Illinois Environmental Protection Agency

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

ILLINOIS EPA RCRA CORRECTIVE ACTION CERTIFICATION

This certification must accompany any document submitted to Illinois EPA in accordance with the corrective action requirements set forth in a facility's RCRA permit. The original and two copies of all documents submitted must be provided.

1.0 Facility Identification

Name: Equilon Enterprises LLC d/b/a/ SOPUS
County: Madison
Street Address: 900 South Central Ave
Site No. (IEPA): 1191150002
City: Roxana
Site No. (USEPA): ILD080 012 305

2.0 Owner Information

Name: Not Applicable
Mail Address:
City:
State: Zip Code:
Contact Name:
Contact Title:
Phone:

3.0 Operator Information

Name: Equilon Enterprises LLC d/b/a/ SOPUS
Mail Address: 128 East Center Street
City: Nazareth
State: PA Zip Code: 18064
Contact Name: Leroy Bealer
Contact Title: Senior Program Manager
Phone: 484-632-7955

4.0 Type of Submission (check applicable item and provide requested information, as applicable)

☐ RFI Phase I Workplan/Report
☐ RFI Phase II Workplan/Report
☒ CMP Report;
☐ Other (describe):

IEPA Permit Log No. B-43R
Date of Last IEPA Letter on Project: August 22, 2022
Log No. of Last IEPA Letter on Project: B-43R-CA-107
Does this submittal include groundwater information: ☒ Yes ☐ No

Additional Information to IEPA Log No. B-43R-CA-109

Date of Submittal:

5.0 Description of Submittal: (briefly describe what is being submitted and its purpose)

Additional Information requested by IEPA to Log No. B-43R-CA-109 PWY SEE – Response to 8/22/22 Letter & Final Design Report and Construction Work Plan

6.0 Documents Submitted (identify all documents in submittal, including cover letter; give dates of all documents)

RCRA Corrective Action Certification, Additional Information to IEPA Log No. B-43R-CA-109 PWY SEE – Response to 8/22/22 Letter & Final Design Report and Construction Work Plan). Copy of submittal also sent electronically directly to A. Butler, V. Poornaka and A. Al-Janabi of IPEA.

For: Additional Information to IEPA Log No. B-43R-CA-109

Date of Submission: 1/30/2023

7.0 Certification Statement

(This statement is part of the overall certification being provided by the owner/operator, professional and laboratory in Items 7.1, 7.2 and 7.3 below). The activities described in the subject submittals have been carried out in accordance with procedures approved by Illinois EPA. I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

7.1 Owner/Operator Certification

(Must be completed for all submittals. Certification and signature requirements are set forth in 35 IAC 702.126.) All submittals pertaining to the corrective action requirements set forth in a RCRA Permit must be signed by the person designated below (or by a duly authorized representative of that person):

1. For a Corporation, by a principal executive officer of at least the level of vice president.
2. For a Partnership or Sole Proprietorship, by a general partner or the proprietor, respectively.
3. For a Governmental Entity, by either a principal executive officer or a ranking elected official.

A person is a duly authorized representative only if:

1. the authorization is made in writing by a person described above; and
2. the written authorization is provided with this submittal (a copy of a previously submitted authorization can be used).

Owner Signature: _____ Date: _____

Title: _____

Operator Signature: _____ Date: 1/26/2023

Title: **Senior Program Manager**

7.2 Professional Certification (if necessary)

Work carried out in this submittal or the regulations may also be subject to other laws governing professional services, such as the Illinois Professional Land Surveyor Act of 1989, the Professional Engineering Practice Act of 1989, the Professional Geologist Licensing Act, and the Structural Engineering Licensing Act of 1989. No one is relieved from compliance with these laws and the regulations adopted pursuant to these laws. All work that falls within the scope and definitions of these laws must be performed in compliance with them. The Illinois EPA may refer any discovered violation of these laws to the appropriate regulating authority.

Any person who knowingly makes a false, fictitious, or fraudulent material statement, orally or in writing, to the Illinois EPA commits a Class 4 felony. A second or subsequent offense after conviction is a Class 3 felony. (415 ILCS 5/44 (h))

Professional's Signature: _____ Date: 1/27/2023

Professional's Name Wendy M. Pennington

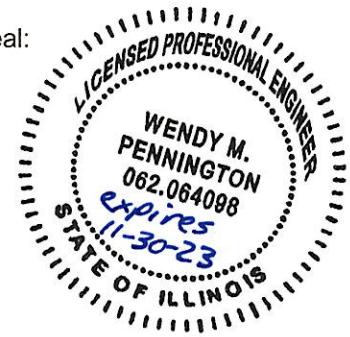
Address 100 N. Broadway, 20th Floor

City St. Louis

State MO Zip Code 63102

Phone 314-452-8929

Professional's Seal:



For: Additional Information to IEPA Log No. B-43R-CA-109

Date of Submission: _____

7.3 Laboratory Certification (if necessary)

The sample collection, handling, preservation, preparation and analysis efforts for which this laboratory was responsible were carried out in accordance with procedures approved by Illinois EPA.

