



Illinois Environmental Protection Agency

Bureau of Land • 1021 North Grand Avenue East • P.O. Box 19276 • Springfield • Illinois • 62794-9276

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: Equilon Enterprises LLC d/b/a Shell Oil Products US

Facility Address: 900 S. Central Ave., Roxana, IL 62048

Site ID #: 1191150002 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.

☐ LPC-160 Forms

Groundwater

☐ Quarterly - Enter: 1, 2, 3, or 4

☐ Semi-Annual

☐ Annual

☐ Biennial

Leachate

☐ Quarterly - Enter: 1, 2, 3, or 4

☐ Semi-Annual

☐ Annual

☐ Biennial

☐ Groundwater Data (without LPC-160 Forms)

☐ Quarterly - Enter: 1, 2, 3, or 4 ☐ Annual ☐ Semi-Annual ☐ 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)



November 7, 2014

Mr. Steven F. Nightingale, P.E.
Manager, Permit Section
Illinois Environmental Protection Agency
Bureau of Land
1021 North Grand Avenue East
Springfield, Illinois 62794

**Subject: 1191150002 – Madison County
Equilon Enterprises LLC d/b/a Shell Oil Products US
New Groundwater Monitoring Well Installation
Roxana, Illinois
Log No. B-43R-CA-51**

Dear Mr. Nightingale:

URS Corporation, on behalf of Shell Oil Products US, is submitting the boring logs, monitoring well construction diagrams and monitoring well development forms for four additional groundwater monitoring wells installed within the investigation area in Roxana, Illinois. This information satisfies Condition 1(d) of the IEPA RCRA Permit, Permit Approval Letter dated June 13, 2014 (Log No. B-43R-M-9, M-10, M-11, M-12, M-13, And M-15).

If you have any questions or require further information, please contact Bob Billman at (314) 429-0100 or bob.billman@urs.com.

Sincerely,
URS Corporation, on behalf of Shell Oil Products US

A handwritten signature in blue ink, appearing to read "Eric Fritsch".

Eric Fritsch
Task Manager

A handwritten signature in blue ink, appearing to read "Robert B. Billman".

Bob Billman
Senior Project Manager

cc: Kevin Dyer, SOPUS
Shannon Haney, Greensfelder, Hemker & Gale P.C.
Repositories (Village Hall, Library, Website)

LOG OF BORING AND WELL CONSTRUCTION DETAIL

MW-25

Page 1 Of 2

Starting
Date: 8/26/14
Completion
Date: 8/29/14
Casing Elevation: 438.35
Ground Elevation: 438.86

Quadrangle
Sec: 34
T: 5N
R: 9W
UTM (or State Plane) Coord
N: (X): 792086.69
E: (Y): 2321991.75

DESCRIPTION

NOTES

Depth In feet	Well Construction	Inches Driven	Inches Recovered	PID/FID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
5				20.0			FILL	Asphalt (FILL)	Air knifed to 10' bgs to clear for utilities and obstructions.
							ML	Loose, moist, brown, very fine, Clayey SILT (ML)	
				14.8			SP	Loose, dry, brown, fine grained SAND (SP)	
							ML	Loose, wet, brown, very fine, Clayey SILT (ML)	
				2.5				Loose, dry, brown, fine grained SAND (SP), with clay	
10				68.2				Grades to fine sand	
		24	18	3.4					
		24	19	4.0				Grades to fine to medium grained sand	
15		24	16	4.9					
		24	18	4.8					
		24	18	5.0					
20		24	20	4.7					
		24	20	12.1					

Completion Depth: 47.0 Ft bgs
 Project No.: 21562973
 Project Name: Additional Characterization
 Drilling Contractor: Roberts Environmental Drilling Inc.
 Driller Name: J. Crank
 Drilling Method: HSA
 Drill Rig Type: CME 75
 Logged by: E. Arthur
 County: Madison
 Site ID No.: 1191150002
 Federal ID No.: ILD 080 012 305

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 AND WELL CONSTRUCTION DETAIL

MW-25

Page 2 Of 2

Starting
Date: 8/26/14
Completion
Date: 8/29/14
Casing Elevation: 438.35
Ground Elevation: 438.86

Quadrangle
Sec: 34
T: 5N
R: 9W
UTM (or State Plane) Coord
N: (X): 792086.69
E: (Y): 2321991.75

DESCRIPTION

NOTES

Depth In feet	Well Construction	Inches Driven	Inches Recovered	PID/FID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
30		24	16	6.7				Same: Loose, dry, brown, fine to medium grained SAND (SP)	
		24	19	12.5				Becomes gray	
		24	20	12.7				Becomes light brown	
		24	18	13.0					
		24	20	9.5					
35		24	19	7.3			SP		
		24	18	51				Grades to medium to coarse grained	
		24	14	890				Becomes wet, coarse grained	▽
40		24	6	308				Becomes gray	
		24	12	111					
45		24	24	2985					
								Bottom of boring at 47' bgs	

