallons/ft for 2 inch well, 1.468 gallons/ft for 6-inch well)

Gallons/Lin.Ft: .163  
 Vol. Of Water Column: 1.07 gallons  
 Min. Purge Volume: 5.4 gallons (5 volumes)  
 Depth to Top of Screen: 35 ft btoc

Water Added during Drilling: N/A gallons  
 Water to be Removed: N/A gallons (5x added)  
 Ambient PID/FID Reading: 0.1 ppm  
 Wellbore PID/FID Reading: 172 ppm

PURGE DATA

Purge Method: Sub Pump / Surging      Stable: ±0.2      ±1°C      ±10%

Purge Volume (gals)	Time	Depth to Water (ft)	Color	Odor	pH	Temp (°C)	Cond. (µmhos/cm)	Turbidity (NTUs)	DO (mg/l)	ORP (mv)
40	1103	37.97	Clear	Strong HC	6.80	17.11	1290	-42.6	1.36	-76
41	1105	"	"	"	6.84	17.00	1303	-44.5	1.93	-82
42	1107	"	"	"	6.91	17.01	1285	-46.5	1.96	-90
43	1109	"	"	"	6.87	16.95	1286	-47.3	1.95	-86
44	1111	"	"	"	6.92	16.97	1277	-47.5	1.82	-91

Start Time: 0935/1005      Purge Stop Time: 0946/1111      Elapsed Time: 77 min      Total Volume Purged: 44 gallons  
 Average Purge Rate (gallons/min): 1.0/0.5      Well Volumes Purged: 41      Water Quality Meter ID: Troll 9500      Calibrated on: 4-15-11

SAMPLING DATA

Sampling Method: \_\_\_\_\_  
 Sample Date: N/A      Sample Time: N/A      Analysis: N/A

COMMENTS:

DTB = 44.26 ft btoc prior to development  
 DTB = 44.78 ft btoc after development

Turbidity sensor not functioning properly. Water visually sediment free at end of development.

**LOG OF BORING  
ROST-4-PZ (G)**

Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS	Starting Date: 4/21/11	Quadrangle
								Completion Date: 4/22/11	Sec: N/A T: N/A R: N/A
								Casing Elevation: 442.13	UTM (or State Plane) Coord N: (X):793441.03 E: (Y):2322140.41
								Ground Elevation: 442.41	

								DESCRIPTION	NOTES
5				2.5			FILL	Grass cover Soft, moist to wet, dark brown, low plastic, silty clay FILL [FILL]	Air knife completed to 10' bgs to clear utilities, lithology information gained via grab samples from hand augers periodically collected.
				3.6					
				3.6					
				3.0					
				2.1					
10				3.4			SC	Medium dense, moist, brown, fine grained Clayey SAND (SC)	
				1.8					
				2.1					
15				2.3			SP	Medium dense, moist, brown, fine grained SAND (SP)	
	24	10		3.7					
				6.3					
	48	32		9.5					
				2.5					
20				2.9			CL	Medium stiff, moist, brown, low plastic, Silty CLAY (CL)	
				5.8					
	48	38		9.6					
							SP	Medium dense, gray, fine grained SAND (SP)	

URS (ENVI/RO) LOG (EPA FORMAT) 2:1562593 (ROXANA ROST).GPJ\_URSSSTLEV.GDT 5/19/11

Completion Depth: 45.0 Ft bgs  
 Project No.: 21562593  
 Project Name: ROST-4-PZ Delineation  
 Drilling Contractor: Roberts Environmental Drilling Inc.  
 Driller Name: Pat Seymor  
 Drilling Method: Direct Push  
 Drill Rig Type: VTR 9700  
 Logged by: M. Miller  
 County: Madison  
 Site ID No.: 1191150002  
 Federal ID No.: ILD 080012305