Name of Laboratory *NOT APPLICABLE*

_____ Date: _____

Signature of Laboratory Responsible Officer

Mailing Address of Laboratory

Address _____

City _____

State _____ Zip Code _____

_____

Name and Title of Laboratory Responsible Officer

AECOM
100 N. Broadway, 20th Floor
St. Louis, MO 63102
www.aecom.com

314 429 0100 tel
314 429 0462 fax

January 30, 2022

Ms Jacqueline M. Cooperider, PE
Manager, Permit Section
Division of Land Pollution Control
Illinois Environmental Protection Agency
Bureau of Land
1021 North Grand Avenue East
Springfield, Illinois 62702

Additional Information to Log No. B-43R-CA-109 (PWY SEE – Response to 8/22/22 Letter & Final Design Report and Construction Work Plan)
Roxana, Illinois
1191150002 – Madison County
Equilon Enterprises LLC d/b/a Shell Oil Products US
Log No. B-43R-CA-109

Dear Ms. Cooperider:

On behalf of Equilon Enterprises LLC d/b/a Shell Oil Products US (Shell), AECOM Technical Services (AECOM) is submitting the additional information below to the referenced *Response to 8/22/22 Letter and Final Design Report & Construction Work Plan* (FDRCWP) submittal (dated December 16, 2022) for your review. This additional information is being provided in response to questions and specific requests by Illinois Environmental Protection Agency (IEPA) during a virtual discussion on January 5, 2023, outlined below. This virtual discussion was coordinated at the request of IEPA to help facilitate their review and response to the subject FDRCWP.

IEPA General Additional Request – Provide a figure showing the Former Public Works Yard layout and the approximate 1986 benzene release location.

> **Shell Additional Response** – See **Figure 4.a**, enclosed, for the general system layout with the modeled benzene residual plume using a Csat value of 580 mg/kg and including the approximate 1986 benzene release location.

IEPA Original Condition 7.a – *Provide the results for groundwater profiling (GWP) locations GP-15, GP-16, GP-17, and GP-18, and evaluate results of samples in comparison to what was observed at more recent investigation locations.*

IEPA Additional Request – Provide a discussion of why no GWP data is available at the "GP" locations listed in Condition 7.a and provide a comparison of the soil data collected from those locations to more recent investigation data.

> **Shell Additional Response** – GP-15, GP-16, GP-17, and GP-18 were Geoprobe® soil borings performed in December 2012 and January 2013. Soil samples were collected, but groundwater samples were not part of that scope of work. More recent soil samples were taken from nearby locations PD-08, PD-09, PD-10 and PD-11 during the 2019 Pre-Design Investigation. A comparison of the 2012/2013 benzene soil data results to the 2019 benzene soil data results can be found in **Attachment G-1**, enclosed.
>
> In general, the benzene analytical results from the 2019 sampling were lower than the

benzene analytical results from the 2012/2013 sampling event. One exception is 37 feet below ground surface (bgs) at the GP-18 / PD-11 sampling locations. See **Figure 6.a**, enclosed, for the locations of the "GP" borings performed in 2012/2013 with respect to the locations of the "PD" borings performed in 2019.

IEPA Original Condition 7.c – *The vertical extent of groundwater contamination at sampling locations PD-03, PD- 07 and PD-17 must be delineated. The field sampling was ended prematurely.*

According to Table 6 of Attachment A, the following benzene concentrations were reported: PD-3 was 1,200 mg/L at 71 ft bgs; PD-7 was 1,400 mg/L at 55 ft bgs; and PD-17 was 2,200 mg/L at 50 ft bgs when groundwater sampling stopped at the respective borings. New borings should be installed adjacent to these locations and benzene concentration in groundwater delineated vertically until the appropriate standards are met.

IEPA Additional Request – Provide a figure showing the "PD" locations performed during the Pre-Design Investigation as well as the Pre-SEE drilling and sampling locations for ease of reference during submittal review.

Shell Additional Response – Additional groundwater profiling near PD-03, PD-07 and PD-17 will be conducted during installation activities of the SEE system and steam vapor points (SVPs). Profiling will be performed in the SVP boring nearest to PD-03, and in the steam injection/extraction boring nearest to PD-07. Profiling will be performed in a boring to be located approximately halfway between PD-06 and PD-17 (refer to Shell Responses to Conditions 7.g and 7.h). See **Figure 6.a**, enclosed, for the "PD" locations with respect to the proposed Pre-SEE sampling locations.

IEPA Original Condition 7.d – *Attachment A, Figure 2: The underground water line depicted on Figure 2, has the potential to be a preferential pathway for vapors. The location and elevation of any underground lines along Eighth Street must be provided, and a demonstration provided on how these are not a concern or how they will be addressed.*

IEPA Additional Request – Provide further information regarding the SEE System with respect to underground utility lines as discussed.