Completion Depth: 47.0 Ft bgs
 Project No.: 21562973
 Project Name: Additional Characterization
 Drilling Contractor: Roberts Environmental Drilling Inc.
 Driller Name: J. Crank
 Drilling Method: HSA
 Drill Rig Type: CME 75
 Logged by: E. Arthur
 County: Madison
 Site ID No.: 1191150002
 Federal ID No.: ILD 080 012 305

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



Illinois Environmental Protection Agency

This form may be completed within Acrobat before printing.

Well Completion Report

Site Number: 1191150002

County: Madison

Site Name: Village of Roxana, Illinois

Well #: MW-25

State

Plane Coordinate: X 2321991.75 Y 792086.69 (or) Latitude: Longitude:

Borehole #: MW-25

Surveyed by: Juneau Associates, Inc. P.C.-Robert Brown, PLS

IL Registration #: 35-3298

Drilling Contractor: Roberts Environmental Drilling, Inc.

Driller: J. Crank

Consulting Firm: URS Corporation

Geologist: E. Arthur

Drilling Method: Hollow Stem Auger

Drilling Fluid (Type): N/A

Logged By: E. Arthur

Date Started: 8/26/14 Date Finished: 8/29/14

Report Form

Completed By: E. Fritsch

Date: 10/22/14

ANNULAR SPACE DETAILS

Elevations (MSL)*	Depths (BGS)	(.01ft.)
438.86	0	Top of Protective Casing
438.35	0.51	Top of Riser Pipe
438.86	0	Ground Surface
436.86	2.00	Top of Annular Sealant
401.35	37.51	Static Water Level (After Completion)
406.76	32.10	Top of Seal
404.76	34.10	Top of Sand Pack
402.76	36.10	Top of Screen
392.76	46.10	Bottom of Screen
392.51	46.35	Bottom of Well
391.86	47	Bottom of Borehole

* Referenced to a National Geodetic Datum

Type of Surface Seal: Concrete

Type of Annular Sealant: Cement/Bentonite Grout

Installation Method: Side Discharging Tremie

Setting Time: 10:30 / 8-29-14

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

Installation Method: Gravity Feed

Setting Time: 17:00 / 8-28-14

Type of Sand Pack: ANSI / NSF Quartz Sand

Grain Size: 61 grade (Sieve Size)

Installation Method: Gravity Feed

Type of Backfill Material: Native and Placed Sand
(if applicable)

Installation Method: Gravity Feed

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

CASING MEASUREMENTS

Diameter of Borehole (inches)	9
ID of Riser Pipe (inches)	2
Protective Casing Length (feet)	N/A
Riser Pipe Length (feet)	35.59
Bottom of Screen to End Cap (feet)	0.25
Screen Length (1" slot to last slot) (feet)	10
Total Length of Casing (feet)	45.84
Screen Slot Size **	0.010 in

**Hand-Slotted Well Screens are Unacceptable

GROUNDWATER DEVELOPMENT/SAMPLING DATA SHEET

PROJECT NAME: Additional CharacterizationPROJECT NUMBER: 21562473.15000DATE: 9/16/14WEATHER: Overcast 70°FIELD PERSONNEL: E. ArthurMONITORING WELL ID: MW-25

INITIAL DATA

Well Diameter: 2 in.
Total Depth of Well: 45.80 ft btoc
Depth to Water: 37.00 ft
Height of Water Column: 8.80 ft
(0.163 gallons/ft for 2 inch well, 1.468 gallons/ft for 6-inch well)

Gallons/Lin.Ft: 1.43 ^{EA}
Vol. Of Water Column: 1.43 gallons
Min. Purge Volume: 7.15 gallons (5 volumes)
Depth to Top of Screen: 36 ft btoc

Water Added during Drilling: 80 gallons
Total Water to be Removed: 87.15 gallons (5 volumes + 1x added)
Ambient PID/FID Reading: 0.0 ppm
Wellbore PID/FID Reading: 184.9 ppm

PURGE DATA

Purge Method: _____

Stabilized: +/- 0.2 +/- 1 °C +/- 10 % visually sediment free

Purge Volume (gals)	Time	Depth to Water (ft)	Color	Odor	pH	Temp (°C)	Cond. (µmhos/cm)	Turbidity (NTUs)	DO (mg/l)	ORP (mv)
<u>0</u>	<u>1215</u>	<u>37.00</u>								
<u>90</u>	<u>1345</u>	<u>37.00</u>								
Not Collected Per SOP										