Water Depth: 38 ft., After ATD hrs.  
 Water Depth: \_\_\_\_\_ ft., After \_\_\_\_\_ hrs.  
 Water level at time of drilling  
 Water level after drilling  
 ATD - At time of drilling  
 NE - None Encountered  
 NA - Not Applicable

Geoprobe  
 Air Knife/Hand Auger Sampler  
 Air Rotary  
 Sonic  
 Splitspoon Sampler  
 Hollow Stem Auger-  
 Soil samples not collected

**URS**  
 USC based on field visual observations

**LOG OF BORING  
ROST-4-PZ (G)**

Depth In feet	Inches Driven	Inches Recovered	Blow Counts	PID (ppm)	Sampler Graphic	Symbol	USCS	Starting		Completion		Casing Elevation: 442.13	Ground Elevation: 442.41	UTM (or State Plane) Coord N: (X):793441.03 E: (Y):2322140.41
								Date: 4/21/11	Quadrangle	Date: 4/22/11	Sec: N/A T: N/A R: N/A			
30	48	38		18.8			SP	Same: Medium dense, gray, fine grained SAND (SP)						
				25.0				Black staining						
	8.0	3" silty clay seam												
	3.6													
35	48	38		20.7										
				17.6										
40	48	42		10.7			SM	Medium dark, gray, moist to wet, fine grained, Silty SAND (SM)						
				40.5			Medium dense, wet, brown, fine to medium grained SAND (SP)							
				91.3										
45	48	42		95.7			SP							
							Bottom of boring at 45.0' bgs							

Completion Depth: 45.0 Ft bgs  
 Project No.: 21562593  
 Project Name: ROST-4-PZ Delineation  
 Drilling Contractor: Roberts Environmental Drilling Inc.  
 Driller Name: Pat Seymor  
 Drilling Method: Direct Push  
 Drill Rig Type: VTR 9700  
 Logged by: M. Miller  
 County: Madison  
 Site ID No.: 1191150002  
 Federal ID No.: ILD 080012305

Water Depth: 38 ft., After ATD hrs.  
 Water Depth: \_\_\_\_\_ ft., After \_\_\_\_\_ hrs.  
 Water level at time of drilling  
 Water level after drilling  
 ATD - At time of drilling  
 NE - None Encountered  
 NA - Not Applicable

Geoprobe  
 Air Knife/Hand Auger Sampler  
 Air Rotary  
 Sonic  
 Splitspoon Sampler  
 Hollow Stem Auger-  
 Soil samples not collected



USC based on field visual observations

URS (ENVIRON) LOG (EPA FORMAT) 21562593 (ROXANA ROST).GPJ\_URSSITLEV.GDT 5/19/11



Site Number: 1191150002

County: Madison

Site Name: ROST-4-PZ Delineation

Well #: ROST-4-PZ(G)

State

Plane Coordinate: X 793441.03 Y 2322140.41 (or) Latitude: 0 0 Longitude: 0 0

Borehole #: ROST-4-PZ(G)

Surveyed by: Juneau Engineering & Surveying - Phil Huskey, PLS

IL Registration #: 35-2659

Drilling Contractor: Roberts Environmental Drilling, Inc.

Driller: Pat Seymour

Consulting Firm: URS Corporation

Geologist: Mike Miller

Drilling Method: Hollow Stem Auger

Drilling Fluid (Type): N/A

Logged By: Neeta Satam

Date Started: 4/22/11 Date Finished: 4/22/11

Report Form Completed By: Wendy Pennington

Date: 5/2/11

ANNULAR SPACE DETAILS

Type of Surface Seal: Concrete

Type of Annular Sealant: Cement-Bentonite Grout

Installation Method: Tremie

Setting Time: 1645

Type of Bentonite Seal - Granular, Pellet, Slurry (Choose One)

Installation Method: Placed

Setting Time: 1515

Type of Sand Pack: ANSI/NSF Sand

Grain Size: #10 (Sieve Size)

Installation Method: Placed

Type of Backfill Material: Native & Placed (if applicable)