Shell Additional Response – The vertical distance from any steam injection point to an underground utility is at least 25 feet or greater. Vertically, the extraction wells will be located between the injection points and the depth of any underground utilities. The extraction wells have a radius of capture of about 70 feet. The increased temperatures from steam injection are expected to dissipate within about 15-20 feet of the injection points. Temperature sensors are being installed throughout the target treatment areas (both horizontally and vertically) to monitor temperatures. The monitoring to be performed along East 8th Street at the SVP locations will also serve as vapor monitoring near underground utilities (the primary row of SVPs is located near underground utilities.

IEPA Original Condition 7.g – *Attachment A, Appendix H: No groundwater samples were collected at PD-06, PD-10, PD-15, or PD-16. However, PD-06-, PD-09, and PD-16 had a dyeLIF response. Therefore, new samples must be collected for groundwater delineation at PD-06, PD-09, and PD-16.*

IEPA Additional Request – Provide a figure showing the "PD" locations performed during the Pre-Design Investigation as well as the Pre-SEE drilling and sampling locations for ease of reference during submittal review. Provide additional information (including figures) regarding not proposing additional groundwater profiling at PD-16 at this time. In an email dated January 26, 2023, it was requested that Figure 5B from Attachment A (*Public Works Yard Predesign Investigation Report*) of the January 31, 2022, *Public Works Yard Steam Enhanced Extraction Work Plan* be updated to include all the data for the "GP" locations.

Shell Additional Response – Additional groundwater profiling near PD-06 will be conducted during installation of the SEE system. Profiling will be performed in a boring to be located approximately halfway between PD-06 and PD-17. Groundwater profiling at PD-09 was extended to a depth of 80 feet bgs, where benzene was detected at 0.025 mg/L; therefore, no further profiling will be performed with respect to this location. See **Figure 6.a**, enclosed, for the "PD" locations with respect to the proposed Pre-SEE sampling locations.

Additional groundwater profile is not proposed at PD-16 at this time. Groundwater profiling was performed to a depth of 80 feet bgs at locations to the north (PD-05), southwest (PD-08) and southeast (PD-09) during the 2019 Predesign Investigation activities. The benzene analytical results at 80 feet bgs at the surrounding borings are summarized below. PD-16 is also located within the footprint of the target treatment Area A and will be remediated by the SEE system.

LOCATION	Benzene @ 80 feet bgs (mg/L)
PD-05	0.18
PD-08	0.27
PD-09	0.025

Figure 9 (Benzene Groundwater Analytical Results) from Attachment A (*Public Works Yard Predesign Investigation Report*) of the January 31, 2022, *Public Works Yard Steam Enhanced Extraction Work Plan* is enclosed as **Attachment K** and shows all the groundwater profiling benzene results from the 2019 investigation. Also included in **Attachment K** for purposes of completeness is Figure 8 (Benzene Soil Analytical Results) from the same attachment in the same Work Plan.

Figure 5.b from Attachment A (*Public Works Yard Predesign Investigation Report*) of the January 31, 2022, *Public Works Yard Steam Enhanced Extraction Work Plan* did include the VOC data for the "GP" locations; however, the locations were mislabeled as GP-15A through GP-18A. The figure has been corrected with the correct "GP" location labels and has been updated to also include the PID data for those locations. This revised figure is included in **Attachment J (rev.1)**.

Copies of this submittal have been electronically sent directly to Amy Butler and Visal Poornaka. A copy of this submittal is also being electronically sent directly to Collinsville FOS (attention Ali Al-Janabi).

If you have any questions during your review, please contact Buddy Bealer, SOPUS Principal Program Manager, at leroy.bealer@shell.com (484-632-79556), or Wendy Pennington at wendy.pennington@aecom.com (314-452-8929).