Start Time: 1215
Average Purge Rate (gallons/min): 1

Purge Stop Time: 1345
Well Volumes Purged: 5

Elapsed Time: 90 min
Water Quality Meter ID: —

Total Volume Purged: 90 gallons
Calibrated on: —

SAMPLING DATA

Sampling Method: _____

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

COMMENTS:

DTB = 45.80 ft btoc prior to developmentDTB = 45.84 ft btoc after developmentVisually Sediment Free

LOG OF BORING AND WELL CONSTRUCTION DETAIL

MW-26

Page 1 Of 2

Starting
Date: 8/25/14
Completion
Date: 8/28/14
Casing Elevation: 441.02
Ground Elevation: 441.29

Quadrangle
Sec: 34
T: 5N
R: 9W
UTM (or State Plane) Coord
N: (X): 792393.52
E: (Y): 2322012.55

DESCRIPTION

NOTES

Depth In feet	Well Construction	Inches Driven	Inches Recovered	PID/FID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
								Asphalt (FILL)	Air knifed to 10' bgs to clear for utilities and obstructions.
				2.0			FILL		
							CL	Soft, dry, reddish brown, low plastic, Silty Sandy CLAY CL)	
5				6.5				Loose, dry, brown, fine grained SAND (SP), trace clay	
				6.9				Clay grades out	
10				6.3					
		24	14	1.3					
		24	14	1.3					
15		24	16	2.0			SP		
		24	17	2.0				Grades to fine to medium grained	
		24	20	3.6					
20		24	20	4.3					
		24	12	4.9					

Completion Depth: 49.0 Ft bgs
 Project No.: 21562973
 Project Name: Additional Characterization
 Drilling Contractor: Roberts Environmental Drilling Inc.
 Driller Name: J. Crank
 Drilling Method: HSA
 Drill Rig Type: CME 75
 Logged by: E. Arthur
 County: Madison
 Site ID No.: 1191150002
 Federal ID No.: ILD 080 012 305

Water Depth: 40.5 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

URS

USC based on field visual observations

LOG OF BORING AND WELL CONSTRUCTION DETAIL

MW-26

Page 2 Of 2

Starting
Date: 8/25/14
Completion
Date: 8/28/14
Casing Elevation: 441.02
Ground Elevation: 441.29

Quadrangle
Sec: 34
T: 5N
R: 9W
UTM (or State Plane) Coord
N: (X): 792393.52
E: (Y): 2322012.55

DESCRIPTION

NOTES

Depth In feet	Well Construction	Inches Driven	Inches Recovered	PID/FID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
30		24	18	6.4				Same: Loose, dry, brown, fine to medium grained SAND (SP)	
		24	18	5.3					
		24	19	5.9					
		24	20	2.9				Becomes gray Grades to medium grained	
		24	18	5.2				Becomes orange brown Becomes gray	
35		24	20	5.0				Becomes fine grained, with silt	
		24	18	8.5			SP	Becomes light brown, medium grained	
40		24	13	25.0				Becomes moist, brown	
		24	18	3.0				Becomes wet	▽
		24	23	2.3					
45		24	23	2.0					
		24	10	3.0					
								Bottom of boring at 49' bgs	

Completion Depth: 49.0 Ft bgs
 Project No.: 21562973
 Project Name: Additional Characterization
 Drilling Contractor: Roberts Environmental Drilling Inc.
 Driller Name: J. Crank
 Drilling Method: HSA
 Drill Rig Type: CME 75
 Logged by: E. Arthur
 County: Madison
 Site ID No.: 1191150002
 Federal ID No.: ILD 080 012 305

Water Depth: 40.5 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

URS

USC based on field visual observations



Illinois Environmental Protection Agency

This form may be completed within Acrobat before printing.

Well Completion Report

Site Number: 1191150002

County: Madison

Site Name: Village of Roxana, Illinois

Well #: MW-26

State

Plane Coordinate: X 2322012.55 Y 792393.52 (or) Latitude: Longitude:

Borehole #: MW-26

Surveyed by: Juneau Associates, Inc., P.C.-Robert Brown, PLS

IL Registration #: 35-3298

Drilling Contractor: Roberts Environmental Drilling, Inc.