Installation Method: Cave-in & Placed

WELL CONSTRUCTION MATERIAL

(Choose one type of material for each area)

Table with 2 columns: Material Type and Material Specification (SS304, SS316, PTFE, PVC, or Other)

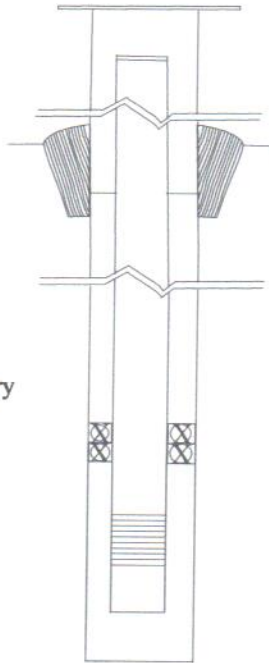


Table with 4 columns: Elevations (MSL)\*, Depths (BGS), and (.01ft.) descriptions of well components and their elevations/depths.

\* Referenced to a National Geodetic Datum

CASING MEASUREMENTS

Table with 2 columns: Measurement and Value (e.g., Diameter of Borehole: 9 inches)

\*\*Hand-Slotted Well Screens are Unacceptable

GROUNDWATER DEVELOPMENT/SAMPLING DATA SHEET

PROJECT NAME: Roxana Rost-4-PZ Delineation PROJECT NUMBER: 21562593.00011  
 DATE: 4/27/11  
 WEATHER: Cloudy 65°-60°  
 FIELD PERSONNEL: T. Andrews  
 MONITORING WELL ID: R0ST-4-PZ(G)

INITIAL DATA

Well Diameter: 2" in.  
 Total Depth of Well: 44.53 ft btoc  
 Depth to Water: 38.08 ft btoc  
 Height of Water Column: 6.45 ft  
 (0.163 gallons/ft for 2 inch well, 1.468 gallons/ft for 6-inch well)  
 Gallons/Lin.Ft: .163  
 Vol. Of Water Column: 1.05 gallons  
 Min. Purge Volume: 5.3 gallons (5 volumes)  
 Depth to Top of Screen: 39.53 ft btoc  
 Water Added during Drilling: N/A gallons  
 Water to be Removed: N/A gallons (5x added)  
 Ambient PID/FID Reading: 0.0 ppm  
 Wellbore PID/FID Reading: 1640.0 ppm

PURGE DATA

Purge Method: Submersible Stable:  $\pm 0.2$   $\pm 1^\circ\text{C}$   $\pm 10\%$

Purge Volume (gals)	Time	Depth to Water (ft)	Color	Odor	pH	Temp (°C)	Cond. (µmhos/cm)	Turbidity (NTUs)	DO (mg/l)	ORP (mv)
42	10:45	38.60	clear	strong HC	6.97	16.67	988.6	16.2	52.50	-34
43	10:48	38.60	"	"	6.93	16.41	983.1	-20.8	52.50	-61
44	10:51	38.60	"	"	6.93	16.40	981.5	-45.1	52.50	-65
45	10:54	38.60	"	"	6.93	16.39	982.4	-50.1	52.50	-67
46	10:57	38.60	"	"	6.92	16.41	982.5	-51.1	52.50	-67

Start Time: 9:25 Purge Stop Time: 10:57 Elapsed Time: 93 min. Total Volume Purged: 46.5 gallons  
 Average Purge Rate (gallons/min): 0.5 Well Volumes Purged: 44.3 Water Quality Meter ID: Troll 9500 Calibrated on: 4/27/11

SAMPLING DATA

Sampling Method:  
 Sample Date: N/A Sample Time: N/A Analysis: N/A

COMMENTS:

DTB = 44.53 ft btoc prior to development  
 DTB = 44.53 ft btoc after development

Turbidity sensor not functioning properly. Water visually sediment free at end of development.