Sincerely,

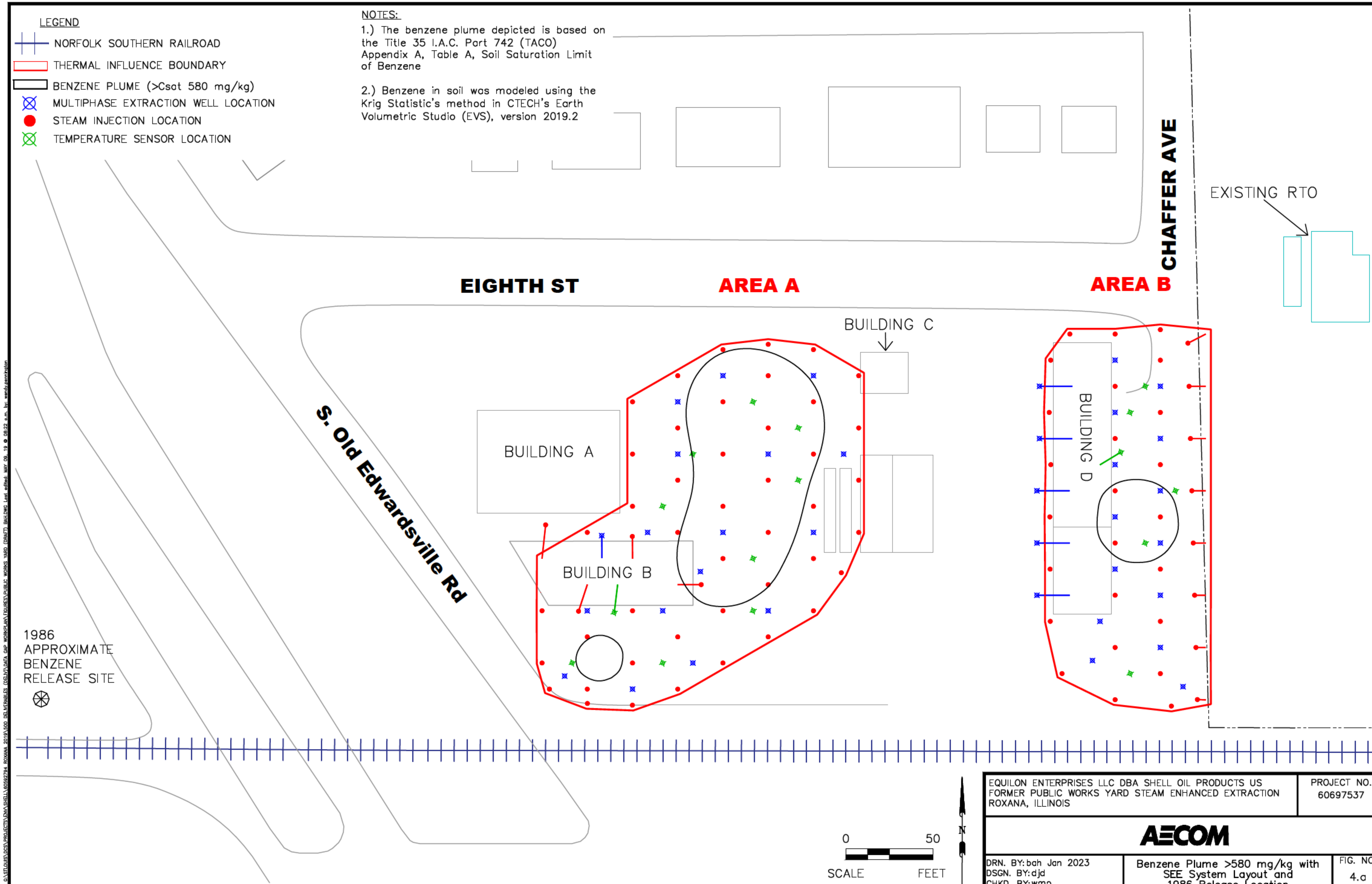
Brett Howell, PG Geologist	Samuel Fisher, CHMM Environmental Scientist	Wendy Pennington, PE Program Manager

Enclosures:
- **Figure 4.a** Benzene Plume >580 mg/kg with SEE System Layout and 1986 Release Location
- **Attachment G-1** Comparison of Benzene Soil Analytical Results – 2012/2013 ("GP" Locations) and 2019 ("PD" Locations)
- **Figure 6.a** Soil Gas, Soil, and Groundwater Sampling Locations – Pre-SEE (Including Previously Sampled Locations)
- **Attachment K** Figures 8 and 9 from Attachment A (*Public Works Yard Predesign Investigation Report*) of the January 31, 2022, *Public Works Yard Steam Enhanced Extraction Work Plan*
- **Attachment J (rev.1)** Corrected Figure 5.b from 2019 Predesign Investigation

cc: Buddy Bealer, Shell
Amy Butler, IEPA, Springfield
Visal Poornaka, IEPA Springfield
Ali Al-Janabi - FOS, IEPA, Collinsville
Greg Mollett, Greensfelder, Hemker & Gale P.C.
Repositories – Roxana Public Library, website
Project File

Figure 4.a

Benzene Plume >580 mg/kg with SEE System Layout and 1986 Release Location


LEGEND
NORFOLK SOUTHERN RAILROAD
THERMAL INFLUENCE BOUNDARY
BENZENE PLUME (>Csat 580 mg/kg)
MULTIPHASE EXTRACTION WELL LOCATION
STEAM INJECTION LOCATION
TEMPERATURE SENSOR LOCATION
NOTES:
1.) The benzene plume depicted is based on the Title 35 I.A.C. Part 742 (TACO) Appendix A, Table A, Soil Saturation Limit of Benzene
2.) Benzene in soil was modeled using the Krig Statistic's method in CTECH's Earth Volumetric Studio (EVS), version 2019.2
EIGHTH ST
AREA A
AREA B
CHAFFER AVE
EXISTING RTO
BUILDING A
BUILDING B
BUILDING C
BUILDING D
S. Old Edwardsville Rd
1986 APPROXIMATE BENZENE RELEASE SITE
0
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SCALE
FEET
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EQUILON ENTERPRISES LLC DBA SHELL OIL PRODUCTS US
FORMER PUBLIC WORKS YARD STEAM ENHANCED EXTRACTION
ROXANA, ILLINOIS