Driller: J. Crank

Consulting Firm: URS Corporation

Geologist: E. Arthur

Drilling Method: Hollow Stem Auger

Drilling Fluid (Type): N/A

Logged By: E. Arthur

Date Started: 8/25/14 Date Finished: 8/28/14

Report Form

Completed By: E. Fritsch

Date: 10/22/14

ANNULAR SPACE DETAILS

Type of Surface Seal: Concrete

Type of Annular Sealant: Cement/Bentonite Grout

Installation Method: Side Discharging Tremie

Setting Time: 15:15 / 8-27-14

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

Installation Method: Gravity Feed

Setting Time: 13:30 / 8-27-14

Type of Sand Pack: ANSI/NSF Quartz Sand

Grain Size: 61 grade (Sieve Size)

Installation Method: Gravity Feed

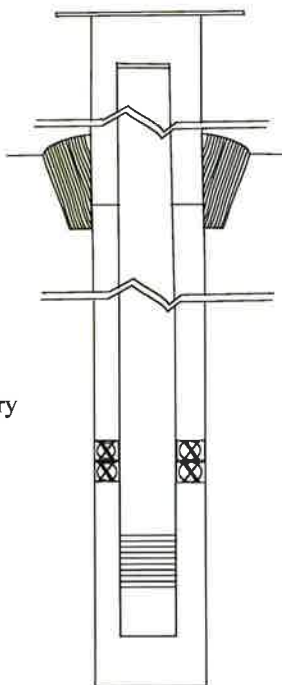
Type of Backfill Material: Native and Placed Sand
(if applicable)

Installation Method: Gravity Feed

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.)
441.29	0	Top of Protective Casing
441.02	0.27	Top of Riser Pipe
441.29	0	Ground Surface
439.29	2.00	Top of Annular Sealant
401.11	40.18	Static Water Level (After Completion)
406.87	34.42	Top of Seal
404.87	36.42	Top of Sand Pack
402.87	38.42	Top of Screen
392.87	48.42	Bottom of Screen
392.62	48.67	Bottom of Well
392.29	49	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)	38.15
Bottom of Screen to End Cap (feet)	0.25
Screen Length (1" slot to last slot) (feet)	10
Total Length of Casing (feet)	48.40
Screen Slot Size **	0.010

**Hand-Slotted Well Screens are Unacceptable

GROUNDWATER DEVELOPMENT/SAMPLING DATA SHEET

PROJECT NAME: Additional CharacterizationPROJECT NUMBER: 21562973.15000DATE: 9/17/19WEATHER: Cloudy 65°FIELD PERSONNEL: E. ArthurMONITORING WELL ID: MW-26

INITIAL DATA

Well Diameter: 2 in.
Total Depth of Well: 48.38 ft btoc
Depth to Water: 39.91 ft btoc
Height of Water Column: 8.47 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: 1.38 gallons
Min. Purge Volume: 6.90 gallons (5 volumes)
Depth to Top of Screen: 38.50 ft btoc

Water Added during Drilling: 140 gallons
Total Water to be Removed: 147 gallons (5 volumes + 1x added)
Ambient PID/FID Reading: 0.0 ppm
Wellbore PID/FID Reading: 0.0 ppm

PURGE DATA

Purge Method: PumpStabilized: +/- 0.2 +/- 1 °C +/- 10 % visually sediment free

Purge Volume (gals)	Time	Depth to Water (ft)	Color	Odor	pH	Temp (°C)	Cond. (µmhos/cm)	Turbidity (NTUs)	DO (mg/l)	ORP (mv)
<u>0</u>	<u>1100</u>	<u>39.91</u>	<u>Not Recorded Per SOP</u>							
<u>160</u>	<u>1300</u>	<u>39.91</u>								

Start Time: 1100
Average Purge Rate (gallons/min): 1.3

Purge Stop Time: 1300
Well Volumes Purged: 5+

Elapsed Time: 120 min
Water Quality Meter ID: N/A

Total Volume Purged: 160 gallons
Calibrated on: N/A

SAMPLING DATA

Sampling Method:

Sample Date: N/ASample Time: N/AAnalysis: N/A

COMMENTS:

DTB = 48.38 ft btoc prior to developmentDTB = 48.90 ft btoc after developmentVisually Sediment Free

LOG OF BORING AND WELL CONSTRUCTION DETAIL

MW-27

Page 1 Of 3

Starting Date: 10/15/14
Completion Date: 10/17/14
Casing Elevation: 443.40
Ground Elevation: 443.70

Quadrangle Sec: 34
T: 5N
R: 9W
UTM (or State Plane) Coord
N: (X): 793753.22
E: (Y): 2322016.01

DESCRIPTION

NOTES

Depth In feet	Well Construction	Inches Driven	Inches Recovered	PID/FID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
5				0.3			FILL	Asphalt/crushed limestone (FILL)	Air knifed to 10' bgs to clear for utilities and obstructions. 10" diameter surface casing set to 10' bgs due to the proximity of the boring to an underground natural gas line.
				1.4			CL	Soft, moist, brown, Silty CLAY (CL)	
				2.2				Increasing silt	
				0.7			ML	Soft, moist, brown, Clayey SILT (ML), with sand	
10				0.5			SC	Loose, moist, brown, Clayey SAND (SC)	
		24	22	3.5			SM	Loose, moist, brown, Silty SAND (SM)	
		24	17	4.4			SP	Loose, moist, brown to dark brown banded, fine grained SAND (SP), trace silt	
15		24	21	5.1					
		24	21	3.1				Becomes fine to medium grained	
		24	18	3.0					
20							SM	Loose, wet, dark brown, fine grained, Silty SAND (SM)	
		24	22	3.7			SP	Medium dense, dry, light brown, fine to medium grained SAND (SP), trace silt	
		24	24	4.7					