PROJECT NO. 60697537

AECOM

DRN. BY: bah Jan 2023
DSGN. BY: djd
CHKD. BY: wmp

Benzene Plume >580 mg/kg with SEE System Layout and 1986 Release Location

FIG. NO. 4.a

Attachment G-1

Comparison of Benzene Soil Analytical Results - 2012/2013 ("GP" Locations) and 2019 ("PD" Locations)

ATTACHMENT G-1
COMPARISON OF BENZENE SOIL ANALYTICAL RESULTS
2012/2013 ("GP" Locations) and 2019 ("PD" Locations)

GP-15		PD-08		GP-16		PD-09		GP-17		PD-10		GP-18		PD-11	
Sample Depth (ft bgs)	Benzene (mg/kg)	Benzene (mg/kg)	Sample Depth (ft bgs)	Sample Depth (ft bgs)	Benzene (mg/kg)	Benzene (mg/kg)	Sample Depth (ft bgs)	Sample Depth (ft bgs)	Benzene (mg/kg)	Benzene (mg/kg)	Sample Depth (ft bgs)	Sample Depth (ft bgs)	Benzene (mg/kg)	Benzene (mg/kg)	Sample Depth (ft bgs)
37	974 / 1150	110 / 86	37			0.036	41	15	154 / 391			37	453	740	37
		2300	40	42	476					<0.0254	19			29	45
47	283					43	43			0.0118	46	53	668		
		<5.4	51	51	25			45	1560					15	57
55	194					240 / 260	54	57	178					8.9	61
		0.14	62	57	431 / 473			65	15.4			63	67.8		
74	3.97			77	2.81										
89	0.483			91	0.0488										

Figure 6.a

Soil Gas, Soil, and Groundwater Sampling Locations - Pre-SEE (Including Previously Sampled Locations)

LEGEND

- NORFOLK SOUTHERN RAILROAD
- THERMAL INFLUENCE BOUNDARY
- GROUNDWATER SAMPLING LOCATION
- SOIL SAMPLING LOCATION
- SOIL GAS SAMPLING LOCATION
- 2019 PREDESIGN INVESTIGATION LOCATION
- 2012–2013 SOIL SAMPLE LOCATION

NOTES:

1.) SVP–07 and SVP–08 borings will be sampled for groundwater to a depth of approx. 80 ft bgs before installation.

2.) The SVP locations will be soil sampled during installation.

3.) Some locations will be sampled for multiple media types. Such locations have multiple labels that are color–coded according to the legend to indicate media type.

4.) Locations depicted here will be sampled prior to the start of SEE operation.

CHAFFER AVE

EIGHTH ST

S. Old Edwardsville Rd

SVP-08 SVP-09 SVP-10 SVP-11 SVP-12 SVP-13 SVP-14 SVP-07

SVP-01 SVP-02 SVP-03 SVP-04 SVP-05 SVP-06

PD–12 PD–1 PD–13 PD–14 PD–2 PD–3 PD–6 PD–7 PD–4 PD–15 PD–5 PD–16 PD–17 PD–8 PD–9 PD–19 PD–10 PD–11

SB-101 SB-102 GWP-101

GP–15 GP–16 GP–17 GP–18

SI-AA3 SI-AA1 SI-AB1 SI-AC4 SI-AD6 SI-AD4 SI-AE6 SI-AD2 SI-AE1 SI-AH5 SI-AI7 SI-AG3 SI-AJ6 SI-BG1 SI-BI4 SI-BG2 SI-BG4 SI-BE2 SI-BD2 SI-BE4 SI-BB1

X-AB4 X-AA2 X-AC5 X-AB1 X-AD5 X-AC3 X-AE4 X-AF6 X-AG7 X-AF4 X-AF3 X-AH7 X-AG5 X-AH5 X-AJ8 X-AI6 X-BH2 X-BG1 X-BH3 X-BG2 X-BF1 X-BG3 X-BF2 X-BE1 X-BF3 X-BE2 X-BD1 X-BE3 X-BD2 X-BC1 X-BD3 X-BC2 X-BC3 X-BB2 X-BB3

1986 APPROXIMATE BENZENE RELEASE SITE

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EQUILON ENTERPRISES LLC DBA SHELL OIL PRODUCTS US FORMER PUBLIC WORKS YARD STEAM ENHANCED EXTRACTION ROXANA, ILLINOIS		PROJECT NO. 60697537
AECOM		
DRN. BY: bah Jan 2023 DSGN. BY: djd CHKD. BY: wmp	Soil Gas, Soil, and Groundwater Sampling Locations – Pre SEE (Including Previously Sampled Locations)	FIG. NO. 6a

Attachment K

Figure 8 and 9 from Attachment A (*Public Works Yard Predesign Investigation Report*) of the January 31, 2022, *Public Works Yard Steam Enhanced Extraction Work Plan*

LEGEND

- INVESTIGATION LOCATIONS
- INVESTIGATION LOCATIONS WITHOUT SOIL BORING

NOTES:

1) CPT/DYE LIF PLUS SOIL BORING AND/OR GROUNDWATER PROFILE WERE PERFORMED AT INVESTIGATION LOCATIONS.
2) REFER TO TABLE 1 FOR APPLICABLE LABORATORY/AECOM QUALIFIERS
3) * INDICATES A DUPLICATE SAMPLE

Location	Sample Depth (bgs)	Benzene Result (mg/kg)
PD-14	45 ft	290
	49 ft	23000
	*49 ft	*13000
	55 ft	10

Location	Sample Depth (bgs)	Benzene Result (mg/kg)
PD-02	50 ft	120
	52 ft	150
	60 ft	38
	*60 ft	*23

Location	Sample Depth (bgs)	Benzene Result (mg/kg)
PD-12	52 ft	11 F1 J
	55 ft	79
	59 ft	0.51

Location	Sample Depth (bgs)	Benzene Result (mg/kg)
PD-06	45 ft	19
	46 ft	120
	51 ft	70
	54 ft	8.1
	63 ft	2.3

Location	Sample Depth (bgs)	Benzene Result (mg/kg)
PD-01	53 ft	2.31
	55 ft	1.58

Location	Sample Depth (bgs)	Benzene Result (mg/kg)
PD-07	27 ft	0.0022 J
	43 ft	0.054 J
	51 ft	5200
	*51 ft	*5000

Location	Sample Depth (bgs)	Benzene Result (mg/kg)
PD-04	35 ft	0.005
	41 ft	0.092
	53 ft	320

Location	Sample Depth (bgs)	Benzene Result (mg/kg)
PD-17	45 ft	6.5
	55 ft	32

Location	Sample Depth (bgs)	Benzene Result (mg/kg)
PD-10	19 ft	<0.0254
	46 ft	0.0118

Location	Sample Depth (bgs)	Benzene Result (mg/kg)
PD-05	17 ft	0.001 J
	43 ft	7380
	53 ft	982
	62 ft	4.15

Location	Sample Depth (bgs)	Benzene Result (mg/kg)
PD-11	37 ft	740
	45 ft	29
	57 ft	15
	61 ft	8.9

Location	Sample Depth (bgs)	Benzene Result (mg/kg)
PD-08	37 ft	110
	*37 ft	*86
	40 ft	2300
	51 ft	<5.4
	62 ft	0.14

Location	Sample Depth (bgs)	Benzene Result (mg/kg)
PD-09	41 ft	0.036
	43 ft	43
	54 ft	240
	*54 ft	*260

PD-12, PD-14, PD-02, PD-03, PD-01, PD-13, PD-04, PD-15, PD-05, PD-16, PD-08, PD-09, PD-06, PD-07, PD-17, PD-19, PD-10, PD-11

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SCALE FEET

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PUBLIC WORKS YARD
PREDESIGN INVESTIGATION
ROXANA, ILLINOIS

PROJECT NO. 60592794

AECOM

DRN. BY: bah Oct 2019
DSGN. BY: djd
CHKD. BY: jc/b3

Benzene Soil Analytical Results

FIG. NO. 8

LEGEND
- INVESTIGATION LOCATIONS
- INVESTIGATION LOCATIONS WITHOUT GROUNDWATER SAMPLING

NOTES:
1) CPT/DYE LIF PLUS SOIL BORING AND/OR GROUNDWATER PROFILE WERE PERFORMED AT INVESTIGATION LOCATIONS.
2) REFER TO TABLE 3 FOR APPLICABLE LABORATORY/AECOM QUALIFIERS
3) * INDICATES A DUPLICATE SAMPLE

Location	Sample Depth (bgs)	Benzene Result (mg/L)
PD-12	35 ft	0.027
	45 ft	460
	50 ft	25
	55 ft	330
	60 ft	0.15
	70 ft	0.0052
	73 ft	0.0012

Location	Sample Depth (bgs)	Benzene Result (mg/L)
PD-01	34 ft	0.0022
	44 ft	1.08
	53 ft	114
	60 ft	0.856
	69 ft	0.0013
	75 ft	0.0025
	80 ft	0.0091

Location	Sample Depth (bgs)	Benzene Result (mg/L)
PD-14	40 ft	230
	45 ft	2000
	50 ft	2300
	*50 ft	*2900
	53 ft	970
	60 ft	140
	70 ft	0.13
	78.5 ft	0.31

Location	Sample Depth (bgs)	Benzene Result (mg/L)
PD-02	44 ft	340
	50 ft	2500
	*50 ft	*1500
	59 ft	12
	65 ft	10
	70 ft	0.013
	74.5 ft	0.054