Completion Depth: 51.0 Ft bgs
Project No.: 21562973
Project Name: Additional Characterization
Drilling Contractor: Roberts Environmental Drilling Inc.
Driller Name: P. Seymour
Drilling Method: HSA
Drill Rig Type: DT-8040
Logged by: E. Fritsch/M. Miller
County: Madison
Site ID No.: 1191150002
Federal ID No.: ILD 080 012 305

Water Depth: 42 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 AND WELL CONSTRUCTION DETAIL

MW-27

Page 2 Of 3

Starting
Date: 10/15/14
Completion
Date: 10/17/14
Casing Elevation: 443.40
Ground Elevation: 443.70

Quadrangle
Sec: 34
T: 5N
R: 9W
UTM (or State Plane) Coord
N: (X): 793753.22
E: (Y): 2322016.01

DESCRIPTION

NOTES

Depth In feet	Well Construction	Inches Driven	Inches Recovered	PID/FID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
30		24	24	5.3				Same: Medium dense, dry, light brown, fine to medium grained SAND (SP), trace silt	
		24	24	4.1					
		24	24	3.7			SP		
		24	22	3.5					
		24	22	3.0			CL	Soft, moist, brown, low plastic, Silty CLAY (CL)	
		24	22	3.0			SM	Medium dense, moist, brown, fine grained, Silty SAND (SM)	
35		24	24	2.3				Medium dense, dry, tan to brown, fine grained SAND (SP), with silt	
		24	21	3.6			SP		
		24	21	2.1				Becomes very moist, gray brown	
		24	21	2.1				With clay	
40		24	21	8.3			SC	Medium dense, wet, brownish gray, clayey SAND (SC)	
		24	21	3.0				Medium dense, moist to dry, gray to dark gray, fine to medium grained SAND (SP)	
		24	21	3.0			SP	Becomes wet	
		24	21	3.0					
45		24	23	1.8				2" silty clay seam	
		24	23	1.8					
		24	24	14.2			CL	Stiff, moist, dark gray, Silty CLAY (CL)	
		24	24	14.2			ML	Medium dense, moist, dark gray, Clayey SILT (ML)	
		24	24	16.6			SM	Soft, wet, dark gray, Silty SAND (SM)	

Completion Depth: **51.0 Ft bgs**
 Project No.: **21562973**
 Project Name: **Additional Characterization**
 Drilling Contractor: **Roberts Environmental Drilling Inc.**
 Driller Name: **P. Seymour**
 Drilling Method: **HSA**
 Drill Rig Type: **DT-8040**
 Logged by: **E. Fritsch/M. Miller**
 County: **Madison**
 Site ID No.: **1191150002**
 Federal ID No.: **ILD 080 012 305**

Water Depth: 42 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

☒ Air Rotary

☒ Sonic

☒ Splitspoon Sampler

☒ Hollow Stem Auger-

Soil samples not collected

URS

USC based on field visual observations

LOG OF BORING AND WELL CONSTRUCTION DETAIL

MW-27

Page 3 Of 3

Starting
Date: 10/15/14
Completion
Date: 10/17/14
Casing Elevation: 443.40
Ground Elevation: 443.70

Quadrangle
Sec: 34
T: 5N
R: 9W
UTM (or State Plane) Coord
N: (X): 793753.22
E: (Y): 2322016.01

DESCRIPTION

NOTES

Depth In feet

Well
Construction

Inches
Driven

Inches
Recovered

PID/FID
(ppm)

Sampler
Graphic

Symbol

USCS

SM

Same: Soft, wet, dark gray, Silty SAND (SM)

Bottom of boring at 51' bgs

55

60

65

70

Completion Depth: 51.0 Ft bgs

Project No.: 21562973

Project Name: Additional Characterization

Drilling Contractor: Roberts Environmental Drilling Inc.

Driller Name: P. Seymour

Drilling Method: HSA

Drill Rig Type: DT-8040

Logged by: E. Fritsch/M. Miller

County: Madison

Site ID No.: 1191150002

Federal ID No.: ILD 080 012 305

Water Depth: 42 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



Illinois Environmental Protection Agency

Well Completion Report

Site Number: 1191150002

County: Madison

Well #: MW-27

Site Name: Village of Roxana, Illinois

State

Plane Coordinate: X ^{2322016.01} Y ^{793753.22} (or) Latitude: _____ Longitude: _____

Borehole #: MW-27

Surveyed by: Juneau Associates, Inc., PLC-Robert Brown, PLS

IL Registration #: 35-3298

Drilling Contractor: Roberts Environmental Drilling, Inc.

Driller: P. Seymour

Consulting Firm: URS Corporation

Geologist: E. Fritsch / M. Miller

Drilling Method: Hollow Stem Auger

Drilling Fluid (Type): N/A

Logged By: E. Fritsch / M. Miller

Date Started: 10/15/14 Date Finished: 10/17/14

Report Form

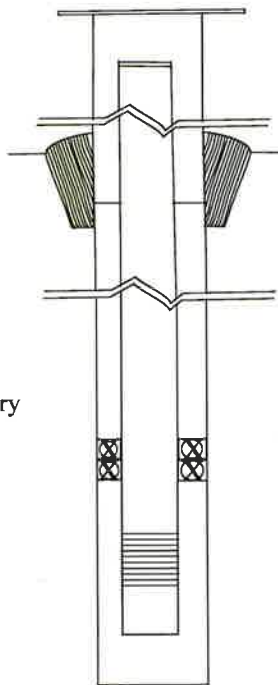
Completed By: E. Fritsch

Date: 10/22/14

ANNULAR SPACE DETAILS

Elevations
(MSL)*Depths
(BGS)

(.01 ft.)



Type of Surface Seal: Concrete

Type of Annular Sealant: Cement/Bentonite Grout

Installation Method: Side Discharging Tremie

Setting Time: 09:00 / 10-17-14

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

Installation Method: Gravity Feed

Setting Time: 16:30 / 10-16-14

Type of Sand Pack: ANSI/NSF Quartz Sand

Grain Size: 61 grade (Sieve Size)

Installation Method: Gravity Feed

Type of Backfill Material: Native and Placed Sand
(if applicable)

Installation Method: Gravity Feed

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

443.70	0	Top of Protective Casing
443.40	0.30	Top of Riser Pipe
443.70	0	Ground Surface
441.70	2.00	Top of Annular Sealant
401.80	41.90	Static Water Level (After Completion)
410.61	33.09	Top of Seal
405.61	38.09	Top of Sand Pack
403.61	40.09	Top of Screen
393.61	50.09	Bottom of Screen
393.36	50.34	Bottom of Well
392.70	51	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)	39.79
Bottom of Screen to End Cap (feet)	0.25
Screen Length (1 st slot to last slot) (feet)	10
Total Length of Casing (feet)	50.04
Screen Slot Size **	0.010

**Hand-Slotted Well Screens are Unacceptable

GROUNDWATER DEVELOPMENT/SAMPLING DATA SHEET

PROJECT NAME: Roxana 4Q14 GWPROJECT NUMBER: 21562973.03004DATE: 10-20-14WEATHER: Sunny, 60°FFIELD PERSONNEL: C. Williams, S. VossMONITORING WELL ID: MW-27

INITIAL DATA

Well Diameter: 2 in.Total Depth of Well: 50.04 ft btocDepth to Water: 41.60 ft btocHeight of Water Column: 8.44 ft

(0.163 gallons/ft for 2 inch well, 1.468 gallons/ft for 6-inch well)

Gallons/Lin.Ft: 0.163Vol. Of Water Column: 1.38 gallonsMin. Purge Volume: 6.9 gallons (5 volumes)

Depth to Top of Screen: _____ ft btoc

Water Added during Drilling: 0 gallonsTotal Water to be Removed: 2.0 gallons (5 volumes + 1x added)

Ambient PID/FID Reading: _____ ppm

Wellbore PID/FID Reading: 1.3 ppm

PURGE DATA

Purge Method: _____

Stabilized: +/- 0.2 +/- 1 °C +/- 10 % visually sediment free

Purge Volume (gals)	Time	Depth to Water (ft)	Color	Odor	pH	Temp (°C)	Cond. (µmhos/cm)	Turbidity (NTUs)	DO (mg/l)	ORP (mv)
0	9:09	41.60	cloudy	none	No	Parameters taken per the SOP				
10	9:52	"	"	"						
20	10:52	45.50	"	"						
25	12:52	41.59	"	slight HC						
40	13:55	48.44	Clear	"						
60	15:02	42.90	"	"						

Start Time: 909Purge Stop Time: 1501Elapsed Time: 290 minTotal Volume Purged: 60 gallonsAverage Purge Rate (gallons/min): 0.72

Well Volumes Purged: _____

Water Quality Meter ID: _____

Calibrated on: _____

SAMPLING DATA

Sampling Method: _____

Sample Date: _____ Sample Time: _____ Analysis: _____

COMMENTS:

DTB = 50.04 ft btoc prior to development, soft bottomDTB = 50.04 ft btoc after development, hard bottom

Hurricane pump would intermittently stop, then restart, possibly due to drawdown and recharge.