Location	Sample Depth (bgs)	Benzene Result (mg/L)
PD-03	45 ft	2.5
	50 ft	1200
	*50 ft	*1200
	55 ft	680
	60 ft	650
	65 ft	880
	71 ft	1200

Location	Sample Depth (bgs)	Benzene Result (mg/L)
PD-07	45 ft	0.4
	50 ft	500
	*50 ft	*380
	55 ft	1400

Location	Sample Depth (bgs)	Benzene Result (mg/L)
PD-13	40 ft	0.00043 J
	46 ft	0.0021
	50 ft	0.00093 J
	59 ft	<0.001
	65 ft	0.0026
	70 ft	0.00047 J
	80 ft	<0.001

Location	Sample Depth (bgs)	Benzene Result (mg/L)
PD-09	35 ft	1.4
	40 ft	1100
	45 ft	340
	54 ft	20
	60 ft	0.89
	70 ft	3.1
	*70 ft	*13
	80 ft	0.025

Location	Sample Depth (bgs)	Benzene Result (mg/L)
PD-04	35 ft	0.0063
	41 ft	67
	43 ft	0.3
	50 ft	2.3
	53 ft	290
	60 ft	0.039
	70 ft	0.0076
	*70 ft	*0.0078
	80 ft	0.0036

Location	Sample Depth (bgs)	Benzene Result (mg/L)
PD-11	35 ft	0.018
	37 ft	1.4
	43 ft	2500
	*43 ft	*2400
	50 ft	1.9
	56 ft	1.2
	60 ft	200
	66.7 ft	0.29

Location	Sample Depth (bgs)	Benzene Result (mg/L)
PD-05	42 ft	1990 J
	*42 ft	*1910 S J
	48 ft	226 J
	54 ft	0.455
	62 ft	0.195
	70 ft	0.184
	80 ft	0.18

Location	Sample Depth (bgs)	Benzene Result (mg/L)
PD-08	35 ft	810
	41 ft	4.9
	46 ft	0.086
	52 ft	0.014
	57 ft	0.011
	62 ft	0.02
	70 ft	0.12
	80 ft	0.27

Location	Sample Depth (bgs)	Benzene Result (mg/L)
PD-17	45 ft	180
	50 ft	1600
	*50 ft	*2200

PD-12, PD-01, PD-14, PD-02, PD-03, PD-13, PD-06, PD-07, PD-04, PD-15, PD-05, PD-16, PD-17, PD-19, PD-08, PD-09, PD-10, PD-11

SCALE 0 40 FEET

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PUBLIC WORKS YARD
PREDESIGN INVESTIGATION
ROXANA, ILLINOIS

PROJECT NO. 60592794

AECOM

DRN. BY: bah Oct 2019
DSGN. BY: djd
CHKD. BY: jc/bs

Benzene Groundwater Analytical Results

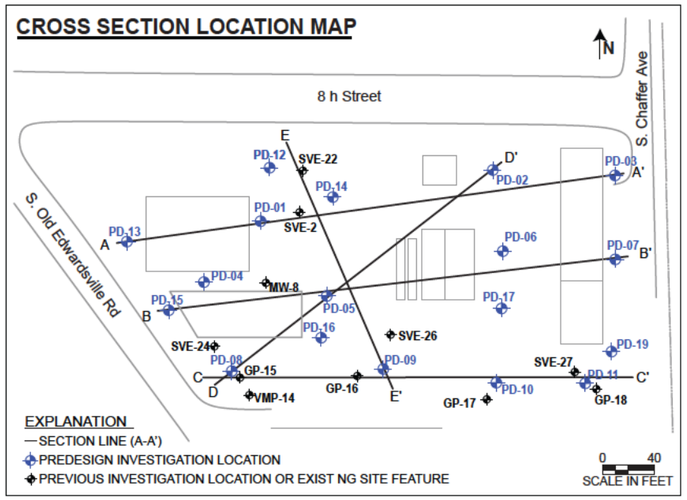
FIG. NO. 9

G:\StLouis\DCS\Projects\ENVISHELL\60592794 Roxana 2019\500 Deliverables (DELIV)\Data Gap Workplan\Draft Predesign Investigation\Figures\Public Works Yard (Fig 9 - FINAL) 102819.dwg — 10/23/2019

Attachment J (rev.1)