Purge water visually sediment free at the end of development

Pumps were changed during development. Pump down time subtracted from the elapsed time.

LOG OF BORING AND WELL CONSTRUCTION DETAIL

MW-28

Page 1 Of 2

Starting Date: 8/25/14
Completion Date: 9/3/14
Casing Elevation: 443.34
Ground Elevation: 443.78

Quadrangle Sec: 34
T: 5N
R: 9W
UTM (or State Plane) Coord
N: (X): 793894.54
E: (Y): 2322110.57

DESCRIPTION

NOTES

Depth In feet	Well Construction	Inches Driven	Inches Recovered	PID/FID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
							FILL	Asphalt (FILL)	Air knifed to 10' bgs to clear for utilities and obstructions.
5				0.5			ML	Loose, dry, brown, very fine grained, Clayey SILT (ML)	
				0.6			SM	Loose, dry, brown, fine grained, Silty SAND (SM)	
				0.5			SP	Grades to fine grained Loose, dry, brown, fine grained SAND (SP), with clay	
10				0.5					
		24	14	1.9			ML	Loose, moist, brown, very fine grained, Sandy SILT (ML)	
		24	20	4.9				Loose, dry, brown, fine grained SAND (SP)	
15		24	18	5.3					
		24	18	6.1					Grades to fine to medium grained
		24	18	6.1			SP		
20		24	19	6.8					
		24	20	7.0					
								Grades to fine grained	

Completion Depth: **46.0 Ft bgs**
 Project No.: **21562973**
 Project Name: **Additional Characterization**
 Drilling Contractor: **Roberts Environmental Drilling Inc.**
 Driller Name: **J. Crank**
 Drilling Method: **HSA**
 Drill Rig Type: **CME 75**
 Logged by: **E. Arthur**
 County: **Madison**
 Site ID No.: **1191150002**
 Federal ID No.: **ILD 080 012 305**

Water Depth: 37.4 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 AND WELL CONSTRUCTION DETAIL

MW-28

Page 2 Of 2

Starting Date: 8/25/14
Completion Date: 9/3/14
Casing Elevation: 443.34
Ground Elevation: 443.78

Quadrangle Sec: 34
T: 5N
R: 9W
UTM (or State Plane) Coord
N: (X): 793894.54
E: (Y): 2322110.57

DESCRIPTION

NOTES

Depth In feet	Well Construction	Inches Driven	Inches Recovered	PID/FID (ppm)	Sampler Graphic	Symbol	USCS	DESCRIPTION	NOTES
30		24	22	7.6				Same: Loose, dry, brown, fine grained SAND (SP)	
		24	20	8.2					
		24	15	8.6			SP		
		24	16	8.0				Becomes with silt	
		24	18	82			ML	Loose, dry, brown, very fine grained, Sandy SILT (ML)	
		24	18	82			CL	Soft, moist, gray, low plastic CLAY (CL)	
		24	18	82			ML	Loose, moist, gray, very fine, Clayey SILT (ML) Clay grades out Become dry	
35		24	18	13.2				Grades to sandy silt	
		24	19	49.9			SP	Loose, dry, gray, fine grained SAND (SP)	
		24	19	49.9			CL	Soft, moist, gray, low plastic CLAY (CL)	
		24	19	49.9			SP	Loose, dry, gray, fine grained SAND (SP), with silt	
		24	19	49.9			ML	Loose, wet, gray, very fine SILT (ML)	
		24	19	49.9			CL	Soft, wet, gray, low plastic, Silty CLAY (CL)	
		24	19	49.9			ML	Loose, wet, gray, very fine SILT (ML)	
		24	19	49.9			CL	Soft, moist, gray, low plastic, Silty CLAY (CL)	
		24	19	49.9			ML	Loose, dry, gray, very fine SILT (ML)	
		24	19	49.9			CL	Soft, moist, gray, low plastic, Silty CLAY (CL)	
		24	19	49.9			ML	Loose, wet, gray, very fine SILT (ML)	
40		24	18	81.2				Soft, moist, brown, medium to coarse grained SAND (SP)	
		24	18	39.2			SP	Becomes wet Become gray	
		24	20	21.8			CL	Soft, moist, gray, low plastic CLAY (CL)	
45							ML	Loose, wet, gray, very fine SILT (ML)	
								Bottom of boring at 46' bgs	

Completion Depth: **46.0 Ft bgs**
Project No.: **21562973**
Project Name: **Additional Characterization**
Drilling Contractor: **Roberts Environmental Drilling Inc.**
Driller Name: **J. Crank**
Drilling Method: **HSA**
Drill Rig Type: **CME 75**
Logged by: **E. Arthur**
County: **Madison**
Site ID No.: **1191150002**
Federal ID No.: **ILD 080 012 305**

Water Depth: 37.4 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



Illinois Environmental Protection Agency

This form may be completed within Acrobat before printing.

Well Completion Report

Site Number: 1191150002

County: Madison

Well #: MW-28

Site Name: Village of Roxana, Illinois

State

Plane Coordinate: X ^{2322110.57} Y ^{793894.54} (or) Latitude: Longitude:

Borehole #: MW-28

Surveyed by: Juneau Associates, Inc., PLC-Robert Brown, PLS

IL Registration #: 35-3298

Drilling Contractor: Roberts Environmental Drilling, Inc.

Driller: J. Crank

Consulting Firm: URS Corporation

Geologist: E. Arthur

Drilling Method: Hollow Stem Auger

Drilling Fluid (Type): N/A

Logged By: E. Arthur

Date Started: 8/25/14 Date Finished: 9/3/14

Report Form

Completed By: E. Fritsch

Date: 10/22/14

ANNULAR SPACE DETAILS

Type of Surface Seal: Concrete

Type of Annular Sealant: Cement/Bentonite Grout

Installation Method: Side Discharging Tremie

Setting Time: 10:40 / 9-3-14

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

Installation Method: Gravity Feed

Setting Time: 16:00 / 9-2-14

Type of Sand Pack: ANSI/NSF Quartz Sand

Grain Size: 61 grade (Sieve Size)

Installation Method: Gravity Feed

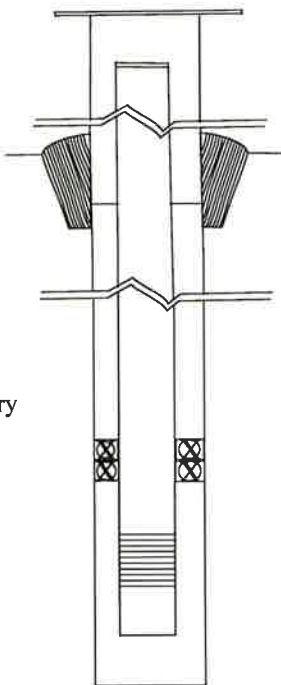
Type of Backfill Material: Native and Placed Sand
(if applicable)

Installation Method: Gravity Feed

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.)

443.78

0

Top of Protective Casing

443.34

0.44

Top of Riser Pipe

443.78

0

Ground Surface

441.78

2

Top of Annular Sealant

402.33

41.45

Static Water Level
(After Completion)

413.73

30.05

Top of Seal

411.73

32.05

Top of Sand Pack

409.73

34.05

Top of Screen

399.73

44.05

Bottom of Screen

399.48

44.30

Bottom of Well

397.78

46

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)	33.61
Bottom of Screen to End Cap (feet)	0.25
Screen Length (1" slot to last slot) (feet)	10
Total Length of Casing (feet)	43.86
Screen Slot Size **	0.010

**Hand-Slotted Well Screens are Unacceptable

PROJECT NAME: Additional Characterization

PROJECT NUMBER: 21562973.15000

DATE: 10/14/14

WEATHER: $\approx 60^\circ\text{F}$, Cloudy, Light mist/rain

FIELD PERSONNEL: E. Fritsch

MONITORING WELL ID: MW-28

Well Diameter: 2 in.
Total Depth of Well: 43.85 ft btoc
Depth to Water: 41.01 ft btoc
Height of Water Column: 2.84 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: 0.963 gallons
Min. Purge Volume: 2.31 gallons (5 volumes)
Depth to Top of Screen: 33.85 ft btoc

210 during drill
Water Added during Drilling: 28 during development gallons (18)
Total Water to be Removed: 25.31 gallons (5 volumes + 1x added)
Ambient PID/FID Reading: 0.1 ppm
Wellbore PID/FID Reading: 0.1 ppm

PURGE DATA

Purge Method: Submersible pump

Stabilized:	+/- 0.2	+/- 1 °C	+/- 10 %	visually sediment free
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[illegible]

Start Time: 13:00
Average Purge Rate (gallons/min): 1

Purge Stop Time: 13:45
Well Volumes Purged: 860

Elapsed Time: 45 min
Water Quality Meter ID: (NA)

Total Volume Purged: 240 gallons
Calibrated on: ~~12/1/77~~ 12/1/77

SAMPLING DATA

Sampling Method:

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

COMMENTS:

DTB = 43.85 ft btoc prior to development
DTB = 43.86 ft btoc after development

⇒ Well purged dry at 240 gallons.

→ Virtually sediment free.