Corrected Figure 5.b from 2019 Predesign Investigation

CROSS SECTION LOCATION MAP



EXPLANATION

Lithology

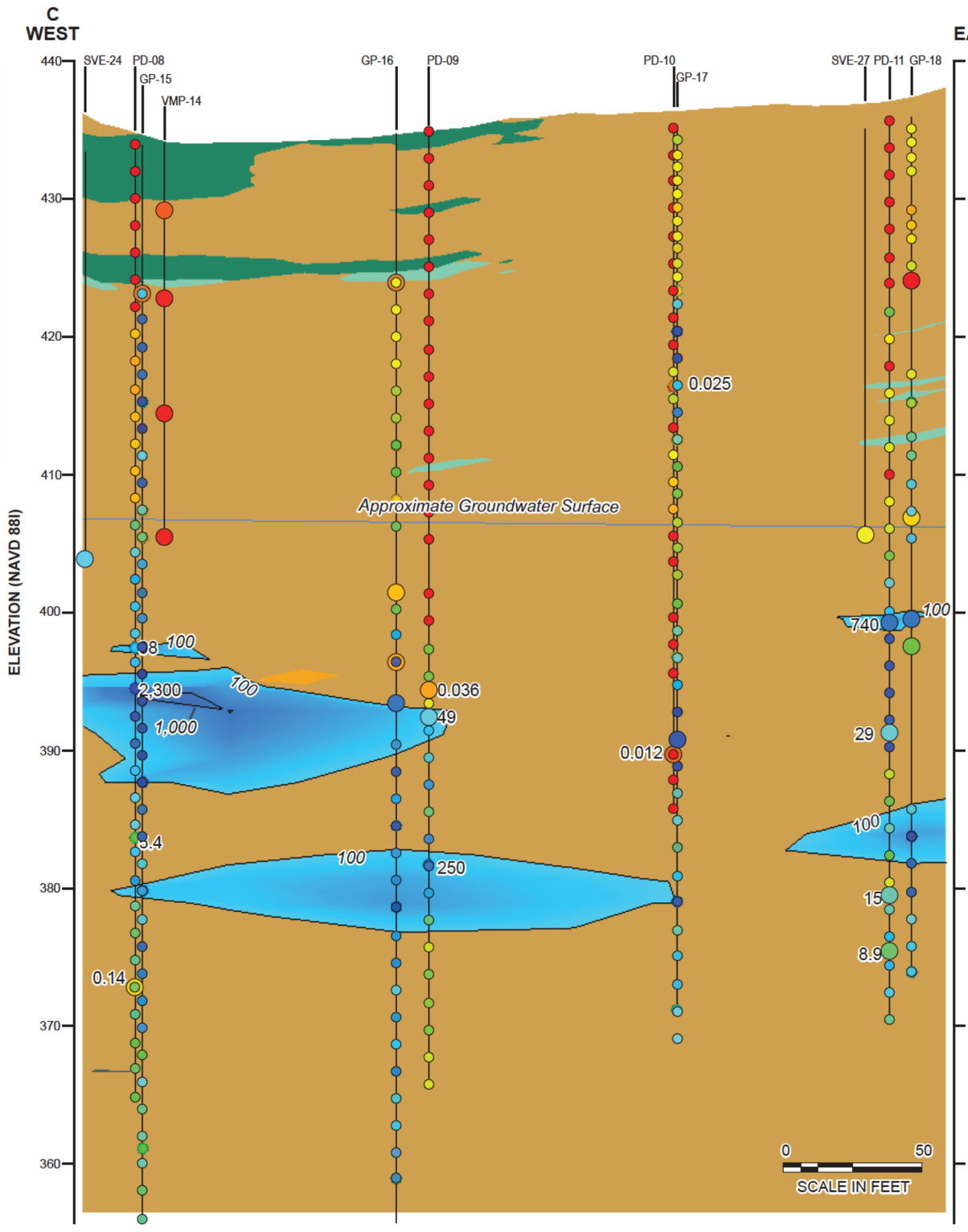
- Sand and Silty Sand
- Sand
- Silty Sand and Sandy Silt
- Clay and Silty Clay

Benzene in Soil (mg/kg)

23,000
10,000
3,000
1,000
300
100
30
10
3
1
0.3
0.1
0.03
0.01

PID Reading (ppm)

>15,000
10,000
3,000
1,000
300
100
30
10
3
1
0.3
0.1
0.03
0.01
0.003
0.001



NOTES

NAVD 88	North American Vertical Datum
mg/kg	milligrams per kilogram
PID	photoionization detector
>	greater than
ppm	parts per million

1. Lithology and concentrations of benzene in soil were modeled using CTECH's Earth Volumetric Studio (EVS), version 2019.2;
2. Contour lines are in orders of magnitude, starting at 100 mg/kg.
3. Modeled lithology is based on CPT data collected at 18 locations on June 10 - June 20, 2019, except the upper 10 feet, which was based on hand auger logs.
4. Benzene in soil was modeled using EVS' Krig Statistics method. The dataset includes historical and predesign concentrations of benzene in soil at the site (larger dots represent analytical results).
5. PID data are represented by small, unlabeled dots.
6. Locations within 15 feet were projected onto the cross section line.
7. The approximate groundwater surface was modeled using gauging data from the 3Q19 Roxana Interim Groundwater Monitoring Program.

PUBLIC WORKS YARD PREDESIGN INVESTIGATION ROXANA, ILLINOIS	PROJECT NO. 60697537
AECOM	
CROSS SECTION C-C' BENZENE IN SOIL	FIG. NO. 5B (rev1)